

# Artisanal and Small-Scale Gold Mining

What needs to be done?





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# 1. Introduction - A call to action

Artisanal and small-scale gold mining (ASGM) occurs in around eighty countries and accounts directly for some fifteen to twenty million livelihoods. It accounts for around one fifth of newly-mined gold production. When responsibly conducted, ASGM represents a significant development opportunity in many rural areas of Africa, Latin America and Asia. But a high proportion of ASGM takes place outside formal legal frameworks and there are growing concerns about some of its adverse environmental, social and governance impacts. The challenge for societies and for the gold value chain is what should be done to enhance and accentuate the positive aspects of ASGM whilst addressing the damaging impacts?

The issues involved are complex and tough to address. There have been many well-motivated interventions. Indeed, in its recent strategy document<sup>1</sup>, the World Bank estimates that since the 1980s the international community has invested over US\$1 billion in support of improving ASM, of which the Bank has contributed over a third. The Bank's focus has been on regulatory reforms and government capacity-building. Other donors have concentrated on mercury abatement, child labour, gender empowerment, community engagement and support for value chain due diligence.

However, it is widely recognised that these interventions have had limited impact. Indeed, the presence of ASGM has grown substantially but efforts to improve environmental, social and governance standards have not kept pace. In some countries, the adverse impacts of ASGM are reaching crisis proportions.

This report sets out some of the challenges, what the World Gold Council (WGC) is doing and what it hopes others – in government, in the gold value chain, in international organisations and in civil society - will do. The issues are too serious to ignore. The WGC recognises that other stakeholders have been working in the field over many years and we do not imply that we have unique insights. However, we strongly believe in the urgent need to work with others to mobilise a 'coalition of the willing' to turn things around. We hope, thereby, to realise a positive vision for the role that ASGM can fulfil for countries and communities if an enabling framework is provided and safeguards are implemented against corruption, human rights abuses and infiltration by organised crime.



*A Burmese woman pans for gold in a small stream Putao, Myanmar.*

<sup>1</sup> World Bank 2024. 'Achieving Sustainable and Inclusive Artisanal and Small-Scale Mining (ASM): A Renewed Framework for World Bank Engagement'



## One size doesn't fit all

One complexity arises from the difficulty of defining 'illegal' mining. Estimates suggest that 85% of ASGM occurs outside legal frameworks but much of this is a traditional or ancestral community occupation that may have been practiced for generations. In other contexts, ASGM may be informal in the sense that in many emerging markets, informality is endemic. In other situations, small-scale miners may be seeking formalisation but national processes are so cumbersome that it is unfeasible to secure the necessary registrations or permits. Those miners caught in this bureaucratic 'doom-loop' are defined by the OECD as 'legitimate'<sup>2</sup>. In some contexts, a country's mining code may simply not include provision for artisanal or small-scale miners. Then there are those miners who are wilfully illegal and who behave recklessly or those who are in thrall to organised crime or corrupt officials.

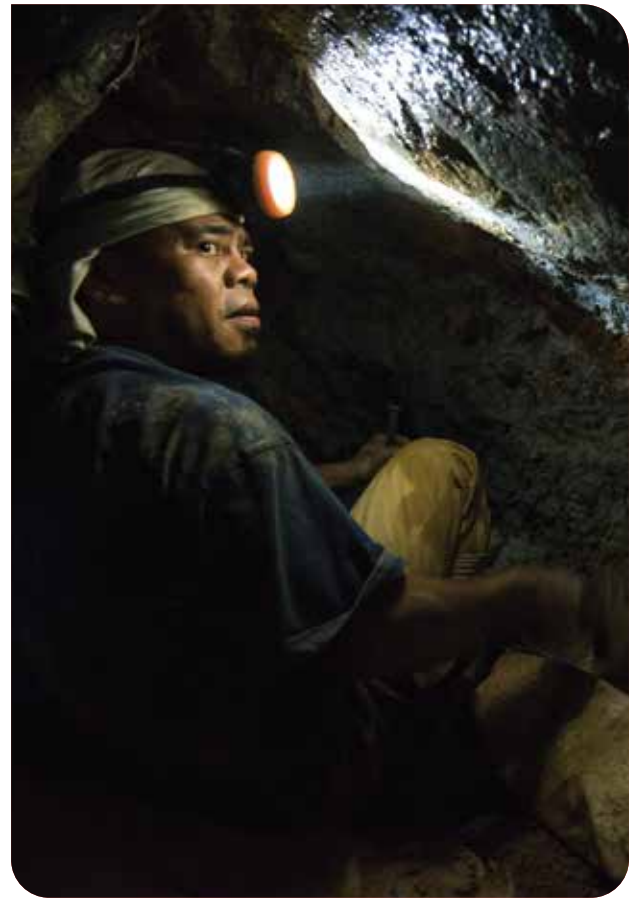
A further complexity comes from the heterogeneity of ASGM situations. The socio-economic, legal and cultural context may vary widely, as may levels of trust and acceptance towards state authorities. Land ownership and competition for land, the role of traditional leaders, the activities of foreign actors, the nature and quality of ore bodies, the presence or absence of industrial mines, the availability of water, migrant or rush mining versus community mining, and alluvial versus hard rock deposits. All these factors serve to make it inadvisable to propose uniform policy responses – but neither should complexity be an alibi for inaction.

