

Socio-economic ASGM Research Methodology



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Design: Fernanda Musskopf

Acknowledgments

Authors

Jorden de Haan (UNITAR) and Brandon Turner (UNITAR)

Reviewers

Rodges Ankrah (US Environmental Protection Agency); Ludovic Bernaudat (UN Environment); Kirsten Dales (Canadian International Resources & Development Institute); Kenneth Davis (UN Environment); Sara Geenen (Institute of Development Policy and Management); Louis Marechal (Organisation for Economic Co-operation and Development); Evonne Marzouk (US Environmental Protection Agency); Jorge Ocaña (UNITAR); Juha Ronkainen (UN Environment) and Malgorzata Stylo (UNITAR)

Citation

UNITAR, 2018. Socio-economic ASGM Research Methodology. UNITAR, Geneva

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Acronyms

ASM	artisanal and small-scale mining
ASGM	artisanal and small-scale gold mining
COP	Conference of the Parties
CSR	Corporate Social Responsibility
IGF	Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development
IGF Guidance	IGF Guidance for Governments: Managing Artisanal and Small-scale Mining
ILO	International Labour Organization
LSM	large-scale mining
M&E	monitoring and evaluation
NAP	National Action Plan
NAP Guidance	Guidance Document: Developing a National Strategic Plan to Reduce Mercury Use in Artisanal and Small-Scale Gold Mining
NGO	non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
SDGs	Sustainable Development Goals
SGBP	state gold-buying programme
UNDP	United Nations Development Programme
UNITAR	United Nations Institute for Training and Research
WHO	World Health Organization

Glossary of terms

ASGM actors	Persons or institutions directly involved in the ASGM supply chain, which add value to gold production or trade. Depending on the context, these may include miners, pit bosses, leaders of mining entities, traders, investors, goldsmiths, exporters, refiners, smelters, importers, end consumers, and bullion banks.
ASGM operations	Areas where ASGM production (extraction, transport, and processing) takes place
ASGM overview	A detailed descriptive overview of the ASGM sector, including policy, regulatory, and institutional aspects; technical and environmental aspects; health aspects; and socio-economic aspects. This is an important “big picture” understanding of the sector.
ASGM stakeholders	Persons or institutions that are indirectly involved in gold production and trade. Depending on the context, these may include landowners, community leaders, customary leaders, large-scale mining (LSM) companies, NGOs, financial institutions, universities, government agencies and specialized services, and bilateral and international development organizations.
Local	Refers to an area or areas within the country, e.g. at the provincial, district, or local level
Miners	Diggers, transporters, and processors (such as crushers, washers, and panners)
Regional	Refers to multi-country, e.g. West Africa



1. Introduction



1. Introduction

The Minamata Convention on Mercury is a global treaty to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. Article 7 of the Convention addresses artisanal and small-scale gold mining (ASGM), the largest source of anthropogenic mercury emissions, and obliges Parties with “more than insignificant ASGM activity” to develop National Action Plans (NAPs).

Annex C of the Minamata Convention outlines the required elements to be included in the NAPs (see Box 1 below)¹.

In order to respond to these obligations, countries preparing NAPs should develop national overviews of the ASGM sector. These should be as comprehensive as possible in order to inform key activities such as the development of mercury inventories and policy interventions that aim to regulate and formalize the sector, as explained in the UN Environment’s guidance document for developing NAPs (NAP Guidance).² The figure below presents the broad categories of information that should be included in the national ASGM overview.³

Box 1. Required elements to be included in NAPs according to Annex C of the Minamata Convention

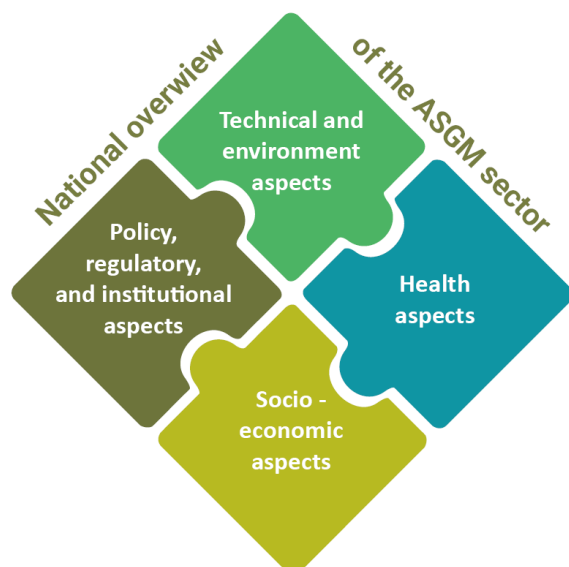
- (a) National objectives and reduction targets;
- (b) Actions to eliminate (see Annex C)
- (c) Steps to facilitate the formalization or regulation of the artisanal and small-scale gold mining sector;
- (d) Baseline estimates of the quantities of mercury used and the practices employed in artisanal and small-scale gold mining and processing within its territory;
- (e) Strategies for promoting the reduction of emissions and releases of, and exposure to, mercury in artisanal and small-scale gold mining and processing, including mercury-free methods;
- (f) Strategies for managing trade and preventing the diversion of mercury and mercury compounds from both foreign and domestic sources to use in artisanal and small scale gold mining and processing;
- (g) Strategies for involving stakeholders in the implementation and continuing development of the national action plan;
- (h) A public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury. Such a strategy should include, inter alia, the gathering of health data, training for health-care workers and awareness-raising through health facilities;
- (i) Strategies to prevent the exposure of vulnerable populations, particularly children and women of child-bearing age, especially pregnant women, to mercury used in artisanal and small-scale gold mining;
- (j) Strategies for providing information to artisanal and small-scale gold miners and affected communities; and
- (k) A schedule for the implementation of the national action plan.

¹ Countries may also decide to include additional strategies in their NAPs, for example, addressing the use or introduction of standards for mercury-free gold and market-based mechanisms or marketing tools.

² UN Environment, 2018. Guidance document. Developing a National Action Plan to Reduce, and Where Feasible, Eliminate Mercury Use in Artisanal and Small Scale Gold Mining. https://wedocs.unep.org/bitstream/handle/20.500.11822/25473/NAP_guidance2018_EN.pdf?sequence=1&isAllowed=y

³ Additional categories that can be addressed in the national ASGM overview are presented on page 18 of the NAP Guidance.

Figure 1. Suggested categories of a national ASGM overview



This socio-economic ASGM research methodology mainly covers the socio-economic aspects of the ASGM overview. It provides a suggested approach for collecting and analysing data in the ASGM sector. It also provides guidance for analysing policy, regulatory, and institutional aspects and health aspects, although further guidance should be consulted to fully cover these aspects (e.g. see NAP Guidance). This information will assist countries to effectively develop “Steps to facilitate the formalization or regulation of the artisanal and small-scale gold mining sector” (as per Annex C, 1.(c) of the Minamata Convention), as well as other requirements of the NAP. This information can also be used to address wider national and regional development challenges.

How can this methodology inform NAPs?

Over the past decades, many interventions in the ASGM sector have been criticized for taking a top-down, legalist, and technocratic approach, typically overlooking context-specific economic and human factors.⁴ However, investigating such factors is not only important for

designing social and economic interventions, but also technical interventions that aim to facilitate behavioural change. For example, the introduction of mercury-free methods requires a comprehensive understanding of the organization of mining communities, their economic capacity, and cultural norms regarding mercury use.⁵

This socio-economic ASGM research methodology therefore supports NAP-executing countries in exploring key social, cultural, and economic aspects of the ASGM sector. This involves collecting mostly qualitative data at the local level, as well as addressing several quantitative indicators at the regional and national level.

In addition to providing input to the development of “Steps to facilitate the formalization or regulation of the ASGM sector”, this methodology can assist countries to collect the information needed to effectively address other elements presented in Annex C of the Convention concerning:

- strategies for reducing mercury emissions and releases (1.(e))
- managing mercury trade (1.(f))
- involvement of stakeholders (1.(g)) and providing information to ASGM communities (1.(j))
- preventing the exposure of vulnerable groups (1.(ii))
- awareness raising in ASGM communities (1.(j))
- the introduction of standards or market-based mechanisms (2.)

This methodology can also provide information to inform the baseline estimates of mercury use and practices employed at the ASGM site (required element (d)), which is typically developed with the use of “Estimating Mercury Use and Documenting Practices in Artisanal and Small-Scale Gold Mining (ASGM)” (hereafter: Baseline Estimates Toolkit).⁶ Specifically, the mainly qualitative data on socio-economic aspects collected with this socio-economic research methodology can be used to interpret, validate, and triangulate the mainly quantitative data collected

⁴ See for example: Stylo, De Haan & Davis, forthcoming; Fritz et al., 2016; De Haan & Geenen, 2016; Verbrugge & Besmanos, 2016; Hilson & McQuilken, 2014

⁵ See for example: Clifford, 2010; Davies, 2014

⁶ O'Neill, J.D., and Kevin H. Telmer. 2017. Estimating Mercury Use and Documenting Practices in Artisanal and Small-Scale Gold Mining (ASGM). Geneva, Switzerland: UN Environment. <http://wedocs.unep.org/handle/20.500.11822/22892>

with the Baseline Estimates Toolkit.

