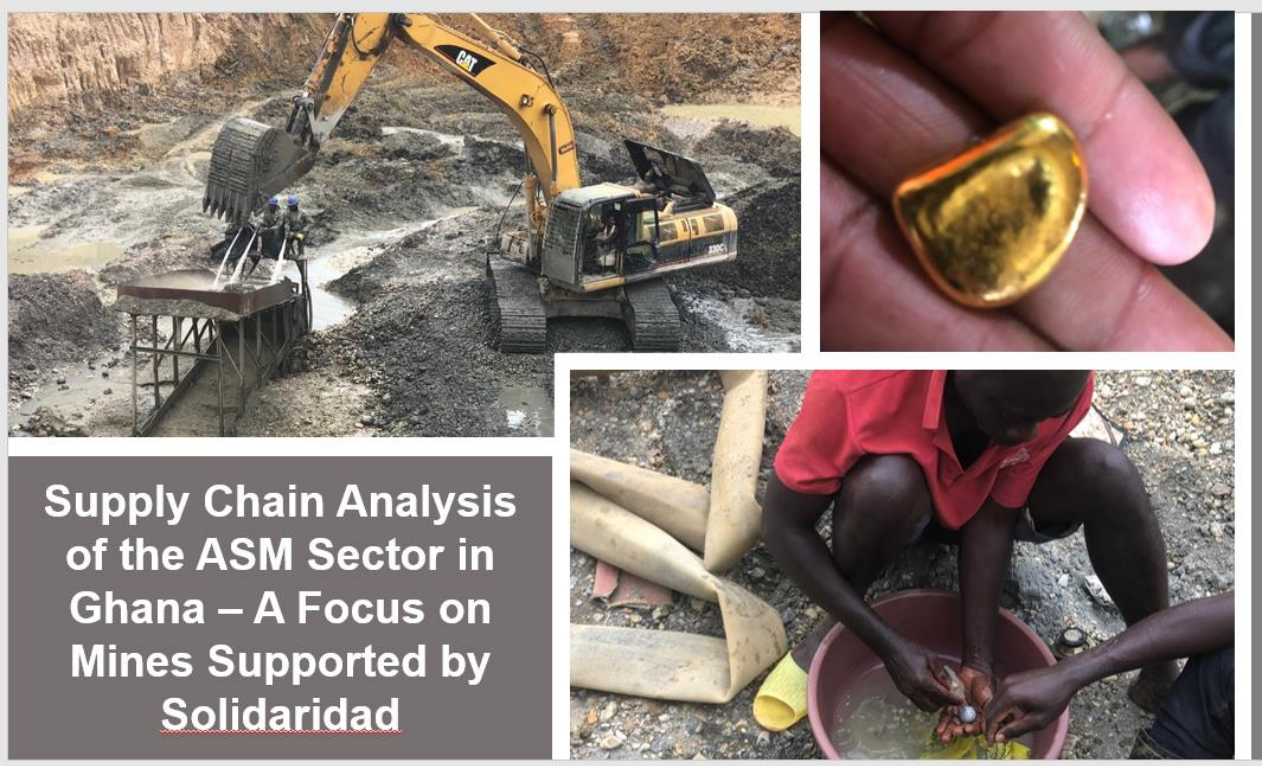
ALLIANCE FOR
RESPONSIBLE MINING

Solidaridad

ANALYSIS REPORT



FINAL REPORT

Submitted by David Johnson
October, 2020

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GLOSSARY OF TERMS AND ABBREVIATIONS

ARM	Alliance for Responsible Mining
ASM	Artisanal and Small-scale Mining
CRAFT	Code for Risk mitigation for ASM engaging in Formal Trade
DDG	Due Diligence Guidance for Responsible Mineral Supply Chains
GASMFP	Ghana ASM Formalization Project
GCR	Gold Coast Refinery
GEPA	Ghana Export Promotion Authority
GGL	Goldridge Ghana Limited
GIPC	Ghana Investment Promotion Centre
GNASSM	Ghana National Association of Small-Scale Miners
GRA	Ghana Revenue Authority
GSA	Ghana Standards Authority
HG	Hibridge Group
LSM	Large Scale Mining
MinCom	Minerals Commission
MSM	Medium-Scale Mining
MLNR	Ministry of Land and Natural Resources
MMIP	Multi-sectoral Mining Integrated Project
NACOB	Narcotics Control Board
NHIS	National Health Insurance Scheme
OBG	Oxford Business Group
OECD	Organization for Economic Cooperation and Development
PMMC	Precious Minerals Marketing Company
SOE	State-Owned Enterprise
TOR	Terms of Reference
UMaT	University of Mines and Technology
WiM	Women in Mining

EXECUTIVE SUMMARY

This supply chain analysis was commissioned by the Alliance for Responsible Mining (ARM), as part of a broader study into the Artisanal Small-scale Mining (ASM) sector in Ghana commissioned by Solidaridad, ultimately aimed at promoting responsible mining in the sector and facilitating formal trade through the introduction and implementation of risk mitigation and due diligence principles into the sector's operations and trade. Specifically, this is to provide a reasonable basis for the creation of supply chains that will be compliant with the Code for Risk mitigation for ASM engaging in Formal Trade (CRAFT).

The project analyzed the chain of gold trading in the ASM sector, from mine to export, focusing primarily on the mines supported by Solidaridad, as per the terms of reference (TOR) for the project. It identified the various players in the ASM supply chain, their respective roles, and the dynamics and nuances of the gold trade in Ghana.

Given the role and impact of regulations on the ASM sector, this assignment looked at applicable regulations, including the various legal and regulatory frameworks that could support, or potentially pose a challenge to the adoption of CRAFT.

The assignment involved engagements with key stakeholders in Accra and field visits to Solidaridad-supported mines in the Western and Ashanti Regions of Ghana. The mines have been the subject of earlier investigations and analysis by ARM, which determined their readiness and preparedness for CRAFT adoption. To situate the project within the broader ASM context, focus group discussions and interviews (structured and semi-structured) were held with local miners, mine owners, different categories of gold dealers, an academic, regulatory agencies, exporters, and other mines not supported by Solidaridad. Observations were also made, particularly during mine visits.

At the end of the project it was realized that, at one end of the spectrum, the supply chain of the ASM sector could be a simple one-step process, where the ASM miner is also the holder of an export license, and is able to go through a relatively straight-forward administrative process to export gold. With such a chain, it is relatively easier to trace the origin of gold, down to the mine and even the pit where the gold is produced.

At the other end, the chain could be a complex multi-link process, involving different miners, mine locations, and several traders in any given transaction. In such trade networks, providing assurance for the source of gold and the mining practices involved in the gold production is much more difficult and complex, and would require a robust traceability system.

Between the two ends of the spectrum, though, there are varying layers and degrees of complexity in the supply chain of gold, depending on the demand and supply dynamics and the number of players within the chain.

This project outlines the potential challenges with the introduction of CRAFT, as well as opportunities that could be harnessed to ensure a successful implementation of the framework. It recommends a phased approach to CRAFT adoption and suggests concrete steps for implementation. It also proposes key action points that need to be considered for a more sustainable CRAFT-aligned ASM sector.

SECTION ONE – INTRODUCTION

1.1 Context

The Artisanal and Small-scale Mining (ASM) sector in Ghana, even though has been in existence for centuries, only received legal recognition in 1989 with the promulgation of the Small-Scale Mining Act. The Act sets out the processes for the acquisition of a small-scale mining license and outlines the legal framework for the regulation of ASM activities. Since then, however, the scale and complexity of small-scale mining operations have grown immensely over time, leading to a debate as to whether the existing legal framework is adequate to effectively regulate the sector. Indeed, some have strongly argued that, owing to the evolution and increasing sophistication of the sector, there needs to be a holistic review and re-categorization of ASM, to allow for the creation of a medium-scale mining (MSM) sector with its associated fit-for-purpose regulations.