ASGM is often exploitative but, compared with subsistence farming, it may also be the most lucrative livelihood available. And in many communities the discovery of small gold deposits is a cause for celebration and generates a sense of adventure and opportunity. We have encountered many inspiring people involved in small-scale mining who have a deep commitment to doing the right thing and to the upliftment of their communities. In other situations, safety standards are, however, appalling and environmental damage may ravage the landscape and accelerate deforestation. Moreover, in some contexts, shadowy 'middle men' thrive in legal grey areas or ruthless and predatory criminal gangs use illegal gold mining to fund violence, modern slavery and sexual exploitation and to facilitate and launder myriad other criminal enterprises.

The WGC argues for action in support of responsible ASGM through formalisation and professionalisation and, in parallel, for action to be taken at both national and international levels against criminal or delinquent elements, to protect the rule of law and to promote the integrity of the gold market.

## The changing scale and significance of ASGM

The WGC supports all responsible gold production, whether from industrial or small-scale sources – or indeed from recycled material. It is keen to support governments, international organisations, supply chain actors, industrial gold miners and ASGM representatives to improve the situation of responsible ASGM operators who seek to formalise and comply with applicable laws. The WGC has produced three reports on the sector: in 2021 setting out how central bank purchases from ASGM can be used to promote formalisation and improved sustainability standards<sup>3</sup>; in 2022 on improving the management of the interface between industrial miners and ASGM<sup>4</sup>; and in 2024 the WGC published an independent report on combatting illegal mining and illicit flows<sup>5</sup>.



*An artisanal gold miner inside shaft, Compostela Valley, Philippines.*

<sup>2</sup> *The Organisation for Economic Co-operation and Development Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High Risk Areas, Gold Supplement.*

<sup>3</sup> *'Central bank domestic purchase programmes', 2021*

<sup>4</sup> *Lessons learned on managing the interface between large-scale and artisanal and small-scale gold miners, 2022*

<sup>5</sup> *Silence is Golden: A Report on the Exploitation of Artisanal Gold Miners to fund War, Terrorism and Organised Crime' by Rt Hon Dominic Raab*



Over many years, ASGM was widely regarded as essentially a marginal activity. In the 1990s, for example, the World Bank has estimated that ASGM accounted for only 4% of newly mined gold and the gold price was around US\$250/oz. Now it accounts for 20% of production and at the end of 2024 the gold price was ten times higher at over US\$2,600. In parts of Africa, ASGM is the most significant rural livelihood after farming. The numbers involved in ASGM have increased because of buoyant gold prices, youth unemployment, poverty, climate change and conflict. Much of the increase is amongst 'rush' miners who have a lower connection with the places and people where they mine and may, therefore, have less regard for the protection of the local environment and communities.

Artisanal and small-scale miners and related forms of illegal mining are estimated to produce between 770 and 1,000 tonnes of gold each year. It has become a very big business, worth over US\$50 billion annually – especially when profit margins are unencumbered by regulatory, fiscal, closure and remediation costs of doing business. Although much illegally mined gold is genuinely artisanal and small-scale, it is increasingly becoming mechanised. In some areas of the Sahel, Sudan and southern Venezuela, where there is weak governance, it uses much of the same equipment as industrial mining. Illegally mined gold has become associated with money laundering and sanctions evasion, the funding of illegal armed groups and drugs and people trafficking. Moreover, the scale of profits accruing to crime groups may help them to buy off politicians, law enforcement officials and traditional leaders. In some national legislatures there are reportedly caucuses financed to promote the interests of illegal miners. In some regions illicit gold may sell at a premium to the international spot price – because of the optionality that it offers to criminal groups in laundering their other profits or in evading regulation.

As the World Bank's recent report has argued, in many communities ASGM alleviates poverty and generates improved livelihoods. Surveys show that most miners want to improve safety and environmental standards and, like people the world over, to improve the position of their family. But ASGM often comes at a high price for the environment, safety, community cohesion and, especially, for governance. In some contexts, environmental legacies are being created for communities that may last for decades or cost billions to remediate.

The growing sense of crisis about aspects of the ASGM sector is not the fault of any one actor but of the accumulation of many failures of commission and omission. Some producer country governments have seemingly turned a blind eye to the social and environmental harms or have lacked the capacity to formalise or regulate ASGM whilst billions of US dollars worth of gold have been smuggled out of their countries in plain sight.

Formalisation is the foundation for producing a better governed and regulated ASGM sector. There is broad support from governments, international institutions, gold value chain actors, civil society and from many ASGM actors for the principle of formalisation. Nevertheless, despite this support, progress towards the objective is glacial and there are even differences of opinion as to what 'formalisation' means. Sometimes governments lack the capacity or resources to administer and enforce a formalisation framework. It can also bring significant costs and obligations for those who have been formalised, and some miners have low trust towards state authorities. Too often, administrative procedures are inaccessible or excessively onerous or they create too many costs all at once rather than being progressive. But ultimately, it is difficult to see a sustainable future for the sector without transitioning miners from the informal to the formal sector given the value of the resources in play and the social and environmental impacts of mining. It is difficult for banks to lend money to small-scale miners, for refiners to accept material from them or for industrial miners to partner with them if they are unable to prove their right to mine and their legal compliance.