Furthermore, as outlined under element (h) of Annex C of the Convention, another NAP obligation is to develop “a public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury”. This should include gathering health data, training for health-care workers, and awareness raising through health facilities. Implementation of the public health strategy will help to prevent the exposure of vulnerable groups—particularly children, women of child-bearing age, and pregnant women—to mercury use in ASGM. Related to this, the World Health Organization (WHO) has prepared the working document “Addressing health aspects in the context of developing National Action Plans under the Minamata Convention on Mercury”.⁷ To assist countries to start collecting health data, several health aspects have also been included in this socio-economic research methodology, which complement the WHO guidance.

How can this methodology be used?

This methodology has been designed to be used in conjunction with the Baseline Estimates Toolkit and follows the same main steps. Each section therefore makes reference to the relevant sections of the Baseline Estimates Toolkit. Together, these two methodologies can assist countries to gather most of the information needed to prepare the ASGM overview in a single study and within the budgetary and time constraints of the NAP projects.

This approach has been tested under the NAP projects in Sierra Leone and the Democratic Republic of the Congo (DRC), which are co-executed by national counterparts and UNITAR. Several examples from these countries are subsequently used in this methodology. As mentioned above, these methodologies should also be coordinated with WHO’s forthcoming guidance for collecting data related to health aspects. This methodology has also been designed to complement the Formalization Handbook, which has been prepared by UNITAR and the UN Environment Global Mercury Partnership to provide countries with guidance for developing a national strategy for formalizing the ASGM sector.⁸ It can help NAP-executing countries to collect most of the key information required for developing such strategies.

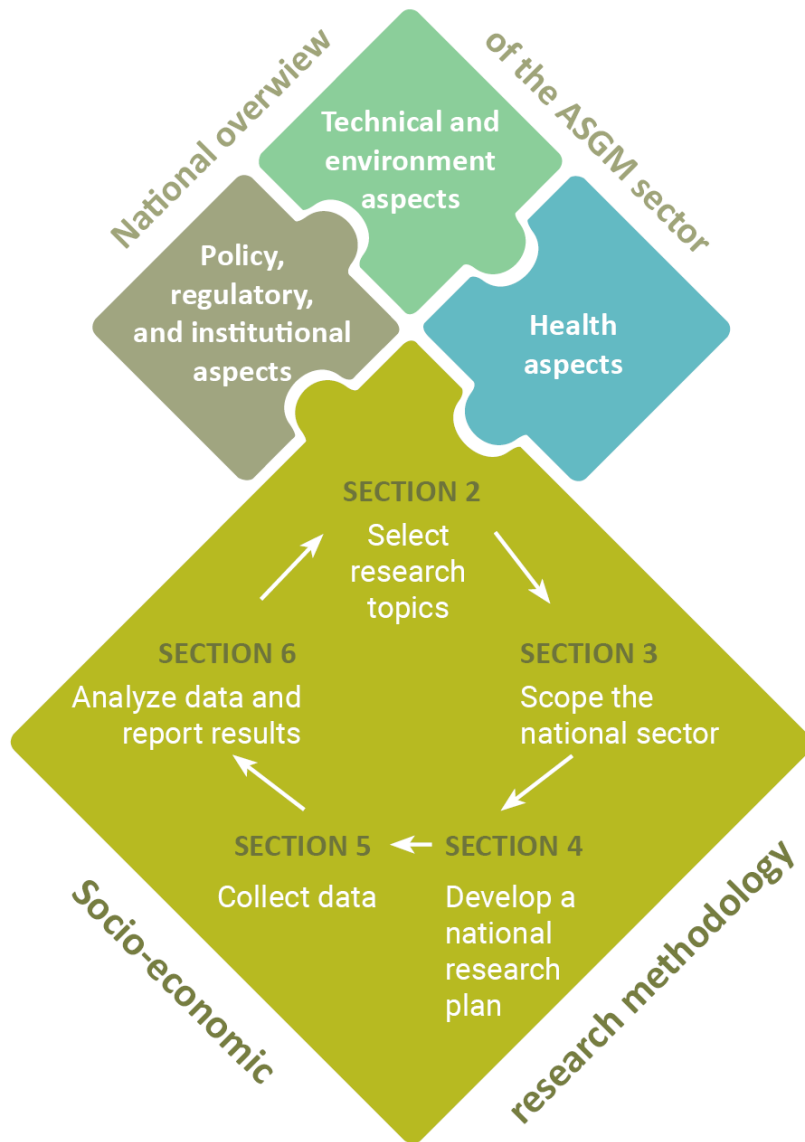
The following sections of this document provide guidance and suggested steps for the research process, which should be tailored to the national situation:

- Section 2 introduces the socio-economic topics that a country would typically investigate as part of the ASGM overview
- Section 3 outlines an approach to undertaking a national sector scoping which lays the foundation for the field study
- Section 4 introduces an approach for developing a National Research Plan, including a research approach and sampling method for selecting ASGM communities and respondents
- Section 5 discusses ethical considerations, a procedure for conducting field research, various data collection tools, and related considerations
- Section 6 discusses the processes for data storage, analysis, and reporting
- Section 7 outlines the limitations of the proposed methodology and highlights several actions that can be taken to mitigate these

⁷ See: http://www.mercuryconvention.org/Portals/11/documents/meetings/COP2/english/2_INF17_WHO.pdf

⁸ UNITAR & UN Environment, 2018. Handbook for Developing National ASGM Formalization Strategies within National Action Plans. UNITAR & UN Environment, Geneva. <http://www.unitar.org/cwm/portfolio-projects/artisanal-and-small-scale-gold-mining-asgm>

Figure 2. The research process





2. Select research topics and establish the research team



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(Baseline Estimates Toolkit: Pages 38-43)

Based on the national context, available information, and priorities, a first step is to decide which specific socio-economic topics should be investigated in the ASGM overview. Research topics that can enable countries to address key requirements of the NAP are suggested below. However, countries should decide to what extent they wish to investigate these topics, and if related topics at the national or local context should be added (e.g. the roles and attitudes of youth, or the relationship between artisanal and small-scale mining (ASM) and large-scale mining (LSM) operations). In the view of time and budgetary constraints, countries may need to prioritize some topics over others. Once a final list of topics and subtopics has been identified, a suitable research team can be established.

2.1 Select research topics

In line with the human rights-based approach that is presented in the Formalization Handbook, this methodology can help to obtain a comprehensive understanding of how the ASGM sector is embedded in the local social order and economy and which stakeholders are involved (with a specific focus on vulnerable and marginalized groups). Altogether, it provides guidance for investigating nine topics:

- Demographic information
- Formality
- Local organization and power dynamics
- Gold and mercury trade
- Mercury use
- Local development
- Women's role
- Children's role
- Health information

Figure 3. Terminology



Most of these topics, including their importance for sustainable development, are discussed in detail in the Formalization Handbook. This methodology focuses mainly on practical steps for investigating these topics.

For each topic, Table 1 below lists general research questions and specific subtopics. The table also provides

references to the relevant elements to be included in NAPs according to Annex C of the Convention, and related guidance documents. Countries should consider investigating all of the topics listed, as they contain important information for informing the strategies required in the NAP. Regarding the subtopics, there is more flexibility to add or amend these as appropriate.

