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Responsible Gold Sourcing from Artisanal and Small-Scale Mining

Scoping Study on Developing Pilot Supply Chains

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Fabian Stähr, Philip Schütte

Hannover, September 2016



Executive Summary

Public and political discussions increasingly acknowledge the role of responsible supply chains in order to support decent working conditions, protect the environment and apply adequate due diligence. In recent years, companies have demonstrated that through applying supply chain due diligence they may act as partners contributing to improved conditions of production of certain raw materials. Establishing certification schemes and institutionalizing supply chain management in line with the OECD Guidance serves to strengthen cooperation between producers and buyers; compliance with international minimum standards may be demonstrated in a credible way.

Gold forms one of the most important products of the global mining sector. About 10% of global gold mine production originates from artisanal and small-scale mining. Artisanal and small-scale mining represents an important livelihood base for the local population: 10-20 million small-scale miners, and their families, directly depend on gold mining. However, this type of mining is frequently associated with difficult working conditions, child labor, and environmental risks. In addition, gold supply chains associated with artisanal and small-scale mining are characterized by higher risks of conflict financing or smuggling. Formalizing the artisanal mining sector and the associated supply chains, therefore, represents an important responsibility in the context of global gold supply chains and value creation.

Gold refiners represent a central leverage point in terms of supporting due diligence and responsible practice in gold supply chains. Gold refiners based in Germany are associated with complex upstream supply chains within the EU and, partly, globally. Currently, these refiners are not purchasing significant quantities of gold from artisanal and small-scale mining sources. The present technical report provides a basic overview on the general sourcing options for German gold refiners with regards to artisanal and small-scale mining gold. To this end, the report explores different criteria such as the current gold production through artisanal and small-scale mining, logistical supply chain requirements as well as relevant international due diligence and sustainability standards.

Responsible sourcing of gold from artisanal and small-scale mining would appear to be a feasible step for some German refiners. A sourcing scenario in compliance with international and industry standards and certification schemes would seem feasible to develop, provided that adequate risk management is implemented. In order to establish a long-term successful gold sourcing relationship, appropriate partners needed to be selected and adequately incentivized. The report illustrates criteria and challenges for this process.

The report further includes an analysis of 12 countries where artisanal and small-scale gold mining is common. The national framework for responsible gold sourcing is evaluated for each country. Overall, according to this analysis, it would seem feasible to establish a responsible supply chain in several of the investigated countries. As a next step, the report suggests evaluating the situation on the ground in more detail, with the aim of outlining more concrete gold supply chain sourcing scenarios.

Abbreviations and Acronyms

AGC	Artisanal Gold Council
ARM	Alliance for Responsible Mining
AS(G)M	Artisanal and Small-Scale (Gold) Mining
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe
CFSP	Conflict Free Smelter Program
CSR	Corporate Social Responsibility
CTC	Certified Trading Chains
DMCC	Dubai Multi Commodities Centre
EITI	Extractive Industries Transparency Initiative
FLO	Fairtrade Labelling Organizations International
FOB	„Free on Board“ (Incoterms)
ILO	International Labour Organization
KYC	Know Your Customer
LBMA	London Bullion Market Association
LSM	Large-Scale Mining
NGO	Non-governmental Organization
RJC	Responsible Jewellery Council RJC CoC – Chain of Custody RJC CoP – Code of Practices
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goals
XRF	X-ray fluorescence analysis

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1. Artisanal and Small-scale Mining and the Concept of Responsible Supply Chains

1.1. Introduction

The production of mineral resources from artisanal and small-scale mining (ASM) operations in many developing countries provides an important livelihood for the local population. Gold is one of the most important ASM commodities: globally, 10 to 20 million miners and their families directly depend on gold production, and additional income is derived from local inter-related businesses. Approximately 10% of the global mine production of gold is derived from ASM which at current market prices has an estimated value of approximately USD14 billion. In some cases, individual artisanal miners only receive approximately one-third of the value of the contained gold, whereas in other supply chains they receive over 90% of the contained gold value. These figures demonstrate that sustainable artisanal and small scale gold mining (ASGM) could make a significant contribution to the reduction of poverty in many developing countries.

ASM activities may occur under extremely difficult conditions and risks including child labor and negative ecological impacts, often criticized internationally. These problems are often exacerbated because of the relative weakness of state oversight that is typical of many developing countries, as well as the uncertain legal status of small-scale mine operators. Legalizing and formalizing the ASM sector and associated supply chains, therefore, plays an important role in facilitating global responsibility in gold value addition.

In recent years, discussions of supply chain due diligence have demonstrated that companies acting as partners in the supply chains can contribute to improving the conditions of mineral extraction, for mutual benefit. Supply chain due diligence and certification procedures contribute to strengthening the relationship between producers and customers and to achieving the objective of credible compliance to internationally recognized minimum standards. The ideal “closed pipe” approach would include a definitive certification of the source, which can be linked through the entire production process to responsible customers and end users.

In the final report on the 2015 G7 summit meeting under German presidency in Elmau, the German federal government introduced “accountability in the supply chain” as an important topic. In this document, the G7 nations emphasized their intention to strive for labor rights, acceptable working practices, and environmental protection in global supply chains. As part of German development cooperation, the Federal Ministry for Economic Cooperation and Development aims to promote an attitude of accountability and responsibility among German consumers of natural resources, including information of end users. In this respect, ASGM is particularly important because of its relevance to development issues.

Gold refineries are fundamental to supporting due diligence and responsibility in the gold supply chain. Over the past few years a clear trend is seen to be emerging internationally whereby some gold refineries are using their influence and accept obligations to improve the working conditions in ASM gold mines. Switzerland, in particular, has initiated important actions in this respect. German gold refineries could also contribute positive initiatives in terms of creating an enabling framework for responsible ASM gold sourcing and supporting constructive international discussions.

This technical report from the Federal Institute for Geosciences and Natural Resources (BGR) explores the background conditions for a commitment to responsible artisanal gold supply chains. The report includes an outline of the commercial expectations of the German refineries (Chapter 2), a discussion of the standards necessary for establishing a responsible supply chain (Chapter 3) and incentives, which are important for its long-term realization (Chapter 4). Lastly, this report examines the background conditions of ASM in producing countries where possible partners for a sustainable supply chain might be located (Chapter 5). The report seeks to provide basic planning information as a base for establishing a pilot supply chain from an ASM gold mine to a German gold refinery. In this context, implementing a pilot initiative could be supported by BGR.

1.2. The Concept of a Responsible Supply Chain

Over the past years, the rise of public interest in sustainability and transparency of supply chains of purchased goods has increasingly resulted in reforms to structures and processes in the supply policy of relevant companies. Due diligence in supply chains, based on guiding principles developed by the Organization for Economic Co-operation and Development (OECD), is now the broadly accepted standard that requires companies to cooperate closely with their suppliers and exchange information.

Responsible sourcing of raw materials can also be envisaged as a “closed pipe”. In this case, the supply chain is characterized by a focused cooperation of relevant actors with selected suppliers both downstream and upstream within the supply chain. This ensures documentation as well as physical traceability of the product up to the end-user. On the one hand this provides an improved risk management and allows on the other hand a more rigorous analysis of the ecological and social factors in the production of raw materials. As in a certification procedure, the requirements to meet specific standards and progressive development at the mine site are the overall objectives of a responsible supply chain.

The operators of ASM also benefit, through improvements in their working environment, from requirements of a responsible supply chain. This includes advantages of a non-financial nature such as improvements of worksite health and safety that can be verified by relevant sustainability standards (Chapter 3). Issues related to an improvement of the financial situation of miners must also be taken into consideration since the work in ASM often exploits local poverty. This can be effected by an appropriate system of incentives that are discussed in more detail in Chapter 4.

The motivation for a commitment by gold refineries to an accountable supply chain from ASM is derived from both the economic as well as the social aspects of corporate social responsibility (CSR). The CSR position refers to an improvement of livelihood of ASM communities, which is facilitated by them being integrated as a partner in supply chain practices of gold refineries. The economic incentive is related to the significant potential for gold production by ASM throughout the world. On a global scale, Switzerland is Europe’s principal location for processing gold from the ASM-sector, although currently gold from Africa is almost exclusively processed in Dubai, United Arab Emirates. Given a responsible and mindful engagement with the ASM-sector, German gold refineries could also tap new and long-term potential sources of gold.

The supply can also be strictly controlled within the parameters of a closed pipe approach as the basis from which critical learning experiences can be obtained for a broader participation in the program. A closed pipe approach is usually taken by private business companies both

for their supply-chain-management as well as their marketing activities. An accompanying participation in this approach by third parties, from state and/or public sector, provides both technical support and also enhances credibility in the process. Furthermore, the relationship with the end-user market provides an opportunity to focus attention on a constructive approach towards challenges of the ASGM sector. This includes both customer awareness for ethical production as well as for the organizations involved in downstream activities, such as jewelers, gold traders and the electronic industry.

1.3. The Structure of Artisanal Gold Supply Chains

The upstream supply chain for gold from industrial mining operations is very different from that for gold from ASM. An industrial-scale supply chain is easier to comprehend because of the relatively small number of actors involved as compared to those in the complex network structure of a natural resources supply chain from ASM. The upstream supply chain in industrial mining consists of the extraction of ore and onsite processing (usually by cyanide leaching) to produce gold doré bars, and the subsequent purifying by a gold refinery. In contrast, there are more participating parties and relevant factors in most supply chains from ASM. The closed pipe approach strives for a vertical supply chain consolidation, whereby certain intermediaries are excluded. The upstream supply chain described in the following is therefore an illustration of the initial situation, and not that of the final status of a closed pipe.

Artisanal and Small-Scale Gold Mining

The preconditions for artisanal and small-scale gold mining (ASGM) throughout the world are very variable. It is motivated by poverty in some areas, while in others it is a recognized and traditional occupation. It may be totally illegal or in contrast even be subsidized and supported by the state. Gold exploitation may remain a recognized way-of-life for several decades in stable communities, but in others it may be typified by uncontrolled “gold-rush” migrations of thousands of miners. ASM may be undertaken by experienced miners using technical equipment, or by artisanal workers with manual exploitation methods. Within this wide-ranging spectrum, only a small number of mines possesses structures that are sufficiently formalized for establishing a closed pipe supply chain.

At the scale of the ore deposit, gold is mined either by small worker- or family-groups, organized in long shifts, or in mines by several thousand, generally disorganized, workers. Gold is mined either from mineralization in bedrock, or from secondary alluvial (placer) deposits. Gold from primary mineralization is generally mined underground with shovels, hammers and occasional blasting, whereas alluvial gold is mostly exploited by panning. A few alluvial deposits are also exploited by dredging.

The subsequent mineral processing depends on the type of ore deposit and the level of organization of the operating companies. The crushing of ore to the separation of gold from the host rock is either being processed mechanical in mills or, in smaller operations without technical equipment, the host rock is crushed manually (for example with mortars). Subsequently, the crushed material passes through a gravity separation because of the higher density of gold as compared to the other minerals that are of no economic interest. Ore deposits of this type exploited by small-scale mines are usually relatively close to the surface (up to a depth of approximately 40 m) and the gold content of the host rock must be greater compared to the usual standard in industrial exploited ore deposits.

Mineral Processing

In the processing stage gold is separated from uneconomic minerals, with the objective of producing doré gold bars or a high-grade gold concentrate that can be sold on the market. In some cases, if the gold is relatively coarse grained or occurs as free gold in the host rock, gravity separation is sufficient without using any chemical additives. However, if this is not the case, a chemical processing stage is then introduced. Gold amalgamation with mercury is the most usual process, but is not necessarily found in all mining operations. Amalgamation is relatively inexpensive (especially if the mercury is recycled) and efficient. However, poorly controlled amalgamation is responsible for numerous health and environmental problems in ASM. Although amalgamation can be acceptable if used under closely controlled conditions, it is also possible to transition to other processing methods.

Gold trading

ASM mostly occurs in rural areas, where gold is sold through local traders and occasionally with the mine owner acting as an intermediary. Traders and mine owners often also act as creditors for ASM operations¹. Gold is usually transported to the nearest international airport, which is often in great distance from the mine site. As a result, this part of the supply chain is often subdivided into several segments. A local gold trader may sell his gold to a larger regional counterpart, who then sells it on to national gold traders and exporters. This chain of intermediary traders is significantly shorter in countries with good infrastructure. Because of the complexity and opaque nature of these trading activities in the gold business, they are characterized by high risks related to corruption, smuggling and money laundering.

In some countries, small-scale miners are required by law to sell their gold to authorized offices of the national central bank. However, in practice this procedure is not always enforceable.

The trading of gold in the producer countries normally results in a consolidation of purchases along the supply chain. Whereas individual miners sell their production in grams, the intermediary traders are working in a 10 – 100 gram range. The larger ASM operations as well as exporters trade their gold in a lower kilogram range, which is the quantity that is transported by air to the international refineries – sometimes officially, but often as smuggled goods.

1.4. Refineries and Downstream Closed Pipe Gold Supply Chain

The closed pipe scenario usually ensures a continuous physical traceability along the upstream supply chain. This is also the target that is envisaged in the downstream supply chain, but there are specific technical restrictions at the refinery stage that result in a mass-balance approach being, in certain cases, an acceptable approach.

In the case of total physical traceability of gold, gold from ASM is processed separately for refining, which can lead to higher production costs and the customer can rely on a physical connection between the final product and the original ASM operation. In a mass-balance approach, however, a physical mixing of gold from different sources is permissible during the processing and refining. Both procedures are certified according to the relevant criteria, but are distinguished by different labels.

¹ The dependency that derives from this is analyzed further in Chapter 4.2.

Certified gold derived from small-scale mining operations is, in the downstream supply chain, mostly used in jewelry manufacture, and this leads to effective publicity opportunities for specific marketing measures.

Tab. 1 The most important customers for gold (according to market sector)

Sector	2015 (tons)	Proportion (%)
Jewelry	2,415	57
Investment	878	21
Central Banks	588	14
Industry	331	8

1.5. Development Relevance

ASGM provides a basic living for millions of people worldwide, as well as an opportunity to participate in social development. However, the sector is also traditionally problematic. ASGM under weak governance is intimidated for financing of conflicts as well as money laundering and smuggling. Furthermore, ASGM has a significant impact on the environment. Abandoned ASGM operations are only very rarely rehabilitated to the natural environment, and often result in locations that are permanently damaged by the mining activity. Health hazards in and around these mining districts are particularly elevated due to the use of mercury. Finally, ASGM is also subject to social challenges. The level of child labor in these mines is especially high and women are often oppressed, particularly in areas with weak governance.

The importance of ASM for sustainable development

In September 2015, the United Nations agreed on 17 Sustainable Development Goals (SDG's) that in many areas affect mining and therefore, albeit with different priorities, the ASM sector. Responsible ASM can contribute directly to achieving the following sustainability objectives:

- #1 No poverty
- #5 Gender equality
- #8 Humane working conditions and economic growth
- #10 Fewer inequalities
- #12 Responsible consumer and production practices
- #15 Rural life

Since ASGM is particularly important for the lower classes of the population, the support for ASGM sector is initially economic (#1, #8, #10). The foundation of an economic livelihood results in part from mining itself. Although uncontrolled mining is in the short-term financially lucrative, the initiation of sustainable and social economic development is neglected. The development of a social and sustainable ASM sector requires in many cases additional support and an acceptable legal framework, and these must usually be provided by the relevant national authorities, the international community, private business or non-governmental organizations.

Challenges for ASM

The public discussion on the challenges of ASM is currently dominated by the debate about “conflict minerals”, and mainly concerns the mining and trading of tin, tantalum (coltan), tungsten and gold (3TG) in conflict-affected and high-risk areas such as the eastern region of the Democratic Republic of Congo (DRC). However, there are numerous other risks derived from ASM, and the discussion should not be reduced to the problems related to **conflict financing**. Additional critical issues include:

- The considerable **environment impacts**, particularly due to the introduction of mercury into the ecological environment and the downstream health hazards for the local communities. In addition, ASM operations are very rarely rehabilitated to the original environmental habitat resulting in a legacy of severely damaged flora in the abandoned mining area.
- Despite the relatively high proportion of women working in small-scale mines, as compared to industrial-scale operations, the **suppression of women** through wage inequality, poorer health and safety protection, and sexual abuse is prominent in areas with weak governance.
- The extent of child labor, despite being prohibited by national regulations, is a major challenge for ASM. Children and their families may argue that this can be necessary because of their poverty (for example as a job after school to fund the purchase of food and school books). On the other hand, the children are exploited with poor wages and suffer from the lack of any economic future due to the lack of a suitable school education.

These challenges can be regarded, according to the guidelines for responsible ASM, as a chance for the development in the sector. In addition to the public discussion of these problems within the constraints of development cooperation, addressing these challenges and risks within the concept of a responsible supply chain can contribute to attain the SDGs.

2. Prospects of German Refineries for Gold Sourcing from Artisanal and Small-Scale Mining

This chapter provides an overview of the results of an evaluation by BGR in February – July 2016. This study analyzed the feasibility, in principal, for participation by German refineries in a responsible supply chain in ASM.

2.1. Gold Refineries

The gold refining business has a long tradition in Germany. The City of Pforzheim has been the center for the German refining industry since the middle of the 19th century. There are 18 gold refineries in Germany that are organized into the Industrial Association of Precious Metals (Fachvereinigung Edelmetalle). There are several other refineries that are not in the association, but their refining capacity is not clear. In the global context, Germany (including the production facilities in other countries both in and outside Europe that are controlled by German refineries) is, after Switzerland, one of the most important countries for gold smelting and refining. The Heraeus Group, based in Hanau but with global operations, belongs to the biggest gold refining companies in the world. There are numerous important or specialist, medium-sized, gold refining companies based in Pforzheim. Aurubis, from Hamburg, is a world leader in copper smelting and recovers a significant quantity of gold as a by-product.

The German gold refining companies are currently, with a few exceptions, focused on sourcing gold exclusively from recycling. In global terms this is a specialist market, because on average about 2/3 of the annual gold production is sourced from mines. The gold recycling market is generally affected by specific trends that are connected to various macroeconomic factors. The greatest proportion of recycled gold is derived from jewelry or investment products such as coils and bars. The recycling of gold-bearing electronic waste or other industrial products requires other processing stages in specially designed plants. In the few instances where German refineries source primary gold from mines, gold is usually derived indirectly through traders from industrial-scale mining operations. In addition to gold, German refineries also process significant quantities of platinum group elements and silver.

2.2. Requirements for Establishing a Responsible Artisanal Gold Supply Chain

In preparation for this report, bilateral discussions were held with six German gold refineries² as well as the Industrial Association of Precious Metals to ascertain their interest and the possibilities for implementing a responsible supply chain including the small-scale mines. The selection of these six refineries was based on the requirement to include plants with significant processing capacity and specific economic significance. Several Swiss and other refineries served as a reference for this discussion, because these companies have already addressed these issues of sourcing from ASGM, either by a direct association or a cooperation with specific certification initiatives.

All the German gold refineries that were involved in these discussions displayed a high sensitivity with respect to the **regulatory requirements** in their gold supply chains as they pertain to the associated risks of money laundering and conflict-financing. The refineries ad-

² This included the following companies: Allgemeine Gold- und Silberscheideanstalt (Agosi), Aurubis, C. Hafner, Heimerle + Meule, Heraeus, Wieland Edelmetalle

dress these risks through their own in-house compliance departments as well as participating in industry initiatives and standards. Compliance to the Responsible Gold Guidance of the London Bullion Market Association (LBMA), which is a requirement for accreditation to the LBMA Good Delivery List, is considered by all refineries as critically important. Several refineries, in part because of inquiries from their customers, are also certified by the Responsible Jewelry Council (RJC), which includes a certification according to the RJC CoC (Chain of Custody) as well as, in part, the RJC CoP (Code of Practices). Several gold refineries are certified according to the Conflict Free Smelter Programs (CFSP), which is particularly relevant if the refinery produces gold alloys (or also platinum group element alloys) that contain tin or tungsten. It is important to note that the certification of a refinery according to RJC CoC results in certain restrictions on sourcing gold from small-scale mines, but certification according to LBMA or CFSP does not include these restrictions. Details on this topic are presented in Chapter 3.

Most of the German gold refineries are focused on recycling, and this is particularly relevant to the potential establishment of a responsible supply chain that includes ASM. Certain **technical requirements** are thereby required for the location-specific refining process, and these cause restrictions on the composition of purchased gold (accessory and trace elements that are deleterious can negatively affect the process). Gold from small-scale mines can, depending on its source or on various processing stages in the upstream supply chain, occasionally contain deleterious elements³ so that, at several locations, it is not technically possible to refine the gold. In certain circumstances gold derived from ASM must be technically treated by the batch process, and this can require a minimum size of the consignment lots.

Furthermore, the requirements and standards of various initiatives for supply chain due diligence are different for recycled and primary gold. This reflects an appropriate distinction that has been included in the OECD Guidelines for due diligence as a fundamental reference in the industry proposals. The purchase of primary gold could increase the requirements for managing the compliance as compared to processing exclusively recycled gold.

Gold from ASM is often delivered to the buyer at an international airport in the producing country. The buyer therefore covers the costs and liability for transport and insurance from the point of export. According to their core business activity, many of the German gold refineries are focused on purchasing gold for delivery to their plant. In several cases the refineries maintain subsidiary companies in countries outside Europe or have the necessary logistical requirements (e.g. contracts with transport service and insurance companies) to purchase gold in **countries outside Europe**, and this is advantageous for an effective and responsible the supply-chain-management.

Some gold refineries categorically rule out the possible participation in a supply chain with ASM, either because gold is only processed as a by-product or because their business is explicitly required to be focused exclusively on recycled gold. The latter is both technically as well as financially important. Full cycle operations are commonly used in recycling, so that the refinery processes gold, for a commission, according to the requirements of the customer and is therefore is not the purchaser of gold. In contrast, gold from ASM is usually purchased by the refinery.

³ Refer to: Hruschka, Melcher & Kain-Bückner (2016), Analytical Tools to Constrain the Origin of Gold from Conflict-Affected and High-Risk Areas – Scoping Study, Part I: Method Screening. Contract study for BGR. Available on <http://www.bgr.bund.de/mineral-certification>

Independently of technical and logistical feasibility for acquiring gold from small-scale mines, the contribution to **development strategy of the commitment** by German refineries to sourcing gold from ASM is recognized and valued in the context of the corporate responsibility (CSR) with respect to aspects of sustainability (e.g. social, environmental). In this respect, several refineries also refer to their CSR activities in Germany (e.g. support for local communities).

Businesses, which in principal appear to have logistical and technical requirements necessary to engage in a supply chain with ASM, are also prepared to support this development. This initially related to the **support at the management level**, and includes aspects of fair wages, improvements to mining conditions as well as technology transfer according to the requirements of the supply chain partners.

The payment of a premium price for certified gold from small-scale mines is generally regarded as being impractical, unless the members in the upstream supply chain and finally the end-user are prepared to accept the higher costs. Most of the refineries, currently, have not identified adequate feedback from their customers with respect to this issue. A unilateral payment of a premium price by the gold refineries, without the possibility for passing these increased costs on to the customer, would not be economically attractive for these businesses. However, some of the refineries are examining if such a practice could be temporarily introduced as a way of financing the premium as a CSR action.

A possible participation in ASM in a responsible supply chain is viewed by those gold refineries, for which such a participation is in general practical, as a long-term process because of both the expectations (progressive improvement of the mining conditions) and the possibility of ensuring secure sources of gold supply. On a global scale, ASM contributes about 10% to the annual production of primary gold, and the industrial-scale mining about 90%. In the long-term, mining contributes an average of 2/3, and recycling 1/3, to the overall annual gold production. Gold from industrial-scale mining can be purchased either through traders or direct from the mining companies, whereby the latter alternative generally requires supply contracts for significant quantities. Only a few gold mining companies also operate and own their own gold refineries. The possibilities for German gold refineries to source their gold from larger, industrial-scale, mines can be coupled with some constraints. Therefore, for medium-sized gold refineries with a limited processing and refining capacity, the sourcing of gold from ASM could be commercially attractive to achieve a better utilization their plant during the fluctuations that occur in the recycling market.

2.3. Consumer Perspectives on Artisanal Gold Supply Chains

In contrast to several gold refineries in Switzerland and the EU, none of the major German gold refineries are currently sourcing their gold from ASM. The discussions that formed a part of this study have, however, demonstrated that several German refineries are open-minded towards the premise of a responsible supply chain for gold derived from ASM. Some of the features in this approach that relate to development policies and corporate responsibility were perceived positively, as was the possibility in the short- to medium-term to secure supplies of gold from partners in ASM as an alternative to recycling.

There are numerous issues related to compliancy as well as logistics (refer to Chapter 3) that need to be addressed in establishing a responsible supply chain. These questions cannot be solved in a general way, but require discussion on a case-by-case basis with potential partners in the supply chain. However, despite these issues, it should be possible for the

gold refineries to prepare a basic strategy for broadening their corporate activities to include sourcing gold from ASM. This would include, for example, the acquisition and analysis of data on gold production, trading patterns and supply chain risks, networks of international members in the ASM sector, or the considerations from the customer perspective about incentives for ASM cooperatives.

All gold refineries emphasize that, as customers, a responsible supply chain process must be both economically sustainable and must conform to the international regulatory requirements. From the perspective of the customer, this process appears to be fundamentally feasible, although there are many open questions that need to be clarified on a case-by-case basis. These include clarification of the relevant compliancy requirements (certification of sites according to LBMA, RJC, CoC or CFSP), the modality for purchasing, as well as the technical limits for the procedures (e.g. minimum quantities to be purchased for batch-processing, composition of the doré gold bars at the time of payment).

At the same time, it must be recognized that the small-scale mine operators must also be incentivized to participate as partners in this type of procedure, and this is discussed further in Chapter 4. Incentives can be of various types, but will in most cases result in an improvement of incomes of small-scale miners themselves, by means of supply chain consolidation (eliminating the intermediary traders), fairer structuring of the purchase price for gold, increase in productivity from the mine, various options for advance financing of projects and premium pricing. At the same time, the concept of premium pricing should not be over- or undervalued.

However, if gold is to be sourced as “certified material” by means of an institutional system such as “Fairmined” or “Fairtrade” gold, then a premium price will be necessary. Several German gold refineries expressed reservations towards the established certification systems and the resultant premium pricing. The question of the transparency and effectiveness of the certification initiatives and the resultant premium pricing was criticized, and a discussion between the various responsible bodies in these certification initiatives could be helpful in this respect (compare the discussion in Chapter 4). In principle, cooperation with the established certification organizations would bring numerous advantages; on the one hand a trustworthy working relationship with small-scale miners, which normally requires a long-term commitment to be established, and on the other hand the advantages of coordination and compliancy with industry standards⁴.