But formalisation and professionalisation involves costs both for the state and for the miners. In the case of the former, resources are needed for permitting, registration and enforcement – but this should be a 'spend to save' exercise if it blocks the disappearance of tonnes of gold that should be part of the national patrimony and should provide a route to the advancement of communities. From the perspective of individual miners, however, formalisation may involve costs in the form of securing permits, safety equipment or implementing better environmental practices. Governments need to create incentives to formalise, including through the provision of better public services in mining communities and the avoidance of disproportionate tax and regulatory costs. As we shall argue, supply chain reforms that deliver better gold recovery rates and a move away from mercury-use, may be a key intervention that helps to finance the transitional costs of formalisation.



*Residents of the world's highest city face great hardships in their search for gold, La Rinconada, Peru.*



## International market expectations

International initiatives against the misuse of gold to finance conflict or crime have had limited success. This is illustrated by the longevity of the many years of conflict in the Democratic Republic of Congo; the Wagner Group and its successors' human rights abuses in the Sahel; the brutal conflict in Sudan; and the entwining between illegal mining and drug and crime networks in the Andean countries. But for all the good that these initiatives have tried to deliver, they have too often encouraged downstream actors to 'derisk' their supply chains through simply avoiding sourcing gold from conflict affected areas rather than exercising due diligence. This is despite the often-excellent work of the OECD and groups like the Responsible Minerals Initiative (RMI) and the European Partnership for Responsible Minerals (EPRM). Arguably one of the flaws has been that national authorities in producer countries have not engaged sufficiently to help ensure that gold from small-scale sources can satisfy the expectations of the international bullion market. The intention of responsible sourcing requirements in relation to gold and other metals is absolutely correct and they work effectively for formal sector actors. But if they are to have the desired effect and to avoid further marginalising small-scale and informal producers, they need to be supported by national programmes, by greater collaboration along supply chains and by progress with traceability technologies.



Gold nuggets in a bowl, Atbara, Sudan.

## Government leadership and assembling 'coalitions of the willing'

Measures to improve the situation of ASGM will not succeed in the absence of host government leadership. However, support is also essential from other stakeholders along the gold value chain. In Ivory Coast, for example, the Government, World Bank, WGC and USAID and the leading industrial mining companies have been seeking to create a series of model, formalised small-scale gold mines geared towards supplying the formal bullion market. The London Bullion Market Association (LBMA) is working in Ghana, Peru and Philippines with governments and leading refiners to enable responsible ASGM operators to discharge due diligence requirements and to deliver material to London Good Delivery List refineries.

A range of United Nations agencies are, through Planet Gold, leading initiatives in 25 countries to enable them to deliver on their Minamata Treaty National Action Plans to transition ASGM away from the use of mercury. Elements of this work include progress on formalisation, promoting alternative processing technologies and providing access to legitimate sources of finance and equipment. Civil society groups like the Artisanal Gold Council, the Alliance for Responsible Mining, Pact, Impact and Solidaridad are key implementing partners for this work and contribute important expertise. But a consistent problem has been that donor funding is often too short-term to achieve systems and behaviour changes or to achieve the scale needed to achieve commercial viability.

In Brazil, the government, with the support of civil society, is taking more effective action against illegal miners who, in recent years, have been attacking indigenous peoples and accelerating deforestation in the Amazon. This includes legal reforms and the use of innovative gold traceability technologies by the federal police. Also in South America, the Inter-American Development Bank and 18 countries have recently announced a collaboration against illegal mining and organised crime. The Organisation of American States has produced detailed analyses of illicit gold flows in Peru, Colombia, Guyana, Suriname and Ecuador.

A pioneering group of seven central banks, working with the World Gold Council and leading international organisations, is implementing good-practice purchase programmes from domestic ASGM actors. These involve progress with formalisation, improved ESG standards and reducing illicit flows. Within governments, the need for co-ordinated multi-agency approaches, is a key learning since mining ministries may not always be able to mobilise the resources and political will needed to face down vested interests. Effective action may need the engagement of ministries as diverse as Finance, Security, Environment, Planning and Geological Surveys and of national Central Banks.



In 2023, the Extractive Industries Transparency Initiative (EITI) introduced important changes to its Standard, designed to encourage its national multistakeholder oversight groups to take a greater interest in artisanal and small-scale mining and to report upon it. Several countries, including Ghana, Ethiopia, Burkina Faso and Mongolia have done so.

Similarly, the NGO Swiss Aid has produced important research into the scale of African ASM gold production and trade flows. It has highlighted the extent to which this gold is overwhelmingly smuggled from the continent, thereby producing negligible benefit for producing countries but potentially yielding great profit for armed groups, organised crime and other illicit actors. Another Swiss civil society group, Earthworm, has recently completed work on producing a best practice framework for intermediate refineries or processing plants. The work of the Global Initiative on Transnational Organised Crime (GI-TOC) also deserves recognition including in relation to its analysis of the impacts of illegal mining in West Africa and the Amazon.