Table 1. Research topics

Topics	Research questions	Subtopics	References
Demographic information	<ul style="list-style-type: none"> • What are the national population characteristics? • What is the average income and main economic sectors? • What is the cost of living in rural areas? • What are the educational levels among different segments of the population? 	<ul style="list-style-type: none"> • Population characteristics (age, gender) • Annual GDP/capita • Main economic sectors • Earnings and cost of living in rural areas • Poverty rate (among different segments of the population) • Employment rate (among different segments of the population) • Literacy rate (among different segments of the population) • School enrolment rate at primary and secondary level • Access to education and school fees • Estimated labour force involved in ASGM* • Estimated annual gold production in ASGM* • Estimated annual export value of gold produced in ASGM* 	Annex C: a-k (cross-cutting issues) * These subtopics, which can enhance the understanding of the socio-economic aspects of the ASGM sector at the macro level, can be investigated with the Baseline Estimates Toolkit and are therefore not discussed further in this methodology.
Formality	<ul style="list-style-type: none"> • What is the current status of legality and formality of the sector? • What are gaps in the regulatory and institutional framework? • What are the barriers to formalization? • How do ASGM actors feel about formalization? • How have formalization policies affected ASGM actors? 	<ul style="list-style-type: none"> • Number of individual miners, entities, traders, goldsmiths, processors, and exporters that possess licenses (e.g. mining licenses, environmental permits, processing and export licenses) • Number of individual miners, entities, traders, goldsmiths, processors, and exporters that requested licenses versus the number issued • Number of mining entities (e.g. cooperatives, SMEs, associations) that have been established • Number of traders' entities that have been established • Hectares of land that have been allocated for ASGM use (either in the form of mining concessions or so-called "ASM zones") • Required documents, time investments and costs (taxes, fees, and potential royalties) for ASGM actors' formalization • Number of ASGM communities educated or sensitized about the regulatory framework and the formalization process • Level of compliance with the regulatory framework • ASGM actors' expectations from government services • ASGM actors' aspirations for the future of the ASGM industry • Economic impact of recent formalization policies • Degree of stakeholder participation in developing formalization policy 	Annex C: c, f, g Section 3.1 of this document discusses the policy, regulatory, and institutional capacity assessment which informs this topic. The information collected under this topic and the two topics below can serve as a baseline against which progress on formalization can be measured; see also pages 116-118 of the Formalization Handbook.

Topics	Research questions	Subtopics	References
Local organization and power dynamics	<ul style="list-style-type: none"> • What are the traditional power dynamics at the district and community levels? • What are the important cultural norms and values? • How is the ASGM sector organized at the local level? 	<ul style="list-style-type: none"> • Traditional and customary leadership at the district and community level • Structures of decision-making at the community level • Cultural norms and values that affect the organization of work in ASGM • Influence of local and traditional leaders in ASGM governance • Types of organizational structures of miners (e.g. single miners, family miners, mining committees, cooperatives, SMEs) • Site hierarchy and decision-making in mining organizations • Division of work in mining organizations • Local ethnic groups and native languages • Interactions with nearby indigenous groups 	Annex C: c, e, g, j Section 2.2 of the Formalization Handbook
Gold and mercury trade	<ul style="list-style-type: none"> • What share of the national gold trade is traded through formal channels? • Who are the formal and informal actors involved in the gold and mercury supply chain? • What are the different routes of gold and mercury trade? • What are the power dynamics in the gold and mercury supply chains? • How is gold traded and how is its revenue distributed? • How is mercury traded and where does it come from? • How is gold production and trade financed? 	<ul style="list-style-type: none"> • Amount of gold traced and sold through official channels annually • Available databases on gold and mercury trade • Amount of taxes levied from the ASGM sector annually • Actors, stakeholders, and structure of the formal and informal gold supply chain • Actors, stakeholders, and structure of the formal and informal mercury supply chain, and the origin of mercury • Power dynamics and trade relations in gold and mercury trade • Organizational arrangements and structures of traders • Informal arrangements in gold and mercury trade • Origin of financial investments made in gold production • Distribution of revenue of gold and mercury trade in the supply chain • Distribution of revenue from gold mining within ASGM communities • Price of mercury at different levels of the supply chain and fluctuations in price over time • Average income of ASGM miners • Use of gold for different purposes (e.g. as a currency, potential for money laundering or financing other criminal activities) • Miners' access to information about gold and mercury prices and trade • Miners' access to finance 	Annex C: c, f, g More detailed guidance for investigating ASGM value chains and in particular the identification of financial flows can be found in: Global Initiative Against Transnational Organized Crime & Levin Sources, 2017. Section 2.4 of the Formalization Handbook

Topics	Research questions	Subtopics	References
Mercury use	<ul style="list-style-type: none"> • What are the local perceptions regarding mercury use? • What are the potential local solutions to reducing mercury use in ASGM or mitigating its impact? • To what extent do ASGM communities have access to alternatives to mercury? 	<ul style="list-style-type: none"> • Awareness of mercury's environmental and health impacts • Attitudes and opinions about mercury use • Possible indigenous strategies/coping mechanisms to mitigate health threats in ASGM • Ideas and potential options for reducing mercury use • Miners' sensitivity to the price of mercury • Miners' access to basic training (e.g. on better mining practices, safety, hygiene) • Potential economic effects of reducing or eliminating mercury use on the local community 	Annex C: a-k (cross-cutting issues)
Local development	<ul style="list-style-type: none"> • Why are people engaged in ASGM? • How has ASGM changed miners' and their families' lives? • How does ASGM relate to wider livelihoods? • How are revenues earned in ASGM used? • How does ASGM relate to education? 	<ul style="list-style-type: none"> • Information on wider livelihoods of ASGM communities, and their linkages with ASGM • Extent and mode of people's involvement in both ASGM and agriculture • Motives of ASGM actors to engage in ASGM • ASGM actors' aspirations for the future • Use of revenue earned from ASGM miners, traders, and other actors, and investments made in other sectors • Negative impacts from ASGM activity on farmland • Positive impacts from ASGM activity on agricultural trade and investment • Impact of ASGM activity on trade of local goods and services (e.g. transportation and construction services, hairdressers, restaurants, small shops) • Positive and negative impacts from ASGM activity on education • Economic effects of ASGM activity on local communities • ASGM actor' access to education and alternative livelihoods • ASGM communities' access to basic necessities (food, water, shelter) • ASGM communities' access to finance • ASGM communities' access to technical assistance 	Annex C: c, e

Topics	Research questions	Subtopics	References
Women's role	<ul style="list-style-type: none"> • What is the role of women in ASGM and the household? • What hazards are women exposed to? • What are the needs of women in ASGM? • To what extent do women have access to valuable assets in ASGM? • What are the opportunities for women in ASGM? • How can women in ASGM be empowered? 	<ul style="list-style-type: none"> • Estimated number and percentage of women working in ASGM • Profile of women engaged in ASGM • Motives for women to participate in ASGM • Women's roles in ASGM and other activities, including the household • Women's exposure to mercury and other health hazards • Gender disparities and women's challenges in advancing in the ASGM sector (e.g. becoming a gold trader) • Women's access to valuable assets (e.g. land, tools, mining groups, capital, markets, participation in decision-making) • Opportunities for women to advance in ASGM • Women's aspirations for the future • Women's current and potential role in promoting occupational health in ASGM, including regarding mercury (e.g. promoting better practices) 	<p>Annex C: c, g, h, i, j</p> <p>More detailed guidance for investigating the role of women ASM may be found in: Eftimie et al, 2012.</p> <p>Section 3.1 of the Formalization Handbook</p>
Children's role	<ul style="list-style-type: none"> • How many children are involved in ASGM? • Why are children involved in ASGM? • What activities do children perform in ASGM? • What health hazards are children exposed to? • What access do children have to education and alternative livelihoods? 	<ul style="list-style-type: none"> • Estimated number and percentage of children working in ASGM • Child labour in other economic sectors • Cultural norms regarding child labour • Children's roles and activities in ASGM (per different age categories) • Children's exposure to health hazards, including mercury • Children's and their parents' motives for engagement in ASGM • Children's access to education • Children's access to alternative livelihoods • Alternative sources of income for the household 	<p>Annex C: g, h, i</p> <p>Section 3.2 of the Formalization Handbook</p>
Health information	<ul style="list-style-type: none"> • What are the current health threats in ASGM communities? • What healthcare services do miners have access to? • What is the capacity of local healthcare providers? • To what extent do ASGM communities have access to other basic services? 	<ul style="list-style-type: none"> • Health status of ASGM communities • General health threats in ASGM communities • Specific health threats arising from ASGM activity • Exposure of miners and communities to mercury • Average distance to nearest healthcare facility • Capacity of local healthcare facilities (e.g. number of staff and their level of training; equipment; vehicles; supply of medicines; knowledge of the ASGM sector, mercury, and related hazards) • Specific communities or areas that are particularly affected by or dependent on mercury use in ASGM • Miners' use of medical services and medicines 	<p>Annex C: h, i, j</p> <p>Official guidance for investigating health aspects of the ASGM sector in the context of Minamata is currently under development by WHO.</p>

In addition to the general research questions and subtopics listed in the table above, countries can also refer to the “Questionnaire to assess risk of contributing to conflict finance and violation of human rights through gold production and trade”, included as Annex 6 to this document. The questionnaire builds on the “OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas”, and can help to promote synergies between the Minamata Convention and OECD Guidance.⁹ Researchers can use it to assess the risk that ASGM contributes to conflict, corruption, and violation of human rights.