All gold refineries have emphasized that premium pricing as part of the certification system cannot be absorbed internally, and must be passed on to the downstream customers up to the end-user. This compares to the basic concept of a closed pipe supply chain that should include the participating organizations and individuals in both the downstream and upstream supply chain. For this to be successful there must be coordination and agreement between the participants in the downstream gold supply chain, and this is currently not the case in Germany. A more detailed analysis of this topic – combined with accompanying political measures to increase awareness – would be desirable for the sustainable implementation of a responsible supply chain, particularly if a closed pipe solution is envisaged.

⁴ For example, some mine sites are certified according to RJC CoC, and the sourcing of gold from ASM in locations that are not RJC certified is only possible if the relevant ASM cooperative is certified to the “Fairmined” standard.

GOLD-RECYCLING

Recycling of gold is, particularly in Germany, an important business. The proportion of recycled gold in the global production is approximately 33%. With respect to the high recycling ratio of gold-bearing products, it is generally accepted that most of the historically produced gold remains in the global value-creation cycle, so that the available gold tonnage is increased annually by the gold that is mined in that year.

The gold-recycling industry comprises two segments:

- High-value recycled gold (jewelry, gold bars and coins).
- Industrial recycled gold (electrical waste).

High-value recycled gold accounts for 90% of the total supply, and is mostly made up of jewelry. The proportion of industrially recycled gold has increased from 5% to 10% over ten years (2005-2015). This is primarily due to the increased use of electronic goods such as smartphones and laptop computers. For example, in 2014 the US based company, Apple, recycled more than 1 ton gold from their computer products.

The recycling market is very dependent on the gold price and the economic situation. The volume of recycled gold reached its peak of 1,728 tons in 2009 during the global financial crisis and concurrent high gold prices.

Based on: The Ups and Downs of Gold Recycling – Understanding Market Drivers and Industry Challenges, Boston Consulting Group 2015.

3. Requirements and Standards for Artisanal Gold Sourcing

The sourcing of gold from ASM demands various source standards as well as logistical, economical and development-policy requirements. This chapter provides an overview of these issues as a basis for planning such a supply chain.

3.1. General Reference Standards

A responsible supply chain for mineral resources (particularly a closed pipe system) is developed according to the obligation of a company to be able to trace, in detail, the traceability of the mineral in a specific supply chain back as far as the production site. The company can then try to cultivate a closer business relationship with the relevant suppliers, and thereby apply their influence on these partners. In this way, the security of supply to the company is enhanced, and the control and risk management along the supply chain can be improved. Consequently, the due diligence requirements and Know Your Customer (KYC) procedures are in the forefront.

The deliberate sourcing of a natural resource such as gold from ASM requires a company to consider the social aspects of the operation, for example in accordance with its corporate social responsibility (CSR) plan, together with the business and risk management issues. In order to meet these demands, the company should consider other criteria that are focused on the challenges of ASM with respect to the environment, work safety, and social matters. These sustainability standards may have already been, or are being, prepared by the company, but recognized standards are also available from third-party sources.

There are therefore two references for the definition of standards in a responsible supply chain from ASM:

1. International regulations and recommendations on due diligence in the supply chain for gold, including the existing industrial standards for the responsible sourcing of gold. Compliance with these standards sustains the management of risks related to conflicts financed through mineral resources, smuggling or money laundering.
2. Initiatives and sustainability standards from third-parties that are focused on the development potential and risks of ASM. Special internal CSR regulations or corporate policies of the company can also contribute to this end.

The compliancy to any of these types of standards is generally controlled by means of audits, whereby independent inspections by accredited third-party auditors (third party audit) are distinguished from semi-independent or internal inspections (second- or first-party audit, for example self-assessment). The final choice of the audit methodology as well as the basis for the assessment⁵ depends on several factors. There are special requirements for auditing ASM because there are limitations to applying several procedures of traditional audit methodology such as the review of receipts and documents.

The fundamental standard references as well as the relevant factors for sourcing gold from small-scale mines are discussed in the following paragraphs from the perspective of a gold refinery and in more detail. International standards, industry standards as well as sustainability standards in ASM are discussed separately in relevant sub-chapters. Furthermore, in the selection of a suitable producer as partner in the supply chain from ASM, it is critical to evaluate the production capacity, which must be compatible with the purchasing objectives of the

⁵ Either „reasonable assurance“ or „limited assurance“

gold refinery. The last part of this chapter is therefore devoted to discussing several relationships between the management of the supply chain and ASM, as this serves to harmonize realistic expectations of all partners in the logistics from the anticipated supply chain.

3.2. International Standards and Regulations

Gold was defined as a “conflict mineral” by the US Dodd-Franks Act (2010) for that which is originating from central or east Africa, and the Act requires that particularly strict due diligence in the supply chain must be implemented and be verifiable. The EU is in the final stages of preparing guidelines to regulate the import of gold (as well as other specified minerals and metals) from global conflict-affected and high-risk areas. In both cases the reference is provided by the OECD guidelines for carrying out due diligence. The guidelines are a basic reference for international gold supply chains, and should be taken into consideration in a responsible supply chain from ASM.

The OECD Guidelines were prepared after an international process of consultation, and include all mineral resource chains with respect to conflict and high-risk areas. However, they include a detailed supplement with special focus on gold and thereby provide a very practical approach to the guidelines that constructively emphasize the risk management in ASM.

The fundamental recommendations of the OECD Guidelines relate to a five-phase system of risk management along the complete mineral supply chain. The gold refineries represent a bottle-neck between the upstream and downstream supply chain, and therefore play a critical role. Various gold industry standards and initiatives (see below) include the OECD Guidelines and attempt to incorporate them into their regulations, whereby the final responsibility in the supply chain remains in every case with the individual companies. The increased communication between companies and suppliers is one important point in the OECD Guidelines, and must be considered in a responsible supply chain (particularly a closed pipe).

The **OECD Guidelines supplement on gold (2012)**, as well as an additional explanation⁶ from the OECD secretariat, define the following points that should be considered for the establishment of a responsible supply chain sourcing gold from ASM:

- The expectations of customers in the sourcing of gold from ASM should be adapted towards the **level of organizational and formal structure of small-scale miners** – the higher the level, then the enforcement of standards and due diligence responsibilities is more effective. The organization of ASGM in developing countries is marked by pronounced differences. “ASM operations” with an evident formal structural level are distinguished from the informal mining operations by family groups or cooperatives. It is reasonable to expect that the ASM operations are sufficiently well structured to implement the OECD Guidelines, as is the case for other companies in the supply chain. On the other hand, it cannot be expected that informal small-scale miners will be able to fulfil their due diligence. Efforts should be focused on improving their organizational structures so that they have a perspective for meeting the relevant requirements.
- A responsible supply chain (particularly a close pipe) from ASM should **seek to shorten the supply chain**. The small-scale miners are commonly exploited by non-

⁶ Artisanal and Small-Scale Mining (ASM) and the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Focus on ASM Gold: Frequently Asked Questions. OECD Secretariat, April 2016.

serious intermediaries. In order to avoid this situation, the OECD guidelines recommend negotiating directly, where possible, with serious ASM operators.

Author's note:

This kind of vertical consolidation of the supply chain can be effectively implemented by relatively large-scale gold mines and well organized artisanal mining cooperatives with a significant and regular production. Smaller and irregular production levels, in contrast, hinder a formalized direct supply. The intermediaries can consolidate the small production levels and provide a regular supply, and they also perform other functions in the local economy, such as financing and pre-financing of miners or, in remote mining districts, the supply of materials that are not locally available. At the same time, it is understood that these practices can also lead to the exploitation of small-scale miners.

Therefore, a holistic approach to structures in ASM supply chains is recommended, and the preferred methods should be decided on a case-by-case basis. The implementation of the OECD Guidelines for transparency and control in supply chains for gold (for example, preparing a document-chain for individual transport consignments) can contribute to understanding the fairness of pricing. In some cases, as an alternative to shortening the supply chain, serious intermediaries or exporters can be intentionally included as service-providers (logistic partners in marketing and export of gold) to ASM producers themselves or, as necessary, to the refineries. This is particularly relevant if the production capacities are low and the purchaser has no plans to establish a local representative structure to support the supply chain in the producing country.

- A supply chain with relationships to conflict-affected and high-risk areas requires a special review of the due diligence risks, especially the so-called “Red Flags”. This requires the deployment of personnel onsite to collect information and make necessary inquiries. Onsite teams can be established with members from the local gold producers and customers (e.g. exporters and gold refineries), and would be particularly suitable for ASM to ensure quality of the process and to support the capacity of ASM operators. The scope of required investigations and inspection is considerably less wide-ranging for supply chains related to small-scale mines as compared to sourcing gold from larger industrial operations⁷.
- **The legitimacy of ASM operations** (legitimate ASM) is often not clearly defined in the national legal framework (a legal grey area). Companies should, however, still consider sourcing gold from such operators so long as they ensure the guidelines are observed. The OECD recommends that a genuine commitment by the ASM operator to the responsibility of the supply chain as well as formalizing the structure of their operation should be prioritized. This can be based on verbal assurances, but requires the ASM operator to pay the necessary taxes and royalties (so long as they are defined by national laws and regulations). At the same time international companies should utilize their position to strengthen the legal situation in the countries highly affected by ASM. If ASM operations are active on a concession held by a

⁷ With respect to the risk assessment for mining operators, the gold supplement of the OECD Guidelines identifies 21 points for LSM-Gold (step 2, section 1, paragraph C.3) and 11 points for ASM operators (step 2, section 1, paragraph C.4). For the risk assessment of their supply chains for gold refineries, the gold supplement of the OECD guidelines identifies 20 points for determining the situation at the mine site and the trading of primary gold for LSM gold (step 2, section 2, paragraph C.3a), and 11 points for ASM gold (step 2, section 2, paragraph C.3b).

larger industrial mining or exploration company, customers should insist on concluding an agreement that permits the formalized local gold production from ASM.

- **An evolving, process-based approach** is critical for establishing the due diligence obligations. The requirements and expectations from partners in ASM can therefore initially be quite modest. At the same time it is important to continuously document the step-wise progress in formalizing the supply chain (for example by training programs). However, if concrete “Red Flags” are identified, recommendations of the OECD Guidelines should be implemented which, as a last resort, include the termination by the customer of its partnership to the supply chain.

3.3. Industry Standards

There are numerous industry standards in the gold sector that are distributed through various supply chain scenarios. The relationship to the OECD Guidelines is common to all of these standards, although some of the standards are focused on even more stringent objectives. The main differences between the various standards are related to:

- The position in the supply chain – to which sector in the supply chain does the standard apply;
- The scope of the standard – what components are included that are over and above the OECD Guidelines;
- The operational procedures of the standard, such as operating handbook and control mechanisms for the standard.

The following explanations do not cover the entire range of these standard-specific characteristics, but only the possibilities for merging the relevant industry standards for the gold refineries with those for sourcing gold from ASM. The relevant industry standards are regularly revised and updated so that the relationships discussed below are reflecting the situation at the time of preparing this report.

The supply chain standard as defined by the LBMA is the most widely used by gold refineries. This is a consequence of the certification according to the LBMA standard, the “Responsible Gold Guidance”, being a requirement for accreditation on the LBMA’s Good Delivery List⁸. The RJC standard is then the next most important that developed the relevant certification for the CoC and CoP sectors. Certification by both the LBMA and RJC industry standards requires an independent, third-party, auditing of participating organizations⁹.

⁸ Similarly, the DMCC (Dubai Multi Commodities Centre) Rules for Risk Based Due Diligence in the Gold and Precious Metals Supply Chain are a requirement for accreditation to the Dubai Good Delivery List. The DMCC guidelines currently have no practical relevance for German gold refineries and are therefore not considered further. It is currently not sufficiently clear to what extent certification will be required according to the Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains, which were established in 2015. However, these guidelines defined by the China Chamber of Commerce of Metals, Minerals & Chemicals Importers & Exporters could be relevant because China, followed by India, is now the most important gold market in the world, and the Shanghai Gold Exchange plays an increasing important role. In principle, this document is also based on the OECD guidelines. The LBMA Good Delivery List currently the most important standard, and the 73 registered gold refineries represent 85-90% of the global gold production.

⁹ There are numerous standards that require regular auditing of the relevant gold refinery. The standards have agreed to a mutual recognition of the audit results so that duplications are minimized for those companies that are members of several standards. There is an essential mutual recognition (in the case of overlapping audit periods) between the RJC Chain-of-Custody (CoC) audits, audits of the Conflict-Free Smelter Program (CSFP) as well as the LBMA, and to a limited extent with the DMCC. Although it is focused primarily on the 3T minerals (tin, tungsten and tantalum), the CSFP includes gold, which can be used by the refineries in small quantities in alloys, and sepa-

The LBMA Responsible Gold Guidance

The standard document¹⁰ for the **LBMA Responsible Gold Guidance** is closely orientated on the general specifications and definitions in the OECD Guidelines and, in this respect, it includes equivalent statements on ASM (see above). Furthermore, the standard takes further risks into consideration, such as money laundering and financing of terrorism, for which specific KYC procedures have been developed. Apart from the standard itself, the key LBMA document is the Third Party Audit Guidance¹¹ that provides instructions on the procedure for which criteria and verification documents are evaluated in the company under audit. In the case of companies and their suppliers already having established specific internal or external assessment procedures, then these should be considered during the auditing process¹². LBMA auditing of gold refineries must be undertaken according to one of two fundamental, but quite different, audit reference standards; ISO 19011:2011 or ISAE: 3000. Both references are recognized by the LBMA. The company will be inspected as to the implementation of the LBMA Standard by means of policy documents and control procedures.

The LBMA (for primary gold and recycled-gold) has developed three “Toolkits” to assist in the preparation and implementation of the LBMA Standard by member companies. These include documents for the company’s internal evaluation of its suppliers by systematic acquisition of information and evaluation by means of a questionnaire, a checklist as well as template for assessing supply chains. These cover the issues such as due diligence of conflict-risks as well as money laundering with KYC. The templates, however, appear to have been prepared mainly for the industrial, formalized, mining and not for the ASM. Some of the required information cannot always be easily obtained, and their verification would be difficult for ASM. The instructions for contending with ASM are therefore important as they are based on the LBMA Audit Guidance and the OECD Guidelines. Accordingly, a gold refinery that sources gold from “illegal” ASM (for which some of the information required by the questionnaire is unavailable or else difficult to obtain) can be successfully certified if they demonstrate that support and training programs on transparency and controls in the supply chain have been arranged. In addition, some of the KYC-information about suppliers cannot be obtained from the small-scale miners themselves, but from the associated gold exporters that are next in the supply chain.

It is therefore possible for a company, which sources gold from ASM, to be successfully certified according to the LBMA Responsible Gold Guidance.

The Responsible Jewelry Council Certification (CoP and CoC)

The **Responsible Jewelry Council (RJC)** is an association of organizations active in the precious metals and diamond sectors, both in the upstream and, particularly, in the downstream supply chain. Members are required to certify their responsible business practices according to RJC Code of Practice (CoP)¹³. Supplementary to this, in principle voluntary and

rate audits are required as necessary for each of these metals. The mutual recognition of audits at the level of the gold refining stage, as discussed above, is valid on the date of submitting the report but can also change with time.

¹⁰ Version 6, August 14, 2015

¹¹ Version 3, March 11, 2016

¹² In addition to the above mentioned mutual recognition of audit results by the LBMA; RJC and CFSP, this system also includes examination procedures of suppliers in the upstream supply chain. This includes, for example, the Conflict-free Gold Standard des World Gold Councils (large-scale industrial mining) as well as the Fairmined and Fairtrade Gold Standards (artisanal small-scale mining), as well as other initiatives that support the implementation of the OECD Guidelines or the US Dodd-Frank Act.

¹³ CoP version from November 2013. The certification document must be issued at the latest 2 years after becoming an RJC member.

much less widespread, the supply chain may be certified according to the RJC Chain-of-Custody (CoC) Standard¹⁴. The RJC CoC certification covers the due diligence obligations for in the supply chain as there is currently a mutual recognition agreement between RJC CoC, BMA and CFSP audits. Both the RJC CoP and the RJC CoC are relevant for sourcing gold from ASM. However, a special RJC CoC certification is not necessary for a gold refinery that is already audited for the LBMA Responsible Gold Guidance or the CFSP program. For a successful RJC certification according to either the CoP or CoC Standards, the company must also undertake a preparatory self-assessment as well as go through an independent audit.

The RJC CoP certification is of special importance because it is compulsory for RJC members. The affected gold refineries that source gold from ASM are required to assess, and so far as is possible minimize, the following risks for which their performance will be audited¹⁵:

- Forced labor;
- Severe examples of child labor;
- Unsafe working practices;
- Uncontrolled use of mercury¹⁶;
- Other significant environmental impacts.

A company should also attempt to verify that the relevant ASM activity is legal or, in case this is not the situation, support the necessary work required to legalize the activity. The RJC CoP therefore requires specific expectations from a company with respect to sourcing gold from ASM, although without prescribing a specific methodology.

The RJC CoC Standard is focused on the supply chain, and currently restricts the possibilities for sourcing gold from ASM, and in principle there are only two scenarios for sourcing gold. In the first case the gold may be sourced from ASM through a supplier that is an RJC member, and normally this would be a large-scale industrial gold mining operator. The sourcing of gold that is produced by ASM controlled by this RJC member (i.e. on its mining concession) is possible under certain conditions¹⁷. The second alternative is sourcing gold supplied from ASM from independent, non-RJC mines, which is possible if the operator is a member of recognized and responsible mining code¹⁸. Currently the RJC only recognizes the Fairmined Standard (Version 2.0) as an external responsible mining standard¹⁹.

¹⁴ Version from November 2012. RJC CoP and CoC Standards are reviewed every five years. The public review and editing process for the RJC CoC Standard had just commenced at the time of preparing this report (August 2016)

¹⁵ In preparation for this audit, the company must document all the steps taken to fulfil these requirements. There are additional requirements for those RJC members that are directly affected by small-scale mining on their concessions, which is particularly relevant for primary LSM gold producers but not normally for gold refineries. Detailed instructions are presented in the RJC Standards Guidance, CoP 7 ("Sourcing from Artisanal and Small-scale Mining"), and more explicit questions for audit are listed in the accompanying RJC Assessment Questions Document.

¹⁶ The use of mercury in the processing stage (amalgamation) should be increasingly controlled with the support of the company, reduced and eventually eliminated. The use of mercury is not banned by the RJC CoP, but the riskiest practices should be avoided. At the same time, the international cyanide management code should be implemented.

¹⁷ In this case, it is a precondition for compliance to the RJC CoC Standard that the industrial mine operator (RJC member) must support the small-scale mine operators in structuring and professionalization according to the OECD Guideline.

¹⁸ „Recognized Responsible Mining Standard“: <http://www.responsiblejewellery.com/recognised-responsible-mining-standards/>

¹⁹ The RJC recognizes as a problem that currently only a very limited quantity of gold is available from small-scale mines within the constraints of the RJC CoC Standard, and that is by sourcing from Fairmined accredited operators, and that additional capacity would be desirable. In this respect, the Fairtrade Gold Standard is under review for possible recognition by RJC. Furthermore, RJC is following with interest the development of the broader-based "Entry Level Standards" from the Alliance for Responsible Mining (pers. comm., M.A. Fleury, RJC, 2016).

The sourcing of gold ASM that are not RJC members, or under the control of RJC members, is only possible for a gold refinery under the constraints of certification according to the RJC CoC Standard if ASM operators are themselves certified according to the Fairmined Standard. However, the sourcing of gold from non-certified ASM is not completely impossible: a gold refinery can dispense with a certification to the RJC CoC Standard, and just be audited to the RJC CoP Standard. An audit of the refinery for conflict minerals should still be possible through the LBMA or CFSP²⁰. In addition, an RJC CoC certification is not necessarily applicable to all the locations and supply chains in the company, but can as necessary be selectively prescribed. In this case, it is important to clearly and physically separate the certified and non-certified materials²¹.

3.4. Sustainability Standards for Artisanal Gold Mining

Background of typical risks

Risky practices in ASM – insufficient safety practices, problematic environmental impacts, negative social factors in community development – are a common reflection of the weak state structures in this sector, as well as the short-term maximization of profits and exploitation of the onsite structures. The support for responsible mining practices in each supply chain with small-scale mines is a balancing act between the local alleviation of individual symptoms and addressing the real causes of these problems.

The development of formal structures and professionalism is a critical process for the support of the responsible ASM. On the one hand this requires the establishment of a legal basis of ASM (e.g. granting of licenses and permits) from which the further processes can achieve an economic development of the mines (e.g. availability for credit financing). At the same time the strengthening of the organizational structures of the ASM organizations (e.g. cooperatives with a reasonable participation for the miners) and the provision of other demand-oriented support services for improving the businesses (e.g. advice on efficient mining procedures, or construction of centralized processing plants). The development of functional and economically justifiable management structures in ASM is the basis for effectively and sustainably improving the operating practices over the long-term from the current widespread risky procedures. ASM operations that already have a functioning management are therefore the best candidates for implementing voluntary standards and certification initiatives.

In the first instance, support for the structural formalization and professionalization of ASM is the responsibility of the state. Moreover, ASM must also clearly show their intention, because responsible production cannot be sustainably implemented without their enthusiasm for and ownership of such a process. The state governance structures are often weakly established in those developing countries that are affected by ASM and the capacity of the

²⁰ At the time of preparing this report, the RJC had 816 members, of which 526 are certified according to CoP and only 37 members are also certified to RJC CoC Standards. The LBMA auditing is the most widespread among the German refineries, followed by CFSP. The RJC CoP certification is commonly found, and a few refineries are also certified according to RJC CoC. The above comments are particularly relevant for these refineries.

²¹ By means of processing at different sites or by batch-processing of different refining phases at the same site. The differentiation of the site or supply chain is only possible for the RJC CoC Standard, and not for the RJC CoP Standard, for which all the sites controlled by the company must be audited. The selective differentiation of supply chains within the RJC CoC Standard is only possible for sources of gold outside of conflict-affected areas. If gold is sourced from a conflict-affected area, then documentary proof of the implementation of the due diligence obligations according to the OECD Guidelines is necessary for all supply chains (regardless of their separate physical locations), and will be audited.

state is often inadequate to formalize and professionalize the small-scale mines²². Because of this, several initiatives provide support to ASM operators by introducing, or developing their own, internationally acceptable standards for responsible mining procedures in small gold mines²³. These initiatives cannot be generally applied throughout a national gold sector without the explicit support of the state, but are focused on individual mines²⁴. Gold refineries and other downstream companies in the supply chain can source gold, at acceptable conditions, from these mines and this conforms to a Closed Pipe supply chain. These initiatives selectively induce a sense of responsibility into the ASM sector, often including development of the local communities. These initiatives are not widespread, but can provide a positive impact at national and international levels.

For the successful realization of such advances by voluntary initiatives to establish responsible mining supply chains, the accompanying role of the national mining inspectorates and their regulatory priorities at the relevant mines according to the prevailing legal framework should not be underestimated. Even if the state authorities are not directly involved in the certification system, the orientation and focus of individual standard criteria in the national legal framework can support the process. If a gold refinery participates in the ASM supply chain, then at least an exchange of ideas or, ideally, the actual participation of national mining authorities, should be taken in to consideration.

Advancing Sustainability Standards by voluntary Certification and Capacity Building

The standards of the two most widespread international organizations in the gold sector, the Fairmined and the Fairtrade Gold Standard as well as their certification systems, are introduced in the following paragraphs²⁵. The introduction will have a focus on an analysis from the perspective of a gold refinery in the supply chain rather than a detailed description of all the standard requirements. Both these standards are very similar and emphasize generally comparable sustainability issues. The following factors illustrate the relevant issues in small-scale gold mining. A customer may take them into account for the responsible sourcing of gold from ASM that are not included in these standards, for example by means for appropriate internal assessments of suppliers. The role of a gold refinery in a responsible supply

²² Furthermore, several states regard small-scale mining as a political problem, rather than as potential for development. Therefore, there is a lack of enthusiasm for formalizing structures and for professionalization. This also reflects the tension between small and large-scale mining, insofar as the tax income from the large-scale mines is much greater than that from the small-scale operations. Most of the developing countries are therefore primarily interested in the production from the large-scale mines, and thereby ignore the development factors such as increasing employment opportunities in structurally disadvantaged regions, for which the small-scale mining is more relevant than the larger mining operations.

²³ This includes various international reference standards, and one of the most important standards is the comprehensive conventions of the International Labor Organization.

²⁴ These are mines that have the necessary requirements for a successful implementation, including the willingness of the small-scale mine operators to improve the operating procedures as well as certain legal factors pertaining to a lawful operation. The willingness of the relevant state to constructively support the process is also a criterion. Current discussions, promoted by the Alliance for Responsible Mining, are focused on the development and institutionalization of a "Standard Zero", which should increase the possibilities for a broad-based participation of small-scale mines to fulfil specific minimum requirements.

²⁵ Both organizations cooperated during the period 2010-2013 and used the same standards for the production and marketing of gold from small-scale mines, but since the termination of their cooperation both initiatives have established separate standards and certification systems. The Fairmined Standard 2.0, dated April 5, 2014 („Fairmined Standard for Gold from Artisanal and Small-Scale Mining, Including associated Precious Metals“) is current. The Fairtrade Gold Standard 1.2, dated November 8, 2013 but implemented in practice since the date of publication April 16, 2015, („Fairtrade Standard for Gold and Associated Precious Metals for Artisanal and Small-Scale Mining“) is current.

chain is not just to ask after the required standards, but also to encourage the support of capacity-building measures, which will assist ASM operators to meet necessary standards²⁶.

The approaches by both Fairmined and Fairtrade Gold are based on the closed pipe concept, and are therefore not widely effective but are focused on the relationships along the supply chain. The ownership of ASM operators is a critical issue in both standards, as the owner is alone responsible for fulfilling the requirements for participating in the system. A process-based approach is present throughout both standards, and it envisages successive improvements with time, normally between one and six years. This time frame essentially constrains the expectations on results and impacts derived from participation of small-scale mines. For the sustainable success of these initiatives, these two issues²⁷ – ownership of the respective ASM and the willingness to participate in a long-term sequential process – should be carefully observed by a gold refinery when sourcing gold from small-scale mines, regardless of the means of sourcing gold or of standards used.

Both standards are applicable to those developing countries in the world that are host to ASM. However, in the case of ASM in high risk areas, there are specific restrictions that must be identified at the site on a case-by-case basis by the relevant responsible organization. At the time of establishing a supply chain, gold refineries must make a very detailed assessment and, as necessary, apply restrictions to sourcing gold from areas with the following characteristics:

- Conflict of interest for the land use between ASM and agriculture;
- Conflicts of interest between industrial mining and ASM;
- Conflicts of interest between local indigenous communities and ASM;
- Areas of armed conflicts;
- Protected areas (e.g. National Parks);
- Areas with particularly valuable ecological systems, even if these are not identified officially as protected areas.