Over the next two years, the WGC will be working with Metals Focus, a leading precious metals research consultancy, to increase the robustness of their data on ASGM flows. In mid-2025, a welcome initiative by the Ashanti King (the Asantehene), is planned to bring together stakeholders to discuss, inter alia, the role of traditional leaders in West Africa in combatting illegal mining and its adverse impacts on the natural environment and on other livelihoods, such as cocoa production.

Clearly more actors are being drawn into addressing the ASGM challenges. But it is important to act with urgency to build wider 'coalitions of the willing' at national and international levels. A key challenge is how to ensure that the overall impact of the plethora of initiatives is greater than the sum of their parts and where gaps may exist to fill them, especially in relation to supply chain interventions and reforms to the way that ASGM enterprises are funded.



Small pieces of raw gold after panning at an open-pit gold mine in Grand Cape Mount, Liberia.

This report sets out some of the World Gold Council's work in the sector and some additional steps which we believe should be discussed and explored. This paper summarises five ASGM-related work streams being undertaken by the World Gold Council.

## Major work programmes





## 2. ASGM and the news agenda in 2024

During 2024, news coverage of issues associated with illegal ASGM mining issues illustrate the growing range of problems associated with the sector:

- In Ghana, in the run-up to the general election in December 2024, there were demonstrations against the environmental damage being caused by illegal mining. There is speculation that the country may run out of potable water by 2030 and large swathes of land are being contaminated badly, making it unusable for farming.
- In South Africa, under Operation Vala Umgodi (Close the Hole), the police isolated over one thousand zama zama miners at an illegal underground mining site at Stilfontein, several dozen fatalities regrettably followed.
- In Chad in November 2024, 23 people were killed in a single incident during clashes between security forces and illegal gold miners near the border with Libya.
- The NGO, Swiss Aid, produced a detailed analysis<sup>6</sup> of ASM African gold which concluded that in 2022, 435 tonnes of gold were being smuggled out of Africa worth over US\$30 billion.
- In Peru, there have been blockades by illegal miners protesting the intention to terminate a programme intended to facilitate formalisation, but which has been used as a cover for illegal mining. Almost 90,000 entered the programme but only 2,500 succeeded in regularising their status over seven years.



*Aerial view of deforestation due to illegal artisanal gold mining in a tropical rain forest, Central African Republic.*

<sup>6</sup>On the Trail of African Gold' Swiss Aid 2024





# 3. The role of Central Banks and the London Principles

In 2021, the WGC produced a report that pointed out the advantages for central banks purchasing gold in local currency from domestic small-scale miners for building their gold reserves. It went on to argue, however, that this investment should also be used to leverage better environmental, social and governance (ESG) performance in the sector. For example, such purchases can be used to incentivise and reward formalisation; they can be made conditional on miners moving away from the use of mercury; and, where they exercise regulatory powers over commercial banks, can use these to facilitate the provision of 'clean' finance for small-scale miners. The role of central banks with a commitment to recognised best practices can be pivotal when appropriately resourced and supported by relevant government agencies.

In 2023 a group of seven central banks – from the Philippines, Mongolia, Tanzania, Zambia, Brazil, Colombia and Ecuador – came together to share best practices. The WGC provides the Secretariat and international institutions like UN agencies, the OECD and the World Bank and IMF contribute their support and expertise to the group. The overall aim is for central banks to move a growing proportion of artisanal and small-scale production from illicit to legal channels and for the miners to be able to rely on fair-dealing. Through the process, the central banks are able either to accumulate greater gold reserves or to sell the gold to trusted refineries. Currently the Central Banks of Brazil and Colombia are not purchasing ASGM material but are increasing their knowledge of good practices. If they were to start implementing buying programmes this could significantly increase the throughput of legitimate ASGM gold entering the licit gold market.

Between 2023 and 2024, a consultation was held with leading stakeholders which led to adoption by the leading central banks of some best practice principles to guide the implementation of domestic purchase programmes.



Concentrated gold deposits from a mine in the rainforest, Guyana.

The 'London Principles' cover twelve topics:

- 1. Legal frameworks, resourcing and transparency:** Creating the infrastructure for a successful ASGM Domestic Purchase Programmes (DPPs) provides an opportunity for central banks, and relevant government agencies, to work together in increasing the formalisation of responsible ASGM entities. It is essential that programmes are based on appropriate legal and regulatory powers, adequate resourcing and strong coordination between national and sub-national governmental agencies. The operation of DPPs should be included in central bank public reporting and opportunities considered for cooperation with national Extractive Industries Transparency Initiative processes directed at building public understanding and accountability.
- 2. Community wellbeing:** DPPs should seek to raise mine health and safety standards and protect miners, their families and communities from abusive labour practices including child labour and forced labour.
- 3. Mercury reduction:** ASGM is the principal source of anthropogenic mercury pollution with grave implications for water, soil and air pollution and human health. DPPs should complement Minamata Treaty National Action Plans, support a reduction in mercury use and seek to promote the adoption of alternative, environmentally responsible technologies for use in ASGM.
- 4. Due diligence:** DPPs should conform with the framework provided by these Principles and reflect risk-based, international due diligence standards, designed to prevent the production of, and trade in, gold from fuelling conflict, funding organised crime or causing abuses of human rights. Due diligence should also cover environmental risks.
- 5. Progressive improvement:** Considering the complex nature and characteristics of informal ASGM entities, DPPs should seek to establish procedures which support progressive and constructive engagement with those miners who act responsibly and, in good faith, seek formalisation. DPPs should seek to give a voice to legitimate ASGM actors and their representatives.
- 6. Formalisation:** Formalisation should benefit responsible ASGM actors through providing greater security of tenure, and improved access to capital for investment in their operations. For public authorities, formalisation creates opportunities to improve environmental performance, to combat the loss of public revenues inherent in illegal mining and illicit financial flows, and to combat corruption. For supply chain participants, formalisation makes it easier to establish provenance, to bolster the integrity of the gold market and to enhance end-user confidence.