2.2 Establish the research team

(Baseline Estimates Toolkit: Pages 91-93)

As discussed in the Baseline Estimates Toolkit, preparing the ASGM overview requires a team of people with specific skills. The ASGM overview, and in particular the field study to collect the information, requires a research team that is quick thinking, open-minded, and good at problem solving. Ideally, team members should have experience in the field, skills in the acquisition and management of data, and basic comprehension of the scientific method. But perhaps most importantly, researchers must be friendly, communicative, and able to rapidly adapt their approaches when new scenarios are encountered. In line with the four categories of information required in the ASGM overview, the research team should include researchers with expertise in the following:

- Technical and environmental aspects of the ASGM sector, including geology, mining practices, and mercury use;
- Socio-economic aspects of the ASGM sector, including the gold value chain, local livelihoods and development, and gender issues;
- Health aspects of the ASGM sector, including the sector’s major health threats and the national health infrastructure; and
- Policy, regulatory, and institutional aspects of the ASGM sector.

The researchers could be recruited from the government, nongovernmental organizations (NGOs), academia, or wherever relevant expertise may be found. The research team should ideally include no more than four people, who have their own domains of expertise, but work closely together to complement each other’s observations as a dynamic team. A larger group typically has less flexibility to swiftly adjust to changes and may be more difficult to manage. If necessary, the research team can contact relevant development agencies for training on the above-mentioned categories.

In addition, it can be beneficial to include on the team an ASGM miner or ASGM community representative with good communication skills. This can help to enhance the research teams’ perceived legitimacy, increase access to information from ASGM communities and sites, and support verification of data. Another approach can be to recruit flexible team members in each community visited. They can support the team in collecting data and assisting with interpretation of local languages and dialects where required.

⁹ More information on the OECD Due Diligence Guidance can be found at: http://mneguidelines.oecd.org/Brochure_OECD-Responsible-Mineral-Supply-Chains.pdf and http://mneguidelines.oecd.org/FAQ_Sourcing-Gold-from-ASM-Miners.pdf



3. Scope the national ASGM sector

3. Scope the national ASGM sector

(Baseline Estimates Toolkit: Pages 46-51, 95-100)

As recommended in the NAP Guidance, countries should start developing the ASGM overview by collecting information that is already available. The Baseline Estimates Toolkit therefore outlines a process for conducting a national-level scoping of the ASGM sector. This involves identifying existing information about ASGM in the country and provides a basic understanding of the sector. While this is a national-level scoping, it is also important to collect information specifically for each of the country's provinces and districts where most of the ASGM activity takes place. This will lay the foundation for the subsequent field study (see Sections 4 and 5) and identify data gaps and uncertainties that need to be further investigated in the field. To ensure a cost-effective approach, it is important that the national scoping is as comprehensive as possible.

Scoping the national ASGM sector includes the following suggested steps:

- Policy, regulatory, and institutional capacity assessment¹⁰
- Literature review
- Interviews with key informants
- Aerial imagery¹¹

In practice, these steps will have some overlap. Therefore, the scoping should be an iterative process.

3.1 Policy, regulatory, and institutional capacity assessment

The national scoping should begin with a policy, regulatory, and institutional capacity assessment. This will

¹⁰ Not covered in the Baseline Estimates Toolkit.

¹¹ This is discussed on page 50 of the Baseline Estimates Toolkit.

inform the policy, regulatory, and institutional aspects of the ASGM overview, and provide valuable information about the topic of "Formality" as presented in Table 1 above. For countries that are developing Minamata Initial Assessments (MIAs), this step should build on the policy, regulatory, and institutional assessment conducted as part of the MIA.

This step will contribute to a preliminary list of national legal and institutional capacity gaps that need to be addressed for successful implementation of the NAP. The assessment involves the following steps (some of which may be implemented in parallel):

- Assess the definition of ASGM activity
- Identify legal strengths, gaps, and barriers
- Identify relevant national institutions and their roles regarding ASGM
- Identify institutional capacity strengths, gaps, and barriers
- Develop a policy, regulatory, and institutional capacity assessment report

Assess the definition of ASGM activity

It is first useful to review the current definition(s) of ASGM activity as it is used in national policies and regulations, and to assess whether it sufficiently covers all characteristics of national ASGM activity.

Identify legal strengths, gaps, and barriers

Under this step, the current legal framework can be compared against what should be in place for effective regulation of ASGM. This should include relevant policies, laws, and regulations at all levels (e.g. local, provincial, regional) that address ASGM, ASM, and the wider mining sector. Legal approaches that do not directly address the mining sector, but are linked to development, environment, health and safety, labour, social welfare, child protection, trade, tax, etc. could also be relevant for the ASGM sector, and should also be considered. The checklist below presents a number of issues that should be reviewed.

Table 2. Checklist for reviewing legal issues¹²

Have the following legal issues have been reviewed?	Yes	No
Mining titles, licenses, and related obligations and rights		
Transfer of rights and mining title upgrades		
Trade and export licenses and related obligations and rights		
Land allocation policies		
Types of recognized entities/structures to perform ASGM activity		
Environmental licenses		
Pollution control measures		
Use of hazardous chemicals		
Rehabilitation and mine closure		
Protected areas		
Fees, royalties, and taxation regimes		
Labour rights		
Health and safety standards		
Child labour		
Supply chain and market standards or initiatives		
Assistance to ASGM actors		
Co-existence of ASM and LSM		
Gender considerations		

The following types of questions can be used to guide this step:

- Which policies explicitly address the ASGM sector?
- Which policies address the wider ASM and mining sectors?
- Which other policies are relevant to the ASGM sector, but do not currently address it?
- Which policies or regulations might hinder the formalization process?
- Does the overall legal framework provide enough incentives for stakeholders to formalize?

- Which of the issues listed in the checklist above are covered by the current legal framework?
- Does the current legal framework adequately cover the national obligations related to the: (i) Minamata Convention; (ii) other international or regional agreements regarding the ASM sector; and (iii) international agreements regarding human rights?
- Is the ASGM sector properly integrated into relevant development plans, such as the national poverty reduction strategy?
- To what extent has the current policy and regulatory framework been successfully implemented?

¹² Each of the issues listed here are discussed in depth in Sections 2 and 3 of the Formalization Handbook, which can provide a frame of reference against which to compare the respective regulations.

Additional guidance in this area can be found in UNEP's

NAP Guidance¹³, NRDC's Checklist of Legal Authorities to Implement the Minamata Convention on Mercury¹⁴, and UNDP's Minamata Initial Assessment Report – Suggested Structure and Contents.¹⁵

Identify relevant national institutions and their roles regarding ASGM

This step involves preparing a list of key institutions and stakeholders, and identifying their respective roles and responsibilities, including legal status. This may include government (e.g. ministries of mines, environment, health, land, local government and rural development, and trade and industry; Geological Survey Department; and parliament); NGOs; LSM companies; financial institutions; development agencies; and research groups at universities working on ASGM. The institutions and stakeholders can be approached to gather general information about the sector (possible interview questions are listed in Section 3.3 below). A full list of typical stakeholders and their potential roles in ASGM governance is provided on pages 81-83 of the Formalization Handbook.

Identify institutional capacity strengths, gaps, and barriers

Following the identification of key institutions and stakeholders, it is important to assess their existing technical, administrative, financial, and infrastructural capacity, and to compare it against the capacity required for fulfilling their mandates and implementing existing and updated policies. This assessment can also address inter-institutional coordination; information management, access, and use; and capacity in the various geographical areas.

¹³ See pages 40-42.

¹⁴ Natural Resources Defence Council, 2016. NRDC Checklist of Legal Authorities to Implement the Minamata Convention on Mercury. <https://www.nrdc.org/resources/nrdc-checklist-legal-authorities-implement-minamata-convention-mercury>

¹⁵ UNDP, 2017. Minamata Initial Assessment Suggested Structure and Contents. <http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Chemicals%20and%20Waste%20Management/undp-ee-wastemgt-Minamata-Initial-Assessment-Report-Guidance-Feb2017.pdf>

The existing capacity can be identified through the review of available studies, evaluation reports, and primary data in the form of semi-structured interviews, observations, and other means (see Section 3.3 below regarding interviewing key informants). As many of the relevant institutions are part of local governments and located in rural areas (particularly those mandated to provide assistance and enforce policies in the ASGM sector), data collection may require extensive travel to obtain documents or conduct interviews. In addition to government institutions, it will be beneficial to assess the capacity of NGOs, international organizations, universities, and other stakeholders that are involved in assisting or inspecting ASGM operations. For example, in many rural areas where ASGM occurs, NGOs and local research centres often play an active role in delivering technical and administrative assistance to ASGM operations.

The current national capacity should be compared against the capacity required to implement the NAP, such as developing, implementing, monitoring, and enforcing the necessary policies and regulations addressing ASGM areas and providing ASGM actors with assistance to enable them to reduce mercury use. The identified gaps can help to inform capacity building measures for the various institutions and stakeholders, which can be included in the NAP's workplan.