The **Fairmined Standard** is supported by the Alliance for Responsible Mining (ARM)²⁸. The essential qualifications and the scope of the implementation of the Fairmined Standard at the exploitation stage of ASGM is defined as follows:

- Mining operations comply with the national definition of ASM, or fulfil specific production standards²⁹;

²⁶ This can be compared to the Certified Trading Chains (CTC) approach by the BGR in the Democratic Republic of Congo (and previously Ruanda). The CTC approach is also based on a voluntary certification of sustainability standards in small-scale mining, and includes two audits that are explicitly focused on improving the situation: a baseline audit includes concrete recommendations for improving the operating procedures according to 20 specific criteria; and the subsequent certification (for example after one year) is based on a compliance audit.

²⁷ Because of the large number of risks, and the potential problems together with the relevant criteria of mining procedures, it is essential to prioritize the process according to the capacity of those involved. A number of these criteria should be required for a formal participation, or at least implemented in the first year. The subsequent implementation of the process criteria in both the Fairmined or Fairtrade Gold Standards takes about three years, although six years is required for particularly challenging criteria. This long-term approach is compatible with the overriding importance of a trustworthy business relationship between the supplier and the customer.

²⁸ The ARM is the responsible organization behind the Fairmined certification system, and also offers a global consultancy for small-scale miners. ARM is financed by international donors as well as members of the gold industry, who pay a fee for certified gold („Fairmined Development Fee“). The total budget for ARM in 2015 was USD 1.3 million, of which 54% was spent on advice to small-scale miners. Since 2015, ARM applies the International Financial Reporting Standard to its accounting. The premium to the gold price (currently USD 4000 per kg, with the actual amount being negotiable for an offtake greater than 20 kg gold per year), which is payable in the Fairmined system, is not included in the Fairmined budget, but is paid out directly to the participating mining organizations. A locally elected committee decides on the management of the proceeds from the premium.

²⁹ Maximum 4 g gold production daily per miner in the operating company. Operating companies that participate in the system may increase the daily gold production up to 8 g per day per miner. With a higher productivity, the operator is considered to be a medium-scale mining organization and is no longer covered by the Fairmined Standard. There are separate definitions for artisanal dredging operations.

- Individual miners in the operating company must be registered in a supply chain production system³⁰; and this is also used as evidence for the supply chain partners with respect to KYC;
- All gold transactions are recorded by the ASM operator in its internal controlling system (ensures traceability).

In addition to these documented requirements, there are a number of responsibilities that the ASM operator, according to its capacity, recognizes in the process approach together with its partners (for example, advice from ARM). This includes the support for responsible mining procedures as well as local community development and ensuring that the Fairmined premium is included in the gold price. The individual sustainability issues in the Fairmined Standard are correlated with the situation of the small-mining operator³¹ and are addressed by a plan (*Fairmined Development Priorities Plan*) that is prepared for each mine separately. In general, the following points are particularly sensitive, both at the mine site and in the host community:

- Relative standing of women and children;
- Child labor and forced labor;
- Responsible use of mercury³²;
- Biodiversity and responsible use of local water resources.

In general, the **Fairtrade Gold Standard** includes the same requirements as the Fairmined Standard, but the individual standard criteria and indicators are described more figuratively. The main difference between the Fairmined and Fairtrade Gold standards is the assessment of the implementation of the OECD Guidelines for due diligence by means of standard criteria: Fairmined regards these as being implicit, whereas the Fairtrade Gold Standard includes a number of explicit criteria for due diligence.

3.5. Operating Requirements for Supply Chain Management

The preparation of a responsible supply chain necessitates that the above-mentioned standards are maintained, on the one hand to ensure the safeguarding of regulatory or self-regulatory requirements, and on the other hand to contribute towards responsible mining conditions in small-scale operations. There are several additional logistical issues related to sourcing gold from ASM that need to be considered. These are addressed in the following paragraphs and should be treated as corresponding to those the previous chapter (motivation for ASM operators).

Criteria for Selecting Artisanal Mining Operators as Suppliers

A gold refinery should be able to apply the following information in their first-pass analysis of ASM operations as being potentially suitable as suppliers in a responsible supply chain. The mining and supply chain structures of small-scale operations for gold are very variable. By no means is every ASM operation³³ suitable for inclusion in a responsible supply chain. The relationship between gold production by the ASM and the demand from international gold traders, taking the logistical costs in the supply into account, is a critical issue.

³⁰ Initially only some of the miners can be registered, but increases with sequential expansion of the system to additional areas and miners.

³¹ There are significant site-dependent differences with respect to the impact of the exploitation of gold, for example the level of precipitation, population density, or the type of gold mineralization.

³² There are specific constraints on usage of mercury, but this is not equivalent to banning the use of mercury.

³³ Compare with the definitions in the OECD Guidelines for different types of small-scale mining organizations. In this text, the term is used generally and in its broadest sense, and includes cooperatives.

The ASM operators should be able to prove a reasonable and regular historical production of gold. The theoretical production and processing capacities of an operator are an indication, but cannot be assumed to be the real production, which is influenced by numerous factors³⁴. Because of the informal structure in ASM, the availability of reliable historical production data is not always guaranteed, so that other indicators (geology, production and processing capacity) must be included in the assessment of an operation.

An overall discussion on gold production from ASM and its influence on the throughput in the supply chain is not reasonable, and should be considered on a case-by-case basis. As an orientation level to be taken into account, it is noted that a monthly production of gold (usually gold doré containing about 90% gold) in the range of 1 – 10 kilograms is already a significant production level for many ASM operations that, depending on productivity, require several dozen to several hundred active miners. This production level would not be reached by many of the smaller ASM operations.

A gold refinery should therefore adopt reasonable expectations with respect to restrictions on the availability of gold. The international freight costs in a supply chain are well known, and normally include the airfreight (plus insurance) from the nearest international airport in the producer country to the gold refinery. A specific minimum quantity of gold must be included in each consignment so that the proportion attributable to the freight charges is not too excessive. Therefore, there must be a compromise in the sourcing of gold from ASM: A gold refinery sourcing gold from ASM should not insist on the usual minimum consignment that is usually required for sourcing gold from large-scale industrial mining. The issue of pre-financing should also be considered³⁵.

The designation of a suitably stable and effective ASM operation (or, as necessary, a group of neighboring operations) is just as important for a responsible supply chain as the gold production levels. The experience of the BGR³⁶ in ASM suggests that the following characteristic qualities should be considered:

- There is a minimum degree of organization of the operations; there are accepted partners available to fulfill the management responsibilities in the operations. The partners in the operations provide an effective means of communication with the other business partners, when possible also in written form (in the local official language);
- The operator has the basic capacity essential to the business. This should include at least a secretary or book-keeper, who is responsible for preparing and administering the relevant documentation, and is directly employed by the operator. Some of the processes in ASM are agreed verbally, but documentation – for example for traceability in the supply chain – is critically important;
- The legal status of the operator as well as the permits for the exploitation must be guaranteed, for example by documentation of the mining license from the state authorities and/or an agreement with the official owner of the concession;

³⁴ The actual production depends on numerous factors, for example the number of locally available active miners (this fluctuates, partly in response to parallel working in agriculture or other mines), the operational capability of the equipment, the availability of chemicals, the unrestricted access to the mine (in particular underground mines), the continuity of the gold grade in the orebody (for example, a local high-grade zone can result in temporary increases in gold production), or variable geological conditions (for example, transition from weathered rock into bedrock). Based on the experience of the BGR, the average gold production per miner in one working day in artisanal small-scale mining is estimated to be: 1 g in South America; 0.5 g in Asia; 0.2 g in Africa. In certain cases, this productivity can, however, be significantly greater or lower than these levels.

³⁵ Compare with the previous chapter „Motivation for small-scale mining operators“ for an overview of this issue.

³⁶ For example, establishing a responsible supply chain with small-scale mining based on the CTC approach in Ruanda and the Democratic Republic of Congo.

- Ideally the operator has access to local technicians and services, for example for legal advice, simple geological services or the processing of the ore. In some cases this can be resolved if the relevant operator is part of a cooperative that provides specific services. Traders and exporters can also offer certain centralized services to their suppliers, for example as part of a supply contract. In this case it is important that the process and associated costs are made completely transparent.
- Finally, the other necessary due diligence obligations and KYC procedures also apply to ASM operators and their owners, as well as associated partners in the supply chain. A detailed list of the relevant OECD requirements is included in Appendix I of this report.

Based on these characteristic qualities, the ASM operators, as long as they are owners within the supply chain participants, should be able to implement instructions and recommendations from business partners, advisors and auditors, and thereby improve their operational procedures.

In practice it is to be expected that mutual trust must be developed between the partners. In many developing countries this requires a significant investment in time as well as personal commitment. It is generally very advantageous to include other contacts, who are already recognized as a partner or intermediary by the mining operator, in this process. For example, these contacts may be active participants in the supply chain, state authorities, international donor programs, voluntary certification initiatives or expert consultants in ASM issues.

Gold Supply Chain Structures and Traceability

The objective of a responsible supply chain (in particular a closed pipe) is the closest and most direct relationship between customer and producer. In the case for sourcing gold from ASM and the sustainability standards applied by voluntary certification initiatives, it is expected that the international buyers of gold accept the delivery to be “free on board” (FOB)³⁷. Therefore, from this point onwards, the buyer assumes the responsibility for the freight and insurance of the gold. However, it cannot be assumed that the local ASM operators have the capacity and, as necessary, the license to export gold. It is therefore sometimes necessary to engage the services of other organizations (for example, export agents or traders as logistics partners). The legally required procedures must also be taken into account, although this is not always the case if the local supply chain for ASM is only informally organized and could therefore be related to the risks associated with smuggling.

A gold refinery interested in a supply chain from ASM should therefore assess if there are any interventions required in the established supply chain, which of the already existing processes could be applied to the advantage of the procedure, the risks that might be present and the required support measures as well as monitoring procedures. The typical gold supply chain must therefore be mapped from production to export in order to understand the dynamics and risks of the local gold business.

This requires the following fundamental information:

- What is the role of gold in the supply chain? Is the gold trade undertaken for profit by all the partners in the chain or is gold treated as an unofficial currency for other – legal or illegal – services or trading activities?
- How is gold purchased and sold along the supply chain? How many intermediaries are acting in a local supply chain? How many of these are logistically necessary and

³⁷ The relevant Incoterms definition actually only applies to sea freight, whereas gold is normally transported by air. In which case, this concept can be expanded so that the FOB location is an international airport.

- which can necessarily be by-passed? How often are individual consignments and associated payments initiated? Is an access to credit or pre-financing available?
- What processing and consolidation processes for individual gold consignments take place in a normal supply chain? What gold product is traded (e.g. gold nuggets, gold dust or gold “sponge” from amalgamation)? At what point are the first bars gold doré poured?
 - What is the documentation of the individual procedures (purchasing, selling, processing, transport and consolidation with other consignments)³⁸? Where, and with what procedures, is the gold analyzed in order to ascertain its value? What procedures are theoretically required by the state authorities and what procedures actually take place?

The traceability of gold consignments within a responsible supply chain is a very important issue for compliancy with international regulations and industry standards. The Fairmined Standard illustrates a practical example for the traceability of gold from ASM, and a similar procedure is used by the Fairtrade Gold Standard. The physical traceability of each and every certified gold consignment is an explicit requirement in the Fairmined Standard. The traceability must be based in every case on documentation and normally also the physically separate traceability along the entire upstream supply chain³⁹. The minimum of documented information that is required for each consignment between two contracted parties includes the date, quantity, price paid and the premium paid (this is included in the Fairmined Standards system) as well as financing costs and taxes. This data must be customized for the relevant country and, as necessary, supplemented with more information. Ideally the Fairmined System requires this to be valid for a linear supply chain with a direct connection between the small-scale gold producer and the international customers. The local intermediaries are therefore eliminated from the supply chain. However, they can be included as logistical service-providers (e.g. for export services) under contact to the relevant ASM operator.

Marketing of Artisanal Gold

Resources in supply chains that are sourced from ASM are marketed by the partners according to different criteria, with or without relating to an external standard. The extent of the involvement of the companies from the downstream supply chain up to the end-user is also critical. Some practical examples can be derived from the closed pipe participation of various electronics companies in sourcing 3T minerals (tin, tantalum and tungsten) from the African Great Lakes region⁴⁰.

Closed pipe supply chains are generally known because of actors, who are either engaged in initiatives such as Fairmined or Fairtrade Gold or within ASM related framework of other industry standards such as RJC (supplemented as necessary by specific ecological require-

³⁸ Intermediary gold traders usually purchase gold based on local experience and without any analysis. Gold is just weighed to determine the price at the time of purchase. Some traders use density tests and can thereby calculate the fineness of gold. Only the bigger traders or exporters have the necessary equipment to chemically determine the gold content, for example with an XRF pistol (X-ray fluorescence analysis).

³⁹ This is the separation of certified and non-certified gold in the supply chain. This issue can only be ignored if the costs incurred are disproportionately excessive. These costs cannot be assessed on an ad hoc basis, but must be demonstrated according to certain criteria.

⁴⁰ The Closed Pipe supply chain is initiated by various players, in part the processing companies, and in part the companies involved at the end of the supply chain with the end-users. For example the industrial processors of tantalum metal, AVX and Motorola, have developed the Solutions for Hope project, the partnership initiative from Kemet, and the Conflict-free Tin Initiative from Philips and other actors in the tin supply chain. All these projects follow the basic principle of strategic participation in small-scale mining in the Democratic Republic of Congo, a region that is globally disadvantaged as a resource supplier. A detailed analysis of this project is available here: http://www.resolv.org/site-ppa/files/2015/08/FinalReport-ELLClosedPipeAssessment_20150818.pdf

ments). There are other projects of various sizes that also relate to the general conditions of a closed pipe supply chain⁴¹.

The development of a responsible supply chain should be regarded as a step-by-step process. Initially, the focus may be on the upstream supply chain, for example to demonstrate capability, and develop demand. In the medium-term the downstream supply chain must be included in the development of a responsible supply chain, in particular a closed pipe. This is advisable if only because of the possible premium price to motivate responsible mining practices, which is economic only if the premium can be passed on to the end-user⁴².

Gold in the downstream supply chain gold is processed into numerous products with different applications (Tab. 1). The gold produced from responsible ASM is not intended for the mass market, but mainly for premium products in a niche market. Furthermore, the demand for responsibly mined gold from ASM is not widespread in many parts of the gold sector, mainly because of the only recently introduced international certification initiatives, such as the Alliance for Responsible Mining (Fairmined) or Fairtrade Gold. An increasing tendency by the jewelry sector can be observed, due to supply chain structure and proximity to the end-user. Increasing demand is also coming from other sectors, such as in the production of premium electronic articles as well as trophies and medals for awards at various events⁴³. However, the quantity of gold used in these products is extremely low, so that the technical capacity and profitability needs to be precisely evaluated, and relevance to the overall market can be ignored.

The Fairmined and Fairtrade Gold Standards already have a certain recognition among the end-users. This type of certification can be an advantage to the marketing of gold from ASM. There are specific requirements for a gold refinery to be included in a supply chain certified according to the Fairmined Standard. The refinery needs to be authorized as a "Fairmined Operator" by ARM, which is formalized as a Permit to Trade⁴⁴. The Fairmined Standard (and the similar Fairtrade Gold Standard) defines various options for paying the small-scale mine operator as supplier, and these were discussed in the preceding chapter under the aspect of pre-financing.

Gold can be marketed as a Fairmined product in the downstream supply chain either as "Fairmined Labelled" or as "Fairmined Incorporated". The former implies complete traceability, so that the gold refinery must separately process the certified gold consignment. For the latter, the certified gold must only be physically separate as far as the delivery to the gold refinery. If a gold refinery intends to certify their supply chain according to the RJC CoC Standard, then there are synergies with the Fairmined Standard⁴⁵.

⁴¹ The definition of a Closed Pipe varies according to the context. It does not necessarily imply a hermetically sealed supply chain with total physical separation of the gold and the requirement that producers only deliver into a Closed Pipe system. More open Closed Pipe approaches tend to use a mass-balance relationship, although this means that some of the certification standards cannot be met.

⁴² Particularly during the development stage, it is generally necessary to provide a subsidy or an investment in responsible mining chains.

⁴³ For example, Fairmined Gold is used for the Nobel Peace Prize, the Golden Palm at Cannes, and the "Olympic Laurel" of the international Olympic Committee, as well as Fairtrade Gold in the Fairphone 2.

⁴⁴ This agreement includes certain license fees that are raised by ARM.

⁴⁵ The Fairmined Standard (but not the Fairtrade God Standard) is currently recognized as a responsible mining standard by the RJC in the framework of their CoC certification. It is therefore possible to source gold from a Fairmined certified small-scale gold mine, even if this mine is not an RJC member. If a gold refinery intends to certify according to RJC CoC and also source gold from a Fairmined-certified gold mine, then there are synergies such as harmonized audits.

Fairtrade Gold has a similar approach to the supply chain traceability as Fairmined and it envisages a complete document-based traceability as well as the physical separation of the gold production consignments. Gold can only be declared by users in the downstream supply chain as certified Fairtrade Gold, if it is assured that the material was physically separated during processing in the gold refinery. Otherwise there is a general, not product-related, marketing under the Fairtrade Gold Sourcing Program label⁴⁶. The approaches to pricing and premium for the purchasing of gold is the same for both Fairtrade Gold and Fairmined, whereby the gold purchase price (from small-scale mine operators) is specified at 95% of the current LBMA price but the level of the premium, as foreseen for development of the mine and community, is different⁴⁷.

⁴⁶ This procedure is similar to the approach of Fairmined, and its differentiation between Fairmined Labelled (total physical separation) and Fairmined Incorporated.

⁴⁷ The premium envisaged by Fairtrade Gold is USD2000/kg, whereas for Fairmined it is USD4000/kg, whereby the latter is negotiable for annual deliveries of more than 20 kg. There are additional license fees that the authorized purchaser must pay to both initiatives (Fairtrade International or ARM, respectively).

4. Incentivizing Artisanal Gold Miners to Participate in a Responsible Supply Chain

It is only practical for ASM to participate voluntarily in the establishment of a responsible supply chain if they are suitably incentivized. These incentives can only be planned if they are analyzed together with other competing motivations provided by local structures in indigenous supply chains. This chapter provides an overview about the background and various incentives that a company may use to successfully establish a responsible supply chain. This chapter also provides information about several certification and support initiatives in ASM that could be useful in the implementation of such an incentive-based system.

4.1. The Function of Gold Trading in Artisanal Supply Chains

A responsible supply chain, which is focused on better structured ASM operators as potential partners, is competing with locally established supply chain structures. These include mine owners (private individuals or ASM organizations) in the producer country, intermediary traders and local exporters. The miners in the ASM are usually not directly involved in the export of gold. Gold supply chains from ASM fulfill various functions in developing countries and they have an important impact on the local gold price:

- Gold is sold on as a **profitable trading commodity**. The profit margin depends on the length of the national supply chain (number of intermediary traders); the price is based on the international gold price.
- Gold is also used as a **parallel currency**. This can be seen in various practices. Intermediary traders purchase and sell gold, but also trade in other consumer goods whose purchase in larger cities (or internationally) is financed by selling gold, which are then sold at a profit in the more remote communities where the small-scale mines are located. As a result, the profit in the supply chain is less, or even not at all, related to gold trading, but is in the trading of consumer goods. In this case, the purchase price paid for gold can be relatively high.
- Gold mines and intermediary traders are involved in **money laundering**, for example related to dealing in drugs or weapons. In this case, the purchase price paid for gold can be relatively high, possibly even higher than the international reference price.
- **State-sponsored programs to purchase gold**, for example by the central bank, can result in local distortions in the gold price. Price distortions occur together with macroeconomic factors (for example, if gold is purchased in local currency, by devaluation of this currency).
- Many miners in ASM are often **in debt**. This reflects the uncertainty related to gold mining: mining can provide no significant income over periods of several days or weeks (for example, if a newly discovered mineralized zone must be accessed by a cross-cut), during which time the miners must still cover their running costs. Gold exporters, intermediary traders and private mine owners deal in credit, or provide advances to the miners, so that they are financed during these times. The resultant servicing of this debt can be balanced against gold deliveries from affected miners (not in their favor) in ASM operations. This can also result in price distortions.
- In addition to such credit to cover daily running costs, **credit** can also be provided for investment in mining or processing by the mine owner, intermediary traders or exporters. This group of people provide the only access to capital markets for artisanal and small-scale miners, who are otherwise locked out of these markets because of the informal nature of their activities.
- In many of the mines, gold is sold by miners to the intermediary traders **based on trust and experience**, without a quantitative analysis of the gold grade or content.

As a result, there is a lack of transparency and it is difficult to understand the basis of the purchase price.

- **Gold smuggling** from ASM is widespread. This means that a legal supply chain is disadvantaged by the required tax payments that are not paid by an illegal supply chain.
- The **tailings** from artisanal gold processing are often gold-bearing, and therefore have a corresponding value for technically better equipped local and regional processing operators. It is not uncommon that, in the case of fine-grained gold, only half of the gold from ASM operations can be recovered. It is therefore important that the economic role of the processing stages in the supply chain are fully assessed.

If, taking the above into consideration, a responsible supply chain is to be competitive, then the financial and non-financial incentives to responsible ASM organizations (e.g. cooperatives) should, on a case by case basis, consider how these people can be persuaded to be partners. If the local intermediary traders and exporters do not participate as partners in a responsible supply chain, it is to be expected that will aggressively confront the presence of the new competitor by, for example, temporarily raising the gold purchase price. In these situations, non-financial incentives – always however in combination with financial incentives – could play an important role for the successful implementation of the responsible supply chain.

A responsible supply chain must inevitably include the mine owner. Ideally this should be a cooperative with democratic representation of the miners. Private individuals, as necessary through their companies, may also be acceptable and fair mine owners, although there is a higher risk for exploitation of the miners themselves.

4.2. Financial and Non-Financial Incentives

A responsible supply chain can offer miners and operators of ASM the following financial (income-sustaining) incentives:

- Fair and transparent payment based on the international reference price⁴⁸ as well as analysis of the gold content or grade.
- Consolidation of the supply chain (elimination of intermediary traders) and resultant higher prices for miners at the point of sale of their gold;
- Measures (e.g. improving the recovery of fine-grained gold, improved planning of the mine) to increase productivity at the local mining and processing level, so that the mine can sell more gold;
- Pre-financing, once mutual trust between the partners in the supply chain has been demonstrated on the basis of several trial consignments;
- Planning secured by long-term business relationships and purchasing guarantees. These can, as necessary, be combined with support (by investment or provision of collateral for local investment credits) for the development of the long-term business plan of the ASM organization;
- Premiums for the social development of the organization and communities around the mine in question.

Perhaps the most important point for the assessment of financial incentives for ASM operators and organizations is that they should not be theoretical in nature, but that they are focused on the practicalities of the local priorities. In most cases the priority for the individual miner in an ASM operation is the personal liquidity – regular payments (e.g. daily or weekly) are usually more important than a moderate increase in the gold selling price, particularly if gold is purchased locally and no long-distance transport issues are involved. ASM organizations are sensitive to the gold price but, due to their cash-flow requirements, have only lim-

⁴⁸ Best practice is a purchase price of 95% of the current LBMA gold price.

ited possibilities to produce gold for stockpiling in order to consolidate into larger consignments or negotiate better prices.

Non-financial incentives, with respect to miners and their social environment, include advice and support for the following issues. This consultant must be knowledgeable and experienced in ASM. If this expertise is not internally available in a gold refinery, it can be acquired externally – for example in the framework of guidance from the certification systems or by independent consultants⁴⁹.

The following issues are discussed only as examples. It is critical to clearly understand the local situation in order to plan a practical incentive system. There is commonly a network of interests and long traditions in the ASM environment, and certain specific procedures will have established themselves around a mine – a long-term and patient process, the complexity of which should not be underestimated, must be anticipated to change this situation.

- Improving the working conditions, in particular avoiding the worst forms of child labor, as well as improving working safety procedures. The latter includes both the safety equipment for the individual miners as well as the mine planning (especially for underground mines);
- Assistance for the successful participation in the structural formalization process and in the associated bureaucracy;
- Assistance for geological exploration – many of the ore deposits exploited by ASM are relatively small and mined out after a few years. Miners in ASM often undertake “mining in hope” with only insufficient understanding of the geological and economic relationships required to open new mines. Competent advice can support the economic development of the operation and the long-term stability at the mine;
- Support to the operating organization of the miners with respect to the special status and rights for women;
- Information on social, environmental and health risks in the community, coupled with relevant measures to address these issues⁵⁰.

A gold refinery can apply its international reputation to encourage the national authorities in the respective producing country to implement a responsible attitude towards ASM. Many problems of ASM are structural and can only be resolved with an adequate inclusion of the sector in the national structures by means of practical strategies. This process can contribute to the national representation and networking of ASM organizations.

The actions that are taken within a responsible supply chain are focused directly on that supply chain. They do not have a broad impact throughout the ASM sector in the respective country, but can bring about a certain positive effect. The effectiveness of these actions can be increased if other parallel development projects are implemented in the country by international partners⁵¹. These projects would include capacity-building and development of mining authorities so that ASM can be more effectively supervised, making geological data available, improved administration of the licensing process, as well as developing and implementing formalization strategies for mining and supply chains.

⁴⁹ The BGR can offer the required expertise and consultancy services to address the measures discussed here for a responsible supply chain

⁵⁰ This relates particularly to the issues associated with the use of mercury in amalgamation. Experience demonstrates, however, that this issue is extremely complex and cannot be solved linearly, as is expected by various international experts

⁵¹ National agencies, such as the BGR and the GIZ (German Agency for International Cooperation), or international organizations such as the United Nations Development Program and the World Bank.

4.3. Initiatives to Support and Certify Artisanal Gold Mining

Certification systems in the natural resources sector aim to assess, transparently and credibly, by means of suitable standards the production and trading of resources for the benefit of customers and end-users. Furthermore, certification systems for ASM also aim to improve the capacities of mine operators by means of accompanying advice, so that the requirements for the certification are not considered to be unreasonable, or unachievable for mining communities. A sequential approach over a period of one to six years is usual for the certification of ASGM – whereas some of the standards must be realized within the first year, other standards can realistically be attained after three to six years (see Chapter 3).