The concentrated gold charge is heated with Borax before being poured into a Gold bar, Guyana.

7. **Incentives:** It is important to ensure that DPPs are based on realistic economic incentives, including in relation to the prices offered to attract the sale of material and the applicable fiscal regime. Formalisation may involve additional costs and responsibilities for ASGM producers. It is, therefore, important, to consider, in cooperation with fiscal authorities and other government agencies, the balancing potential of capacity-building measures and of access to more efficient infrastructure and processing technologies.
8. **Rule of law:** ASGM DPPs should aim to strengthen the rule of law and to promote accountability and appropriate transparency. Such programmes depend upon the provision of adequate security for producers and those involved in the purchase infrastructure. Observance of relevant human rights conventions is of fundamental importance in securing public confidence and the cooperation of ASGM entities.
9. **Accessibility:** Accessibility is fundamental to the success of ASGM DPPs. This includes facilitating responsible ASGM groups to fulfil relevant permitting and regulatory requirements. It also applies to ensuring that the purchasing infrastructure put in place (whether this be directly operated or, for example, through licensed aggregators) is accessible to those responsible ASGM actors who wish to participate.
10. **Access to 'clean' finance:** Central banks with regulatory powers over the commercial banking system should consider using it, or work with relevant regulatory agencies, to facilitate access to banking services and investment capital by responsible ASGM actors whilst guarding against money laundering.
11. **Refining purchased gold:** Domestically-produced gold purchased in local currency from ASGM can strengthen confidence, financial stability and economic resilience. Gold purchased from DPPs must be refined at LBMA Good Delivery List refineries.
12. **International cooperation:** Since ASGM production is susceptible to smuggling and misuse in money laundering, central bank DPPs may be bolstered by cooperation with appropriate regulatory, fiscal and law enforcement agencies in neighbouring countries and with international law enforcement agencies.

Adherence to the Principles, which mirror many of the requirements of the LBMA's Responsible Gold Guidance, is intended to be subject to independent assurance. Amongst the topics on which the central banks' group has already set to work include pricing strategies, understanding the perspectives of small-scale miners, incentives for formalisation and combatting mercury-use.



## 4. Towards more effective co-operation against illegal mining and illicit flows

The WGC works to improve the efficient operation of the bullion market and to ensure that threats to its integrity are addressed. The scale of mining that takes place outside of formal legal structures has escalated rapidly and constitutes an economy worth over US\$50 billion a year. Over the last two years, the gold price has risen by over 40%, drawing more people into the ASGM sector but also increasing the rewards accruing to malign actors, especially organised crime, and increasing the value being smuggled out of many gold producing countries.

Research shows there is potential for ASGM to raise incomes and, in some cases, to enable communities to invest in improved services and infrastructure. Nonetheless, bad environmental practices may condemn communities to eat fish and crops with mercury levels that are highly toxic and damaging to the brains and nervous systems of children. Residents of mining communities where uncontrolled mercury use is high can suffer from learning and neurological impairments, loss of sight and respiratory problems. There is a danger of a slow, degenerative, epidemic of damage to human health around mercury hot spots.

Abusive practices, including child and forced and bonded labour, prostitution and gender-based violence, are enabled by the presence of organised crime. In many situations, those who take the biggest profit out of illegal mining are the ones who impose hazardous and poorly paid working practices on those involved in digging the gold from the earth. It is often difficult for responsible miners to gain access to legitimate finance because commercial banks have understandable concerns that they will become associated with money laundering, smuggling and other illegal practices. But if the money comes from tainted sources then, regrettably, the returns will inevitably go into the pockets of malign actors, reinforcing the likelihood that miners will continue to be deterred from seeking formalisation. Lack of investment also encourages miners to stick with cheap processing options like the use of mercury.

The 'Silence is Golden' report, written by former British Deputy Prime Minister, the Rt. Honourable Dominic Raab, sets out an ambitious action plan for international co-operation against organised crime and mercenary groups. It sets out examples of how illegal mining has been associated with human rights abuses and the exploitation of small-scale miners. It points out, for example, how exploitative mining in the Sahel funds both jihadi groups like ISIS and Al Qaeda and the Russian mercenaries in the Wagner Group.