The following types of questions may assist with information collection:

- How do the various offices of the respective institutions (e.g. Ministry of Mines' central office, regional offices, and Mining District Offices) coordinate with each other, how are mandates divided, and what challenges exist regarding coordination?
- Do the institutions have the required technical (e.g. educational level and number of personnel), administrative, financial, and infrastructural capacity (e.g. vehicles, communication technology) to fulfill their mandates?
- How are the institutional resources currently distributed among the different offices at the national, regional, and local level?
- Do the institutions have expertise in the various dimensions of the ASGM sector (legal, institutional,

financial, socio-economic, and geo-environmental¹⁶) and mercury use, and do they receive periodic training on cross-cutting issues related to the sector?

- Do the institutions have the capacity to fulfill future mandates to implement the NAP and formalize or regulate the sector?

Develop a policy, regulatory, and institutional capacity assessment report

The findings from the above assessments can be consolidated and summarized in a policy, regulatory, and institutional capacity assessment section in the ASGM overview. It can include the following:

- An outline of relevant institutions and others stakeholders, including their respective roles and responsibilities
- A description and analysis of the existing legal strengths, gaps, barriers, and inconsistencies
- A description and analysis of the existing institutional capacity strengths, gaps, and barriers
- Recommendations for developing new or amending existing legislation, policies, regulations, etc.
- Recommendations for strengthening institutional capacity for implementing the NAP

3.2 Literature review

The purpose of the literature review is to collect as much information as possible about the topics and subtopics listed in Table 1 above. It should build on the policy, regulatory, and institutional capacity assessment and any other relevant information already gathered. Whereas many of the topics will need to be further investigated in the field, the literature review should at least gather as

much information as possible about the “Demographic information” presented in Table 1, as well as additional information about “Formality” that has not yet been collected as part of the policy, regulatory, and institutional capacity assessment.

Information should be collected and compiled from a wide range of sources, such as:

- Government reports that contain information about estimates of gold production, trade, and export; mercury import, trade, and export; population estimates; ASGM activity maps; and cadastral information on ASGM licenses, concessions, and permits.
- UN Environment’s information platform, the “Wheel of Knowledge”, which includes ASGM and NAP Guidance materials.¹⁷
- Peer-reviewed publications in academic journals and publications by NGOs, IGOs, and multilateral organizations that are active in the ASGM and/or related sectors; for example, studies published by Levin Sources and Impact that are relevant to the country, or baseline studies undertaken by donor agencies such as the World Bank.
- The World Bank and Pact’s ongoing DELVE project, which will provide a global database on ASM activity that is publicly available.¹⁸
- Information about ASGM from the larger ASM sector of the country, such as artisanal diamond, tin, copper, or coltan mining. Similarly, it may be useful to use regional ASGM studies that cover multiple countries.

To further assist countries in the literature review, Annex 3 includes a list of international sources of information for the ASGM sector and regarding mercury use. This can serve as a basis for collecting information, which should be complemented with documents gathered at the national level.

¹⁶ Each of these dimensions are discussed on page 19 of the Formalization Handbook.

¹⁷ UN Environment, Wheel of Knowledge. ASGM/NAP/Guidance and information materials. http://web.unep.org/globalmercurypartnership/publication_resources_nap

¹⁸ See: <http://www.delvedatabase.org/>

3.3 Interviewing key informants

Since public information about the ASGM sector is often scarce, anecdotal information and input from stakeholders and ministries can also be obtained to help develop an overview of the sector. It is therefore important to interview selected individuals from key stakeholder groups, such as ASGM experts from relevant government ministries (e.g. Ministry of Mines) or academia.

Such experts may be based in the capital, but many are often based in the provinces, for example, as representatives of regional or district level offices of the Ministry of Mines or Environmental Protection Agency. As it is important to collect basic information for each of the major mining provinces, the national sector scoping may require travel prior to the field study (see Section 4 below). Other key informants in the field, such as community leaders and customary chiefs, may also possess valuable information for the national sector scoping (see Sections 4 and 5).

Annex 1 provides questions that can be used to interview key informants to collect general information for the topics listed in Table 1. The Baseline Estimates Toolkit also lists key stakeholders and the types of information they may hold (see pages 48-49).

3.4 National Scoping Report

The information collected in the policy, regulatory, and institutional capacity assessment, literature review, and key informant interviews can be compiled and summarized in a “National Scoping Report”. This should include the following elements:

- a policy, regulatory, and institutional capacity assessment;
- a summary of information collected under each of the nine topics;
- a dedicated section about existing data gaps and limitations, which may be linked to perceptions, potential biases, and the assumed reliability of the collected data; and
- a list of topics that need to be further explored, elaborated, and triangulated in the field study, and recommended approaches for doing this.

The National Scoping Report should also include the elements outlined in the Baseline Estimates Toolkit (page 99), which include: a summary of the spatial distribution and practices characterising each major mining province in the country; a map of the major mining provinces and the general distribution of ASGM sites within them; and highlights of pre-existing information that will be useful to calculate baseline estimates for each province. While none of the elements mentioned above are formal requirements in the Minamata Convention, they are recommended in this guidance because they will be instrumental for developing a comprehensive ASGM overview and an effective NAP.

4. Develop a National Research Plan



4. Develop a National Research Plan

(Baseline Estimates Toolkit: Pages 101-109)

Building on the National Scoping Report, a National Research Plan can be developed to address the data gaps through a field study. In addition to the elements listed in the Baseline Estimates Toolkit (page 109), it should include the following elements:

- A general research approach, including research methods and research tools (see Section 4.1)
- A sampling method for selecting ASGM districts, communities, sites, and respondents (see Section 4.2)

Guidance for determining the sample size and sampling tactics is presented in Section 4.3.

4.1 Research approach

The field study will generally involve an exploratory study, which, in some countries, may be the first significant study to target the ASGM sector and/or its use of mercury. This will typically involve the use of research questions that are generally “normative” and “interpretive” in nature (i.e. they focus largely on the interpretation of opinions and perceptions). It is therefore most appropriate to use qualitative research methods. Although some numeric elements that are more quantitative in nature (e.g. average earnings, cost of living, gold and mercury prices) are also involved, the suggested approach for collecting them in the field is qualitative in nature.¹⁹

Qualitative research can be defined as “a scientific research method to understand a given problem from the perspectives of the local population it involves.”²⁰ The goal of qualitative research is not to collect statistical

¹⁹ Much of the data that is more quantitative in nature, such as GDP per capita and official annual gold exports, is typically collected in the national sector scoping.

²⁰ Tripathy, P., & Tripathy, P. K. 2015. Fundamentals of Research: Dissective View. diplom. de.

information, calculate averages, or generalize with statistical significance for a wider population, but rather to discover variation and contextual complexity. This goal can be pursued by developing case studies that offer a contextualized understanding of the situation. This can be achieved through the use of research tools such as semi-structured interviews, group discussions, and participant observations (see Section 5.3).

Research methodology: Qualitative research with case studies

Research tools: Semi-structured interviews, group discussions, and observations

Research tools, such as semi-structured interviews, group discussions, and observations, should be used in the spirit of “Participatory Rural Appraisal” as introduced by Robert Chambers.²¹ Central to this research philosophy is that rather than approaching respondents in rural areas with a top-down approach in which the researchers are viewed as the experts and the respondents as passive subordinates in gathering data, the researchers view the respondents as the experts that they can learn from. In this approach, researchers are careful not to impose their views of reality on local people, but instead enable them to investigate their own realities by giving them considerable power in steering the conversations. Moreover, researchers are encouraged to enable local people to contribute to the research design and its topical scope, and to encourage information sharing between local respondents and their respective communities. The advantage of this approach is that it has the potential to empower artisanal miners by giving them considerable control over the research and the subsequent change it may contribute to in their livelihoods.

Section 7 discusses the limitations of the proposed research methods, as well as several measures that can be taken to respond to these.

²¹ Chambers, R. 1994. Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm. World Development, 22(10), 1437-1454.



4.2 Sampling method

(Baseline Estimates Toolkit: Pages 102-104)

This section outlines a method for selecting a sample of respondents from a wider population. This should enable the research team to investigate all four aspects for the ASGM overview in a single field study using one sample.

The field study should make use of what is referred to as “non-probability sampling”. This means that the respondents will be selected based on the judgments of the researchers, rather than random selection. In contrast to probability sampling (which is often used in quantitative research methods and aims at a statistically-representative sample), the purpose of non-probability sampling is to select respondents that have specific experience with the issues being studied, while attempting to achieve as much variation as possible in the sample. If the sample is big enough, and if the variation at local, provincial, and national levels is sufficiently captured, the field study can help to obtain a reasonably generalizable representation of the larger population of the study.