Currently the most widespread certification systems for ASGM – the Fairmined and Fairtrade Gold Standards – are based on the approach using incentives that are directly integrated in part of the standard of the respective system. These systems therefore define not only the performance criteria for ASM, but also the management criteria of the participating customers in the supply chain. Both systems include the same basic incentives in their standards, the most important of which are: (1) the consolidation of the supply chain by means of direct export of gold by the ASM organization, (2) options for pre-financing (after an initial test phase for confidence building), (3) a fair and reasonable gold price at the point of purchase (95% LBMA) as well as (4) the payment of a premium for the development of the local community. It is envisaged that the gold price effect related to the incentive program will be carried forward through the entire supply chain as far as the end-user.

The certification systems for ASM therefore represent a potentially important instrument in the responsible supply chain to assess the entitlement and integrity of the supply chain and also to generate suitable incentives. The latter is supported by the long-term approach of the certification systems so that trustworthy business relationships can be established along the supply chain. Furthermore, the certification systems require international coordination along the supply chain – different certification systems can affect the different sectors in the upstream and downstream supply chain and supplement each of the standards and audit processes.

A gold refinery can also consider partnership in a responsible supply chain without necessarily participating in a certification system, although this would require more detailed assessments and support by the gold refinery. Furthermore, this would necessarily require a significant personal participation to establish trustworthy business relationships with the partners in the ASM sector.

Some of the certification and support initiatives for ASM are discussed in the following paragraphs. The coordinators of these initiatives usually employ experts who have sufficient experience to provide suitable, incentive-based, advice to improve the mining procedures in the ASM sector. This type of advice can also be provided independently of the certification process.

Alliance for Responsible Mining

The **Alliance for Responsible Mining (ARM)** is the organization responsible for the Fairmined certification system, and also provides global consultancy services to the miners in small-scale operations. ARM is funded by international donors as well as partners from the gold industry, who pay a fee for certified gold („Fairmined Development Fee”). The total budget for ARM in 2015 was USD 1.3 million, of which 54% was invested in providing advice

to the ASM sector. ARM applies the International Reporting Standard since 2015 to document financial transparency.

The Fairmined system includes the above-mentioned incentives. The gold price premium, which is part of the incentive system (currently USD 4000 per kg; the premium level is negotiable for consignments of more than 20 kg per year⁵²) is not included in the ARM budget, but is paid directly to the respective mining organizations. Democratically elected local committees decide on the distribution of the premium.

ARM, through the Fairmined certification system and dependent on the supply chain characteristics, awards the following certificates (see the details in Appendix II – Certification Initiatives) for gold and gold-bearing products from ASM. In 2015, a total of 107 kg gold, derived from ten ASM operations, was certified by this system⁵³.

- *Fairmined Labelled* (total physical traceability along the supply chain)
- *Fairmined Incorporated* (physical traceability along the upstream supply chain up to the gold refinery and subsequently the mass-balance approach)
- *Fairmined Certified* (no physical traceability)
- *Fairmined Ecological Gold* (no use of chemicals in the processing, in addition to the usual standards).

In addition to the ten certified operations in Colombia, Peru, Bolivia and Mongolia, ARM also cooperates with operators in other countries where the conditions for a successful certification are being sequentially implemented.

Fairmined is currently the most successful in the gold sector up to the marketing certificate for the end-user. Fairmined gold-bearing products are included in the luxury collections of well-known jewelry manufacturers such as Chopard. The certificate recently obtained international recognition in particular thanks to the use of Fairmined Gold in the Golden Palm award at the Cannes Film Festival and in the medal of the Nobel Peace Prize.

Fairtrade Gold

The Fairtrade Standard is well known from the food sector, where the Fairtrade International Label Organization (FLO) is used and distinguished from other national certificates. **The Fairtrade Gold Standard** has very similar standards and incentives as the Fairmined Standard (compare Appendix II – Certification Initiatives). The certificates (total physical traceability, physical traceability in the upstream supply chain with subsequent mass-balance accounting, as well as Fairtrade Ecological Gold) are similar to those in the Fairmined system. The price premium, which is part of the overall incentive system in several standards, is USD 2000 per kg certified gold, and therefore lower than in the Fairmined system.

Fairtrade Gold is focused on marketing and, unlike the Fairmined certification from ARM, there is no similar organization with explicit expertise in ASM that supports Fairtrade Gold. The necessary programs to improve the exploitation and mining procedures are contracted to various other external organizations, who are funded separately, for example by international donors. A number of mines in East Africa (Uganda, Kenya and Tanzania) participate in this program. But at the moment only one mine in Peru is actually certified by Fairtrade Gold.

⁵² In some cases consignments of significant amounts of gold can result in an almost 50% reduction of the premium.

⁵³ Of these operations, five are in Colombia, three in Peru, and one each in Bolivia and Mongolia. The Mongolian company Xamdox was the only organization to be awarded the Fairmined Ecological Gold certificate.

The Dutch company Fairphone, including its Chinese partners in the supply chain, is the most prominent customer for gold (in very small amounts) from this mine.

Artisanal Gold Council

The **Artisanal Gold Council** is a Canadian non-profit organization that, together with international partners, provides direct support to small-scale gold mining, with the objectives to reduce the global discharges of mercury (that which is derived from ASM), support the formalization processes and improve living conditions for the miners. The organization looks after partner-financed projects worldwide, currently in Gabon, Burundi, Guinea, Indonesia, Nicaragua, Peru, Senegal and Suriname.

Solidaridad

Solidaridad is a non-profit organization based in The Netherlands that supports, with the help of its worldwide network, sustainable production of goods in developing countries. In mining its work is focused only on gold. Currently, Solidaridad cares for five major projects on ASGM, including projects in producing countries (such as Ghana, Tanzania and Peru) as well as projects at the policy development level.

The Swiss Commitment to ASGM

Switzerland is the most important gold refining country in the world. There is therefore a substantial commitment in Switzerland to the ASM sector, both by private business interests as well as by the state. Several gold refineries have been criticized in the past for neglecting their obligations for due diligence in the relevant supply chains.

The **Swiss Better Gold Association** is a non-profit cooperative of organizations in the Swiss gold sector that supports the formalization and environmentally-friendly practices in ASM. From the perspective of the private sector, the program attempts to establish both a sustainable as well as economic sourcing of gold from ASM. This includes strengthening the transparency and traceability in the supply chain, the support of cooperation between private business and the certification agencies (including ARM, Fairtrade Gold, RJC) as well as developing methods for the easier availability of credit to the AGM sector. The initiative is strengthened by a cooperation with the Swiss Ministry of Economy as the Better Gold Initiative, which is active as “Public-Private Partnership” in Peru since 2013.

The **Sustainable Artisanal Mining** project was founded in 2005 by the Swiss Agency for Development and Cooperation. This is a bilateral project to assist the ASGM sector in Mongolia. The project supports Mongolia in the central issues of formalizing ASM, insurance and labor safety for miners, responsible management of environmental impacts as well as local community development. The long-term project is currently in its fourth phase.

5. The National Framework in Producing Countries for Establishing a Responsible Artisanal Gold Supply Chain

The basis parameters for ASGM and thereby the requirements for the potential implementation of responsible supply chain actions, differ from country to country. This chapter provides an overview of these basic parameters based on the following criteria: importance of the national gold mining sector, legal framework, development potential of ASM and a risk analysis.

5.1. Parameters and their Constraints

The implementation of a responsible gold supply chain that includes sourcing from ASM is the obligation of participating business partners in the supply chain. The legal, geological and logistical parameters and risks in the respective producing country obviously have a direct impact on the successful outcome of these actions. The basic parameters and risks for a selection of countries are presented in the following paragraphs. This information can provide gold refineries and end-users with some orientation about where potential measures and under what conditions they can be applied.

A responsible supply chain sourcing gold from ASM is not normally viewed from the customer perspective as a business opportunity but also as a development opportunity for improving the living conditions of the local partners in the supply chain, for example ASM organizations. In this respect it is important to emphasize that this type of supply chain cannot guarantee any impact on higher level development policies, as these are the responsibility of bilateral technical cooperation that is focused on a sector-wide level. However, the organization of development policies pertaining to the constraining parameters in the respective producing country is also relevant to the actions within the supply chains, as this assists in illustrating the moral meaningfulness of these types of actions in the respective country.

5.2. Methodology of the Country Assessment

The prequalification of countries in the following analysis was based on the national importance ASGM to the country. In addition, several development policy issues were also considered in the prequalification procedure. As a result, for example, Brazil is not included in the analysis despite the national importance of ASM because the relevance to development policy is more important in other countries. Other countries, such as Sudan, are excluded from prequalification because, despite significant national gold production, the feasibility of implementing the necessary actions was deemed in the short-term to be impractical. The Peoples Republic of China is important because of its significant ASGM sector. On the one hand, there is a local relevance to development policy issues and China is still officially regarded as a developing country but on the other hand, because of China's economic strength and global importance in the resource sector, actions related to the supply chains in ASM would have a questionable public impact.

Official data surveys about ASM in many countries are only rarely available or relatively unreliable because of the observed informality or illegality of the sector. The estimates of gold production and employment in ASM that are presented in the following paragraphs must therefore be regarded with a significant uncertainty. Furthermore, figures published by government authorities, NGOs and other institutions could pursue political interests. The data

and information in the following paragraphs are, where possible, cross-checked from various sources and evaluated for their credibility. However, this evaluation was a desk-top study, and does not provide detailed verification for each country and, because of this reason, the data might not be up-to-date.

Furthermore, in addition to the national significance, the availability of information about ASGM in the various countries is also prejudiced by the public data on this topic. For example, the availability of information is relatively high in some countries due to the international attention, particularly in Peru (Madre de Dios) and the Democratic Republic of Congo (conflict-affected minerals), whereas in other countries there is much less information available.

The screening of the countries focused on the following four criteria:

1. The **potential as a source for gold** is related to the requirements for developing a long-term and stable source for gold. These include a sufficient number of producers, favorable geology as well as long-term experience in the gold mining methods and procedures.
2. The **legal constraints and the level of structural formalization in the ASM** sector reflect the legislation in the country with respect to ASM as well as the practical implementation of the legal framework. The national strategies and policies pertaining to the support for ASM are taken into account here.
3. The **relevance of ASM to development** is related to its economic and social potential for contributing to the reduction of poverty (for example, the number of employees in mostly structurally weak areas in the country) and the improvement of the negative circumstances that are often associated with ASM. At the same time the international donors and certification initiatives active in the country are assessed as possible cooperation partners to be mobilized for the necessary actions and measures.
4. The **risk assessment** depends on the in-country structural conditions for participating in the supply chain, as these have a very significant influence on the feasibility and success of implementing these actions. Conflict-risks are included in this assessment and they can lead to a classification as a conflict-affected or high-risk area. Other risks include widespread illegal trading activities such as smuggling or money laundering as well as important environmental risks and social problems.

The gold production in a country from both industrial large-scale mining and ASM is estimated in the chapter **Potential as a source for gold**, and data provided on the number of miners engaged in the ASM sector. In this way, this chapter presents the most important data on the basis of which the gold potential of a country can currently be estimated. Information on the supply chain (e.g. export, legal vs illegal activities) is also provided, in so far as it is available. Information is sourced primarily from the BGR databases (unpublished), the SNL Metals & Mining Raw Materials Information Service⁵⁴ (unpublished), the UN Comtrade database for exports⁵⁵ (published) as well as official statistics and estimates from the respective government authorities. Furthermore, information is also obtained from the reports by various institutions and NGOs.

The **legal constraints and the level of structural formalization** in ASM and the associated supply chains is of primary importance because this is critical to the success for establishing a legal supply chain for sourcing gold to Germany from responsible ASM. Investing in countries where ASM is illegal or, where it is not possible in practice to implement the legal framework conditions, presents a very significant obstacle to establishing a responsible sup-

⁵⁴ <http://www.snl.com/Sectors/metalsmining/Default.aspx>

⁵⁵ <http://comtrade.un.org/>

ply chain and would require substantial introductory effort (e.g. negotiation for special permits). The national mining and environmental laws, regulations and sector-related strategy documents and as necessary restrictions to the export of resources as well as analyses by institutions such as the United Nations Environmental Program, are the basis for the assessment. The assessment presented in this report is relatively superficial and, if there is interest in a specific country, should be supplemented by further detailed studies.

The **relevance of ASM to sustainable development** in the selected countries is related to the extent to which the political practices in the country define ASGM as contributing to both the campaign to reduce poverty as well as the economic development of the country. Poverty is defined quantitatively as the level of extreme poverty (less than USD 1.90)⁵⁶ that was established by the World Bank in October 2015. National strategies for the fight against poverty and economic development provide important information about the role of ASM. The initiatives for supporting responsible practices in ASM already active in a country, for example technical cooperation projects or other projects that have already carried out a preliminary analysis of this topic, provide further indications for the development potential and practicality of engaging in the ASM sector. This includes, for example, the actions of the Alliance for Responsible Mining (ARM), the Fairmined Standard, Fairtrade Gold and the Artisanal Gold Council (AGC), which are organizations that could also act as potential cooperation partners to accelerate the implementation of a pilot project on supply chains. The general development policy measures undertaken by the Federal Republic of Germany are listed for further information on this topic.

The **risk assessment** for participating in the ASM sector is undertaken separately. It is critical for the customers such as gold refineries to understand if the gold is sourced from a conflict-affected or high-risk region. The Heidelberg Conflict Barometer⁵⁷, supplemented by national and NGO reports, is used to provide this information.

5.3. Results of the Country Assessment

The comparative analysis of the country-specific constraints was undertaken for the prequalified countries according to the above-mentioned criteria. The results of this analysis are presented qualitatively in Tab. 2, and an overview of the analyzed countries is shown in Fig. 1. Separate country profile reports with all the details derived from the evaluation study are presented in Appendix III to this Technical Report.

⁵⁶ <http://blogs.worldbank.org/developmenttalk/international-poverty-line-has-just-been-raised-190-day-global-poverty-basically-unchanged-how-even>

⁵⁷ <http://hiik.de/de/konfliktbarometer/>

Tab. 2 Results of the analysis of the framework constraints in the selected countries. A positive (+), neutral (o) or negative (-) valuation is based on the criteria presented in Chapter 5.2. The results are presented as an overall rating for the feasibility of implementing the actions for a responsible supply chain in the respective country.

Country	1. Potential for sourcing gold	2. Legal constraints and the level of structural formalization	3. Relevance of ASM to development	4. Risk Assessment	Feasibility (Résumé)
Burkina Faso	+	-	+	-	o
Colombia	+	+	o	o	+
DR Congo	+	-	+	-	-
Ecuador	+	o	-	+	+
Ghana	+	o	+	o	+
Indonesia	+	o	o	-	o *
Kenya	-	-	o	-	-
Madagascar	o	o	+	-	o *
Mongolia	o	+	o	+	+
Peru	+	+	-	o	+
Philippines	+	-	o	-	-
Tanzania	+	o	+	-	+

* Official restrictions on exporting gold present obstacles to implementing the actions for a supply chain as described in this report.

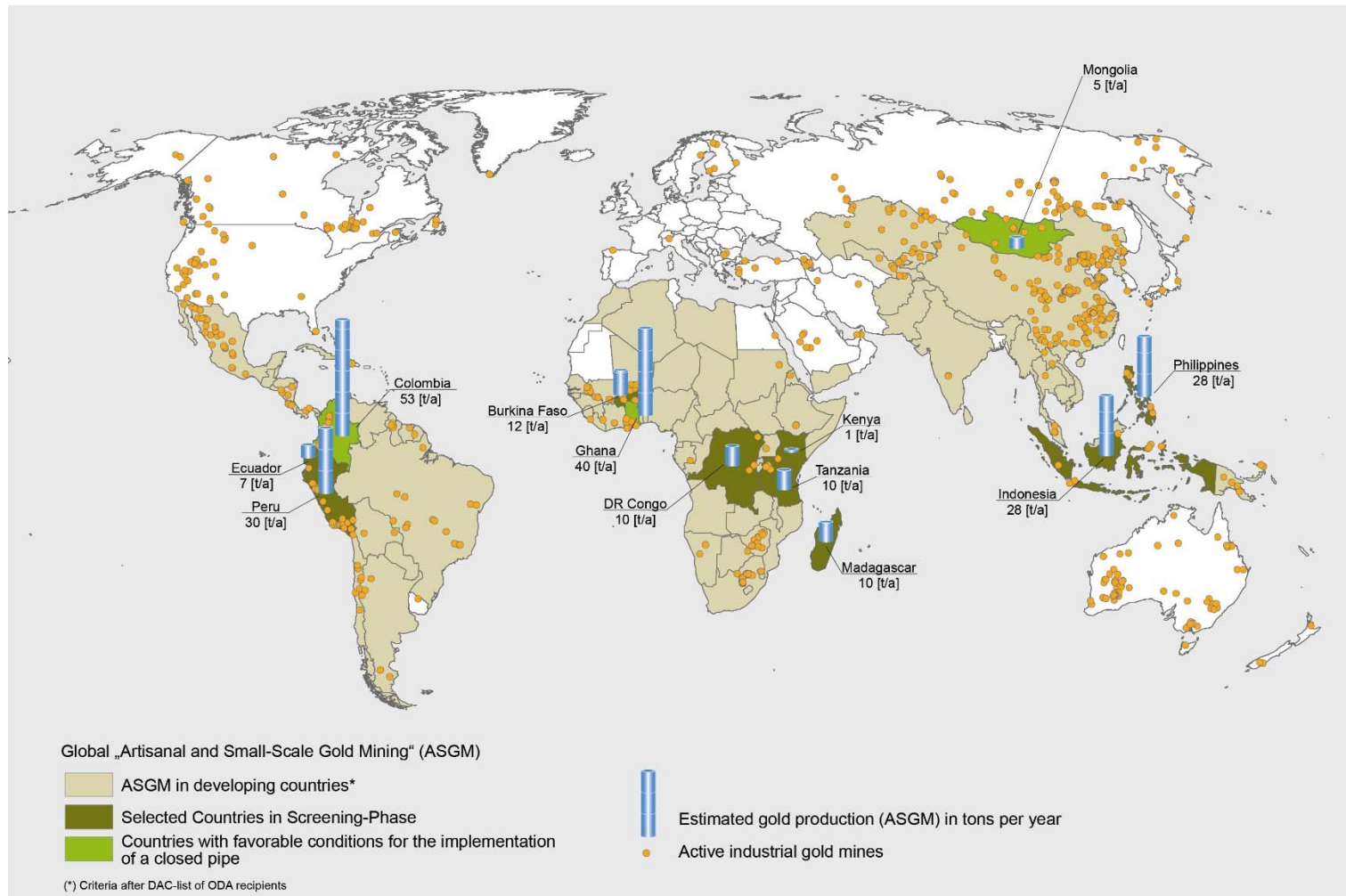


Fig.1 Map of the countries evaluated with regard to the framework for a supply chain commitment in ASGM. Dataset for active industrial mines from SNL Metals & Mining.

Potential of Individual Countries as a Source for Gold

An overview of the typical statistics on national gold production, with special reference to ASM, is provided in Tab. 3. The ASGM sector is particularly important in Colombia, Peru, Ghana, Madagascar, Tanzania, Indonesia and the Philippines. An estimated minimum of 300,000 miners in each of these countries are active in ASGM, and the production represents a major proportion of the national production. For example, ASM in Colombia⁵⁸ contributes 53 tons gold, or 88% of the annual total production. In contrast, industrial large-scale mining is dominant contributor to the annual total production from Peru and Tanzania, where ASM contributes a relatively low 20-25% of total production.

The productivity of ASM can be estimated as the daily gold production per miner. This criterion demonstrates marked differences in the productivity in different countries and continents. In general, ASM is most productive in Latin America and least productive in Africa, although there are important exceptions. The differences in productivity depend on various factors, including for example the geology (grade of the deposits exploited by artisanal miners), the mining procedures or the intensity (fulltime or seasonal) of employment. “Only” 70,000 – 100,000 miners are active in ASM in Peru, but their productivity is very high so that an estimated 30 tons of gold are produced annually.

Tab. 3 Statistics of small-scale gold mining in the evaluated countries (reference year 2014)

Country	Gold Production from ASGM sector [t/a]	Total Gold production [t/a]	Proportion of ASGM to total Gold Production	Employees in the ASGM sector
Burkina Faso	12	37	32%	200,000
Colombia	53	60	88%	340,000
DR Congo	12*	36	33%	>200,000
Ecuador	7	7	100%	90,000
Ghana	40	106	34%	300-500,000
Indonesia	28	69	41%	300,000
Kenya	<1	<1	100%	10,000
Madagascar	10	10	100%	330,000
Mongolia	5	12	42%	55-90,000
Peru	30	140	21%	70-100,000
Philippines	28	46 *	61%	200-300,000
Tanzania	10	40	25%	300,000

Data on gold production from the BGR Resources Databases as well as SNL (2016). Information on the total gold production from the Philippines () is consolidated from combined industrial large-scale production (18 t) and estimated artisanal production (28 t) in 2014. The estimates for the ASM production of gold from the DR Congo does not include significant alluvial dredging operations.*

The importance of national gold production provides an indication of the total volume, but detailed information from appropriate in-country producers is more relevant for a responsible supply chain from ASM. Smaller producers with a regular annual production of several dozen- or hundred-kilogram gold are more valuable for actions for a single supply chain as compared to a larger number of decentralized small-scale miners. These kinds of individual producers can also be found in countries with a lower total production. A reliable analysis of the production capacity, or the possible production potential, of individual producers can only, with few exceptions, be carried out onsite in the relevant country.

⁵⁸ It should be noted that the estimates provided by the Colombian government authorities do not distinguish between small- and medium-scale mining activities

Legal Framework and the level of Formalization in the ASM Sector

The legislative approach to supporting and/or suppression of ASM is very different in each of the selected countries and reflects the role of ASM in the national network of interests between the specific interests of individual business-persons and politicians, corruption risks, conflict risks and tax income. Additionally, there is often a competitive relationship between the small- and large-scale mining organizations, whereby the latter is generally favored by the government because they generate a higher income, even if the resulting suppression of ASM activity is questionable in terms of development policies.

The relationship of various countries to their ASM activity can change with time. For example, the Colombian government was initially confrontational towards a formalization of the ASGM sector, but is not more supportive of the relevant policy approach. In this case, the government foresees a multi-stage process as a progressive method for realizing their objective for the full formalization of ASM by 2032. Other countries are also attempting to formalize the ASM operators by means of various supportive incentives, including, for example, Burkina Faso, Ghana, Tanzania and Mongolia. In Madagascar the government is seeking to decentralize the taxation of ASM, so that the income is fairly distributed between the central government and local communities. However, this progressive approach has not yet been implemented because of the weak administrative capacity during the past years.

In other countries, ASM is usually regarded as a problem, both from the economic as well as social development perspective. For example, in 2015 the actions of the Peruvian government hit the headlines because it used a military approach to act against illegal ASM operations in the Madre de Dios region. Several countries have totally prohibited ASM activities, at least temporarily (e.g. the Philippines). The legal framework and constraints in the Democratic Republic of Congo are relatively meaningless since they cannot be enforced in the relevant regions in eastern Congo due to the unstable security situation prevailing there.

Export restrictions on natural resources or a state-controlled monopoly for purchasing gold can make a strong impact on the actions in a responsible supply chain. The Indonesian government legally requires resource companies to undertake the value-adding processes such as smelting and refining in the country itself. Gold produced in the country must have a demonstrable 99% fineness for export. It is questionable if this is a worthwhile objective for a foreign gold refinery within the supply chain from ASM. The government in Madagascar legally requires that all gold is purchased and exported by the central bank, although in fact this organization does not have sufficient analytical capacity to determine the gold content. As a result, the implementation is practically not possible and smuggling becomes widespread.

Relevance of ASM to Development

The contribution of the ASGM sector to the development of a country depends on numerous factors. In addition to the legal constraints and the number of miners in the ASM sector, most of whom belong to the poorer classes of the population, the plans of the national and regional administrations to implement development strategies and their relationship to the ASGM sector are the most important issues. For example, the government of Ghana connects their National Mining Policy with their national development strategy, and focusses on incentives for formalizing the sector. Tanzania, Colombia and Mongolia follow a similar approach. In each case, it is critical to monitor the actual implementation and practical effectiveness of these strategies.

Responsible supply chains (particularly closed pipes) have a high public prominence and can therefore also provide a positive effect to the appreciation to ASM in the country, even if they cannot be fully implemented. An effective monitoring or integration of supply chain actions in the development policies can, in certain circumstances, be supported by initiatives and government development cooperation projects that are more effective and/or long-term. For example, the activities of Fairmined (Peru, Colombia, Ecuador, Mongolia, as well as pilot projects in Ghana and Burkina Faso) or Fairtrade Gold (Peru, Tanzania, Ghana, Kenya, Uganda) could be relevant, but must be evaluated in more detail on a case-by-case basis.

Switzerland and the USA are particularly active with larger, government-sponsored, projects, but international organizations such as the World Bank are also involved in various countries. The German development cooperation is only directly involved in resource issues to a relatively small extent in the countries in this analysis. Resource partnerships have been agreed with Peru and Mongolia, but these include mainly the industrial large-scale mining. Germany supports a project in the Democratic Republic of Congo that is directly related to the ASM sector. Previously there were also cooperation projects with Ghana and Colombia. The long-term cooperation with Mongolia covers various issues, including mining administration and oversight that is indirectly relative to ASGM.

Effectiveness to development policy.

The assessments and recommendations in this report relate to the local framework conditions, explicitly in the context of the participation of private business in the supply chain from ASM (as necessary with accompanying government support). Accordingly the recommendations do not include any guidelines for countries where, from the development perspective, a cooperation with the state would be advisable in the ASM sector. Relevant factors for the latter, such as demand and inclusion of small-scale mining in national strategies for the fight against poverty and economic development, should be analyzed separately and would lead to different conclusions.

Risk Assessment

ASM is globally characterized by major challenges that are either fundamentally related to ASM itself, which represents the symptoms of underlying problems (such as the legal marginalization) or reflect the generally weak governance in the producing country.

Different challenges and risks, according to the region, to the implementation of a responsible supply chain can be identified. Many countries in the world are characterized by political instability and conflicts in specific regions of the country. These present a risk to the implementation of supply chain actions and in any case, result in mandatory implementation of the OECD Guidelines for due diligence obligations. These types of **conflict-related risks** and their associated **human-rights infringements** refer primarily to the Democratic Republic of Congo and the continuing conflicts in the east of the country. Illegal ASM activities in several regions of Colombia are also controlled by the FARC rebel organization. In recent years this has resulted in an increasing use of gold for smuggling and money laundering. However, because the control over gold mining areas are part of the recent peace agreement between the central government and FARC, the transfer of the control over these areas to the government could provide the Colombian society with an enormous potential for development.