In the case of the latter, its profits from gold have reportedly amounted to US\$2.5 billion, helping to fund the illegal war in Ukraine. The report makes 24 recommendations, for political leadership groups like the G20 and G7; law enforcement institutions like the UN Office for Drugs and Crime and Interpol; UN agencies such as the UN Environment and Development Programmes; the World Bank and regional financial institutions; the OECD, the Financial Action Task Force (FATF) and the World Customs Organisation; and for private sector actors like the LBMA, WGC and industrial mining companies. It also concludes that national level legal reforms and enforcement of frameworks for formalisation must provide a foundation for progress.

Because gold is so fungible and portable, it is essential that law enforcement agencies work much more closely in countering crime. There also need to be policy responses that, for example, address misaligned tax systems that incentivise smuggling or ensure that sanctions are enforceable to counter the financing and money laundering of the proceeds of people, drug and arms trafficking. Law enforcement agencies need to take better targeted action against key figures in the world of international crime associated with the illicit gold trade. Governments should also take more effective action against those actors who facilitate the evasion of taxes and of regulatory enforcement measures including through measures such as Magnitsky sanctions. The report also advocates for the G7 and G20 to recognise that the illicit financial flows from illegal mining amount to a 'systemic threat' to international security. The risks posed by illegal mining and related flows, to security, anti-corruption work and to the integrity of the gold market need to be given a much higher priority by the international community.



*A small piece of gold emerges after mercury is used to separate gold particles from the ore powder at a small-scale gold mine, Zimbabwe.*

# 5. Mobilising multi-stakeholder partnerships to support formalisation and professionalisation

The WGC recognises the importance of mobilising a range of stakeholders in confronting the environmental, social and governance dimensions of seeking to support governments in confronting powerful vested interests and delivering programmes for the formalisation and professionalisation of the ASGM sector.

Our most important partnership is with the World Bank. As noted above, our institutions are seeking to work together initially in Cote d'Ivoire as a template for other countries in West Africa and, potentially, in East Africa and Latin America. The key elements are multi-stakeholder involvement, the creation of model mines, the engagement of international donors, mobilisation of legitimate finance in support of responsible ASGM and the ability for them to access the legitimate bullion market. Three industrial mining companies, Barrick Corporation, Endeavour Mining Plc. and Perseus Mining Ltd., have offered to relinquish areas of their concessions that are not suitable for industrial mining but could provide good prospects for ASGM. Their expectation is that their surrendered areas can be reallocated to community-based co-operatives.



*Mining of gems, gold and sapphires. Ihorombe Region, Madagascar.*

Crucially, whilst the companies will relinquish legal responsibility for the areas, they envisage continuing to provide support and mentoring so that an initial group of four model mines that can be developed to observe good environmental and social standards and produce gold that

A combination of focussed oversight from government agencies and a public-private partnership involving the companies is intended to produce a replicable model via a regional knowledge-sharing platform.

The WGC is also seeking to help foster co-operation between leading gold companies and central banks and the country initiatives supported by the Global Environmental Facility through the Planet Gold programme. ASGM is the only source of increasing mercury emissions against the Minamata Treaty's objective of a phasing-out of the metal because of its serious impacts on the environment and on human health. The Treaty recognised the challenges involved in weaning ASGM off the use of mercury and so took a gradualist approach – but unfortunately this approach has not been sufficiently robust and mercury pollution continues to grow in some ASGM focussed countries. Planet Gold is doing innovative work across 25 countries to encourage formalisation, promote alternative technologies and develop new financing models. There are, however, some challenges of scaling-up the approaches, ensuring that they are financially sustainable and are of sufficient longevity.



*A man uses a pan to search for gold at an open-pit gold mine, Grand Cape Mount, Liberia.*



# 6. The potential for industrial miners and ASGM to work together

Traditionally, many people have viewed industrial and small-scale miners as in competition. In reality, whilst artisanal and small-scale miners are focussed, by technology, financial capacity and regulation, on shallow deposits, industrial miners are able to bring larger, deeper and metallurgically complex deposits to account. They mobilise many millions of US dollars of investment and create the necessary supporting infrastructure. This typically involves many years of prospecting, exploratory drilling, mine design and sophisticated planning for the management of waste and of environmental impacts. Industrial mines are required to pay host governments significant sums in taxes and royalties and their operations are strictly monitored and regulated. Where governments provide a framework for artisanal and small-scale mining it typically involves restrictions on depth and the types of technology to be employed. Much small-scale mining may take place well away from industrial mines. Nevertheless, where the two coincide, it is important that the interface is carefully managed through engagement and the observance of good practices.

Increasingly, large-scale miners recognise that ASGM is an important source of livelihoods for local people and, responsibly undertaken, may contribute to the sustainable development of their local communities. A study undertaken by the World Gold Council and involving 25 case studies, has identified eight potential interventions through which industrial miners may support responsible ASGM. These include:

- **Advocacy with host governments for legal frameworks that facilitate consensual co-existence arrangements** where, for example, a large-scale miner may want a community mining group to develop a satellite deposit. Newmont Corporation in Suriname, for example, undertook a lengthy advocacy programme with the government to allow them to grant mining rights to an indigenous community within their concession.
- **Provision of land and geological information for the creation of responsible ASGM 'corridors'**. Some companies have, however, surrendered ground for such developments only to find that the host government hasn't followed up with the necessary legal and administrative actions to create successful and orderly ASGM enterprises, thereby squandering an opportunity to formalise the sector. This underlines the need for effective collaboration between government agencies and major mining companies.