Various information sources and statistics confirm that the ASM sector's contribution to Ghana's total gold production has increased steadily since its legalization and record keeping. According to the World Bank, the sector's contribution has increased from 5% in the 1990s, to 11% in the 2000s, and 30% in the 2010s. Officially, the sector is currently believed to contribute about 35% to Ghana's annual total gold production. This percentage is, however, disputed by major stakeholders in the sector, who strongly argue that small-scale mines produce as much as their large-scale counterparts, if not more.

With an increase in production from the ASM sector, however, comes the problematic issues of environmental and social impacts, which have been a subject of intense public discourse, particularly in the past few years. ASM operations, their impact, contribution, and regulations, have been a sensitive political issue, particularly between the leading political parties, as well as traditional leaders and advocates. It is quite clear, though, that a thorough and meaningful assessment of the sector cannot be done without looking at the legal and regulatory framework that governs it.

While large scale mines are first given exploration or prospecting licenses, and subsequently granted mining licenses after successful exploration, small-scale mines, on the other hand, are provided with mining licenses at the outset. Most small-scale mines, therefore, bypass the exploration phase, which would otherwise have helped to focus mining activities on defined and proven ore-bearing areas. In determining areas to mine, ASMs are sometimes guided by historical and other non-scientific information, with little regard for proper mine planning, pit design, modeling, sequencing, etc. Unfortunately, this approach to mining, particularly the absence of exploration data, leaves much larger environmental footprints than otherwise would have been required if the mining were based on empirical exploration data. It is worth stating, though, that the Minerals Commission (MinCom) is considering carrying out preliminary exploration of all potential mining sites before issuing mining licenses to ASMs, in an effort to address the trial and error approach.

1.2 Responsible small-scale mining

In response to environmental and other concerns, the ruling New Patriotic Party (NPP) government, on assumption of political office in January 2017, immediately instituted a ban on small-scale mining activities, with the intent to sanitize the sector and reduce its environmental impact. The ban was initially expected to last the first few months but was extended severally until December 2018 when it was eventually lifted. During the period of the ban, the Multi-sectoral Mining Integrated Project (MMIP) was developed, with support from the World Bank, and in consultation with key mining sector stakeholders. The MMIP was designed to clean up the sector, introduce livelihood enhancement,

promote formalization, and ensure good environmental governance. According to the Oxford Business Group (OBG), "Through improving environmental protection and overall regulation, the reforms should boost Ghana's reputation as an ethical supplier of gold and minerals on an increasingly demanding global market. By tackling illegal and informal mining activities, and encouraging small scale miners to obtain licences, the government also hopes to raise its income from the segment."

The rational for the ban continues to be a subject of much debate, as illegal mining is widely known to exist, and environmental degradation ongoing.

Currently, very few small-scale mines, particularly those under Solidaridad's programme and the government's model mining programme, take up meaningful environmental stewardship. The sheer number of small-scale mines scattered across mining districts, the remote location of mining concessions, and the lack of resources, make it difficult for the regulator, Minerals Commission, and other official monitoring agencies (such as the small-scale mine committees located in mining districts) to effectively monitor the operations of ASMs and ensure compliance with existing laws and regulations on environmental management.

With the prevailing condition, the introduction of a responsible mining framework, such as CRAFT, will not only help individual mines, but also complement government's effort at building a legal small-scale mining industry and supply chain, increase national revenue from the sector, and boost the profile of the country as a preferred destination for ethical ASM gold.

1.3 Background to the study

The Alliance for Responsible Mining (ARM), as part of its objective of transforming the ASM sector into a socially and environmentally responsible activity, while improving the quality of life of artisanal miners, their families and communities, has developed a strategy of connecting miners with formal and fair supply chains. An underlying principle of this strategy is to engage ASMs for them to progressively appreciate and adopt risk-mitigation and good practices in mineral production, in exchange for improved market deals. In pursuant of this, ARM, together with Resolve, and with the participation of a multiplicity of stakeholders, including Solidaridad, developed a Code of Risk-mitigation for ASM engaging in Formal Trade (CRAFT). The CRAFT framework is a tool for ASMs to demonstrate eligibility to sell minerals –including gold-, and for the industry to source them in compliance with the Organisation for Economic Cooperation and Development (OECD) Due Diligence Guidance (DDG) for Responsible Mineral Supply Chains and legislations derived from DDG. CRAFT is further intended to be responsive to reputational challenges of responsible supply chains.

Solidaridad, in partnership with ARM intends to introduce a CRAFT framework in Ghana, particularly for the small-scale mines that it supports. ARM has already carried out a study of the individual mines supported by Solidaridad and analyzed their operations in relation to the CRAFT. This assignment (supply chain analysis) is meant to provide further information and guidelines for a successful CRAFT supply chain implementation in Ghana.

2.1 Objectives

The overall objective of this project was to identify the risks and opportunities, deterrent effects and incentives for the establishment of legal CRAFT-compliant supply chains in Ghana, focusing on mines supported by Solidaridad. The assignment is to help determine the official conditions to be able to trade in gold and understand the roles of the different players along the supply chain from the mining sites to the international markets.

To achieve the above stated objective, various players along the ASM supply chain were identified and mapped, from the national to the local and mine level. The stakeholders identified and targeted for the analysis included regulators, industry associations, gold traders, gold exporters, gold miners, and employees of mines. A full list is provided as an Appendix (1).

2.2 Methodology

The analysis involved desktop reviews, 28 structured and semi-structured interviews, two focus group discussions, and observations at two mines. Desktop reviews provided useful information on the existing regulations, policies, and developments within the sector, particularly the successes and challenges associated with the introduction of different policies and interventions. The structured and semi-structured interviews allowed respondents to address specific questions, while also providing the needed context for more thorough understanding of key issues. This was particularly important in appreciating the relative successes or otherwise of specific interventions in different mining jurisdictions. The focus group discussions were deployed in engaging the miners and mine management, proving helpful in bringing forth valuable information for the purpose of this assignment. Observations were carried out at mine sites, which then formed the basis for more in-depth probing and questioning.

2.3 Mission planning

Working off a stakeholder list, which was agreed with ARM and Solidaridad, interviews were scheduled with the respective stakeholders, nationally and at the local level (mine and district level), with the support and assistance of Solidaridad's local team. The interviews were planned to start at the national level during the first week of September, and then at the local level the week after, and back at the national level for a couple more days for fact-checking, clarifications, and alignment. A schedule of the interviews is provided as an Appendix (2).

Even though the initial intention was to separately interview the Customs Division of the GRA and the Bank of Ghana, it was realized, through interviews with the other stakeholders (PMMC and MinCom), that the involvement of these institutions in the supply chain was minimal. PMMC and MinCom also provided information on the role of these institutions in the chain, rendering separate interviews with them redundant.

Currently, local refineries are not actively involved in the ASM sector supply chain and were thus not actively included in the study. However, information was still obtained on the status and performance of refineries, especially with regards to the ASM sector and the potential of participation in CRAFT DDG and adoption.

SECTION TWO – ANALYSIS

"The first mine was a small scale mine, and the last mine to close will be a small-scale mine. The rest will find themselves in between."

Ishmael Quaicoe, Lecturer, UMaT

3.1 ASM sector overview

Whereas different terminologies may be assigned to different sizes of small-scale operations, ASM operations can be categorized broadly into three – artisanal, semi-mechanized, and fully mechanized operations.