The study population should include ASGM actors, which are persons or institutions directly involved in the ASGM

supply chain, and which add value to gold production or trade; and ASGM stakeholders, which can be understood as persons or institutions that are indirectly involved in gold production and trade.²²

Study population: Actors and stakeholders involved in the ASGM sector at the local, provincial, and national levels

Sampling method: Non-probability sampling

In some cases, countries that are small and have sufficient budgets may decide to visit all ASGM communities and nearby sites to collect data for the ASGM overview. For example, in Sierra Leone, it was possible to visit at least all

²² Depending on the context, ASGM actors may include miners (diggers, transporters, and processors, such as crushers, washers, and panners), pit bosses, leaders of mining entities, traders, investors, goldsmiths, exporters, refiners, smelters, importers, end consumers, and bullion banks. ASGM stakeholders may include landowners, community leaders, customary leaders, large-scale mining (LSM) companies, NGOs, financial institutions, universities, government agencies and specialized services, and bilateral and international development organizations.

of the areas where significant ASGM activity takes place. However, given the often remote nature of ASGM activity, as well as the budgetary and time constraints of the NAP project, it will usually be necessary to select a limited number of ASGM districts (or provinces) and communities from which to collect data from selected respondents. The following sampling process may be followed:

- Step 1. Select productive ASGM districts
- Step 2. Select ASGM communities (including nearby mining sites)
- Step 3. Select respondents in districts, communities, and sites

This process is illustrated in Figure 4 below.

In order to select the country's most productive ASGM districts, it is important to identify all districts in which ASGM takes place. This should be followed by consulting available information from the national sector scoping and identifying the districts where the most ASGM activity takes place. Other elements that may be considered in the selection of the districts include the use of mercury, geological diversity, and adoption of different mining practices.

In each district, data can also be collected from selected ASGM stakeholders that are not based in ASGM communities or sites, but in province capitals and towns. This is discussed under Step 3 below.

Step 2: Select ASGM communities

This step involves selecting a number of ASGM communities in each selected district. Based on the context-specific characteristics of the ASGM communities and nearby mine sites, heterogeneous communities should be selected that vary individually and that together constitute a reasonably representative reflection of the national ASGM context. As discussed in the Baseline Estimates Toolkit (pages 102-103), communities should be selected based on the relative distribution of ASGM activity; scale of gold production; diversity in ore type; accessibility of mining areas; and the adoption of different mining practices. Regarding socio-economic aspects, other issues can be considered, such as the level of formality, different forms of organization, and access to various types of assistance (e.g. technical, administrative, and financial assistance).

Table 3 below presents criteria that could be considered in selecting mine sites. The different options presented for these criteria are not exhaustive and each criterion should be viewed as having a spectrum of possibilities. National researchers are encouraged to adapt the table's contents to the national situation and add additional criteria and categories that they consider to be important in the National Research Plan.

Figure 4. The sampling process

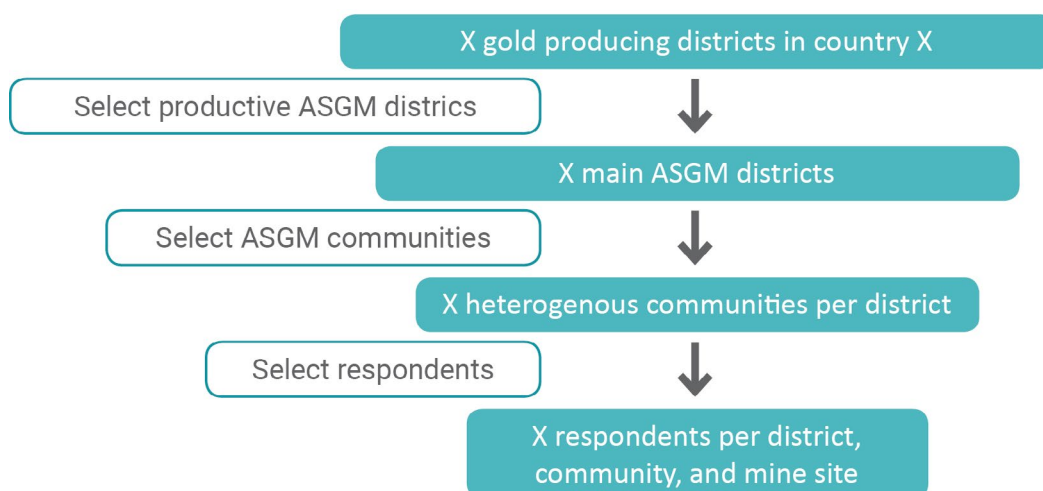


Table 3. Criteria to consider in the selection of ASGM communities

Criteria to consider	<<Spectrum>>		
Security	According to national evaluation standards		
Accessibility	Easy to access	Feasible to access	Difficult to access
ASGM production	High	Moderate	Low
Mercury use	Present	Unknown/uncertain	Absent
Ore type	Hard rock mining	Alluvial mining	Colluvial mining
Processing techniques used	Manual grinding and simple gravimetric methods (e.g. panning, sluice boxes)		More advanced methods (e.g. ball-mills, centrifuges, cyanidation)
Form of organization	Formal organization structures	Informal organization structures	Individual miners
Legality	Possession of mining licenses		No possession of mining licenses
Access to assistance	Miners have received assistance		Miners have not received assistance
History	E.g. history of LSM activity on the ASGM sites		
Other criteria

In addition to using these criteria, some mining areas could also be selected because no research has been conducted there yet, or if an area contains information that can fill an identified knowledge gap.

Finally, in addition to selecting ASGM communities that vary individually, it is also a good practice to select mine sites that capture a lot of diversity within a community (e.g. selecting one mine site that contains different ore types, processing techniques, and degrees of formalization). This helps to obtain a relatively representative picture of the national situation.

Step 3: Select respondents in ASGM districts and communities

Once the ASGM districts and communities have been selected, respondents should be identified for interviewing or observing at the provincial and district level, community level, and mine site level. Table 4 below lists key respondents that should be approached at each of these respective levels. This builds on the individuals identified in the Baseline Estimates Toolkit (pages 63-65), but also lists additional persons that can be approached for investigating socio-economic and health aspects.

Although the table below presents some of the key ASGM actors and stakeholders, the specific names and categories of individuals may differ depending on the country. In some cases, certain actors and stakeholders may overlap or other relevant individuals should also be approached. The table below should therefore be adapted to the national and local context and national priorities, to guide the National Research Plan.

Table 4. Key respondents to interview*

Provincial and district level	Community level	Mine site level
Provincial and district mining offices	Community leaders	Diggers
Provincial and district environment offices	Traditional landowners	Transporters
Customary and traditional chiefs	Cooperative/association leaders	Processors (crushers, washers, panners)
Big traders	Processing centre owners	Team leaders/pit bosses
Goldsmiths	Small traders	License holders
Gold exporters	Community health officers	Female miners (all types)
<i>Local NGOs and universities assisting ASGM communities</i>	Local shop holders	Children
<i>Provincial technical mining services from the government</i>	Mercury traders	Small traders
<i>Local customs officers</i>	Local shop holders/sellers of foodstuffs	Owners and workers of small-scale mining companies
<i>Provincial or district health centres/hospitals</i>	Youth leaders	Local shop holders/sellers of foodstuffs
<i>Investors in ASGM production and trade</i>	Farmers	
<i>Medium and large-scale mining companies</i>		

* Respondents that are listed in italics are actors or stakeholders that are less crucial to interview, but that nevertheless possess useful information for understanding the ASGM sector in the local context and local economy.

Once the main respondents have been identified, a standard approach should be outlined to ensure that the same respondents are systematically interviewed in the various provinces, districts, communities, and mine sites that are visited. For example, in every province that is visited, the provincial mining and environment offices could be visited first. And at the district level, customary or traditional chiefs could be visited first to obtain their support in conducting research in their territory. Similarly, at the community level, it may be beneficial to first visit and interview the community leader and landowners. At the mine site, team leaders and pit bosses could be interviewed first, before speaking with miners. This relates to sampling tactics and ethical considerations in the research procedure (see Section 4.3).

To ensure that vulnerable groups are proportionally targeted in the field study, the research team can aim to

interview a certain percentage of that group. This should be undertaken with an approach that is systematic, but at the same time flexible to adapt to realities in the field. For example, if there are 20,000 female miners in a country that has 100,000 miners, it may be difficult to ensure that 20% of the miners interviewed at each mine site are female. There may be sites that have no female diggers, and others where females make up 40% of the diggers. By keeping good records of the gender of miners that are interviewed and using this information in the selection of respondents during site visits, it can be feasible to include an average of 20% of female diggers in the interviews of the total ASGM study.