Gold **smuggling** for money laundering, avoidance of export tax, as well as for other types of tax evasion by organized crime, present a further problem that globally affects the supply chain for gold. In Latin America, gold is used for money laundering in the cocaine trade,

whereas gold smuggling in east Africa is primarily undertaken to hide the source of gold from the conflict-affected regions (Democratic Republic of Congo). In most countries gold smuggling is widely used to avoid export taxes.

Social and environmental risks are associated with illegal ASGM combined with weak governance. This is most commonly reflected by the worst forms of child labor exploitation and forced prostitution. Major environmental risks derive from the uncontrolled use of mercury (also sometimes cyanide) for the processing of gold from ASM. Work-safety procedures also present a general high risk factor. All these risks occur in nearly all the countries included in this assessment. As already mentioned, these challenges actually represent a chance to improve the living conditions of the affected people. The inclusion of in-country partners, who already conform to specific minimum standards, in the planning stage is advisable for a successful implementation of supply-chain-management.

5.4. Countries Recommended for Assessing Opportunities for Responsible Artisanal Gold Sourcing

The evaluation of the information summarized in Tab. 2 relates to a summary of the above mentioned issues and the resulting recommendations of countries where, based on their framework conditions, it appears reasonable to search for potential partners in a supply chain with small-scale miners. These recommendations should include supplementary more detailed investigations of local conditions in the relevant country and should not be regarded as the final selected recommendations that exclude other countries. On this basis, it is recommended to evaluate the feasibility of initiating a supply chain from ASM in the following countries:

- Colombia
- Ghana
- Mongolia

A participation in **Colombia** is favored by good geological availability of gold as well as high productivity of ASM that, together, are indications for sufficient potential supply chain partners over the long-term. In addition, the legal framework is positive because the government foresees a progressive, multi-phase process for formalization. The unstable security situation in parts of the country could be resolved because of the completion of the peace negotiations with FARC. Certified material (Fairmined) is already available from several mines in Colombia.

Ghana is also rich in gold and is therefore potentially a good basis for developing a long-term source for gold. The implementation of a responsible supply chain in Ghana would be supported by many years of experience both in the state and private sectors of the gold mining industry. The relationship between the national development strategy with the National Mining Policy is also an indication of the persistent approach towards formalizing the status of the ASGM sector, although if this actually can be implemented remains to be seen. It remains to be evaluated if gold can be sourced from ASM in cooperation with an industrial mining company in order to better address the legal risks. It is not yet possible to source certified gold from the country, although the Alliance for Responsible Mining already cooperates with a pilot mine to generate the conditions for a certification according to the Fairmined Standard.

The ASM sector in **Mongolia** primarily provides economic support to the rural population. There are fewer gold occurrences in Mongolia as compared to Colombia or Ghana and the ASM sector is considerably smaller. However, the formalization of the sector has progressed

further in Mongolia, which is in this respect one of the more advanced countries in the world that, to a large extent, is due to the long-term cooperation with Switzerland (Sustainable Artisanal Mining). Criminal structures are present within the sector, in particular by illegal mining and gold smuggling across the border to China, but in general these appear to be less institutionalized as in other countries. Certified gold (Fairmined) is already possible to source from Mongolia and the Fairmined-certified “Ecological Gold” (produced without using any mercury in the processing) is only available from Mongolia.

The following countries, which appear to have the necessary national framework conditions for a supply chain action, even if less definite as the above-mentioned favorites, are classified in the **broader focus**.

- Tanzania
- Peru
- Ecuador

Tanzania is one of the major gold producing countries in East Africa and, although the production is dominated by industrial large-scale mining operations, ASM is very widespread. The legal and political framework conditions appear to be favorable in Tanzania for implementing a pilot project on sourcing gold from ASM. However, most ASM operations are not formalized and a selective commitment would be necessary and fewer local partners would be available for participating in supply chain actions. Fairtrade Gold has already made initial progress in establishing local pilot projects, but it appears difficult to breakup traditional supply chain structures (Chapter 1.3).

Peru has a century's long tradition in ASGM and the country is endowed with an effective state governance that is very experienced in mining. Apart from the problematic producer areas such as Madre de Dios (and the related risks there), there are also stable areas where responsible ASM is already successfully carried out. This includes mines certified according to the Fairmined and Fairtrade Gold Standards. However, because there are an increasing number of organizations actively taking advantage of the relatively positive framework conditions, additional supply chain actions in Peru would therefore seem to have less of a public impact as compared to other countries.

The relatively low gold production in **Ecuador**, as compared to its bigger neighbors Peru and Colombia, seems to be due to the disadvantageous framework conditions for mining. Ecuador contains high-grade gold ore deposits. The Ecuador government distinguishes ASM into the manual artisanal and semi-mechanized categories. The purely manual artisanal mining is generally ignored by the authorities, but the miners in the better formalized and semi-mechanized small-scale mining receive, in part, state support. In view of this it is necessary to evaluate if a commitment to a responsible supply chain could be reasonably implemented. Other risks include mainly the smuggling of gold in the border region to Colombia, which is undertaken to avoid the official export license for gold that is required in Ecuador.

6. Conclusion and Outlook

This BGR report explores the background for a possible engagement of German gold refiners to responsibly source gold from ASM. Responsible ASM gold sourcing in line with international supply chain standards such as OECD and LBMA guidelines can be reconciled with both business practices of gold refineries as well as with the framework encountered in certain gold-producing developing countries. While there is already some international experience with measures for introducing responsible gold supply chains in the ASM sector (for example, a closed pipe), this approach has not yet been applied in Germany. Therefore, it is worth considering a pilot initiative that could be implemented by a German gold refinery with support by BGR.

The framework conditions for ASM in developing countries are often related to social, environmental and economic problems. Furthermore, artisanal gold supply chain structures are more complex compared to those in industrial gold mining. The successful implementation of a responsible supply chain provides the possibilities to work towards improved conditions for the production and trading of gold, therefore offering positive development incentives. With respect to the national framework for ASM gold sourcing, Ghana, Colombia and Mongolia (and, to a lesser extent, Ecuador, Peru and Tanzania) seem particularly suited for a possible pilot supply chain. However, if suitable partners are identified, a responsible pilot gold supply chain could be implemented in other countries as well.

The results of this scoping study tentatively suggest **three different scenarios** for implementation a responsible supply chain for gold in ASM:

- (1) Sourcing of responsibly produced gold from an ASM mine that has already been **certified** by third parties (e.g., Fairmined, Fairtrade Gold). The implementation of this first scenario would include a fixed gold price **premium payment**.
- (2) Sourcing of responsibly produced gold from an ASM mine need not necessarily be from certified mine (**no premium payments**). In this case, **alternative incentives** need to be provided for the local miners in the ASM operations, and relevant standards need to be implemented outside of the certification systems.
- (3) **Gold cannot be directly sourced** from ASM because, based on a detailed onsite evaluation, the framework conditions of a given supply chain are not favorable for meaningful engagement. In this case, responsible ASM gold sourcing could still be supported indirectly.

Sourcing gold from an already certified mine, or a mine currently undergoing a certification process (**Scenario 1**), permits the participating gold refinery to assign specific supply chain questions, such as the local incentivizing⁵⁹ as well as the auditing of ASM operations, to qualified third parties. This results in an alleviation in the risk management by the gold refinery; moreover, a well-established local network can be relied upon. The readiness of ASM operators to participate in the certification emphasizes their reliability in a long-term and stable business relationship. However, a definite component of this scenario is the willingness to not only pay a “fair” price for gold but also premium (approximately 5-10% of the gold price) for the benefit of community development. If a gold refinery itself does not undertake to pay this premium price, then it should be ensured that this premium is paid from the downstream supply chain (and ultimately, the end-user).

If the payment of a fixed price premium is ruled out (**Scenario 2**), for example because of a lack of demand in the end-user market, then a responsible gold supply chain from ASM could also be implemented with alternative incentives. These incentives may include alterna-

⁵⁹ The implementation of additional incentives is obviously desirable from the perspective of development policy.

tive advantageous payment terms, advisory and consulting services or technology transfer. This scenario implies that the gold refinery accepts a more active role in assuming the responsibility for local engagement for a possible initiative in the gold-producing country.

This report demonstrates that the principle requirements and framework conditions for successfully establishing a pilot supply chain for ASM gold sourcing are realistic to achieve. However, it is possible that a specific implementation plan involving direct engagement cannot be realized due to different factors (**Scenario 3**). In this case, it might be beneficial to analyze and influence the current framework conditions for responsible ASM gold sourcing – for example to improve the demand for certified gold.

A detailed analysis of the feasibility of a given scenario would be the next phase following this general evaluation of supply chain standards, incentives as well as the framework conditions in selected producer countries where potential partners for ASM gold sourcing are located. This includes checking the facts of the framework conditions as well as identifying stakeholders in selected producer countries, so that concrete supply models for sourcing gold can be developed.

Appendix I – OECD-Requirements for ASM

Responsibilities for Gold Refineries According to the OECD Guidelines for the Source of ASM Gold from Conflict-Affected and High-Risk Areas

In the OECD Guidelines, the supplement on gold, Section II, Paragraph C.3.b makes the following points with respect to the required risk assessment by the gold refineries in their supply chains.


For ASM Gold: obtain evidence of the factual circumstances of gold extraction, trade, handling and export. Companies should complement the steps they are taking to progressively collect the following information by referring to Step 3(C) and the Appendix to assist and enable artisanal and small-scale miners to build secure, transparent and verifiable gold supply chains:

- i. Identification of the suppliers of ASM Gold to the local gold exporter using reliable, independent source documents, data or information; any information on the government, political or military affiliations of those suppliers including in particular any reported instances of affiliation with non-state armed groups and/or public or private security forces; and the geographic sourcing area those suppliers. ☒
- ii. The mine(s) of origin, the transportation routes and points where gold is traded. ☒
- iii. The artisanal mining team or association, and an assessment of whether they can be considered to be involved in Legitimate Artisanal and Small-Scale Mining (see Definitions). ☒
- iv. The methods of gold processing and transportation. ☒
- v. Taxes, royalties and fees paid to government institutions and officials □ on export. □
- vi. Identification and “know your counterparty” information (where applicable) of the gold exporter and all actors in the supply chain from the gold exporter to the refiner, including international gold traders and all third party service providers handling the gold (e.g. logistics, processors and transportation companies) or providing security at mine sites and along transportation routes. The identification should comprise the following measures, but the extent to which such measures are carried out should be determined on a risk sensitive basis: □
 - identification of the ownership (including beneficial ownership) and corporate structure, including the names of corporate officers and directors); ☒
 - identification of the related businesses, subsidiaries, parents, affiliates; ☒
 - verification of the identity of the companies using reliable, independent source documents, data or information (e.g. business registers, extract, certificate of incorporation); ☒
 - checking government watch list information (e.g. UN sanctions lists, Lists of specially designated nationals in the Office of Foreign Assets Control (OFAC Specially Designated Nationals Lists), World-Check search); ☒
 - identification of any affiliation of the company with the government, political parties, military, criminal networks or non- state armed groups, including in particular any reported instances of affiliation with non-state armed groups and/or public or private security forces. ☒
- vii. Militarization of mine sites, transportation routes and points where gold is traded and exported.
- viii. Evidence of any serious abuses (torture, cruel, inhuman and degrading treatment, forced or compulsory labor, the worst forms of child labor, gross human rights violations, war crimes, or other serious violations of international humanitarian law,

- crimes against humanity or genocide) committed by any party in mines, transportation routes and points where gold is traded and/or processed;
- ix. Information on any direct or indirect support to non-state armed groups or public or private security forces through the extraction, transport, trade, handling or export of gold (see Definitions); ⁶
 - x. Any instances, reports or suspicions that gold from other sources is being unknowingly introduced into the gold supply chain, and/or fraudulently represented. ⁶
- i) If relevant, instances of conflict or tensions in the relationship between medium and large-scale miners and artisanal and small-scale miners.


Appendix II – Certification Initiatives

Profile: Fairmined

Fairmined Gold (Date: September 2016)		
Objective	<p>The objective of certification is the production and sale of responsibly mined gold sourced from ASM.</p> <p>The certification will support capacity of miners in ASM operations, the sustainable development within the local community, and local actions for environmental awareness. The experience and knowledge of the Alliance for Responsible Mining would be made available.</p> <p>As incentives, the sale of gold is fixed at a guaranteed market price (95% LBMA), and a premium for investment in the local sustainable development is assured.</p>	
Standard	<p>Initiation of the Standard (preliminary): 2004, last update 2014</p> <p>Time required for certification of a small-scale mine: generally 18 – 24 months, up to three years for poor level of formalization / weak governance.</p> <p>Subdivided into three categories along the supply chain:</p> <ul style="list-style-type: none"> • Fairmined Labelled (total physical traceability) • Fairmined Incorporated (physical traceability from the mine to the authorized purchaser; total traceability of the documentation) • Fairmined Certificates (no physical integration, support for gold production by sale of certificates) 	
Distribution and Partners	<p>The Alliance for Responsible Mining initiated the Standard,</p> <p>The current ASM operations certified by Fairmined:</p> <ul style="list-style-type: none"> • Colombia (5), Peru (3), Bolivia (1), Mongolia (1) <p>Currently in the certification process:</p> <ul style="list-style-type: none"> • 107 ASM organizations in Bolivia, Brazil, Burkina Faso, Ecuador, Gabon, Cameroon, Colombia, Mali, Peru, Senegal <p>Fairmined Gold customers (total 90) are located in:</p> <ul style="list-style-type: none"> • AUT, CAN, COL, DEN, GBR, GER, FRA, ITA, JPN, NLD, SGP, SPA, USA <p>Prominent customers include:</p> <ul style="list-style-type: none"> • Luxury fashion label Chopard, Central Bank of Luxembourg, Cannes Film Festival, Nobel Peace Prize, Olympic Laurel-Trophy 	

<p>Costs</p>	<p>Costs are dependent on the location and size of the operation in the supply chain as well as the selected category of the Fairmined Standard.</p> <p>The objective is the purchase of gold at a transparent and fair market price (95% LBMA) as well as a negotiable premium that is intended for sustainable development in the local community. The usual premium is USD 4,000 per kg, and this is normally transferred along the supply chain to the end-user.</p> <p>Audit costs arise for the partner organizations in the supply chain. These depend on the length of the audit and are USD 1,325 (first day) and USD 1,200 (every additional day) plus the travel expenses for the auditor.</p>
<p>Implementation and sustainability</p>	<p>The focus of the certification at the mine site is the avoidance of child labor, labor safety issues, local community development, gender and social issues (including the income paid to the miners), environment.</p> <p>The use of chemicals (mercury, cyanide) is recognized as a problem in small-scale gold mining, but their avoidance should not prohibit the development of ASM. Instead, incentives are prepared for a stepwise reduction.</p> <p>The distinctive label “Fairmined Ecogold” is awarded for processing without using any chemicals, for which a special premium of USD 2000 per kg is assured.</p>
<p>Additional Information</p>	<p>Alliance for Responsible Mining Website http://www.responsiblemines.org/en/ Fairmined Website http://www.fairmined.org/?lang=de International Q&A https://www.scsglobalservices.com/fairmined-gold-certification Fairmined-Standard v 2.0 http://www.responsiblemines.org/images/sampledData/EstandarFairmined/Fairmined%20Std%202020200_2014%20ENGLISH.pdf Case Studies from the project countries and other publications http://www.responsiblemines.org/en/resources/arm-publications</p>

Profile: Fairtrade Gold

<p>Fairtrade Gold (Date: September 2016)</p>		
Objective	<p>The objective of the certification is the production and fair trade of responsibly produced gold from ASM.</p> <p>The focus is on the capacity of the miners in small-scale organizations as well as the development of organization structures and their integration with other organizations in the supply chain up to the end-user.</p> <p>As an incentive, the sale of gold is fixed at a guaranteed market price (95% LBMA), and a premium for investment in the local sustainable development is assured.</p>	
Standard	<p>Initiation of the Standard: 2010 (last update 2015)</p> <p>ASM operators as well as organizations in the supply chain that are strongly associated with the end-user (e.g. jewelers) are awarded a Fairtrade label if the requirements for certification of the mine are fulfilled and documented. Certified gold must be totally physically traceable.</p> <p>The preparation and mentoring of the ASM operators up to a successful certification takes about three years, depending on the starting level. External audits of mine operators are carried out every three years.</p>	
Distribution and Partners	<p>The label of Fairtrade International (FLO) is awarded, and the certification is carried out by FLO-Cert. Consulting partners provide the expertise for capacity-building of ASM operations.</p> <p>One cooperative in Peru is currently certified by Fairtrade Gold.</p> <p>Nine operations in East Africa (Tanzania, Uganda and Kenya) are currently in the certification process and some of these operations are expected to be certified during the current year.</p> <p>Downstream customers: Fairtrade Gold is successfully marketed primarily in GBR and FRA. Other markets include:</p> <ul style="list-style-type: none"> • BEL, CAN, DEN, HKG, NLD and USA <p>Special Remarks: since 2016 Fairtrade gold from Peru is used in the production of the Fairphone 2.</p>	

<p>Costs</p>	<p>The costs for using the Fairtrade Gold label depend on the amount purchased annually. If more than 0.5 kg gold per year is purchased, then a license agreement is concluded between both parties.</p> <p>The objective is the purchasing of gold at a transparent and fair market price (95% LBMA) plus a premium that is invested in the local community development. The premium is currently EUR 1,500 per kg or USD 2,000 per kg.</p> <p>Further costs for the participating partners are required for the certification by FLO-Cert. For large operations this is usually about EUR 2,000 – 2,800 per year.</p>
<p>Implementation and sustainability</p>	<p>The focus of the certification at the mine site is the avoidance of child labor, labor safety issues, gender, social issues (including the income paid to the miners) and environment. An additional objective is the support for democratic structures and political representation of ASM organizations.</p> <p>The use of chemicals (mercury, cyanide) is recognized as a problem in ASGM, but their avoidance should not prohibit their development. Instead, incentives are prepared for a stepwise reduction.</p> <p>The distinctive label “Fairtrade Ecological Gold” is awarded for processing without using any chemicals, for which a special premium of 15% of the market price is assured.</p> <p>The annual sales figures for Fairtrade Gold are not currently available.</p>
<p>Additional Information</p>	<p>International Website http://www.fairgold.org/</p> <p>International Q&A http://fairgold.org/q-a/</p> <p>Information about the producers https://www.fairtrade-deutschland.de/produzenten/gold/</p> <p>Information for companies https://www.fairtrade-deutschland.de/fuer-unternehmen/service/gold/</p> <p>National (German) FAQ https://www.fairtrade-deutschland.de/fuer-unternehmen/service/gold/faq-gold/</p> <p>Audit report activities of Fairtrade Gold in East Africa http://www.aidenvironment.org/publication/external-evaluation-of-extending-fairtrade-gold-to-africa-project/</p>

Anhang III – Country Profiles

Burkina Faso

Burkina Faso



Potential as a Source of Gold

Up until the beginning of the 20th century gold mining in Burkina Faso consisted only of artisanal small-scale operations. Artisanal gold mining activities before the first industrial exploration programs at the beginning of the 1930's were particularly intensive in the Gaoua and Poura regions. Apart from a short period of industrial gold mining projects (an average of 4 tons per year during 1933 – 1940, and up to 5 tons per year during 1985 – 1994), significant gold production first commenced in the country in 2007. Exploration successes because of the high potential for gold mineralization (in the Birrimian Greenstone Belt) together with an increasingly investor-friendly legal framework resulted in an increase of the gold production from 2 tons (1997) to 37 tons (2014). Since 2009, gold is the most important export product. According to the official export statistics, Switzerland is the principal customer for gold from Burkina Faso, with a proportion of 96%.

It is estimated that 200,000 miners are directly engaged in the ASGM sector in Burkina Faso, and the government estimates that ASM produces about 1 ton gold annually, although international experts consider that this figure is considerably higher. Conservative estimates by the authors of the Berne Declaration, which investigated in detail the artisanal gold sector in the country, assume a production of 7 tons and other estimates are even higher.

Legal Framework and Level of Formalization

The French colonial government enacted in 1922 the first documented definitions and laws pertaining to small-scale gold mining in Burkina Faso. The purpose of these laws was to regulate ASM in the Gaoua and Poura regions. Apart from regulations to the land-use laws, there were no further changes to the national mining laws after the independence from France in the year 1960 to 1991. This is primarily due to the unstable political situation at the time as well as the relatively low national relevance of the mining sector. The geological survey of Burkina Faso drew up several laws to regulate the sector that were based on the French mining laws. These laws regulated the labor safety issues, the treatment of both toxic and explosive dangerous materials, the trade of gold as well as undertaking environmental impact studies. The first national mining law was enacted in 1996. ASM and its development potential were recognized and technical and financial support was specified. However, the authorization of ASM as foreseen by the law was never implemented, and therefore most of miners in ASM are still considered as illegal operators.

The current mining law that dates from 2015 includes additional attempts to incentivize ASGM. This focusses on the financing of geological exploration, the regulation of the use of chemicals, as well as the restoration of abandoned mining districts. The legal framework prohibits any form of child labor for those under 16.

Various activities in ASM are forbidden for children under 18: underground work, use of mercury and cyanide, the use of explosives, gold panning as well as the transport and milling of rock materials.

Relevance of ASM to Development

More than half of the population of Burkina Faso live at levels beneath the poverty limit of

USD 1.90. Particularly for the rural population, working in the ASGM sector is essential for their livelihood.

Only a small proportion of ASM in Burkina Faso is legal. Tikando, which is the largest artisanal gold mine in the country, has a special status. According to official statistics, the production of 50 kg gold per month represents a large proportion of the gold produced from ASM in Burkina Faso. This mine seems to be relatively well organized as compared to the general conditions in Burkina Faso. Measures are taken in understanding the rock mechanics (safety with respect to stability of the rock in the mine); child labor, even it is otherwise present, is prohibited in underground mining. However, the distribution of profits gives rise to some skepticism, because the contributions from the miners to the owner of the Tikando Mine comprise a significant proportion of the turnover.

The Alliance for Responsible Mining is currently undertaking a support project in Burkina Faso. The project is financed by the Global Environmental Fund and the Fonds Français pour l'Environnement Mondial. The objective of the project is to identify two pilot mines in Burkina Faso for support in fulfilling the requirements of the Fairmined certification standard. The issues to be addressed include the legal status of the mining activities, the integration of women in the mine organization and the mechanization of ASM activities.

German Development Cooperation

Support for development cooperation is existentially important for Burkina Faso. Grants and foreign credit comprise more than 70% of the national budget. German development cooperation is focused on assuring the essentials for the livelihood of the people of Burkina Faso. The priorities for bilateral development cooperation with Burkina Faso include: agriculture and securing the nutrition of the people, drinking water and sanitation facilities as well as decentralization and community development. Mining, especially artisanal mining, has not been included in the development cooperation. Furthermore, Burkina Faso is, since 2013, a member of the Extractive Industries Transparency Initiative (EITI).

Risk Assessment

The research undertaken for the "Berne Declaration", which is a Swiss non-governmental organization for improving national development cooperation, resulted in public attention in September 2015 on ASGM in Burkina Faso. This research analyzed the relationships in the supply chain between the Swiss refinery Valcambi, which is the biggest gold refinery in the world, and Togo, which is a neighboring country to Burkina Faso. The research identified Togo as an alleged transit-country for gold derived from Burkina Faso. The report also revealed dangerous labor conditions and child labor in several gold mines in Burkina Faso.

Despite being prohibited, child labor is widespread in the ASGM sector in Burkina Faso. The research in five mining communities by the Berne Declaration revealed that 30-50% of the miners were minors. If these figures are extrapolated to the national level, then 60,000-100,000 children are working in artisanal gold mining in Burkina Faso. A regional UNICEF project estimates that the distribution of amphetamines to children working underground is widespread.

The working conditions for the miners in small-scale operations in Burkina Faso are dangerous, particularly for children. For example, twelve hour day and night shifts have been documented. Furthermore, there is no adequate safety equipment available for physical safety at work, or when working with toxic materials such as mercury. Moreover, it has been documented that the procedures for working with explosives are neglected and possibly as many as 46 miners were killed in a related incident in 2015.

Smuggling gold out of Burkina Faso to avoid the export taxes is very lucrative, especially if transited through Togo. This is related to the significant difference in the costs for exporting gold from Burkina Faso and from Togo. In Burkina Faso, the export tax for gold is fixed at CFA 500 per gram gold, whereas in Togo the same tax is only CFA 45 per gram gold. Ac-

According to the assessment of a national expert from EITI, the smuggling activities are supported by the widespread corruption throughout the country.

There is violent conflict between the opposition and government in parts of the country, but in this case there is apparently no relationship with gold mining.

Summary

A development commitment to the ASM sector in Burkina Faso appears to be reasonable in view of the extreme poverty of the people, the importance of mining and the prevailing bad conditions in the ASGM sector. Nevertheless, these general conditions are not suitable for implementing a pilot project for responsible ASM.

The basic issues, which have been identified by the research of the Berne Declaration, represent a general risk to the reputation that could arise by a commitment in Burkina Faso. The widespread gold smuggling for avoiding export taxes represents a risk for a Closed Pipe supply chain because ASM operators and gold trades would be more interested to sell their gold at higher prices into an illegal supply chain. Finally, the legal basis is not clear for some of the regulations in the mining sector.

The identification of a pilot mine, which would meet the minimum standards for this action, could become difficult. Only a small proportion of mining is legalized. There are infringements of the national laws, for example with respect to child labor, even in the relatively well organized small-scale mines such as Tikando.

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Colombia

Colombia



Potential as a Source of Gold

Gold mining in Colombia has been very important since the Spanish colonial period. Until the beginning of the 20th century, a third of the global production of gold was derived from Colombia. The country contains large areas of favorable geological conditions for the presence of gold-rich porphyry copper and epithermal deposits as well as also massive sulfide deposits. The production has increased strongly since 1980 and annual production of gold has increased from 5-10 tons during the previous decades, to 35 tons in 1990. After variations in the annual production, the country is now producing about 60 tons (as of 2014) that is mostly exported to the USA and Switzerland. The gold mining industry in Colombia is liberalized and based on private business initiatives.

The ASM sector in Colombia extends most along the Pacific coast in the Choco, Cauca and Narino regions as well as Antioquia, Santander and Huila in central Colombia. In the coastal regions, gold is derived from alluvial mining of placer deposits, whereas gold in central Colombia is sourced from primary gold mineralization in the bedrock. According to government estimates there are up to 340,000 people engaged in the ASM sector in Colombia. This estimate includes mining for commodities other than gold, and also includes the category of “medium-scale mines”. The contribution of small- and medium-sized mining to the total gold production of Colombia is estimated at about 88%.