- **Taking account of ASGM in mine design:** It is, of course, important to ensure that where it may be necessary to resettle communities including artisanal and small-scale miners, this is done with payment of appropriate compensation and for the maintenance of alternative livelihoods. A failure to do this can create a continuing sense of grievance and lead to continuing incursions and conflict. Additionally, however, it is prudent for industrial mines to consider whether in siting infrastructure they can avoid inadvertently sterilising viable small-scale deposits.
- **Provision of technical support:** Industrial miners can provide support to responsible and constructive ASGM in areas like undertaking the legal and administrative steps to achieve formalisation; coaching in core business skills like management practices, procurement and book-keeping; the design of safety systems; and measures to improve the management of environmental impacts. This might also include, as B2Gold Corporation have done at their Gramalote project in Colombia, the provision of processing equipment for use by local ASGM.
- **Supporting access to legitimate gold markets:** Regrettably, in the absence of a government or central-bank sanctioned purchase programme, it is often difficult for ASGM entities to sell in to legitimate markets or to be sure that their gold is not going to be smuggled out of the country. Thus, large-scale miners can consider options that facilitate access to reputable refineries for those ASM mining operations in whose governance they have confidence. Calibre Mining Corporation in Nicaragua, for example, within the context of a multistakeholder partnership including national and local government and small-scale miners, operate a programme for the purchase and processing of local miners' gold.
- **Working with ASGM in planning for mine closure:** it is notoriously difficult for industrial mining companies successfully to decommission gold mines and receiving formal sign-off, if there is a danger of local gold miners subsequently invading the site and seeking to 'remine' areas where they hope to find remaining deposits. Thus, it is good practice to include ASGM groups in the local engagement planning and potentially granting permission for ASGM to work in some controlled and monitored areas.

<sup>7</sup>Lessons learned on managing the interface between large-scale and artisanal and small scale mining' - World Gold Council 2022

# 7. Supply chain interventions

The WGC has been reviewing technologies to improve the traceability of gold and been looking at the role that such technologies might play in supporting the integration of ASGM into formal markets, including through raising 'red flags' and complementing due diligence processes. We have, for example, been supporting research into cost-effective measures for improving the traceability of ASGM materials using hand-held XRF scanners. These are not as accurate as laboratory-based processes, but are mobile, generate real-time data and are inexpensive to operate once properly calibrated. This technology is based on the ability to analyse the presence of other 'background' minerals alongside gold deposits. These will typically change significantly as between mines, including mines in close proximity. Further work is still needed but results to date have been encouraging. If, for example, a refinery or a processing plant keeps a data base of the 'fingerprint' of gold from each location from which it sources gold, and material is kept segregated up to the point of delivery, then it should be possible to identify attempts to feed non-compliant gold into the supply chain.

## The potential role of mercury-free processing plants in unlocking reform in the ASGM sector

As noted earlier, the challenges associated with the ASGM sector are not susceptible to a 'silver bullet' approach. For a start, gold is produced through a range of different processes, with alluvial gold, for example, raising different challenges from hard rock deposits. The pioneering public-private partnership, Swiss Better Gold Initiative, for example, produces around four tonnes of gold annually in South America using technologies such as gravimetric concentrators and shaking tables.

There are also a variety of alternatives to the use of mercury that use non-toxic agents such as borax. However, despite its toxicity, mercury is used in the majority of ASGM situations. This is particularly surprising given that mercury amalgamation often struggles to recover more than a 40% gold recovery rate. Unfortunately, many small-scale miners dispose of their tailings into rivers or sell them to traders who give them poor prices and take them off for reprocessing using cyanidation to boost gold recovery to over 90%. However, adding cyanide to mercury has disastrous environmental impacts.

Peru has an unusual, and probably unique, concentration of established gold processing plants. A particular cluster is located in the province of Arequipa and concentrated around the town of Chala. The best known, Veta Dorada,

plant is owned by a TSX-listed company, Dynacor Group Inc. It sits near to the logistical artery of the Pan-American Highway and sources ore from over 750 established suppliers. Each of the suppliers has to establish that they have a right to mine, have the correct permits and they are cross-referenced to the national tax authorities. The miners deliver their ore to the processing plant where the gold grade is tested and a price agreed. The plant also has a team of technicians who provide technical support to their suppliers. Dynacor has taken over 25 years to become established and to build trust with their suppliers. But it is now amongst Peru's ten biggest gold producers and it sells its output of around four tonnes exclusively to Swiss-refinery Precinox. Dynacor is now seeking to utilise its model in several West African countries.

The WGC believes that stakeholders should work together, especially including host and donor governments, to examine the potential for a much wider provision of centralised mercury-free processing plants. The WGC has recently commissioned ASGM experts, Levin Sources, to undertake a survey of the operation of such processing plants; the results of this research will be available by the end of the first quarter of 2025.