Artisanal mining

Artisanal mining operations are the least sophisticated of the three, in terms of technical and organizational complexity. Artisanal mining involves individuals or groups of miners working on an open concession or in underground shafts (locally called "ghettos"). With limited capital to invest, a lot of these miners are sponsored, in the form of equipment, food, and other livelihood support, by would-be gold buyers and entrepreneurs. There is an established convention where these buyers/sponsors purchase the gold from the sponsored miners at a discount, as a means of maintaining goodwill and sustaining the support. Mined gold is also used as a means of payment to offset the sponsorship value over time. The equipment and technology used for such operations are usually locally made.

In terms of sales, there are different selling or purchasing arrangements for the ore mined by artisanal miners. Raw or unprocessed ore may be sold directly to a sponsor, after samples are taken and tested to estimate the quality and quantity of the gold. In some cases the sponsor may be a mill owner, who then undertakes the milling, processing (extraction), and sale of the gold to a local trader.

Mined ore may also be shared or split between the miner(s) and the sponsor, either equally or in three parts, with the miners retaining two parts, and the sponsor receiving one part, depending on a pre-determined sharing arrangement.

Artisanal miners also have the option of processing their ore. This is done through washing, panning, usually gold-mercury amalgamation (amalgam), burning/heating of the amalgam (to remove impurities), and smelting to remove even more impurities and end up with "pure" gold. Gold is usually exported in this form (after the smelting) for further refining at refineries. At any point in the processing stages, the miner may also decide to sell in whichever form to augment cash flow or meet other operational and personal commitments.

There are occasions where the amalgam gold (locally called "balls") is sold at the mine site (at a discounted price, locally termed "bush price") to a gold buying agent (bush buyer), or where the burnt/heated amalgam (sponge gold) is sold to a gold trader in the locality.

Gold-mercury amalgam

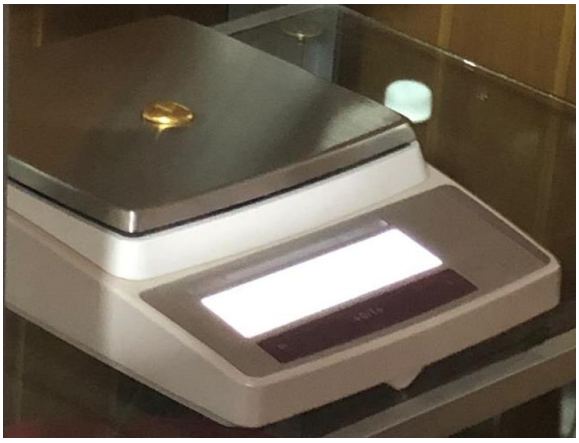
The bush buyer is usually funded by a local buyer who resides in the locality or major town. A bush buyer could act as “agent” for several local buyers. The price of the balls is negotiated between the miner and the buyer and is not directly pegged to the world gold price. This is because, at this point in the processing stage, the quantity and purity of amalgam gold cannot be scientifically determined. Amalgam gold is sold based on its weight. It is measured locally, using “matches,” “blade,” and “pound” as units of measurement.

Ten (10) matches make one (1) blade, and ten (10) blades make one (1) pound. One hundred and twenty-nine (129) pounds make one (1) kilo, even though amalgam gold is not usually sold in large volumes such as kilos. It must be emphasized, however, that amalgam gold contains mercury and other metals, and that the true weight and purity of the gold can only be determined after the mercury and other metals have been extracted, hence why its sale is not directly tied to the gold price.

Artisanal miners may trade their gold daily or weekly, depending on the volumes mined, the proximity of the mine to a selling point, or the cash-flow needs of the miner. The low-volume individual producers usually sell on a daily subsistence basis, in blades or in matches, while the larger volume producers trade their gold once a week, in pounds or kilos in a refined (smelted) state. Miners usually work six days a week and use their off days (locally called “breaking day” or “taboo day”) to trade their gold.

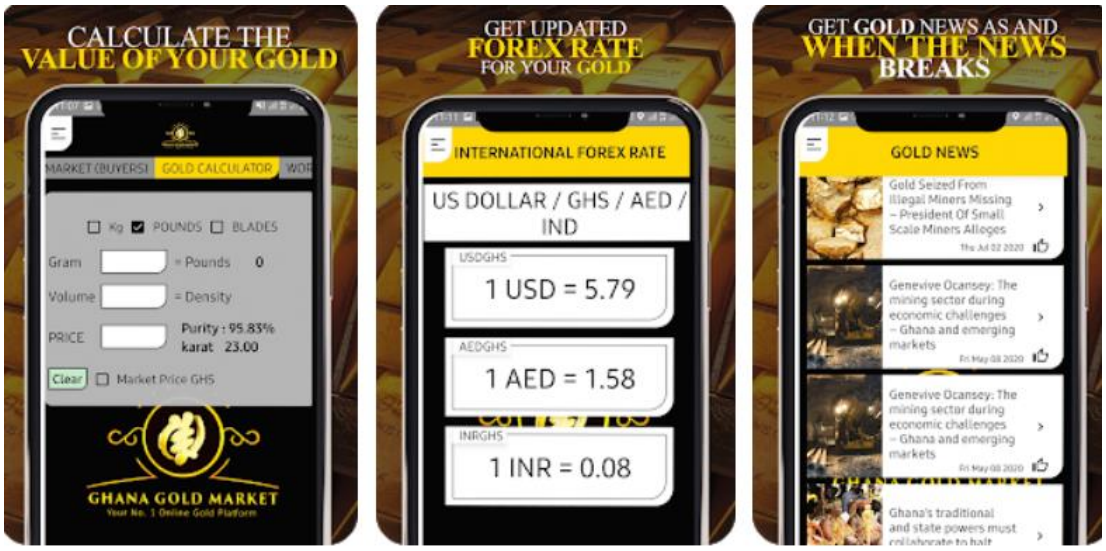
Apart from being sold as sponge gold or amalgam, gold may also be sold in a refined state, after smelting. Smelting involves burning at high temperatures, and subsequently dipping the gold in an acid solution to remove mercury and other metals. Due to the extremely high melting point of gold (higher than the mercury), the mercury evaporates during smelting, leaving the pure gold. However, this gold still contains other metallic impurities that are alloyed with the gold (silver, palladium, antimony, etc.), which is usually removed by dissolution in acids or cyanide, and electrolytic selection.

Once smelted, the gold is then placed on a gold water density testing machine, to determine its weight and volume. It is at this stage that the price is usually pegged to the world market price.



Water density testing device

If gold is to be sold after smelting, the weight and volume figures, as well as the proposed (buyer's) unit purchase price, are then fed into a software application (app) that was designed for gold dealers in Ghana by Ghana Gold Market. The app then automatically calculates the pounds, density, carat, and price of that piece of gold.



Ghana Gold Market software application interface

The miner or seller of a piece of gold is not obliged to sell to the first potential buyer. The gold trade is competitive, and traders or mines would typically shop around, bargain, and sell to the highest bidder.

Semi-mechanized ASM operation

This kind of operation employs a combination of mechanization and manual labour, and the production volumes are much higher than artisanal operations. The machinery and equipment may be imported (such as excavators) or locally manufactured (such as sluicing units). Semi-mechanized operations may be financed by financiers who may own the concessions, may be in partnership with concession owners, or may simply be entrepreneurs who invest in the mining operations.