Legal Framework and Level of Formalization

The ASM sector in Colombia is defined by the legislation since the enacting of the “Mining Code of Colombia” in 1988. This code covers the legal fundamentals for formalization as well as recognizing the rights of ethnic minorities. The registration for the formalization process only had a time window of six months and this has resulted in the lack of legal status for the work of most of the miners in the ASM sector. Tax relief was later introduced for the ASM sector and the illegal status was cancelled in 1994. The “National Mining Development Plan” (1997) and the “New Mining Code” again focused on the industrial large-scale mining and supports foreign investments for granting further concessions. This has resulted to an increase in the officially granted areas for exploration and exploitation from 1.1 million ha in 2001 to 8.4 million ha in 2009. Many of these areas were only registered by their owners as a speculation, with the objective of subsequently transferring them at a profit without the concession-holder having undertaken any development plans. Although the government allows and supports the cooperation between the major large-scale mining companies and ASM operators, in fact this practice has resulted in many favorable areas being granted without there being any active mining operation with which the ASM operators could enter into legal cooperation.

In recent years the approach of the government towards the management of ASM operations has changed from a confrontational to a constructive attitude. In 2010 and 2012 the requirements for the formalization process were backed up by heavy penalties for illegal mining. The difference between “illegal” and “informal” mining was not recognized, and so most of the miners in the ASM sector were threatened with draconian penalties. This was then revised in 2013, mostly due to pressure from the ethnic minorities and indigenous peoples, in the “National Formalization Policy” so that the vaguely defined “traditional” mining could be declared as “informal” mining. The government now plans to formalize 40% of the ASM sector by 2019 and aims for 100% by 2032. Importantly, the formalization does not

consist of only one single bureaucratic procedure, but is understood as a multi-phase process. There are five steps to formalization:

- 1) Legal basis
- 2) Mining technology and ecology aspects
- 3) Social and labor-rights aspects
- 4) Economic and fiscal aspects
- 5) Final formalization

A special department in the Ministry of Mining was opened to support and implement this process. This centralized approach creates risks for conflict with the local administrations, which were previously responsible for controlling the sector and have therefore lost their influence. This law was overturned in May 2016 by the Colombian constitutional court. Local administrations still have the possibility to make decisions about mining projects in their jurisdictions.

Relevance of ASM to Development

The World Bank estimates that only 6% of the Colombian population receive less than USD 1.90 per day, but the wealth in the country is not evenly distributed. A third of the Colombian population lives under the national poverty level, and for many years the established ASM operations represent an important basis for the livelihood of the local populations in poor areas. In addition to the globally recognized problems of unregulated ASM (for example, environment and labor safety), there are special risk in Colombia related to the acquisition of gold mines and supply chains by guerilla groups and criminal gangs. These risks are similar to those arising from conflict-financing in the DR Congo. However, from the reverse perspective, the advances in the formalization of the sector and the establishment of responsible gold supply chains could contribute to the stepwise stabilization of areas in the country that have been encumbered by conflict.

Many initiatives are focused on the sustainable development of ASM in Colombia. This occurs together with the efforts by the government to increase the formalization and supervision of the mines that is directly supported by the USA (for example, the BioREDD+ project for legal and technical advice; the active ASGM project by Chemonics/USAID).

- Colombia is a key country for the work of the Alliance for Responsible Mining. Preparatory projects with local gold mines (Oro Verde) were in effect the basis for the development of the Fairmined Standard for responsible small-scale gold mining. There are two Fairmined certified cooperatives in Colombia – Iquira and La Llanada, both of which are located in southwest Colombia. Six further cooperatives are in the process of being certified.
- The Canadian mining company, Gran Colombia Gold, entered into a cooperation with the international development organization Chemonics, with the aim of engaging ASM operators, who are working around the concessions operated by the company, into the official supply chains and procedures. The objective is to establish a legal basis for ASM activities, coupled with increased productivity and reduced environmental impacts.
- The Motorola Solutions Foundation finances a project in Colombia supported by Solutions for Hope, Resolve and the Canadian Ministry of Foreign Affairs that is testing the possibility, among others, for the processing of the gold in a local refinery. This project is currently in the pilot phase.

German Development Cooperation

The main focus of the development cooperation between Germany and Colombia is the improvement of the peace process and crisis prevention. These issues, together with the subsidiary topics of sustainable economic development in rural areas as well as the protection and sustainable development of natural resources, are all indirectly related to artisanal

gold mining. The BGR managed a Technical Cooperation project from 2001-2012 for the reduction of environmental impacts from ASGM in specific regions of the country. The BGR currently participates as an advisor in regional cooperation with the Andean countries for questions pertaining to mining-related environmental issues, although this is primarily aimed at the large-scale industrial mining operations. Since 2013, Colombia is also a candidate member of the Extractive Industries Transparency Initiative (EITI).

Risk Assessment

A major challenge for the ASGM sector in Colombia is the complex relationships between gold trading, smuggling, money laundering and drug trade. Particularly at the export level many gold supply chains are encumbered by these risks. The KYC procedures are thus very important for a participation in the gold sector in Colombia.

The *Fuerzas Armadas Revolucionarias de Colombia* (FARC) and other guerilla groups play a special role in the context of the local gold supply chains. The illegal control over gold mines and supply chains in several regions of the country has become a principal source of finance for the FARC and other guerilla groups. The affected ASGM, similar to the situation in DR Congo, contribute to the financing of the conflicts. Guerilla groups and criminal gangs control the production and the transport of gold. These armed groups act as a state within a state, collecting illegal taxes either as cash or from the gold production and raise transport taxes at the borders of the areas that they control.

This conflict has lasted for over 50 years. A historic ceasefire agreement was concluded in June 2016. The question is now how far the political negotiations will contribute to improvements to the controls and transparency in the gold sector. Currently many parts of the country are classified by the Heidelberg Conflict Barometer as “major crisis” or “limited warfare”. If the state authorities, after the potential conclusion to the peace negotiations, continue to have no access to the mining activities of the guerilla groups (apart from the FARC, mainly the Ejército de Liberación Nacional, ELN) and criminal gangs, the so-called BACRIMS, in their controlled regions, the sourcing of gold from these areas represent a major risk. The OECD Guidelines for Supply Chain due diligence must be respected for the handling these conflict risks.

Mercury is also widely used in the processing of gold in Colombia. According to the estimates by the Colombia government, 170 tons of mercury were released without any controls into the environment during 2015 alone. A total of 60% of the hydrographic regions in Colombia are contaminated with mercury,

The trafficking and forced prostitution of young women and girls is a major social problem in the districts of illegal ASM. In some cases, it is tolerated or even supported by state authorities. Women and girls of the Afro-Colombian minority or the community of indigenous people are particularly endangered. In some cases this extends to forced labor and slavery, by which the women and girls receive no wage for their services.

Summary

The sourcing of gold from Colombia does offer possibilities for a “closed pipe” action, in spite of the above-mentioned risks. In some regions, there are good conditions for this type of participation and the production quantities are more than sufficient. Initiatives such as Fairmined (also known as Oro Verde) are active in several mines in the country and it should be determined if, and under what conditions (certified gold with premium payments, or uncertified gold without premium but applying the responsible sourcing standards), they could participate in a pilot supply chain. The Colombian government is creating good framework conditions for the future of the sector with the multi-phase formalization process in their “New Formalization Policy”, and this will contribute to the sustainability, and possibly also a positive publicity effect for a pilot supply chain.

Nonetheless, the risks and limitations to the constraining conditions for sourcing gold from

Colombia must be addressed. Because of the conflict risks, it is essential that gold is sourced strictly according to the OECD Guidelines for due diligence obligations as well as sufficient KYC procedures. A successful conclusion to the continuing peace negotiations could, in the medium-term, lead to a decrease in the conflict risks, but the universal money laundering risks will remain significant. It is essential that the legal situation and requirements are examined on a case-by-case basis, for example, with reference to the responsibilities of, and relationships between, the concession owners and ASM operators.

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Democratic Republic of Congo (DRC)

Democratic Republic of Congo (DRC)



Potential as a Source of Gold

The east of the DR Congo is characterized by high-grade gold mineralization of various types. Numerous primary gold occurrences are located for over one hundred kilometers associated with greenstone belt units, granitoid intrusives and geological structures of various ages. Furthermore, there are widespread alluvial deposits. Many of the gold deposits, mostly the more easily accessible alluvial deposits, were discovered and brought into production during the 1920's and 1930's, some even in 1900. The mines in the Kilo Moto district were among the earliest and historically important, with production commencing in 1905 and today it is still the focus for more exploration. Most of the large-scale industrial gold production in the DR Congo is derived from the Kibali mine (operated by Randgold Resources, annual production 20 tons gold), NE of Kisangani and the Twangiza mine in South Kivu (operated by Banro, annual production 4 tons gold).

ASGM in eastern Congo has dramatically expanded in the past years. An uncontrolled local ASM sector became established in the area during the 1980's and 1990's as a result of the gradual closure of the operations of the run-down, state-owned mining companies and focused on both gold as well as the 3T minerals (tin, tungsten and tantalum). Gold has been increasingly attractive to the ASM sector due to both the increase in gold prices over the past decades, but also the increasing importance of the OECD due diligence obligations for the supply chains for the 3T minerals in order to address the risks from local conflicts. The earnings potential is relatively high and the controls low. The favorable geological conditions support artisanal mining of over 1000 small deposits as well as several major deposits. Currently, several thousand artisanal workers have resulted in a local gold rush on one of these major deposits. At least 200,000 miners are engaged in the ASM sector in eastern Congo, which is five times the number of miners engaged in the 3T sector. The artisanal hard-rock gold production is currently (2016) estimated at about 12 tons gold per year. Additionally, there is a significant artisanal production (no concrete figures available) from alluvial dredging operations. More than 90% of the artisanal gold is smuggled from the DR Congo, through the eastern neighboring states, to Dubai.

Legal Framework and Level of Formalization

The artisanal gold mining and its associated supply chain in eastern Congo are usually illegal and informal. This is the case for both the situation onsite at the mines, the trading along the network system of "small" and "large" intermediaries as well as in the centers for gold buying in the major towns and cities on the borders of eastern Congo, from where the gold is exported or, more likely, smuggled.

The government has already identified designated zones for ASM, created a special registry and tax system for ASM as well as attempted together with the assistance of the UN to establish local trading centers for gold. However, these attempts within the overall context of the 2002 Mining Law were mostly not successful because the gold mineralization outside the designated zones was higher grade and the profit margins in the smuggling supply chains were also higher. The trade of gold from ASM through legalized traders and exporters is economically unattractive because of the numerous taxes and fees for the registration as well as for mining and trading permits. Furthermore, the payment of unofficial fees to traditional authorities (mostly local community chiefs) is widespread. There are also numerous other factors, referred to below in the risk assessment, that contribute to this very complex situation for local ASM.

For the official ASGM in Congo, which is extremely minor, there are numerous regulations

that are only occasionally actually implemented. Mine validation commissions are proposed to eliminate the most serious abuses of human rights in the supply chains and they will classify individual mines as red (unacceptable), yellow (problematic) and green (no problems). Theoretically the trading of gold is prohibited from mines classified as red. At the export level, a certificate (*ICGLR certificate = International Conference on the Great Lakes Region*) is issued for separate export consignments and should provide confirmation that the gold consignment is derived from an acceptable mine and that the necessary legal fees have been paid. This national process is only selective and represents a credibility risk because a proposed national measure to coordinate the auditing by independent third parties has not been effectively implemented.

Relevance of ASM to Development

ASGM is often characterized by dangerous work-safety conditions, uncontrolled use of mercury as well as social injustices including child labor. Furthermore, about 2/3 of the small-scale mines in eastern Congo are controlled by illegal armed groups. Very serious infringements of human rights, including forced labor, are widespread. Practically the whole sector from mine production to export (smuggling) operates illegally and the lack of legal security lowers the perspectives for positive development. The local prices paid for gold to the miners are relatively high (often 80% of the LME price). These high purchase prices for gold are sustained by money laundering activities associated with gold trading. Because of the low productivity by the miners, their total income is actually low and the locally widespread provision of credit (pre-financing) to the miners of ASM operations leads to their indebtedness and dependence on the intermediary traders.

Laws have been, or will be, enacted in the USA and EU that require companies to implement their due diligence obligations in the supply chains for products that could be related to conflict-affected resources, of which gold is one. The gold supply chains that are established in eastern Congo are focused on other markets and end-users (Dubai, India and China), so that legal pressure from the United States or the EU has no effect on the supply chains.

Numerous donors are active in the resource sector in eastern Congo, partly as advisors to the dysfunctional state, partly to provide direct support to the affected ASM cooperatives and traders. The Canadian NGO Partnership Africa Canada is undertaking an important project in the area, which is focused on establishing together with responsible local organizations a legal pilot supply chain, in which the production conditions and traceability will be controlled. While a number of requirements have already been established (e.g. registration of miners or incentivizing by improved processing technologies), the NGO has still not been able to successfully establish within five years a functional supply chain up to the export level.

In a German-Congolese cooperation project that was established in 2009, the BGR supported the implementation of independent auditing of mines in eastern Congo according to the *Certified Trading Chains* (CTC) Standard. CTC requires a minimum performance standard in the fields of supply chain transparency, local communities, work safety, human rights and environment, and supports mainly ASM operators to fulfill these requirements. The CTC approach is not broadly effective because it can only be implemented on individual mines with suitable legal operating procedures. Until now the approach has focused on the 3T minerals, but in the meantime two gold mines are also participating.

German Development Cooperation

Despite the challenging framework conditions (dysfunctional state and corruption risks) that questions the sustainability of development cooperation, there has been German-Congolese cooperation for many years. This is based on the disastrous and needy situation of the Congolese population, as well as the often-mentioned, rich resource endowment of the DR Congo. The responsible use of these resources as well as the transparent

and legal distribution of the resource-related income suggests an enormous development potential for the country. Germany supports in particular the certification processes in eastern Congo, which are focused on restricting the financing of illegal groups from the resource supply chain (conflict-related minerals) and improving the transparency in the sector.

Risk Assessment

The DR Congo is one of the countries with the highest risk profile pertaining to ASGM. This situation reflects the problems of the conflicts in eastern Congo, the role of the state institutions and organized crime that conceal the basic challenges of a non-formalized ASM sector.

The state supervisory authorities have failed and subject to high corruption risks. Furthermore, because of the well-established resource potential of the DR Congo, ASM competes with industrial, large-scale mining and the government legislations has been accused of favoring this sector. In eastern Congo, segments of the gold supply chains are controlled by illegal armed groups (militia as well as the Congolese army) and illegally taxed. 95-98% of the produced gold, with a total value of USD 400-500 million per year, is smuggled out of the country. Gold supply chains are subject to the risks of money laundering, which is related through links to regional organized crime. In addition, gold also fulfills the function of a parallel currency in the inaccessible areas of eastern Congo, and thus the supply chains are not linear and cannot be controlled.

The DR Congo is a conflict-affected and high-risk region, where the OECD Guidelines for due diligence obligations apply to resource supply chains. The country is also directly included in the Dodd-Frank Act in the USA, which necessitates special requirements for the documentation required by international customers, to demonstrate the responsible management of the resultant source risks.

Summary

The direct sourcing of conflict-free and legally traded gold derived from Congolese ASM is extremely difficult and could not be realistically implemented as a pilot project. There are a limited number of mines that are certified or validated as “green”, but they have a low production capacity and the controlling of the associated supply chain as far as export would be complex. The locally established projects by international organizations attempt to develop legal supply chains at the piloting scale, but in the short-term the expectations should not be over-exaggerated. Some international business people attempt to establish in-country legal gold-buying and export centers, but they fail due to the high official fees that result in the legal, as compared to the illegal, supply chains being economically unattractive.

While legal supply chains from ASM in eastern Congo are hardly established, the parallel supply chains of the industrial large-scale mines are functional. It could be reflected if the support of a local cooperation between small-scale and large-scale mining (for examples as sub-contractor on the concessions of the industrial operator) could make possible the indirect sourcing of gold from ASM. However, because of the complex political conditions, this is probably not a realistic proposition for a short-term measure for a responsible supply chain from ASM.

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Ecuador

Ecuador



Potential as a Source of Gold

Gold mining has a long tradition in Ecuador, as it does in the neighboring countries. Gold production was already active during the times of the Inca Empire (approximately 1500) and was expanded during the Spanish colonial governance. The geology of the country is permissive for the types of gold mineralization that are typical for NW South America, such as gold-bearing porphyry copper deposits, massive sulfide mineralization, skarns as well as various genetic categories of hydrothermal quartz veins.

As compared to the larger neighbors Peru and Colombia, large-scale industrial mining has not been developed as a result of various interlinked geological, economic and political factors. Small-scale, semi-industrial production was established locally in several areas at about 1900, particularly around Portovelo-Zaruma and that has continued with interruptions until the present day. As compared to its neighboring countries, Ecuador is considered to be significantly underexplored. Around the year 2000, numerous international junior companies commenced exploration for gold and copper, which has resulted in discovery of several deposits that are large enough to be mined by a large-scale industrial operation. The Fruta del Norte occurrence was discovered in 2006 is not only the largest gold deposit in Ecuador, but one of the largest deposits globally discovered during the recent years. However, because of the unfavorable framework conditions for mining that were enacted by President Correa, it was not possible to develop the project efficiently and finally the development was terminated in 2013-2014. The recent change of government policy towards more investor-friendly conditions in the mining sector means that there is a real chance for the development of the project.

Gold production from Ecuador is derived completely from ASM, although the Ecuadorian definition includes both the traditional manual mining operations as well as the more developed semi-industrial small-scale mining. The number of miners in the small-scale sector has increased significantly in the 1980's, when a local gold rush in the Nambja region lasted about ten years and engaged about 25,000 miners in an area of less than 1 km². The official data for Ecuadorian gold production and export is very variable, and are usually in the range 2-9 tons gold per year, depending on the level of mining activity and other factors such as smuggling. The "United Nations Environmental Program" (UNEP) estimates that about 90,000 miners were active in the small-scale sector in 2012, and classified this estimate as "conservative". Gold mining, both semi-industrial and traditional artisanal mining, takes place, with interruptions, along the whole of the Andes mountain chain that extends from south to north through the country.

Legal Framework and Level of Formalization

The legal framework conditions for the ASM sector in Ecuador are characterized by the essential differences between "small-scale mining" (SSM) and "artisanal mining".

Small-scale mining was first mentioned in the "Mine Promotion Law" (1974). This law required SSM activities to be registered, but not the artisanal miners that worked in specifically designated ASM zones. This results in conflicts, particularly in the Portovelo-Zaruma region, between the miners from the small-scale sector and the Ecuadorian government, who questioned the legality of their mining activities, and resulted in the separation of the two sectors. Whereas the SSM sector formally belongs to the industrial sector, the artisanal mining has not received significant legal attention.

The first revision of the mining law (1985) forced the Ecuadorian small-scale mining operators into an illegal status, since the sector was not mentioned in the new law. This was cor-

rected later (new mining law, 1991), and the illegal small-scale mining operators were given the opportunity to register concessions over their mining areas with any additional requirements. The sector was still defined as a subsistence economy, which does not provide any possibilities for economic development.

Small-scale mining was last regulated in 2001, and the following criteria for the SSM sector were defined:

- Maximum concession area of 150 Ha
- Maximum production of 100 tons ore per day
- Maximum investment for activities in the concession of USD 1,000,000

Artisanal mining was still not clearly defined in the law.

With respect to the use of mercury, the Ecuadorian government did not insist on general prohibition, but on initiatives to minimize the use in the ASM sector. This was supported by national and international programs for education, technical advice as well as better availability to investment in environmentally-friendly technologies.

Relevance of ASM to Development

The Ecuadorian government has assigned an ambiguous development potential to small-scale mining (similar to its approach to the industrial large-scale mining). On the one hand the SSM sector has been supported over the past decades through the legal framework, by initiatives and with investment, whereas on the other had artisanal mining is not given any significant attention because it is classified as a subsistence economic without any development potential. However, for the poorer population in Ecuador in structurally weak regions of the country (25% of the population live under the poverty level), the artisanal mining sector provides the local means for a livelihood. The programs prepared for the SSM sector could also be applied to the artisanal mining.

Development potential could, for example, be derived from the proactive approach by the Ecuadorian government towards the use of mercury, and new investment for environmentally-friendly developed in local mining communities. The Artisanal Gold Council (AGC) is advising the Ecuadorian government on the implementation of a “National Development Plan” for minimizing the environmental impact caused by the use of mercury. At the same time, it must be emphasized that the previous lack of any regulation of the use of mercury has resulted in massive environmental damages and it is not clear who is responsible for the clean-up. Work safety procedures are also an important issue. The miners in the Portovelo-Zaruma mines are currently on strike for better pay.

German Development Cooperation

The focus for German development cooperation is the strengthening of the public administration and support for economic reforms as well as protection of the environment and natural resources, in particular the maintenance of Ecuador’s famous biodiversity. Mining has not played a significant role in the bilateral development cooperation.

The BGR participates as an advisor in regional cooperation with the Andean countries for questions pertaining to mining-related environmental issues, although this is primarily aimed at the large-scale industrial mining operations.

Risk Assessment

Because of various local conflict issues, the OECD Guidelines for due diligence obligations should be observed for sourcing gold from Ecuador so that the conflict risks in the supply chain can be evaluated.

The northern border region between Ecuador and Colombia is partly under the control of

Colombian FARC rebel groups. Colombian refugees migrated to Ecuador as a result of the lengthy inner-Colombian conflict and they often engaged in illegal gold mining in the northern border areas. Furthermore, because of their uncertain status the refugees are a target for human trafficking, forced prostitution and unsafe working conditions.

The situation is now more stable since an operation by the Colombian military against FARC positions in Ecuador in 2008 resulted in increased controls by the Ecuadorian government along the border. Nonetheless, FARC still has some influence over the illegal gold mining in northern Ecuador. However, the center of Ecuadorian gold mining is located in the central and southern parts of the country, and therefore only a relatively small proportion of the gold production is affected by these risks.

The access to natural resources is sometimes affected by occasional local armed conflicts between indigenous peoples and the government. This is also increased since the Ecuadorian government has declared all mining activities to be in the “public interest”. This has resulted in forced relocation of indigenous peoples. However, the oil production is more affected by this issue than gold mining.

At all the border areas, with Colombia and Peru, there are additional risks of gold smuggling to avoid the authorized export license for gold that is required by Ecuador. This results in risks for misappropriation of gold from the legal supply chains.

The general political conditions in Ecuador, and the politically influenced development strategy for the national mining sector, are to a certain extent unclear. This also applies to the legal status of ASM in the country.

Summary

The legally defined separation of small-scale and artisanal mining, the selection of possible pilot mines as partners in a closed pipe is focused on formalized small-scale mining. This type of mining is operated by cooperative associations and is faced by numerous challenges from environment, work safety and fair pay issues. From the perspective of development policies, it would be more reasonable to address gold sourcing from legalized, and easier controlled, small-scale mining as it would from the strictly artisanal operations.

There are only a few international initiatives for ASM active in the country, which could form a partnership for a closed pipe. A stronger focus is probably required on cooperation with individual cooperatives of sufficient size, but the legal status and the role of the supervisory authorities must be analyzed in detail and clarified.

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Ghana

Ghana



Potential as a Source of Gold

Ghana has a long tradition of gold production that developed during the 19th century as a colony, also known as Gold Coast, of the British Empire. During 1900 to 1990 the annual production ranged between 5 and 30 tons gold. Production has increased continuously since 1992 to 106 tons in 2014, which is primarily due to the export-oriented legislation of the Minerals Commission in 1984 and the resultant foreign capital investment. After South Africa, Ghana is the second biggest gold producer in Africa. Furthermore, two gold refineries have opened in Ghana during the past 5 years. These refineries have an annual capacity of 100 to 150 tons and Ghana is therefore the second country in Africa with its own gold refining capability. South Africa continues to be the main customer for gold doré from Ghana. International companies, such as AngloGold Ashanti (the predecessor company Ashanti Goldfields was based in Ghana), Goldfields Ltd as well as the state-owned State Mining Corporation (SMC) are the main players in the gold sector in Ghana. Gold is primarily mined in open pits and partly from underground mines. The gold mineralization is distributed throughout the western part of the country and occurs in five Gold Belts.

The ASGM sector in Ghana currently directly engages an estimated 300,000 - 500,000 miners and some estimates are as high as 1 million miners. There is not a clear differentiation between the artisanal, low-productivity small-scale operations locally known as “Galamsey” and the semi-mechanized small-scale operations. Estimates by the Ghana government in 2013 of the contribution of the ASGM sector to the national production of gold were 40 tons gold, or about 34% of the total production. The importance of the ASGM sector has developed during the past decade, when gold production from the sector exceeded the 7.5 tons level in 2006 and has therefore increased by 500% since then. This is mainly due to the high level of activity by Chinese investors and workers in medium-scale mines, which was probably wrongly classified as “ASM”. After these activities were terminated during 2013, it can be expected that the proportion of production from ASM has decreased.

Legal Framework and Level of Formalization

The legislation for ASM in Ghana is regulated by the „Small-Scale Gold Mining Act 1989” as well as the „Minerals and Mining Act of 2006 (Act 703)”. These laws prohibit the following: ASM on concessions that have already been granted to third parties; operating without a license or registration and the participation of foreigners and minors. A breach of these regulations can result in a jail sentence of up to five years.

At the end of 2014, there were a total of 1300 licensed ASM operations in Ghana. Official estimates suggest that more than 90% of ASM operations are illegal. Once the registration is successfully completed, the government is supporting the formation of a Small-Scale Mines Committee that will include a majority of members from state offices. The deletion of Paragraph 15 of the “Small-Scale Gold Mining Acts 1989”, which provided for tax exemption for three years, is a critical change in the current Ghanaian Mining Law (Mining Act of 2006). Furthermore, the Mining Law regulates the purchase of mercury only from officially authorized vendors, but does not regulate the use of mercury for processing of gold. The ownership of gold is legal and there is no maximum amount until the illegality of the source is demonstrated.

A National Mining Policy, which was formally adopted by the Ghanaian government in early 2016 after several years of elaboration, is intended to support incentives for the ASM sector and addresses only licensed and registered miners in the small-scale sector. This document provides the political framework for the easing of access to financial capital markets, the

granting of mining licenses as well as the access to technologies and consulting services for sustainable and safe mining by small-scale operators. The “ASM Zones” that were previously designated and controlled by the government are retained. In case of land-use conflicts, the government supports mining companies and ASM organizations with cooperation actions and standardized procedures. These measures, however, contradict the legislation in the Mining Act of 2006, which prohibits any mining by third parties on concessions that have already been granted. The current policy has not yet been harmonized into the legislation, and the practical implementation of the policy is therefore uncertain.