The box below presents an example from the DRC, which illustrates how the sampling method was used for the ASGM overview.

Box 2. Drawing a sample – an example from the DRC*

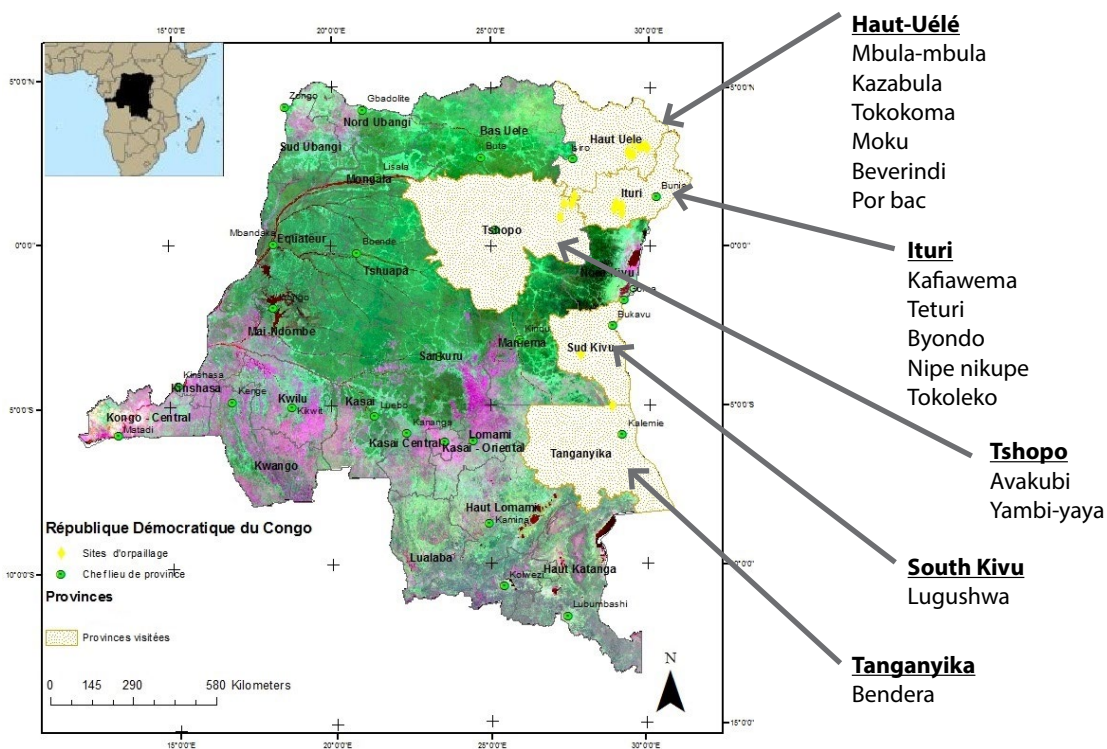
The DRC is a large country that is exceptionally rich in minerals, including gold, which are largely located in the eastern part of the country. The Congolese Environment Agency, Agence Congolaise de l’Environnement (ACE), with technical support from UNITAR, is producing a NAP for reducing mercury use in the ASGM sector. As part of the NAP, ACE has subcontracted the Expertise Centre on Mining Governance (CEGEMI – a specialized research center at the Catholic University of Bukavu) to develop the ASGM overview. CEGEMI first conducted a National Sector Scoping and developed a National Research Plan for the subsequent field study, with the use of this Socio-economic ASGM Research Methodology and UN Environment’s Baseline Estimates Toolkit. As part of the National Research Plan, a sampling method was developed in three steps.

First, the largest ASGM-producing provinces were selected. The gold resources of the DRC are mainly concentrated in two geological formations: the Kibalian and the Kibarien. Within those geological

formations, five provinces were selected: South Kivu, Tanganyika, Haut-Uele, Tshopo, and Ituri. More 80% of national gold production is estimated to take place in these provinces.

Second, within the five provinces, 15 mining sites and nearby communities were selected. These were selected with the aim of having a diverse sample in terms of types of mineral deposits, organization of miners, size of the mining site and local population, and level of formality. Other criteria that were considered in the selection include accessibility and security, which both present significant challenges in the Eastern DRC. The figure below illustrates a map of the DRC, in which the selected provinces and respective mining sites are highlighted.

Third, categories of key respondents in the DRC’s ASGM sector were identified (similar to those listed in Table 4 of this methodology). Quotas were also set for the most vulnerable groups, such as women and children, to ensure that they were adequately represented.



* This example is used with permission and is based on the full research report: Nkuba, B., Zahinda, F., Chakirwa, P. Murhi, I, de Haan, J.S. and Bashwira, M., 2018. L’or artisanal congolais. Analyse socio-économique et de l’utilisation du mercure. Agence Congolaise de l’Environnement, Kinshasa.

4.3 Determine the sample size and sampling tactics

Determine the sample size

The ideal sample size (both in terms of selected ASGM communities as well as total observed respondents) depends on the national context. Generally, data collection can stop when “data saturation” is reached; in other words, the newly collected data does not provide additional useful insights and the research questions can be reasonably answered with the already collected data (while accounting for the diversity of the sector). At the same time, the sample size is limited by the budgetary and time constraints of the NAP, and potentially competing research questions. Collecting information for developing the baseline estimates will require visiting a larger number of ASGM communities and mine sites and conducting more surveys compared to collecting information on the socio-economic and health aspects. The latter typically requires less respondents, but longer group discussions and interviews to accommodate a more in-depth and contextualized understanding.

A balanced approach is therefore required to collect data that is diverse, large, and detailed enough to address all required components of the NAP, as well as certain broader issues of the national sustainable development agenda. One way to deal with this is to visit a large number of sites for acquiring information for developing baseline estimates, and spend more time in a selected but diverse number of communities where socio-economic and health aspects can be investigated in more depth. In other cases, if the research team is experienced and skilled enough to do a more rapid assessment of the socio-economic and health aspects of the ASGM sector, it may be feasible to gather such data in each of the areas where data is collected for developing the baseline estimates. Box 4 on page 46 explains how this has been undertaken for Sierra Leone’s ASGM overview.

Finally, whatever approach is taken, the limitations of the sample should be documented, and recommendations should be made to conduct future studies that address the data limitations and gaps (see Section 7).

A balanced approach is required to collect data that is diverse, large, and detailed enough to address all required components of the NAP, as well as certain broader issues of the national sustainable development agenda.

Sampling tactics

Conducting field research in the ASGM sector is often chaotic and challenging as unexpected events may occur or respondents are secretive because of the sensitivity of the topics being discussed. It is therefore important to use smart sampling strategies to ensure that the identified respondents can be interviewed and share valuable and reliable information.

For example, the field research team may make use of “snowball sampling”, a strategy in which respondents are sampled based on responses from other respondents in the ASGM value chain. This can be particularly helpful for approaching respondents that are difficult to verify, such as unlicensed gold traders or mercury suppliers. For example, researchers could ask miners at the end of an interview to identify the people that buy their gold or supply them with production and processing tools such as shovels and mercury. These identified individuals could then be interviewed and asked similar questions at the end of the interview. As a result, the small-scale local gold traders could then refer the researchers to investors and the bigger traders that buy gold from them.

Similarly, researchers may use the principles of “purposive sampling”, whereby they search for additional respondents to answer specific research questions. This may be particularly useful if a country wants to investigate specific phenomena in addition to the case studies described above. For example, a country may want to investigate female gold mining associations (if they exist) in order to learn more about the potential for women empowerment in ASGM. Such a sampling strategy requires specific information that could be collected in the national sector scoping discussed above

(under “Demographic information” and “Formality” listed in Table 1).

The effectiveness of any sampling strategy for collecting valuable information often depends on one central issue: the level of trust between the research team and local and national stakeholders. As has been observed among countries developing ASGM overviews, the often contrasting levels of formality between ASGM communities and the government and the associated potential for distrust is one of the main barriers for governments in obtaining reliable information for the NAP projects.²³ There are many factors that influence this level of trust and the perceived legitimacy of the research team, ranging from how the research team is dressed and the language they use, to the way in which they first engage the community and the amount of time they spend there. Moreover, trust is closely related to the participatory approach discussed above (see Section 4.1), as well as wider research ethics and procedures of data collection that are adopted in the field research (see Section 5 below).



²³ Stylo, De Haan & Davis, forthcoming.



5. Collect data



5. Collect data

(Baseline Estimates Toolkit: Pages 53-58; 114-131)

This section briefly discusses research ethics and proposes a procedure for data collection in ASGM communities. This is followed by an outline of different tools and related best practices for data collection.