Semi-mechanized operations mostly have both permanent salaried workers (paid monthly) and casual workers (paid daily, weekly, or as and when they work). The organizational structures are well defined, usually with the owner(s) having the complete and final say. Semi-mechanized operations typically

mine and carry out the gold-mercury amalgamation process –when used- on site. The heating of the amalgam and smelting are usually done remotely, mostly in a dedicated facility close to or within the premises of the owner. Such operations usually sell their gold in a smelted form.

In a competitive gold trading market, and with the London Bullion Market Association (LBMA) price as a guide, gold from these operations may be sold to a trader, agent (these terminologies will be explained later) or directly to an exporter. In some cases, the concession owner may have an export license, and will thus export directly to a foreign entity or refinery.

Fully mechanized ASM operation

Though not a common phenomenon in the ASM sector, there are a few fully mechanized ASM operations where almost the entire chain of mining activities is fully automated and mechanized, with higher production volumes and less labour. As expected, this requires heavy capital outlay and owners of such operations usually export directly. Though fully mechanized operations do not typically fit the traditional ASM definition (with large labour force, use of simple mining tools, etc.), in Ghana such sophisticated operations fall under the ASM legislative/regulatory framework, since they still do not meet the criteria to be classified as Large-Scale Mining operations. This is part of the reason why some industry experts have called for a further recategorization of the country's mining sector into Artisanal and Small-Scale Mining (ASM), Medium-Scale Mining (MSM), and Large-Scale Mining (LSM), with the fully mechanized ASM operations being re-classified as MSMs.

3.2 Solidaridad-supported ASMs

For this assignment, only mines supported by Solidaridad were visited, even though information on others was reviewed. Owners of the visited mines, management personnel, and other ancillary workers were interviewed for this project. There were also focus group discussions. A past executive of the **Ekom Ye Ya** Cooperative mine was also interviewed, who provided a historical account of the journey towards the formalization of the small-scale mining sector in Ghana. The specific mines that were used for this project were **Obeng, Agya Pa Ye, Solution,** and **Beaver** mines. Being all semi-mechanized, these mines exhibited the characteristics of the semi-mechanized operations described above. They were all involved in alluvial gold mining, and adhered to the following process:

Simplified alluvial gold extraction and processing

The mines employ 30 to 40 permanent employees each, with some having over 300 casual workers. Interestingly, while some of them pay their permanent employees monthly, and casual workers daily or weekly, at least one mine, Beaver, had a different payment arrangement. Permanent employees are rather paid weekly, while casual workers are paid a fixed monthly allowance. The reason for the

monthly payment for the casual workers, it was explained, was to ensure that these workers remain punctual to work during the course of the month. The mine facilitates the workers' registration unto the National Health Insurance Scheme (NHIS), and they also earn monthly "bonus," depending on the mine's operational performance and an individual worker's output for that period.

The mines operate either four-hour back-to-back shifts, or eight-hour back-to-back shifts. While some of the mines (for example, Obeng and Egya Pa Ye) have dedicated agents who buy their gold, others (such as Beaver and Solution) shop around, after the weeks' production, seeking the best price.

In terms of sales, Egya Pa Ye and Obeng mines each has a dedicated buyer (major trader or aggregator) who offers a competitive price, based on the selling price at the time of sale. Even where another major trader is offering a slightly higher price, their dedicated trader is able to match that price. For these two mines, the relationship with the trader is of utmost importance.

With Beaver and Solutions mines, they usually sell to the highest bidder. Typically, they would call a few traders, ask for the going price, bargain, and sell to the highest bidder. Just like Egya Pa Ye and Obeng, Beaver and Solution mines are not sponsored, and so are not compelled to sell their gold to a particular buyer.

Regarding pricing, it worth mentioning that, even though the price is pegged to the LBMA price, in reality, the price is determined by the prevailing conditions at the time of sale (how much the major traders are willing to pay), and is usually at a discount of between 3% and 6% of LBMA price, which includes the operational, logistics, and other costs of the traders. The price is, thus, fixed by the major traders/aggregators.

Even though there are potential benefits to the miners, in terms of pricing, if the miners aggregate and sell their gold together, the process and logistics of coordinating the aggregation require time (away from their core mining activities) and financial resources. This is a disincentive for the miners who would rather focus on their mining activities since there is no shortage of off-takers.

The mines usually provide their own transportation for the gold, and this is not necessarily captured as an additional cost.

All the mines identified funding as a major challenge to their operations, and the ASM sector generally. It was understood that the banks consider ASM operations as risky ventures, compelling concession owners to fall on family, friends, and sometimes wealthy individuals/sponsors to raise funding for their capital-intensive operations. The mines unanimously agreed that the cost of acquiring/renting/leasing machinery (excavators) remains a significant barrier to their operations and expansion.

Obeng and Egya Pa Ye mines are financially stronger, and own their own equipment, while Beaver and Solution mines use a combination of owned and leased equipment. In relation to this, an equipment leasing scheme was being introduced where ASMs, through GNASSM, were to be given an opportunity to acquire excavators and pay over a period. Beaver mine expressed an interest in being part of this scheme. However, due to the unfavourable conditions being proposed by the leasing entity, negotiations have stalled, and the leasing arrangement has since been suspended.

Managing community relations and paying compensation for land and crops was identified as an issue of concern. To maintain good relations with the surrounding communities, the mines allow community residents to work on the concessions, even if as casual workers. Residents who are not employed by the mines (either as permanent or casual workers) may still scavenge for gold on the concession. They then sell the gold back to the concession owners at a discounted price.

3.3 Understanding the trade dynamics and price determination

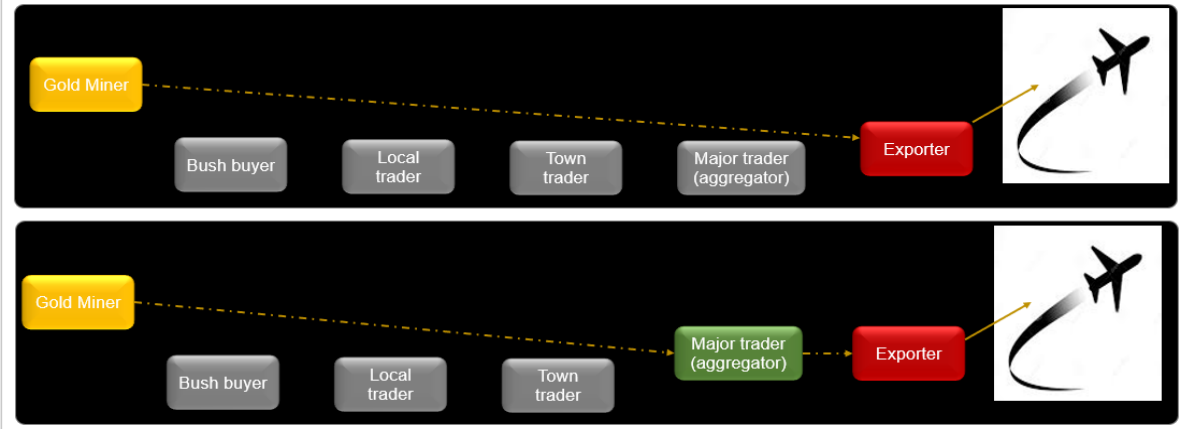
Ultimately, the local gold trade price is influenced by the world gold price, as determined by the LBMA. Gold exporters, who are the last link in the local supply chain, offer to buy gold at the LBMA price, discounted by a percentage, depending on the taxes (such as withholding tax) and other statutory fees (such as assay fees) to be paid. Depending on volumes of purchase, who is selling the gold (either a miner or a trader/agent), the business model of the exporter, and other factors, the discount could be less than 1%. There are exporters who reduce their profit margins (to less than 1%) and offer a more competitive price to the trader or miner, to secure more volumes and earn loyalty.