Relevance of ASM to Development

In their “National Mining Policy” (published in 2016), the government of Ghana recognizes the development potential of ASM and considers that this is an important contribution to the national development strategy, the Ghana Shared Growth and Development Agenda II (2014-2017). This aims for a fundamental change in ASM, ranging from the penalization of illegal activities to incentives for the formalization of the sectors.

One of the two gold refineries located in the Ghanaian capital city, Accra, the Sahara Royal Gold Refinery, regards ASM in Ghana as an important strategic partner for the sourcing of gold. However, because the refinery first opened in August 2015, it is not yet possible to evaluate the situation.

With an estimated engagement of up to 1 million people in the ASGM sector, which represents about 4% of the total population, the sector is of enormous economic importance to the country. The ASGM sector can and should play a major role in reducing poverty – a quarter of the population lives below the poverty level.

The Alliance for Responsible Mining is currently working with one pilot mine to meet the requirements for a certification according to the Fairmined Standard. The Artisanal Gold Council in cooperation with the NGO Solidaridad organized, in five selected ASM communities’ during December 2012, several training workshops to address the issues of reducing the environmental impacts, mainly from mercury.

The “ASGM Research Group” from the US University of Michigan is focused on the ASGM sector in Ghana. The group has presented their studies of the ASGM sector, from the perspective of ecological, social-economic, and legal issues, in numerous presentations, workshops and publications.

German Development Cooperation

Germany belongs to the most important cooperation partners in Ghana. The focus of the German development cooperation addresses agriculture, sustainable economic development, vocational training as well as good governance. Mining is currently not a major issue in the bilateral development cooperation, although up until 2000 the BGR supported the national Geological Survey in mapping of the entire country as a long-term bilateral cooperation action. Ghana is also a member since 2010 of the Extractive Industries Transparency Initiative (EITI).

Risk Assessment

In spite of the lengthy experience in the LSM and ASM sectors and the critical role that gold mining has played in Ghana for more than a century, the implementation of laws and guidelines for formalization of the sector remains mostly ineffective. More than 90% of the miners in the ASM sector continue to work in an uncertain legal situation. The formalization process is considered to be complicated and bureaucratic. For example, the establishment of an ASM Committee, including numerous state supervisors, as a requirement is exemplary in theory, but in practice difficult to implement for many of the miners in the sector. Furthermore, large areas of the country are covered by concessions owned by large companies.

The uncertainties, with respect to the cooperation between LSM and ASM, between the legal prohibition (Mining Act of 2006) and the guidelines (National Mining Policy) emphasizes the uncertain legal status of the miners in the ASM sector.

The situation has been complicated in recent years by the uncontrolled activities of Chinese investors and mine operators in southwest Ghana. Large machines are often imported for the mining of gold, which leads to serious environmental damages, such as the local contamination of drinking water. Chinese investors are therefore required not to engage visibly in the ASM sector and officially a Ghanaian national must act as a front-man for the relevant operations, but he is controlled by Chinese business people from the background. This issue was highlighted in April 2013, when 17 people died in an accident that occurred in an illegal Chinese-Ghanaian gold mine. The government of the time reacted with the expulsion of many thousands of Chinese business people. This has resulted in a regional reduction in illegal mining activities.

The use of mercury was officially prohibited in 1989. However, registered small-scale miners are currently allowed to acquire mercury from authorized traders. The Ghanaian government estimates that there is a significant black market for mercury, so that it continues to be used in small-scale mines. Investigations by the ASGM Research Group have demonstrated, mainly in northern Ghana, the strong contamination of the drinking water by mercury, heavy elements as well as arsenic.

Summary

The requirements for implementing a pilot action on ASGM are essentially existent in Ghana. Gold mining has a long tradition and embedded in the social framework, and the policies of the government with respect to ASM are acceptable. The government has prescribed a “Good Governance” approach and would probably positively welcome a responsible participation, such as a “Best Practice” concept with a widespread impact. The possible use, as required, of the participation of the gold refineries in Ghana would also be advantageous. There is no resource-related armed conflict in the country and therefore there are no geographic constraints.

Several mines have the necessary degree of formalization and would be good entry points for a closed pipe approach. The implementation would require clarification of several legal issues related to the application of the Mining Policy, which is mining-friendly towards small-scale operations, in contrast to the currently valid Mining Law. For example, it is not clear how a formal cooperation between LSM and ASM can be concluded for a mining concession for an ASM operation on a concession that is already granted to an industrial mine. Furthermore, the feasibility of establishing the so-called ASM Committee can be evaluated in the relevant supply chain. The supervision by members from various state organizations might give the Committee a high degree of legitimization, but it also implies additional bureaucracy. In this respect, the methods by which other projects that are already active in the country (e.g. Fairmined) address this issue need to be evaluated.

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Indonesia

Indonesia



Potential as a Source of Gold

Indonesia produces 60-80 tons gold annually, and therefore belongs to the largest 10 producers in the world. With the Grasberg mine, where the US company Freeport McMoRan Inc. mines copper and gold, Indonesia is home to the second-largest gold mine in the world. In addition, the Batu Hijau mine (Newmont Mining Corp.) is a significant gold producer. The situation of major international companies involved in gold mining in Indonesia is becoming increasingly critical. This is primarily due to the Indonesian legal requirement for foreign mining companies to increase the value of their products by undertaking the smelting and refining themselves in the country. For gold mining, gold exported from in-country refineries must demonstrate a 99% fineness. Finally, the 2009 Mining Law requires that, within 10 years of commencing production, mining projects must be majority-owned by Indonesian shareholders.

ASGM is distributed over large areas of the Indonesian archipelago (it is reported from 31 of the 33 provinces) and directly engages an estimated 300,000 people. Both primary gold mineralization as well as alluvial placer deposits are exploited. The amount of gold produced by the sector is not definite. The Indonesian government estimates that 7% of the national gold production is sourced from the ASM sector, which represents about 4-6 tons and is an unrealistically low figure. The University of Victoria estimates an annual production of 13 tons gold just from the central region of Kalimantan. In the neighboring Philippines (with comparable mining ASM technologies), the sector engages 200,000-300,000 people for an annual production of 25-30 tons gold. A similar estimated value should be applied for Indonesia.

Legal Framework and Level of Formalization

ASGM is increasingly widespread in Indonesia and regional migration of workers coming from other islands can be observed. ASM is usually informal and the associated gold supply chains are characterized by smuggling. The use of mercury for amalgamation has been an increasing health problem for a long time.

The national legislation of the Indonesian government is focused on wealth-creation from the industrial large-scale mining, but also takes ASM into account. Among other issues, it prohibits the use of mercury, constrains the possibilities for smuggling and includes designated zones for ASM. Because of the decentralized government structures, the supervision and control of ASM is delegated to the level of the provincial and regional administrations, although their capacity for actually undertaking an effective monitoring and supervision cannot be assumed. The prohibition of mercury should be implemented throughout the country by 2019, but this should compete with foreseeable smuggling problems: because of the large number of import centers as well as the decentralized supply structure (mostly from dentists), it will not be possible to rigorously control this situation. The legislative fundamentals are also not optimal. The Mining Law of 2009 permits the local administration centers to grant a mining permit, even in environmentally sensitive areas. Laws and regulations are not optimally harmonized between the central, provincial and regional levels of administration, so that there are serious uncertainties as to the legal status of the miners in the ASM sector.

Relevance of ASM to Development

In contrast to other developing countries, Indonesia is already relatively prosperous: only 12-15% of the population live under the poverty level. However, in view of the large total population of the country, this represents in absolute numbers about 30 million people. ASGM ful-

fills an important function in reducing poverty and economic development, and is attractive for the poorer levels of the society, as is demonstrated by the high levels of inner-Indonesian migration. From the perspective of development policies, particularly the reduction of the use of mercury and reducing the risk of the environmental impacts and health issues (for example, by means of mercury recycling and safer amalgamation processes).

The United Nations Environmental Program (UNEP) and the Pure Earth-Blacksmith Institute have operated many projects during the past years on the issue of reducing the use of mercury in Indonesia. Pure Earth is also planning to establish a supply chain system, in which the Indonesian central bank could be the purchaser of gold from ASM operations. Another project, scheduled to last for 5 years, has just been initiated by the Artisanal Gold Council (AGC). The project aims to cooperate with the government and civil organizations on improving the management of the ASGM regulating procedures, as well as establishing a training center for capacity-building in ASM. The project is concentrated on the Central and South Kalimantan regions, Java and Sulawesi. There are currently no known projects for the production and sourcing of certified gold from ASM (Fairtrade or Fairmined).

German Development Cooperation

The German development cooperation with Indonesia is focused on the issues of energy and climate-change, sustainable economic development as well as good governance. Mining has not played a direct role in the cooperation projects. However, mining, and specifically ASM, is indirectly included in the programs for forestry reform, the ecologically sustainable business support as well as the reorganization of the Indonesian government. Indonesia is also a member of the Extractive Industries Transparency Initiative (EITI) since 2010.

Risk Assessment

The decentralization of the Indonesian authorities is indispensable in view of the size of the country, but this also involves risks for corruption and weaknesses in supervision at the level of the responsible provincial and regional administrations. As a result, the legalization and formalization perspectives for ASM differs locally from region to region.

The use of mercury in the widespread amalgamation is a central problem in Indonesian ASGM. The relevant prohibition of the use by the government is difficult to implement in practice, partly because of the widely-distributed smuggling network (numerous harbors and ports, local dental practices). There are plans for developing the capacities of miners in the ASM sector (e.g. training centers) that include improved or alternative processing technologies.

There are several armed conflicts in Indonesia. In Papua and also in the Aceh region, in the far north of Sumatra island, the access to resources is a conflict issue (including conflicts with the major, industrial mining operators). Conflicts with militant Islamist groups occur on Sulawesi island and in the east of the island of Java.

Cases of the worst forms of child labor (according to the ILO definition) with serious dangers for health have been documented in the Indonesian ASGM sector. Until now there has been no systematic evaluation (including concrete quantitative estimates) of child labor in small-scale gold mining in Indonesia. The government, in its "National Action Plan to Eliminate Worst forms of Child Labor", aims to eliminate child labor by 2022.

Summary

In Indonesia, a large number of possible sources of gold from ASM should be potentially available. However, a legal supply chain must be established that observes the legal requirement for most of the value-creation in the country. This implies that gold must be refined to a fineness of >99% in Indonesia. It is therefore questionable, in these circumstances, if gold can be directly sources from Indonesia within the constraints of a closed pipe supply

chain. An in-country source of gold is only realistic if the project intends to install their own refinery capacity in the country, or enter into relevant partnerships with local operators. In this case, a useful incentive (technology and knowledge transfer) could be directly provided for the local participants.

The development impact of participating in the development of an ASM supply chain on the basis of responsible production procedures would be high with respect to the widespread social and health risks. Indonesia might potentially benefit from this participation with an improved reputation about the situation of national small-scale gold mining. It needs to be evaluated if a mine – or possibly a centralized processing facility that is fed by several mines – possesses the legal requirements for this type of supply chain. Additionally, the local administrative authorities (provincial and regional) would need to be included. As necessary, these authorities must be supported in the designation of the zones for ASM (for example, estimation of resources), but if this is realistic to implement in the short-term as part of the supply chain cooperation is questionable in view of the bureaucracy and capacity-deficits that are typical of the region. It would be more realistic to cooperate with one of the above-mentioned support projects that are already established (e.g. AGC), but the precise situation of the projects are not known.

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Kenya

Kenya



Potential as a Source of Gold

Gold was discovered in Kenya during the 1930's, and a small, semi-industrial production established (for example, Rosterman Mine), but it did not continue after the independence of the country in 1963. There is no industrial, large-scale gold mining in Kenya, as is the case in the neighboring Tanzania, but the geology of Kenya is locally similar to that in Tanzania (Greenstone Belts) and, and therefore favorable for gold mineralization. Gold exploration has increased in the country during the past ten years by international companies, including a major company, Acacia Mining (formerly African Barrick Gold).

During the past ten years, artisanal gold production has been established in Nyanza province in western Kenya. About 10,000 people are directly engaged, as well as about 15,000 in the supply services. Gold is therefore, after gemstones, the most important product from the national ASM sector. Between 1-4 tons gold is exported annually from Kenya (some of which is also smuggled out of the country) and most of this is destined for the UAE (Dubai). Some of the exported, or smuggled, gold is actually transit gold that is sourced from DR Congo or Tanzania, but Kenya is falsely declared as the land of origin. From the typical productivity per miner in East Africa, it can be estimated that the legal production of ASGM in Kenya is at least 600 kg gold per year.

Legal Framework and Level of Formalization

The artisanal gold mining in the west of the country – mainly in Migoria and Kakamega Counties on the east bank of Lake Victoria – has some similarities to a locally constrained gold rush. The problems typical of informal and unregulated ASM can be witnessed and are reported in the local media: child labor is commonly observed, the uncontrolled use of mercury is widespread. Stable artisanal organizations are occasionally participating in the gold production and their activities are (semi-)legal and can be better evaluated.

The lack of regulation of ASM in the country is a reflection of a fundamental problem with mining in Kenya, which is much less developed as compared to other countries in East Africa. During the past decades, the Kenyan government has focused on other sectors of the economy, in particular tourism. Until October 2014, mining was regulated by a national mining law dated from the colonial period in the 1940's,

However, the relative neglect of the mining sector by the Kenyan government has been lately reversed because of the recent exploration successes (both hydrocarbon and mineral resources) and awareness of the development of new ore deposits. A new Mining Law was introduced by the government in 2014. Although large-scale industrial mining is prioritized, the law addresses the supervision of ASM (reorganization of the mining supervisory authorities, concessions for artisanal mining). Both the requirement and support for the legalization and formalization of ASM are now explicit issues for the government. As part of a general decentralization of government and supervisory authority, together with the national authorities, the local authorities are increasingly involved in the regulatory work. However, improvements are generally irregular and difficult to recognize for the outsider.

Relevance of ASM to Development

The national development strategy for Kenya is presented in the second "Medium Term Plan 2013-2017", and the overriding development objectives are defined in the national "Vision 2030". The mining sector is defined therein as one of prioritized national sectors that should encourage economic growth and development. As a result, the public expectations of the

sector have increased.

On the overall national scale, ASGM is of relatively low importance: the primary economic development potential is seen in the industrial large-scale mining. However, ASM make an important development contribution at the local scale, and the state would also profit from the taxing of gold exports (previously 2.5%, now 5% of the export value).

The “Fairtrade Gold in East Africa” program, financed by Comic Relief, was active on two ASM operations in Kenya during 2012-2015. The program did not directly focus on a Fairtrade Gold certification, but focused on the capacity-development of the participating pilot operations. Conclusions can be drawn from this program about the possible success and the constraints to these types of actions in the country.

Significant advances have been made by this program during the past 3 years: local schools recorded a higher presence of the school children as a result of reduced child labor, work safety and health protection measures improved in the operations (for example, reduced, controlled use of mercury; safety equipment). The experience derived from the pilot operations was demanded, or distributed, both locally (copying “best practice” procedures by the neighboring operations) as well as national (formation of a network of small-scale gold mining).

German Development Cooperation

Germany has a special relationship with Kenya and was the first country to recognize the independence of Kenya in 1963 under international law. The main priorities for German development cooperation are in agriculture, water, health and good governance practices. Mining, and particularly ASM, has not yet been directly included in the development cooperation. The formalization of ASM supply chains is related to the support for transparency and reduction of corruption (good governance), and would be compatible with the national development priorities.

Risk Assessment

The Kenyan government must demonstrate that national policy decisions in the mining sector are also actually implemented. The recent increase in the export tax (from 2.5 to 5%) also increases the risk that gold mined legitimately in Kenya will be smuggled out of the country to avoid the official export taxes.

Risks from public corruption are widespread in Kenya. The situation of ASGM is further aggravated by the fact that the relevant mineralized areas are often privately owned. The land-owners profit from the gold mining (either officially or unofficially) and exert influence on operational decisions in order to promote their own interests.

Kenya acts as an important transit country in the Great Lakes region for smuggling both conflict-affected gold from the DR Congo as well as illegally mined gold from Tanzania. The international credibility for the gold that is legitimately mined in Kenya suffers from these smuggling activities, as is also the case in the neighboring Uganda and Burundi. Kenya does not share a border with the DR Congo, and is therefore not directly affected by the conflict-mineral regulations of the Dodd-Frank Act, but it is regarded as a “red flag location” by the OECD, with the associated necessity for due diligence obligations in the supply chains.

Summary

The local development impact for implementing an action is present in Kenya, because of both the demand from the ASM sector as well as the potential for organizing such an action according to the recently introduced legislative and policy decisions of the government.

If a commitment for an action in Kenya is under consideration, it is recommended to discuss the possibilities for cooperation, or points of mutual interest, with one or other of the active

Fairtrade Gold pilot projects. Further negotiation is required, among other issues, for the improvement of the mining productivity (for example, pre-financing and business plans) as well as establishing international gold marketing structures (instead of the current practice of selling gold to local buyers).

If gold is sourced from Kenya, then the regional risk profile must be taken into consideration and the traceability along the supply chain must be completely documented and credibly audited. This could result in higher costs (e.g. audits, additional internal due diligence).

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Madagascar

Madagascar



Potential as a Source of Gold

Numerous gold fields and concessions were developed at the turn of the previous century in Madagascar and the first concession was granted in 1886 at the time of the Merina kingdom. During the subsequent colonization by France from 1896, foreign gold explorers and prospectors discovered more occurrences, mostly in the northern half of the country. Primary mineralization occurs mostly as gold-bearing quartz veins as well as being associated with sulfides. The largest proportion (estimated 80%) of the historical gold production, however, was derived from alluvial secondary deposits. Gold mining has always been at a small-scale, and today the mining is still dominated by ASM enterprises. Industrial, large-scale mining on Madagascar is focused on other resources (e.g. nickel). However, today they are professional gold exploration activities because the country is considered by international experts to have a significant geological potential. The country is relatively under-explored, in part because of the local political developments.

ASGM in Madagascar has increased significantly during the last 15 years, mainly because of the increase in the gold price, the accessibility of the relevant gold occurrences and the extreme poverty of much of the population that suffer from the political and economic decline of the country. In 2001 an estimated 200,000 people were actively engaged in ASM for gold and gemstones, and now it is approximately 500,000 people (2/3 of which are active in the gold sector). Many of these people work in mining in addition to their subsistence farming activities and the productivity is therefore low. Gold rush conditions sometimes occur, although fewer than in ASM for gemstones. Currently the estimated annual gold production is 10 tons. Private export of gold is officially prohibited since 2012 and the central bank should act as the only purchaser and exporter. However, the realization of this presidential decree is doubtful. Some of the gold production is unofficially smuggled out of the country, usually to the United Arab Emirates (Dubai). Gold also acts as an unofficial parallel currency in the country and this results in the local gold price occasionally exceeding the international reference price. The local jewelry handcraft industry should also be taken into consideration.

Legal Framework and Level of Formalization

The Madagascan Mining Law of 2005 envisages a decentralized supervision and taxation of the various segments in the local gold supply chains. Individual ASM operators require a mining permit that is issued by the local municipality, and is conditional on the environmental and work safety regulations in the municipality. Gold buyers also require a license issued by the municipality for their activities and are required to pay a royalty (2% of the value) to the municipality, a proportion of which is forwarded to the central government. A presidential decree of 2012 requires that the Madagascan central bank to be the only purchaser and exporter of gold. Although there are various problems related to the foreseen function of the central bank in gold trading (for example, there is no refinery in the country, no analytical capacity at the central bank), the general legislation pertaining to ASM, with the decentralization approach to supervision and tax distribution, is deemed to be satisfactory. Despite this, it is still problematic that an estimated 90% of the ASM operations are informal, and legal specifications can rarely be implemented in practice. Mining permits have been issued to only a few mines, such as Betsiaka that was granted a permit in 2008, to stimulate the transition from ASM to a more industrial mining operation. In this case, a partial formalization can be presumed, but it is not clear how much gold is produced by each of the mines and the level of formalization in the associated supply chain.

Relevance of ASM to Development

Madagascar is one of the poorest countries in the world, where 90% of the population live below the poverty level. The repeated uncertainties in the political development during the last years are negative attributes from the perspective of economic development. The 500,000 people engaged in ASM for gold and gemstones represent 2.5% of the population that is active in mining and, together with their dependents in the same household, it is estimated that ASM contributes directly to the livelihood of at least 10% of the Madagascar population.

The working conditions in ASM are severe, the work safety standards are poor, particularly in gemstones but also in gold mining. Child labor is widespread in the form of “family mining” and compromises their chances for an education in the local schools. Widespread environmental problems, also in the ecologically extremely valuable protected areas in Madagascar, are caused by ASM; and abandoned sites of ASM are not rehabilitated. The lack of formalization in the sector and the international smuggling result in significant losses of income, both by the central government and the local mining communities. Finally, but no less important, the potential income for the ASM operators themselves suffers from the lack of transparency and lack of formalization as well as the associated corruption.

German Development Cooperation

The German and international development cooperation with Madagascar was encumbered after the putsch in 2009 and subsequent international isolation of the country, which was gradually lifted after the new elections in 2013 and the subsequent appointment of the new President. Since then, Germany plans to increase its involvement in the environment and fight-against-poverty sectors. Germany is not directly involved in the mining sector, but other donors such as the World Bank are managing significant programs in the country. As part of this program, regional geological mapping of the whole country was undertaken in 2008-2009 by the BGR and other geological surveys. Madagascar is also a candidate member of the Extractive Industries Transparency Initiative (EITI).

Risk Assessment

The state structures and capacities were massively burdened by the events of 2009. Even if the country appears to be politically on the road to improvement since 2013, the newly established system remains fragile, as indicated by the attempt to impeach the President in 2015. The reliability and capacity of the state authorities in the mining sector are limited. The widespread lack of formalization of the poverty-driven ASM sector, together with the weakness of the state authorities, suggest that the chances of success for a short-term formalization of the sector are low and a long-term approach is required.

Summary

The summary about the implementation of a closed pipe action in Madagascar is rather ambiguous. As compared to other countries, there are no active certification programs and there are no industrial large-scale mining companies active in the gold sector in Madagascar that could be regarded as exemplary for sourcing gold from ASM. There are serious practical deficits in the formalization process, even if the legislation at least appears to be sufficient.

The exceptionally high relevance of local ASM to development suggests that improvements to the sector would be desirable, but would require a longer-term commitment and must probably also include capacity-building measures in the government administration to ensure the sustainability of a legal supply chain. This could not be accomplished by individual closed pipe actions.

Furthermore, the possibility of selectively sourcing gold from the small, previously formalized sector of ASM operations, for a closed pipe approach needs to be evaluated. In addition, the

possible role in the supply chain of the Madagascar central bank or other exporters must be investigated in detail, and as necessary strengthened (for example, improving their analytical capacities for analysis of the gold content for valuation-purposes in a legal supply chain).

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Mongolia

Mongolia



Potential as a Source of Gold

In 2008 the annual gold production in Mongolia was 15 tons, but this decreased during 2009-2013 to an average of 7.5 tons mainly because of the legislation to protect the environment and a strike by the workers at the Boroo gold mine. The production increased again in 2014 to 11.5 tons. Gold is produced as a by-product from large-scale industrial copper mining. The Oyu Tolgoi copper mine (operated by Rio Tinto plc and Turquoise Hill Resources Ltd, formerly Ivanhoe Mines Ltd) commenced production in 2013 and is now one of the biggest mining projects in the world.

ASGM in Mongolia is relatively recent and first appeared in the early 1980's. The reason behind the development of the artisanal gold mining in rural areas of Mongolia was undoubtedly the poor economic situation in the early 1990's as well as the extreme winters between 1997 and 2002. Many people engaged in their traditional livestock activities lost their livelihoods and turned to ASGM as an alternative source of income ASGM occurs in 18 of the 21 provinces in the country. Mainly, primary gold mineralization in bedrock is mined. Alluvial gold deposits are mined in the area of the Tuuls river drainage, in the central-northern part of Mongolia. It is estimated that a total of 55,000-90,000 people are engaged in small-scale gold mining in Mongolia, and according to rough estimates they produce about 5 tons gold, primarily for the neighboring Chinese market.

Legal Framework and Level of Formalization

The problems that are associated with unregulated ASM were recognized at a relatively early stage by the Mongolian government in 2002, and after a few years relevant political strategies and legislation were adopted. At the same time, several miners from the small-scale sector built up their own internal structures, such as the establishment in 2007 of the NGO "Bichil Uurkhaichdiin Kholboo" (Association of Small-Scale Mine Operators).

The Mongolian government adopted the "Temporary Regulation on Artisanal Mining Operations" and the "Sub-Program for Development of Small-Scale Mining up to 2015" in 2008. A task force was also established within the Mongolian Ministry of Mines especially for the formalization of ASM. This work was soon successful; during an evaluation of the guidelines an increase in their practical effectiveness was examined, as were the incentives necessary for implementation of the guidelines. As result, in 2010 the guidelines were harmonized with a supplementary article that regulates the land-use rights for the ASM operators as this had been recognized as a priority constraint for the operators. In the meantime, about 10% of the ASGM operations in Mongolia are formalized. Whereas illegal miners earn an average of USD 176 per month, the registered and formalized miners can in the medium-term, as a result of improved productivity and despite higher fees and taxes, earn approximately double as much.

Miners from the ASM sector can register themselves under Mongolian civil law as "unregistered partnerships) that are, by definition, prohibited from commercial activities. Currently about 410 mining organizations are included in this category. The general mining law applies to registered private companies or cooperatives, and this includes wide-ranging bureaucratic requirements. The practical implementation is however not clear.

Despite this pragmatic approach and the resulting success, the expansion of the legal gold supply chain from ASM is not without problems. ASM operators in Mongolia are required to sell their gold to the central bank, with a 10% tax deduction. Additional taxes of USD 45 per month for the formalization must be paid, and this has resulted in widespread illegal mining

and smuggling.

Relevance of ASM to Development

Only a very small proportion of the Mongolian population is affected by severe poverty, but the traditional economic livelihood – such as livestock farming – in the structurally fragile regions is diminishing. The economic situation for people in rural regions has deteriorated since the collapse of the Soviet Union. ASM, which provides approximately 20% of all employment in rural areas, represents a critical contributor to the development efforts for the reduction of poverty, even if an average monthly wage of USD 176 for the illegal miners is significantly less than the national minimum wage. The income potential increases significantly after formalization, up to USD 360 per month.