*Miner uses mercury to separate out the gold from waste minerals, Guyana.*

### The potential advantages of such an approach might be:

- The creation of centralised processing plants could act as regulatory 'pinch-points' for governments, especially if they were to create pressure on ASGM operations to use such infrastructure. Moreover, by centralising processing in this way it would facilitate meeting the market expectations of due diligence and would make it more difficult for gold to be smuggled out of the country.
  - Cyanidation has the potential to increase gold recovery rates to over 90%. However, although cyanide (unlike mercury) eventually diffuses, it is highly toxic, and its use needs to be carefully managed so as to protect human and animal health. It is not desirable for there to be widespread use of cyanide in informal settings and without effective oversight. The creation of centralised processing plants could, therefore, allow much higher gold recovery rates and reduce the hazards associated with mercury, but enable cyanide to be restricted to licensed plants that can be required to adhere to the Cyanide Code and be monitored. Of particular importance, the tailings associated with the processing could be properly engineered and policed.
  - The increased value created by significantly higher gold recovery rates could be used to fund the costs associated with formalisation. They might also increase revenues for ASGM co-operatives, miners and their families and finance some tax revenues for governments. In principle, such an innovation could produce benefits for all stakeholders and for the environment.
  - Gathering together a high proportion of ASGM production through this means would have the potential to transform the sector in relation to its acceptability to international bullion markets and to downstream users. It could make significant inroads into illicit flows and increase opportunities to isolate illegal mining and smuggling - with benefits for those refineries committed to high Good Delivery Standards. Indeed, the benefits for combatting flows to organised crime might even be sufficient to motivate the international community to provide a subsidy for the costs of establishing the network.
- b) **Identifying suitable sites:** the location of processing sites would be fundamental to their viability. Thus, the plants would need to be accessible to miners or to licensed aggregators, they would need access to power sources and sites for waste storage and disposal and would need to satisfy environmental and social impact assessments and permitting processes.
- c) **Achieving significant progress on formalisation:** if the introduction of officially supported processing plants is to achieve the maximum benefits in terms of governance and regulation then it needs to be accompanied by progress with formalisation. If the correct incentives are used then this should give ASGM improved security of tenure, access to new sources of 'clean' investment and, in time, improved access to public services. It would also enable due diligence requirements to be discharged more readily and routes paved to reputable refiners and markets.
- d) **The plants would need to be sufficiently trusted for miners to be willing to sell them their ore:** In other words, the plants would need to demonstrate to potential suppliers of ore, that they achieve high levels of gold recovery, can resolve issues around grade and price fast and are transparent in how they work. If the plants are to compete with established supply chains, it may be necessary to produce funding models that replace existing illicit pre-financing mechanisms.
- e) **The risks of corruption and insecurity would need to be mitigated:** whilst the price of gold remains buoyant it will be important that the processing plants are not the subject of elite capture and can be buttressed against demands for 'protection payments' by criminal gangs or the siphoning off of material. One option for the preferred route to market might be for the purchasing to be undertaken by the relevant country's central bank.

A successful initiative to establish a network of several hundred processing plants in those gold producing countries where there is significant ASGM production, would need to clear several hurdles including:

- a) **Commanding strong support from producer country governments:** the introduction of a processing plants would, in most countries, represent a significant change to the value chain and may attract pushback from a variety of vested interests. Thus, governments would need to invest political capital in ensuring that there is acceptance of the reform.



*A miner sifts through crushed ore powder for gold particles, Zimbabwe*

<sup>8</sup> See International Cyanide Management Institute and International Cyanide Code <https://cyanidecode.org/>



## 8. Conclusion and a call to action

The World Gold Council plans to work with our international partners, especially the World Bank and Intergovernmental Forum on Mining, Metals and Sustainable Development, host country and donor governments, international development agencies, providers of capital, supply chain actors, civil society groups, and representatives of small-scale mining cooperatives and enterprises to devise effective models - both for processing plants and the broader sector.

There is growing activity in the sector, and broad support for mobilising 'coalitions of the willing' to work together, both internationally and at the country level. Artisanal and small-scale gold mining underpins the livelihoods of millions of families, but in many places, the current model comes at too high a cost.

ASGM has the potential to be a powerful driver of development, but to achieve this goal, we must acknowledge the scale and complexity of the challenges the sector faces and mobilise a determined effort to align its practices with sustainable development. We must support responsible ASGM while addressing the governance and environmental management issues that are increasingly associated with the sector.

The World Gold Council does not claim to have unique insights on the dynamics of the ASGM sector. We recognise and respect the work and insights of those who have engaged with these issues for many years. Our aim is to collaborate, identify synergies between our work, and pinpoint any gaps. It is not sustainable for a sector to remain largely in the shadows, with much of its output smuggled beyond national boundaries. Nor should it be acceptable for land and water resources in fragile environments to be degraded beyond use. Equally, it must not become normalised for organised crime and armed groups to launder the proceeds of their illicit activities in plain sight.

We believe that the surge in ASM gold production in recent years has created a new and increasingly hazardous reality. In response, we aim to foster a multistakeholder coalition to address these pressing risks to security, governance, and the environment. However, this is not just about mitigating risks - it is about unlocking opportunities through formalisation and professionalisation, ensuring that ASGM becomes a genuine force for positive economic and social impact, rather than a mixed blessing.



*Large and small scale miners use hydraulic techniques to mine gold deposits, causing major impact on the rain forest environment, Venezuela.*



## Important information and disclosures

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