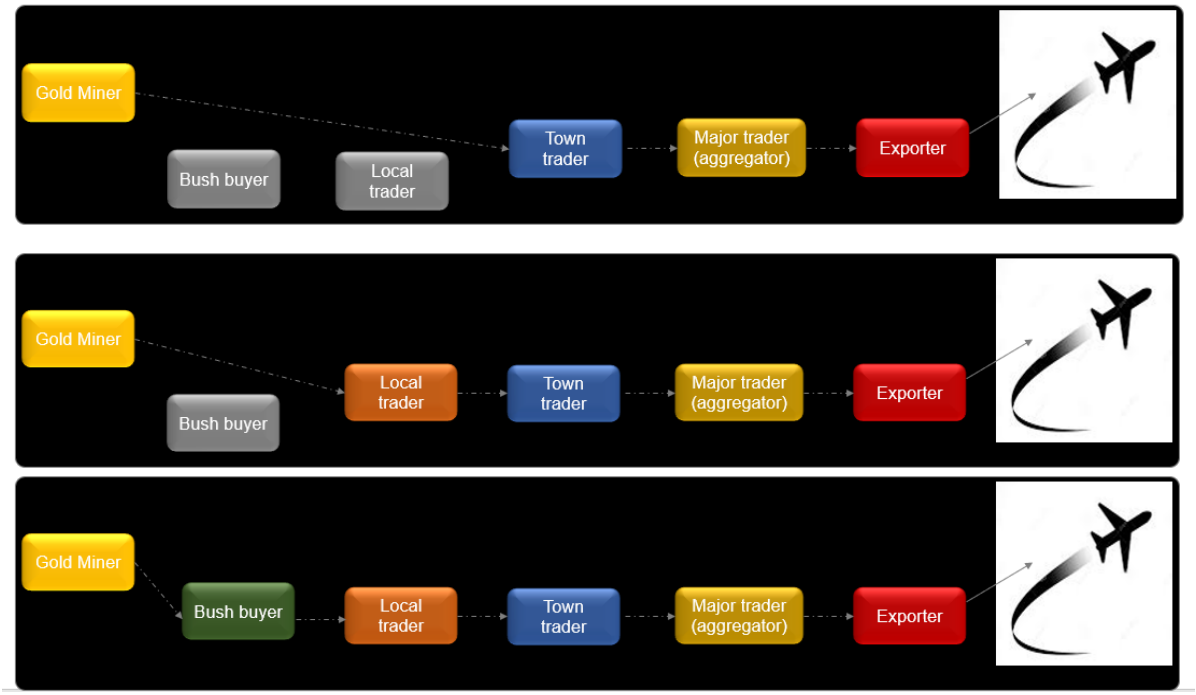
There are general demand and supply (pull and push) forces, as well as the number of trade nodes along the chain, that influence gold trade prices along the chain.

The supply chain of the gold trade could be a simple one-step process – from the local miner to a foreign entity (where the miner has a gold export license), as illustrated on the next page.

The prices determination, in such an instance, is tied directly to the LBMA price and discounted through negotiations between the miner and the buying entity.

Since most miners do not have export licenses and direct contact with foreign buyers, other intermediaries come into play. The supply chain could, therefore, consist of several transactional processes and players, such as illustrated below:





Simplified gold trading processes showing the active players along the chain in different colour codes, while the inactive players are in grey.

It must be stated that the illustrations above are simplified and do not fully describe the extent of networks and complexities of the chain. A local trader or town trader, for example, could sell directly to an exporter, and so can a bush buyer sell directly to a town trader or major trader, thereby by-passing the local (and town) trader.

The trade could be driven by a foreign buyer (refinery, individual, or company) or by the gold producer/miner.

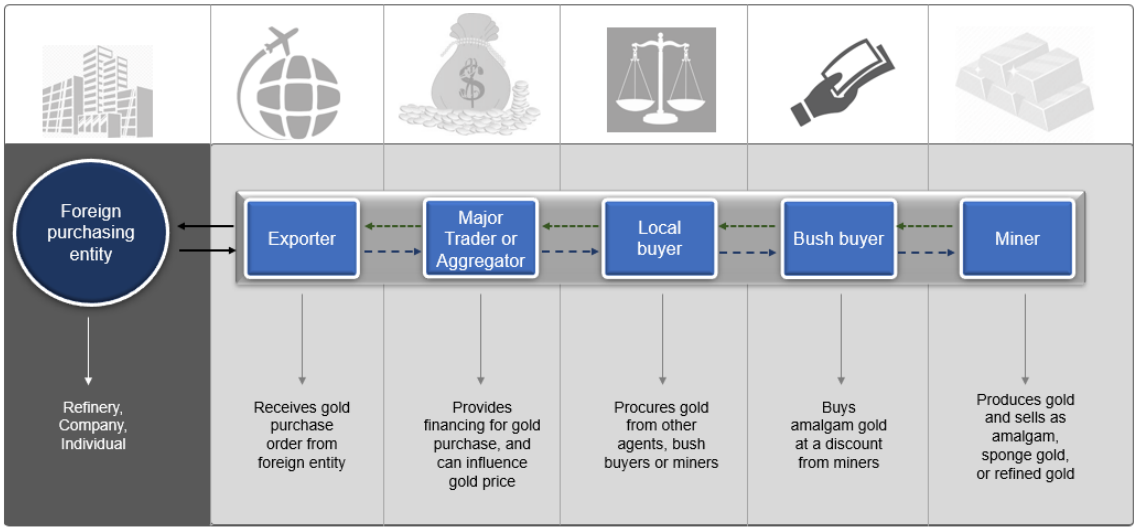
In the former arrangement (top-to-bottom), the foreign entity may request for gold through a local exporter, specifying the quantity, purity, payment arrangement, timeframe for delivery, and other transactional details. The local exporter then contacts a known mine or trader for the supply. Where the volumes required are more than a particular miner or trader can deliver within the stated timeframe, the exporter may purchase from more than one mine or trader. The transportation liabilities could be borne by either the exporter or the miner/trader, depending on the agreement.

In a miner-driven transaction (bottom-up), the miner who is willing to sell might either offer the gold to a dedicated trade partner or to whoever might be willing and able to purchase the quantity being offered at the best possible price.

Depending on the location of a mine, and its proximity to a major gold trading hub, such as Tarkwa, there could be several buyers along the chain before the gold is exported. In major trading hubs, there are usually different tiers of traders, based on their financial strength and legal status (licensed and unlicensed). There are active gold trading transactions between the traders so it is not uncommon for traders to sell their gold to other (larger and financially stronger) counterparts in the same locality who are able to offer slightly higher prices.

Major traders (who, for the purpose of this analysis, will also be called aggregators) play a significant role in the trade chain. These are usually primary financiers of the gold trade who sometimes invest in mining activities as well. They also prefinance a network of local buyers/agents (usually unlicensed)

who reside or operate in gold producing areas. The local agents, upon the advise of the major traders (regarding prices, volumes, etc.), buy directly from miners or from bush buyers. Through this financing arrangement and networks, the major traders wield power and influence, and can drive gold prices at the local level. This ability to influence prices is particularly felt when there is cash or credit crunch, and the major traders are the ones with the liquidity.



A simplified version of a typical gold supply chain flow with key actors

Gold prices in major gold trading hubs, such as Tarkwa, are generally higher than the prices in surrounding gold-producing communities, such as Bibiani, Wassa Akropong, Bekwai, etc. The prices in these communities are rather benchmarked to prices in Tarkwa, and not necessarily the LBMA. An exception would be where a miner in any of these communities has a direct link to an exporter and so trades directly.