The Mongolian government cooperates since 2005 with the Swiss Agency for Development and Cooperation on the “Sustainable Artisanal Mining” project (SAM) for the support to the sustainable development of the ASM sector. The project includes the core issues of formalization, insurance protection for the miners, reduction of the environmental impact, work safety as well as local community development. After 10 years, approximately 7000 miners in the small-scale sector are now working legally and demonstrate the success of the implementation of this project. The project is now in its fourth phase, and the objective is to launch Mongolia as an internationally accepted center for “Best Practice” in the ASGM sector. Delegations from Tanzania, Zimbabwe, Ethiopia and the African Mineral Development Center (AMDC) have already exchanged experiences with experts in Mongolia during their visits to the country.

The Alliance for Responsible Mining is also dedicated to Mongolia and has, supported by the SAM Project, certified the “Xamodx” mining community with the Fairmined label. This is the first mine in the world that, since April 2016, produces “Fairmined Ecological Gold”, for which the mine guarantees that no mercury or cyanide is used during the production.

Cooperation between the “Bornuur Miners”, the Mongolian government and the SAM Project is another example of successful support for sustainable development in the ASGM sector. A prohibition on the use of mercury in the production was implemented a result of the initiative of the local miners and, with technical support to avoid the use of mercury, a local processing facility was constructed. This concept was successfully implemented and has been transferred to two other mining districts.

German Development Cooperation

The natural resource sector in Mongolia is a central issue for German development and cooperation. The support for sustainable mineral resource management, together with biodiversity and energy efficiency, is one of the three core topics of the German-Mongolian development cooperation. The Federal Government supports the vocational training and further education in Mongolian mining (long-term advice for the mining inspectorate by the BGR), cooperation with the private business sector within the context of the integrated mineral resource initiative (IMRI), and good economic governance leadership. It is aimed to include German industrial companies in a development partnership (PPP). Mongolia was also the first country with which the German government concluded a raw materials partnership. Since 2011, this includes intensive cooperation on raw materials, technology and industry topics. Since 2010, Mongolia is also a member of the Extractive Industries Transparency Initiative (EITI).

Risk Assessment

The expansion of the implementation of the framework strategy that has been adopted by the Mongolian government is difficult because of the inadequate presence in rural areas. Furthermore, the potential is legally uncertain for further development of the ASM sector for

a “non-profit” activity with limited equipment to productive structures.

The use of mercury was officially prohibited by the government in 2008. Until then, up to 10 tons mercury were smuggled annually into the country and used for amalgamation in numerous small processing facilities. 145 of these facilities were closed subsequent to the government prohibition. However, as an incentive to ASM operators to avoid the use of the amalgamation process, only four centrally controlled gold processing facilities were supported in the country. As a result, mercury is still used locally and under poor conditions for amalgamation because of the long distances to the official processing plants.

The requirement to sell gold to local banks, from where it is transferred to the central bank, is another factor behind the growth of people working in illegal ASM – also known as “Ninja Miners” in Mongolia. At the point of sale, an additional 10% tax is payable, and this results in widespread smuggling activities to the local gold markets in China that borders to the south.

There is no systematic evaluation (including concrete quantitative estimates) of child labor engaged in the ASM sector in Mongolia. Only the ILO estimated in a 2005 report that the number of children engaged in the ASGM sector in Mongolia was 10-15,000.

Summary

The Mongolian ASGM sector is relatively well developed, as compared to other countries in the world. This is primarily related to the lengthy cooperation with the Swiss Agency for Development and Cooperation and the related “Sustainable Artisanal Mining Project” (SAM). This favors the development of practical legislative actions for the formalization of the sector and ASM communities, which are commended by experts as a global “best practice” model. Approximately 10% of the national ASGM sector has completed the formalization.

In principle, there are suitable approaches for discussion about a closed pipe action, both from the private business as well as from the state supervision authorities. In order to be sustainable, a legal gold supply chain must as a whole be economically competitive, despite the required fees and taxes, as compared to the illegal mining activities and associated smuggling. Because of the reduction in the number of mercury processing centers, technical advice and support for environmentally-friendly processing of the mined gold, would be necessary for the implementation of a closed pipe action in the rural regions.

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Peru

Peru



Potential as a Source of Gold

Peru is currently the fifth largest industrial gold producer in the world, with an official annual production of 150-180 tons. Most of gold in Peru is produced from open-pit mining, usually as a primary product but also as a by-product of base-metal deposits. The Yanacocha mine in northern Peru is the largest gold mine in south America and is operated by the US gold mining company Newmont Mining Corporation. Other international gold mining companies (e.g. Barrick Gold Corporation) also participate in the Peruvian mines.

ASGM has been active for many years in nearly all the Peruvian provinces. The estimated number of miners in the sector is about 70,000-100,000 (2012), which represents 0.3% of the total population. At least 30 tons of gold is estimated to be produced annually from ASM activities. The main centers for artisanal mining are in the northwest and southeast of the country. Most of the ASM activity in the main production provinces, Madre de Dios, Cusco and Puno is illegal, but in the other regions it is usually legal or tolerated. The gold mineralization in the Madre de Dios region occurs as alluvial placer deposits, as is also found in the neighboring regions in Bolivia and Brazil. In other parts of the country, ASM usually exploited primary gold mineralization in the bedrock.

The officially stated gold exports from Peru, or the stated imports of the destination countries, are 200-300 tons annually, which is considerably more than the official production figures. The difference is due to the illegal gold mining activity as well as gold smuggling from the neighboring countries, probably induced by the lower export taxes in Peru. Switzerland is the biggest customer for gold from Peru.

Legal Framework and Level of Formalization

ASGM in particular in the Madre de Dios region has, over several decades, developed resilient structures and has numerous political supporters in local and regional government positions, but at the same time the mining is, in practice, almost all totally illegal or informal. Amalgamation is in widespread use (3000 tons cumulative use of mercury between 1900 and 2010) and as a result 40% of the population in this region have levels of mercury in their blood that are high enough to be a threat to their health. Other problems typical for ASM also occur. For example, according to the estimates from 2010 by the ILO, 50,000 children are engaged in the Peruvian ASGM sector. However, this figure appears to be rather high when compared to the total number of people engaged in ASM as estimated by the government and must therefore be treated with caution.

The serious lack of regulation in certain regions with ASM contrasts strongly with the particularly high capability and long traditions in mining in Peru. Despite the efforts of the Peruvian government to formalize the ASM sector, including both numerous legislative initiatives to support ASM operators as well as military operations and destruction of technical equipment belonging to the illegal ASM-miners, these attempts to resolve the situation have, until now, all failed in the critical regions. As a final consequence, the Peruvian government issued a state of emergency for the Madre de Dios region in May 2016.

Relevance of ASM to Development

The declaration of a state of emergency in Madre de Dios was internationally reported, and demonstrates the importance of ASGM to the political life in Peru. Pedro Pablo Kuczynski, the recently elected President of Peru, announced that he would continue the formalization process that had been initiated by his predecessor and introduced into the political debate

the concept for new investment in environmentally-friendly ASM. This would be financed by a bank that has yet to be founded. Peru also works with regional programs that were adopted in February 2016 together with the governments of Ecuador, Colombia and Bolivia. A formalized ASM sector would have potential for social, ecological and economic development actions. The prohibition of amalgamation could reduce the mercury contamination of the drainages in the Amazonas region, and thereby lessen the health risks for the indigenous populations. A regional formalization of ASM operators would terminate their legal, social and political stigmatization, and encourage investments into the region. Price transparency could be improved so that the contribution of ASM to poverty-reduction (1/4 of the people in Peru are living below the poverty level) would be more recognized.

Currently, there are numerous initiatives and organizations that work towards the establishment of sustainability standards, formalization, certification and responsible supply chains for Peruvian ASGM. These include, among others, the Alliance for Responsible Mining (with the Fairmined program), Fairtrade Gold, the Better Gold Initiative (a PPP between the Swiss government and refineries), the Artisanal Gold Council as well as the NGO Solidaridad. There is a long-term cooperation with the SOTRAMI cooperative in southern Peru. Infrastructure for sanitary facilities, schools, transport routes and power supply were constructed in the communities from this region with the funds from the premium price for certified gold. Furthermore the prohibition for using mercury resulted in a reduction of the environmental impacts. There are several other projects for reducing the use of mercury, which are supported and implemented in particular by the United Nations Environment Program (UNEP).

German Development Cooperation

The bilateral development cooperation is focused on the key issues of support for democracy, water and the management of natural resources and climate change. The cooperation in the field of natural resources also includes the German-Peruvian Raw Materials Partnership that was adopted in 2014. The harmonization of the sustainable mining of raw materials with social and ecological standards is a central theme of this program, but artisanal mining is not explicitly included. The BGR is involved as an advisor on mining-environmental issues in a regional cooperation with various Andean countries for cooperation, but the focus is on industrial large-scale mining. Since 2012, Peru is also a member of the Extractive Industries Transparency Initiative (EITI).

Risk Assessment

Peru is an attractive source for gold due to its high production capacity (both industrial and artisanal). The risk profile of the country, however, requires special supply chain due diligence obligations to be observed in order to avoid any reputational risk. For example, the Swiss gold refinery Metalor was publicly criticized after local business practices were made public by several NGO's.

Risks for sourcing gold from the ASM sector in Peru are very specific according to the region. Risks can be minimized if gold is preferably sourced from those provinces that are not dominated by illegal ASM. In those regions dominated by illegal ASM activities, such as Madre de Dios, the illegal status and neglect towards environmental standards (use of chemicals) present significant problems. Criminal networks have become established in these areas, which are not only involved in gold smuggling, but also trafficking of drugs and people, in particular forced prostitution (often with minors). Gold trading in this environment may also be used as a mechanism for money laundering.

Special risks resulted from the unstable political situation caused by the state of emergency in the Madre de Dios region as well as the election of Pedro Pablo Kuczynski as the new President of Peru, who supported the continuation of the previous policies pertaining to ASM, but only narrowly won against his opponent Keiko Fujimori, who acted as a supporter of the illegal mine workers in the Madre de Dios. The possibility for further political unrest will become clearer during the coming months.

Summary

The extensive experience and current attention with issues of sustainability of the local ASM sector and the responsible sourcing of gold from Peru, are advantageous with respect to the effective initiation of a pilot supply chain. Local networks and knowledge are available, and there is real public interest. There are already one bigger (SOTRAMI, several 100 kg production capacity) as well as several smaller gold mines that are either certified (Fairtrade Gold, Fairmined) or in the process of being certified. It must be realized that the sourcing of certified gold is linked to an obligatory premium for local community development. It needs to be decided on site if the payment of the premium can be avoided if alternative incentives (e.g. long-term contracts or pre-financing) are suggested. Alternatively, the cooperation with a legal, but not formally certified mine, is possible as well.

Sourcing of gold from the known problem regions, in particular Madre de Dios, should be rejected, because the associated risks for the supply chain and for the reputation are considered to be very high. Even sourcing of gold from the other regions should require a detailed control of the supply chain partners (for example, exporters) in order to manage any related risks.

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Philippines

Philippines



Potential as a Source of Gold

The official gold production in the Philippines ranges between 30 to 40 tons and during the recent years it was 15-20 tons per year. The “Far Southeast” project contains a high in-situ value (several dozen billion dollars), but is still in the development phase and is not in production. Currently industrial large-scale gold mining in the country is undertaken in two projects operated by medium-sized international gold companies (B2Gold: Masbate, and OceanaGold: Didipio).

The government estimates that 200,000-300,000 people are engaged in the ASGM sector. ASM is widespread through the country and occurs in 30-40 of the 81 provinces. A concentration of about 20,000 miners is found in the Composta Valley district (Mindanao islands). Up to 90% of gold produced in the ASGM sector is estimated to be smuggled out of the country (mainly to China) and it is difficult to estimate the real production capacity. Estimates range for an annual production of 25-30 tons gold from ASM, and therefore ASM provides the dominant proportion of the national gold production.

Legal Framework and Level of Formalization

ASGM extends throughout all of the islands in the country. There have been numerous changes to the law during the past 25 years in an attempt to regulate ASM. After the first legal definition of “Small-Scale Mining” in 1984, the “People’s Small-scale Mining Act” of 1991 provides the legal framework for ASM in the Philippines. The law is focused on an economic support for ASM, but also takes social and ecological issues into account.

Subsequently, on the one hand, tax remissions for miners in the ASM sector and, on the other, fines for environmental contamination were introduced. Despite the efforts of the government to define the legal framework for ASGM, most of the sector remains in an informal status. The lack of regulation of the ASM sector is due to the difficulties related to the decentralized supervisory structures in the Philippines.

Mercury is used extensively for amalgamation in the Philippines. The government has repeatedly prohibited the use of mercury, but has been unable to implement this prohibition. The relevant ministry for ASM (Department of Environment and Natural Resources) has enacted other measures, in addition to the issue of mercury usage, pertaining to the rights of indigenous people as well as the protection of the nature reserves.

In practice, the issues for child labor and work safety are of critical importance. In particular, an estimated 15,000 children are engaged “compressor mining”, which has been officially prohibited since 2012 and is one of the most dangerous forms of child labor. This type of gold mining takes place in regions near the coast and is particularly widespread in the Philippines. The miners, including children and young adults, dive into narrow shafts that have been excavated under water to collect gold-bearing sediments that is manually carried in buckets to the surface. An air-pipe from a diesel compressor is used to provide breathing air during this work. A failure of the compressor, fast diving (“diver sickness) or landslides in the area of the excavations can result in long-term damage and injuries, and even death.

The recently elected President of the Philippines, Rodrigo Duterte, comes from the Mindanao archipelago, which is partly dependent on the extensive ASM. In a statement from February 2016 Duterte indicated that, during his time as mayor, mining activities were not tolerated because of the prevalent damage to the environment, and that they did not comply with the sustainability standards. In addition, his campaigning for the presidency focused on the key issue of “zero tolerance” towards criminals. During the first weeks after the election sev-

eral hundred supposed drug-dealers were found dead. The first political decree pertaining to the ASGM sector called for a moratorium on all mining activities. At the time of preparing for the publication of this report it was not possible to estimate the effects of this decree, but it could lead to an uncertain situation in many parts of the country.

Relevance of ASM to Development

A quarter of the Philippine population lives at levels below the poverty line. Workers engaged in ASM can make between USD 6-12 per day, which represents about double the national minimum wage. The sector therefore makes an important contribution to reducing poverty.

Despite the high export tax of 7% on gold (which is a reason for the gold smuggling is preferable to official export) and the requirement for ASM operators to sell their gold at world market prices to the central bank (which fails because of the long distance to the official buying offices and the activities of the intermediary traders), the Peruvian state derives practically no economic benefit because of the informal organization of ASM and the associated supply chains.

The unregulated use of mercury for amalgamation represents an environmental and health risk. The government introduced a national strategy to reduce the use of mercury by the ASGM sector and were advised, during the development and implementation of this program 2009-2011, by the Artisanal Gold Council (AGC) in cooperation with the United Nations Environmental Program (UNEP). Currently, there are no projects on the production and sourcing of certified gold from ASM operations in the Philippines (Fairtrade Gold or Fairmined).

German Development Cooperation

The financial development cooperation between Germany and the Philippines has been suspended since 2009. The reason for this was the expropriation of a terminal at the Manila airport that had been financed by a German company. The current cooperation in the technical development sector with the Philippines is focused on promoting peace and transitioning from conflict. Since 2013, The Philippines is also a member of the Extractive Industries Transparency Initiative (EITI).

The development of the political situation in the country after the election of Rodrigo Duterte as the new President of the Philippines, in particular the effect on international partner, is uncertain. During the first weeks of his presidency there was an increase in the number of murders that were either approved or even supported by Duterte.

Risk Assessment

The principal challenge is the insufficient control by the government over the decentralized ASM activities on all of the islands. This leads to a generally informal status, widespread environmental problems as well as children working in dangerous conditions. An effective control to reduce the dangerous working conditions and the use of mercury has not yet been registered. The government control of supply chains is also very weak and informal intermediary traders purchase the gold instead of the central bank, and then smuggle the gold to China.

Armed conflict between government soldiers and various Islamic rebel groups occurs mainly in the Mindanao archipelago. Apart from the ideological and religious motives and the desire for more autonomy, the conflict is also focused on controlling the exploitation of natural resources. The western region of Mindanao is best avoided as a result of these conflict-related risks. This region was classified by the Heidelberg Conflict Barometer in 2015 at the highest conflict level ("war"). Local armed conflict also occurs in other parts of the country. The OECD Guidelines for due diligence obligations should therefore definitely be observed in case of developing a supply chain for gold derived from the Philippines.

Summary

The numerous defects in the ASGM sector in the Philippines represent on the one hand a high risk, but on the other hand a potentially high impact of a controlled, responsibly managed, supply chain. For example, a “Best Practice” alternative model, where child labor, mercury use and other problems are avoided, could have a positive regional effect. Cooperation on or near a LSM concession might be considered as a means to clarifying the legislative fundamentals and legal status of the participating small-scale mine operators.

A detailed traceability in the supply chain is essential because of the high smuggling-related risks. This could be challenging in view of the decentralized location and, depending on the geographical location of the mine, complex transport network via land, air and sea. The issue of pricing would definitely need to be addressed for a closed pipe, to reduce the incentives for smuggling. In this respect, it needs to be examined if cooperation with an LSM could also be advantageous.

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Tanzania

Tanzania



Potential as a Source of Gold

After South Africa, Ghana, Mali and Sudan, Tanzania is the fifth largest gold producer in Africa. The importance of the gold sector is demonstrated particularly well by the export statistics: in 2012 the value of the gold exports comprised 94% of all Tanzanian exports. Gold was produced in Tanzania during the pre-colonial period and has been in continuous production since then – initially by private (colonial) investors. After independence in 1961, the gold sector was nationalized and the privately operated mines were successively closed, but this policy was suspended in the 1990's. The re-privatization and liberalization, as a result of investor-friendly policies and the subsequent reforms to the mining law, lead to a steep increase in the national gold production at the beginning of the new millennium. From 2000 there was a boom in the Tanzanian gold sector with an average annual production of 40 tons gold. International gold producers, such as AngloGold Ashanti, the state-owned Stamico as well as Acacia Mining (formerly African Barrick Gold) operate in Tanzania. Their production is refined primarily in Switzerland and South Africa, but also recently in India.

The temporary closure of the privately-operated gold mines resulted in the first expansion of the ASGM sector: many experienced miners used their knowledge and move to work in the informal sector. The increase in the gold price as well as expansion of the industrial large-scale mining resulted in a further expansion of the ASM sector in the country, partly in competition with the large-scale operations. According to estimates by the World Bank, in 2012 a total of 685,000 people were engaged in ASM, of which most were in the gold sector. Other sources estimated that at least 300,000 people are engaged in ASGM. An estimated 150,000 people work in the center for artisanal mining, the Geita District in the north of the country. The annual gold production from ASM is estimated to be at least 4 tons (about 10% of the national production). Import statistics from the United Arab Emirates (Dubai), which is the principal destination for gold from Tanzanian ASM, suggest the production could be considerably higher (more than 10 tons), most of which is smuggled out of the country without the official export procedures.

Legal Framework and Level of Formalization

With respect to the increasing importance of the ASGM sector, during the past decades the Tanzanian government has repeatedly revised the legislation in favor of the small-scale operators. The 1979 Mining Act provided ASM operators with the first opportunity to be granted concessions. The concerns of the ASM sector were addressed by the revisions in the 1998 Mining Act. The ASM sector was then included in the national development strategy for the first time, and objectives for formalization were defined and standards identified for working conditions and environmental impacts.

The investor-friendly legislation, however, favors the industrial large-scale mining, as compared to ASM, for the granting of concessions. This led to conflict in the early 2000's. Although the government declared in 2005 that the livelihood of ASM operators must be compatible with the industrial mining, the tension between the illegal ASM operators (the "intruders") and the large-scale gold companies has remained until today.

The biggest reform to the mining legislation was implemented in the Mining Law of 2010. The most important revisions for the ASM sector could be summarized in four points:

- 1) The ASM sector should have stronger influence over the granting of land-use rights and concessions.
- 2) As part of the process to decentralize government structures, the granting of mining licenses should be administered by local government offices.

- 3) A special program for the granting of micro-credit to small-scale mine operators should strengthen investment in the sector.
- 4) The Tanzanian government strengthens the development of capacity-building measures in the ASM sector for improving the procedures pertaining to work safety, environmental impacts, technical equipment and the procedure for formalization.

The implementation of the formalization procedures has previously been very slow and in 2009 there were still 10,000 applications for mining permits dating from 2007 that not been processed by the responsible Ministry.

An environmental impact assessment was not required for granting of a license to small-scale mine operators, in contrast to industrial large-scale mines. However, they must provide the government authorities with an “Environmental Protection Plan” as well as an “Environmental Investigation” and a “Social Study Report”. The use of mercury is not generally prohibited, but the use of a retort to control the amalgamation process and recovery of the poisonous material is a legal requirement (but in practice this is ineffective). The use of cyanide for leaching is only allowed with a written permission, but the penalty for disregarding this is only USD 31.

Relevance of ASM to Development

Tanzania is characterized by extreme poverty, 76% of the people live below the poverty level. The national ASGM sector is one of the biggest in central and east Africa and represents an important contribution to the economic development of many people. However, there are widespread situations, as in other countries, where the ASM operators are disadvantaged and, as compared to the intermediary traders and license owners, they only receive a relatively small proportion of the value of their production.

Because of its relevance to development, the national “Five Year Development Plan 2011-2016” provides for strategic supportive measures for the ASM sector. This includes the improvement of productivity by providing easier access to machines and equipment, as well as establishing central local processing facilities. More support is foreseen for geological exploration and the characterization of gold deposits.

With the financial assistance from Comic Relief, the “Fairtrade Gold in East Africa” program 2012-2015 was active in three ASM operations in Tanzania. The program aims to provide focused capacity-building measures as the basis for subsequent certification to the Fairtrade Gold Standard. An evaluation of the program to date provides useful information about the possible successes and the constraints of these types of action in the country. The program was particularly successful in further improving the situation on the well-managed ASM operations, pertaining to improved environmental protection, the increase in productivity as well as reduction of child labor. On the other hand, poorly managed and organized ASM operations were characterized by internal conflicts and financial problems that encumbered an effective progress in the program. Serious challenges still remain, for example in the area of work safety.

Although it was possible to register progress at the mining level in suitable operations (that can be expanded further), in the current program there were no significant advances in the marketing and sales of the gold production. This is still in the hands of local intermediary traders and the supply chain structures that have been established over many years could not be effectively adapted (see below). Therefore, there is an important potential for development in the establishing a responsible supply chain between the mine and export.

German Development Cooperation

Mining, particularly ASM, has not played a direct role in the German development cooperation with Tanzania. The focus of the development cooperation is in the areas of water supply, health care and HIV prevention as well as environmental policies, with the protection of the biodiversity of the country as the major issue. Furthermore, since 2015 there is a program to

support good financial governance and in this respect it is noted that Tanzania is since 2013 a member of the Extractive Industries Transparency Initiative (EITI). In the natural resource sector, the BGR is engaged in Tanzania on the one hand with geothermal energy and on the other it supports the African Minerals and Geosciences Center in Dar-es-salaam in the establishment of the geochemical analytical laboratory with equipment and training for orderly laboratory practices. Tanzania is also a member state of the International Conference for the Great Lakes that includes regional cooperation on the conflict-minerals issue.

Risk Assessment

The structures and dependency relationships in Tanzania's gold supply chains sourcing gold from ASM are very complex. In a pilot project, the "Federal Bank of the Middle East" developed four "Fair Trade Gold Centers"⁶⁰ that should purchase gold from the small-scale mine operators at the usual international market prices. These centers therefore represent competition for the locally established gold buyers and intermediary traders. Since the latter often provide cash advances or informal credit to the small-scale mine operators so that long-term dependency relationships arise from servicing this debt. This results in the situation that the ASM operators persist in selling their gold only to the local established traders. The interest on credit is sometimes so high that the informal gold traders can pay prices over and above the gold market price and even then make a good profit. Because of this, the gold traders can defend their local market position in the region against the new competitors.

In order to avoid the export tax, which was raised from 3% to 4% in the Mining Act of 2010, some of the gold from ASM is smuggled out of the country, mostly to Dubai (occasionally through neighboring states such as Kenya). The gold produced by ASM is typically sold, through a network of agents and gold traders, to Indian jewelers in Dar-es-salaam, where it is smelted and locally worked into jewelry, or smuggled out of the country. The Tanzanian government has established the Tanzania Mineral Audit Agency that, among other duties, is engaged in the state controls on gold smuggling related risks and has established special inspection desks at the international airports in Tanzania.

Another potential risk in Tanzania arises from conflict-related gold from DR Congo that is smuggled through Tanzania to Dubai, where it is incorrectly declared as being sourced from Tanzania. Therefore, Tanzania is directly affected by the conflict-mineral paragraphs in the Dodd-Frank Act and the OECD Guidelines for due diligence obligations should be given particular attention throughout the supply chain.

Child labor is widespread in Tanzania. According to government estimates, 20% of the children⁶¹ are engaged – mostly in agriculture. Nonetheless, according to reports by Human Rights Watch, several thousand children also work in ASGM. Furthermore, prostitution is widespread in ASM communities, and this leads to the spreading of sexually transmitted diseases. In 2003, 41-68% of the women in several mining communities were infected with HIV or other sexually transmitted diseases. This demonstrates, compared to the national HIV level of 5.1%, the extreme danger for women in mining communities. A responsible program for sourcing gold should therefore consider prevention-measures in the local communities.

Summary

The legal and political framework conditions for implementing a pilot project for sourcing gold from ASM would be advantageous in Tanzania. However, it can be expected that a large proportion of the Tanzania ASM are not directly accessible for such a supply chain because the mining is not yet formalized or is even illegal. The participation of selected ASM partners in a pilot supply chain may be feasible, as the initial progress by the local Fairtrade Gold initiatives has demonstrated. From the perspective of development policy, the positive impacts from such an action would be particularly valuable in Tanzania bearing in mind the

⁶⁰ There is no relationship with the "Fairtrade International (FLO)" or the "Fairtrade Gold" programs.

⁶¹ at the age of 5 – 17 years

depressing situation in many of the mining communities.

Some of the gold trading along supply chains between mine and export is official, whereas other supply chains are informally established and conclude with smuggling. Previous experience in Tanzania demonstrates that the established local gold supply chain structures (trading network) between the mine and export are very difficult to break apart, even if the official supply chain is affected. Therefore it is important to analyze these supply chains in more detail, and consider including local intermediary traders during the planning of a “closed pipe”, but giving special attention to transparent pricing.

A final possible option would be dialogue with the active industrial large-scale gold producers in the country (e.g. Acacia Mining). These producers are damaged by the illegal activities of the small-scale mines on their concessions. However, they realize that local miners must be provided with alternatives or development perspectives, because a ban will not prevent illegal mining. As a result, these large-scale producers may be prepared to support several selected ASM communities. Supply chain partnerships might be supported in this context.

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