The gold trading industry was once dominated by Ghanaians. Currently, however, Indians control about 80 to 90% of the gold trade, and act as major traders (aggregators), as well as exporters. Unlike the Ghanaians who occupy and focus on specific nodes along the chain, the Indian companies in the gold business are purposely structured to control the entire chain of the gold trade. With access to cheaper credit abroad, they invest heavily in the chain by prefinancing mining and trading activities, including setting up trading shops in major gold producing areas. Their proximity to the mines and major trading hubs give them direct access to the miners, as well as other local traders. Offering competitive prices, they buy large volumes to compensate for small profit margins. While the Ghanaian law makes it illegal for foreigners to engage in small-scale mining, there is no such legal restriction on foreign participation in the gold trade.

3.4 The role of Precious Minerals Marketing Company

The Precious Minerals Marketing Company (PMMC) Limited has undergone changes in name and mandate since it was first established in 1963 as the Ghana Diamond Marketing Board. It was renamed Diamond Marketing Corporation in 1972 and Precious Minerals Marketing Corporation in 1989 before its current name in 2000, with a conversion in status from a State-Owned Enterprise (SOE) to a Limited Liability Company.

Until 2016, one of the key functions of PMMC was to buy and sell gold produced by the ASM sector. The company was, thus, the only official exporter of gold from the small-scale mining sector. With a change in mandate in 2017, however, PMMC has since become the national assayer of all gold

produced for export, from both the small- and large-scale mining sectors. Through this assay function, PMMC determines the true value of gold for export, from which the government, through the Customs Division of the Ghana Revenue Authority (GRA), applies the necessary taxes.

With the new role as sole assayer, PMMC relinquished its role as purchaser and exporter of gold from ASMs. Following this, it liberalized and facilitated gold trading by issuing licenses to would-be gold traders and gold export companies. PMMC has issued over 190 gold buying licenses and about 20 gold export licenses. There are several other gold traders who operate without the requisite licenses in the gold producing areas.

Even though it no longer purchases and exports gold, PMMC remains a credible source of reference for international refineries and entities that intend to purchase gold legitimately from Ghana. Though it neither vouches for any of the gold exporting entities, nor the authenticity of their products, PMMC still plays an important match-making role of providing a list of exporters in good standing to international buyers, upon request.

The gold export process

In preparation for export, gold exporters prepare an invoice to cover the export (showing evidence and price of purchase), a packing list (which states the content, weight, purity, etc.), and an indication of the value of the export (based on the day of export). These documents and the accompanying gold are sent to the Kotoka International Airport, where the gold is inspected by the Narcotics Control Board (NACOB) to ensure that narcotics are not being smuggled with the gold. The gold is then assayed at the PMMC assay laboratory at the airport to determine or confirm the weight and purity. PMMC issues a certificate to cover the assay and a 3% withholding tax is then charged by GRA, based on the assayed value. Once payment is made the export is closed and affixed with Customs and PMMC seals.

A Customs Declaration documentation is then generated, and the product/export specifications are then fed into an online Customs Administration and Management System (UNIPASS) for approval. The approval, when issued, is printed and sent to the Customs office for the gold to be released to the designated airline for export.

There is a legal requirement for 80% of the value of all gold exports (as well as other export commodities) to be repatriated back to Ghana, within 30 days of the export. This repatriation is received through the exporter's bank. If this is not done, and the exporter is not able to provide an official bank receivable document to cover the repatriation, the exporter will be disabled in the UNIPASS system and will not be able to carry out subsequent exports until such repatriation is done.

The use of the banking system to facilitate the gold export transaction and the subsequent repatriation makes it relatively easier to track the movement of funds, and thus, helps in the prevention of money laundering.

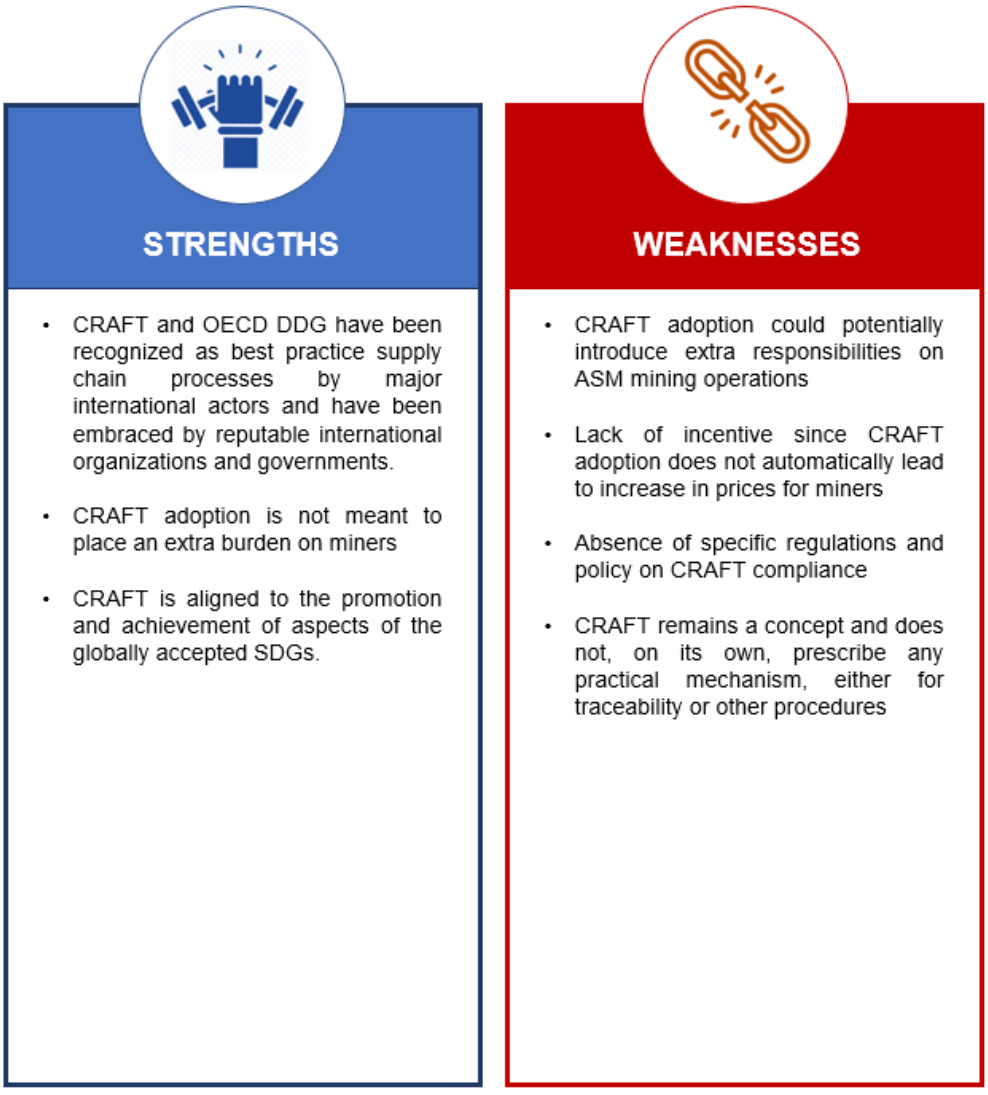
Cost breakdown

Apart from the withholding tax mentioned above, costs that are borne during gold export include PMMC assay cost of 0.1772% (of the value of export), Minerals Commission cost of 0.2%, freight fee (determined by the airline), and NACOB fee of 25GHS (which is about US$4) per consignment. Regarding the NACOB fees, it must be noted that there could be several consignments during one export, either to different clients/recipients, or different consignments to the same client. The 25GHS is charged per consignment (and not necessarily per export). The exporter charges around 0.15% for third-party exports (exporting on behalf of a third party that does not have an export license).

SECTION THREE – CRAFT IMPLEMENTATION

Based on available literature, interviews, discussions, and observations, CRAFT implementation in Ghana is feasible, given that the ASM sector is generally quite matured and largely formalized. Also, majority of the high risks identified and highlighted in the OECD DDG have either been addressed or are not present or could be addressed through a mitigation strategy to be implemented by the miners. That said, the successful implementation of CRAFT would have to consider the following analysis:

4.1 SWOT analysis



4.2 Practical way forward for CRAFT – next steps towards adoption

It is clear, from the analysis, that the lesser the nodes and number of players in the supply chain, the easier it will be to ensure a CRAFT-compliant supply chain. Based on this, ideally, a CRAFT-compliant chain should have only the **mine(s)** and the **exporter**, or alternatively, the **mine**, a **major trader**, and the **exporter** in the local supply chain.

It has already been established that the Solidaridad-supported mines, and specifically the four mines used for this project meet the minimum requirements for legal trade. The mines also, collectively, are able to produce more than the minimum volumes needed for export on a regular basis. An earlier study (by ARM) confirmed that the gold production of the various mines (supported by Solidaridad), together, are between 1.5 – 5.5kg/month, which is more than the 1kg minimum volume required for export.

On the strength of the information gathered through this project, two schemes are being proposed:

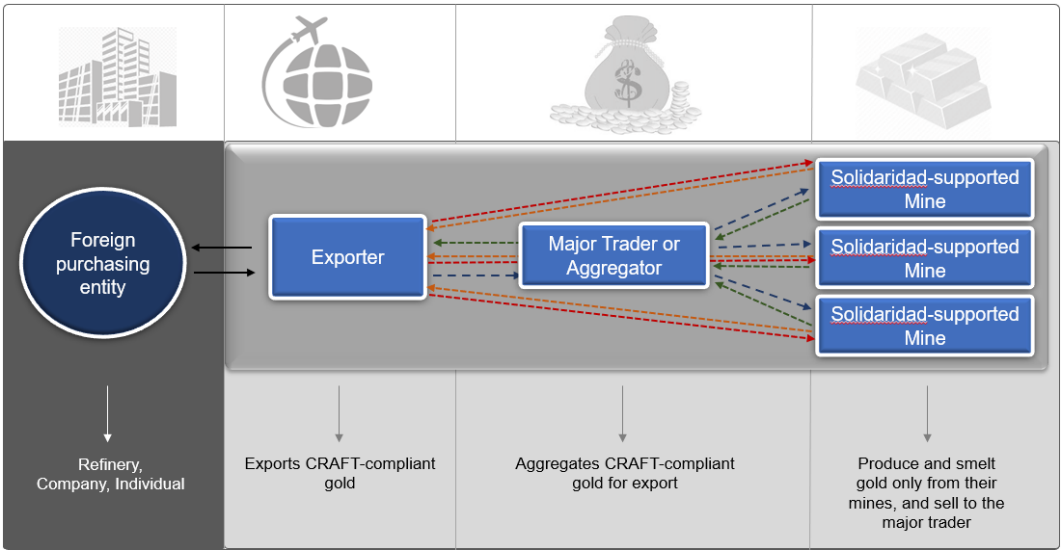
1. Miner-Exporter Scheme: With this scheme, the mines (supported by Solidaridad) will sell their gold directly to an exporter, having completed smelting of the gold produced. This will be done weekly, with the exporter arranging for the transportation and security of the gold to

Accra through the exporter's agent. The individual mines will arrange for the gold to be transported from the respective mining areas to Tarkwa, as is currently the practice (except for Agye Pa Ye mine which transports its gold to Kumasi). This scheme will make it possible for the mines to receive higher prices for their gold (possibly between 1% to 3%), since the various middlemen (traders, agents, bush buyers, etc.), will be eliminated. With the absence of the middlemen, and with the mines selling their gold directly to the exporter, the possibility of traceability is greatly enhanced.

The aggregation of gold from the various mines by an exporter's agent will also help to reduce the cost of transportation and security. The exporter confirmed that such arrangements have been done in the past, where the cost of transportation, security, and insurance were included in the operational cost of the exporter. A minimum volume of 10kg is usually required to warrant such an arrangement. The exporter mentioned, however, that for the well-established mines that appreciate the importance of having security, insurance, etc., even 2kg of gold could be transported under such protocols.

2. Miner-Aggregator-Exporter Scheme: This scheme is similar to the Mine-Exporter scheme described above but adds an extra node to the chain by introducing an aggregator between the mine and the exporter, ideally to be based in Tarkwa (or a major trading hub). Liaising between the mine and the exporter, the aggregator should have the capacity to fund the purchase of gold in large volumes and, possibly, pre-finance some mining activities. Funding is a significant bottleneck to ASMs and, as such, the presence or existence of a financier, with fair financing terms and arrangements, will be a game changer.

There are already some of such aggregators/financiers who ARM/Solidaridad will need to engage once the necessary commitments have been sought from the mines. There is the option of either working with an already established and licensed top-tier aggregator/financier or, alternatively, build the capacity of a mid-tier aggregator/financier who might be more incentivized with the prospect of getting regular supplies from well-established ASMs. Such a mid-tier aggregator should, however, be in a position to support the mines financially, if need be. A needs assessment will need to be carried out on the mines to identify their specific needs.



Graphical representation of the two proposed schemes

Even though both schemes will efficiently drive the CRAFT initiative, the preference is to have a Miner-Exporter Scheme. If well implemented, the Miner-Exporter Scheme will provide more benefits to both the miners and the exporters, while guaranteeing a more effective traceability system. The preference for such a scheme has been confirmed by an exporter, who disclosed that dealing directly with the mining entity allows for better and more flexible price negotiation (usually discounted at between 3% to 6% of LBMA spot price). Practically, while buying from the miner is preferred, the exporter is usually compelled to also buy from agents in order to meet volume demands of foreign refineries and other buyers. The exporter affirmed the company's willingness to, in principle, trade exclusively in responsibly produced gold if the production volumes can be guaranteed.

It will be helpful to undertake due diligence on the exporter to ensure that the exporter is also aligned to the OECD DD principles.

4.3 Partnership identification for CRAFT implementation

This project has identified Gold Coast Refinery (GCR), Goldridge Ghana Limited (GGL), and Hibridge Group (HG) as suitable potential partners for CRAFT implementation. These companies are involved in the purchase and export of gold and have already made firm commitments towards CRAFT-compliant supply chains. Being exporters themselves, they fit into the Miner-Exporter Scheme described earlier.

GCR, by virtue of its sustainability mandate and due diligence obligations under LBMA rules, focuses on responsibly mined gold from the ASM sector. However, because there isn't yet a robust system in place to drive responsibly mined gold in the ASM sector and the company is yet to secure dedicated volumes of gold from the large-scale mines, the refinery is yet to begin full-scale operations, despite the substantial capital invested in the refinery. For GCR, therefore, being able to acquire substantial volumes of responsibly mined gold from the ASM sector to feed the refinery is a critical business imperative with a strong business case. The company is, thus, willing to support the development of responsible supply chains for the ASM sector.

On its part, GGL plays an active role in the ASM sector and has pledged support for the promotion and implementation of CRAFT in Ghana. The company undertakes, among others, gold trade and export, and is about to sign a Memorandum of Understanding (MoU) with GNASSM to support responsibly mined gold. It has already funded projects aimed at mercury elimination in the ASM sector.

HG, as well, trades and exports ASM gold. The company promotes responsibly produced gold through the provision of technical services to the small-scale mining sector and is an advocate for implementing a tagging/hallmarking system that will facilitate traceability of gold.

Fortunately, Solidaridad has an ongoing relationship with all these companies.

In terms of practical next steps, it is strongly recommended that ARM/Solidaridad undertakes the following:

- Makes an initial selection of mines that are CRAFT-compliance ready (those far advanced in meeting the requirements of, at least, Modules 1 to 4 of CRAFT).
- Carry out a gap analysis to identify the exact (financial, technical, etc.) needs of the selected mines, and what will be required to enable them meet the production and other requirements for a responsible supply chain.

- Engage GCR, GGL, and HG, with a view of assessing their capacity to address the gaps identified in the gap analysis exercise.
- Facilitate the signing of a MoU between the mines and the exporters.

The potential challenge, particularly with Egya Pa Ye and Obeng mines, is to get them to sell their gold to these entities (GCR, GGL, and HG), given that they have established a loyal relationship with their respective buyers. During the gap analysis, it might be possible to identify areas where these new entities can offer support to Egya Pa Ye and Obeng. Solidaridad's relationship with these mines should also be leveraged in this regard, since both mines are part of the Solidaridad's supported mines. It would also be worth sizing the interest of the buyers already engaged with Egya Pa Ye and Obeng to assess their willingness to integrate a chain with either GCR, GGL, or HG.

While these are important next steps to be taken, the long-term sustainability of CRAFT would involve more broad-based and policy-related efforts driven by different stakeholders at the national level.

4.4 Sustaining CRAFT

A comprehensive implementation plan needs to be developed, outlining the immediate steps to be taken, as well as medium- and long-term strategy and plans aimed at mainstreaming CRAFT compliance across the entire ASM sector.

To assure the sustainability of the project and creating long-term impact in the selected mining organizations as well as broaden our reach in the Ghana ASM sector, we suggest to include the identified mines in ARM's Sustainable Mines Program, which is ARM's new strategic program to promote the progressive development in ASM gold supply chains based on the Craft and Fairmined Standards. The aim is to transform ASM through multisectorial alliances between development cooperation, philanthropy, governments and the gold industry in high impact programs, where initial public funds (eg facilitated by Solidaridad) are complemented with funds from the private sector (gold industry).

ARM, after having implemented the Fairmined initiative for more than 7 years, has already established relationships with a broad variety of international market actors (refineries, manufacturers, companies from the jewelry and financial sector) who have expressed their interest in not only engaging in trade relationships with mining organizations complying with basic CRAFT criteria but may also be willing to finance the miners' development path to help them reach CRAFT compliance, and even higher sustainability levels (eg working towards Fairmined certification).

Through the formulation of a second phase follow-up project, ARM and Solidaridad can work together to collect the necessary public and private funds to help the mines reach CRAFT compliance and establish formal supply chains that go beyond the national level, facilitating the trade of responsible ASM gold from Ghana to US and European markets, creating long-term relationships between miners and market actors that take co-responsibility in promoting a more responsible ASM gold trade.

Beyond this support to targeted mining organizations, broader themes should be considered for the long-term sustainability of CRAFT:

- The introduction of hallmarks for responsibly produced gold should be explored. The Ghana Standards Authority (GSA) is particularly receptive to the idea of hallmarking and has the facilities for that. The Government of Ghana, through its agencies such as Mincom and GSA, should work in partnership with the GNASSM to revise the current Code of Practice (CoP) for the ASM sector, to ensure its alignment with the relevant DDG requirements. ASMs should be educated on the revised CoP, through workshops and other programmes and Mincom should

subsequently monitor and ensure compliance. Gold produced in accordance with the provisions of the CoP should be hallmarked and traded as such.

- Similar to the hallmarking system described above, there should be a traceability mechanism at the mine/operational level which will help trace gold to its origin. UMaT could be engaged to look into the development of such a mechanism.
- There is the need to create awareness and advocacy around responsibly produced gold, through well-coordinated communication and advocacy campaigns. There should be a national effort to position Ghana as a destination for responsibly mined ASM gold. This can be done through the Ghana Investment Promotion Centre (GIPC), Ghana Export Promotion Authority (GEPA), and other allied agencies. Mincom and PMMC could also play leading roles in promoting responsibly mined ASM gold by putting notices on their websites and linking foreign buyers with local exporters of CRAFT-compliant gold.
- PMMC should explore the idea of introducing different categories of gold trading licenses, where those who trade in CRAFT-compliant gold will have a separate license indicating as such.

APPENDICES

APPENDIX 1 – List of Stakeholders Identified and Targeted for the Analysis

- Minerals Commission (national and mining district levels – Accra, Tarkwa, and Bibiani)
- Precious Minerals Marketing Company - PMMC
- Gold exporter (A.A. Minerals)
- Gold refineries (Gold Coast Refinery)
- Women in Mining - WiM
- Federation of Ghana Goldsmiths and Jewelers Association
- Chamber of Gold Exporters
- Gold miner and exporter (Emmanuel Yirenkyi Antwi)
- Gold traders in Tarkwa and Bibiani
- Miners and mine management of Obeng mines
- Miners and mine management of Agya Pa Ye mines
- Mine management of Beaver mines
- Owner of Solution mines
- Ghana Standards Authority - GSA
- Ministry of Lands and Natural Resources - MLNR (Ghana ASM Formalization Project)
- Bank of Ghana
- Customs Division of the Ghana Revenue Authority - GRA
- Ghana National Association of Small-scale Miners - GNASSM

APPENDIX 2 – Schedule of Meetings

Activity	Date
Meeting with PMMC and Federation of Goldsmiths and Jewelers Association	Thursday, Sept 3
Meeting with Minerals Commission	Tuesday, Sept 8
Meeting with Women in Mining	Tuesday, Sept 8
Meeting with AA Minerals	Thursday, Sept 10
Meeting with Chamber of Gold Exporters	Thursday, Sept 10
Meeting with miner and exporter (Emmanuel Yirenkyi)	Friday, September 11
Travel to Tarkwa	Sunday, Sept 13
Meeting with gold traders in Tarkwa	Monday, Sept 14
Meeting with Tarkwa District Minerals Commission officer	Monday, Sept 14
Meeting with lecturer, University of Mines and Technology (UMaT)	Tuesday, Sept 15
Travel to Wassa Akropong	Tuesday, Sept 15
Meeting with Management and miners of Obeng mines	Tuesday, Sept 15
Travel to Bibiani	Wednesday, Sept 16
Meeting with Bibiani District Minerals Commission officer	Wednesday, Sept 16
Meeting with gold traders in Bibiani	Thursday, Sept 17
Meeting with Kom Ye Ya Co-operative Miners Association	Thursday, Sept 17
Meeting with owner of Beaver Mine and Health and Safety Officer – Beaver Mine	Thursday, Sept 17
Interview with owner of Solutions Mine	Friday, Sept 18
Travel to Atuntuma	Friday, Sept 18
Meeting with miners – Agya Pa Ye mine, Atuntuma	Friday, Sept 18
Travel to Kumasi	Friday, Sept 18
Travel from Kumasi to Accra	Saturday, September 19
Interview with Ghana Standards Authority	Wednesday, September 23
Interview with Ghana ASM Formalization Project (GASMFP)	Thursday, September 24