5.1 Research ethics²⁴

When collecting data in the field, it is important that the researchers respect research ethics. National researchers need to respect local traditions, customs, norms, and values, and avoid saying anything that could be interpreted as coercive. In addition, the universally accepted ethical principles in conducting qualitative research—respect for persons, beneficence, justice, and respect for communities—need to be applied throughout the process.²⁵ More specifically:

- *Respect for persons* means that the autonomy of participants must be ensured, and that when diminished, they must be protected. Respondents should not be used simply as a means to an end, but rather an end in itself.
- *Beneficence* implies that the risks associated with the research should be minimized to the extent possible, and that benefits of participation should be maximized.
- *Justice* requires that respondents benefit from the knowledge acquired through the research.
- *Respect for community* requires respect for the values and interests of local communities and protecting them from harm.

These principles relate to the participatory style of doing research outlined in Section 3, which focuses not only on the “response”, but also on the “respondent”. It is important that the research team considers how to integrate these principles in the field study, especially because the study addresses sensitive issues that are directly affecting the community’s health as well as their socio-economic position. For example, after the respondents are interviewed about issues related to mercury use, they should receive (after the interviews have ended) information about the specific threats posed by mercury. This should include practical advice for the respondents and their families and community on mitigating mercury impacts. Guidelines for this are provided in the next section. The research team should also think of ways to share the research results and NAP contents with the targeted communities after the research has ended, and preferably target them in awareness raising and capacity building activities as the NAP is implemented.

Regarding respect for persons, it is important to obtain “informed consent” from the research participants prior to data collection. Informed consent can be understood as “a mechanism for ensuring that people understand what it means to participate in a particular research study so they can decide in a conscious, deliberate way whether they want to participate.”²⁶ It may be given both on paper as well as orally. In general, data collection activities that involve more than a casual interaction with a person require individual informed consent from that person, even if community-level permission exists. It is important that this information is provided in a language and at an educational level that the participant can understand and that enables them to make a free decision about participating in the research (see Box 3 below).

²⁴ Not covered in the Baseline Estimates Toolkit.

²⁵ These principles are further elaborated in The Belmont Report: National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The Belmont Report. Ethical Principles and Guidelines for the Protection of Human Subjects of Research. Washington, DC: National Institutes of Health, 1979. <https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html>

²⁶ Rwegoshora, H. M. M., 2014: 142. “A guide to social science research”, Second edition, Mkuki na Nyota Publishers Ltd, Dar es Salaam, Tanzania.



Box 3. What does a respondent need to know to give informed consent?

- Purpose of the research
- What is expected of a participant, including the time required
- Expected risks and benefits, including psychological and social
- The voluntary nature of the research and possibility to withdraw at any time without any consequences
- How confidentiality will be protected
- Contact information of the local lead researcher for questions related to the research

5.2 Procedure of data collection

Under the supervision of the national NAP project coordinator, the research team should undertake the following steps prior to ASGM site visits.

- Obtain official support letters from high-ranking government officials that request provincial and local authorities to authorize data collection
- Obtain formal approval from provincial and district authorities to visit mine sites
- Visit local authorities, such as customary leaders and cooperative or association leaders, as applicable, to obtain formal approval for visiting the mining sites
- Inform local communities about the research, its intended purpose and geographical scope, and the wider NAP project

An example of the data collection procedure that was used for developing Sierra Leone's ASGM overview is presented in Box 4 below.

Box 4. Data collection procedure Sierra Leone

The Environmental Protection Agency of Sierra Leone (EPA-SL), with technical support from UNITAR, undertook national sector scoping and a field study to develop an ASGM overview for its NAP. The research team visited 15 different ASGM communities and surrounding mining sites located in 10 chiefdoms spread over four provinces of the country. This captured the ASGM areas believed to be most active at the time of research.

In terms of procedure, a formal letter was signed by EPA-SL and National Minerals Agency (NMA) authorities to ensure that the field study had full political support from the Government of Sierra Leone. In addition, provincial EPA-SL and NMA offices were visited in every province to interview key staff members and obtain their logistical and political support for the research. In each chiefdom, the research team first visited the respective paramount chief to obtain their consent to collect data in their territories, and to interview them. In each community, the team first engaged the community leader and, where present, the local youth leader to pay them “respect” (a small sum of cash). The community leader

and community elders were subsequently engaged in a group discussion to inform them about the research and the NAP project, obtain an overview of ASGM activity in their community, and answer any questions from community members. Only after the community leaders’ consent was given were further interviews and observations conducted in the community and nearby mine sites.

In each ASGM community, the team recruited one or two community members to accompany them on the site visits, and to provide interpretation services where necessary. Subsequently, the research team split up in two smaller teams (each accompanied by a community member) that collected information related to their respective domains of expertise: one team comprised environmental and technical experts, and the other included health and socio-economic experts. This procedure was undertaken in all 15 communities that were visited, where the team conducted over 300 interviews with a variety of stakeholders at the provincial, district, community, and mine site levels.

When communicating with ASGM communities, it is important to promote mutual trust and to be clear and honest about the purposes of the research. This will encourage the communities to be open about sensitive topics such as mercury use and gold trade. It is also necessary to carefully consider what message is communicated. A good approach may be to emphasize that the research team will not deprive miners of their livelihoods. Instead, the research will increase understanding of how they operate, what challenges they face, and possible ways to improve their operations. The intention is to mitigate social, health, and environmental impacts in their community and surroundings, while also increasing miners’ productivity and their access to markets. This will also enhance the sector’s positive contributions to local development.

During the ASGM site visits, the researchers should take the following steps:

→ Establish positive relations with mining communities

and miners at mine sites. This can be done by showing interest in the community’s culture and activities, and by engaging in some small talk, such as asking miners how their production is going that day, or if they have watched the latest football match.

- Introduce the team to respondents; explain the research purpose and background, expected results, and confidential treatment of data; emphasize the voluntary nature of the research; and obtain informed consent for data collection and potential recording of the interviews.
- Ensure that a conversational tone continues when the interview moves into more serious and sensitive topics, rather than presenting questions as an interrogation.
- Take notes and, if consent is obtained, record audio of the conversations.
- Manage, analyse, and store data in a consistent and confidential manner.

- Provide space for questions from respondents, and explain the next steps of the ASGM study and NAP project.

It is important to end data collection at any site with some brief awareness raising activities that address the negative effects of mercury use. This can be complemented with preliminary training on measures that miners can directly take to mitigate these effects (keeping in mind that more extensive awareness raising and training should take place during NAP implementation). To avoid influencing responses, it is better to undertake such awareness raising and training after collecting data. This will ensure that the responses obtained during data collection provide a representative picture of the average ASGM community.

Depending on the context, researchers can raise awareness on five general recommendations:

- Avoid whole ore amalgamation and process the ore as much as possible before adding mercury. This may be achieved by improving gravimetric techniques, such as optimizing the homogeneity of rocks before adding them to sluices to enhance their effectiveness, and by combining different gravimetric techniques (e.g. grinding, sluicing, sieving, panning)
- Avoid burning amalgams at home, in residential areas, and in close proximity to pregnant women and children
- Avoid chemical leaching (e.g. treating ore tailings with cyanide) after mercury use
- Avoid direct contact with mercury and inhalation of its vapours
- Store mercury safely: tightly seal it in durable glass, steel, or plastic vessels under a layer of water, which prevents the mercury from evaporating, and keep it outside of the house

While these recommendations can help to avoid some of the worst practices used in ASGM, detailed guidance on improving ASGM practices can be found in “A Practical Guide. Reducing mercury use in Artisanal and Small-scale Gold mining”²⁷

²⁷ UN Environment, Global Mercury Partnership, Artisanal Gold Council, UNIDO, University of Victoria and International Union of Geosciences

5.3 Data collection tools

(*Baseline Estimates Toolkit: Pages 53-58*)

This section discusses three qualitative data collection tools: (i) semi-structured interviews; (ii) group discussions; and (iii) observations. These tools mainly focus on investigating socio-economic and health aspects, and are similar to the tools used for collecting data for developing baseline estimates.²⁸ However, one important difference is the way in which the tools are used. For example, when investigating baseline estimates, interviews generally focus on collecting tangible pieces of information in a relatively fast manner (e.g. the number of bags of ore extracted in a day). In contrast, when investigating socio-economic and health aspects, semi-structured interviews should be used, which are more open-ended and general in nature, go more in-depth about personal experiences and perceptions, and typically require more time. The recommended use of these tools is discussed below.

Semi-structured interviews

Semi-structured interviews can be conducted with the respondents. A semi-structured interview provides the interviewers with a balance between an open-ended interview and a structured survey, which allows them to explore particular themes in more depth. The interviewers can ask the respondents for illustrative examples and ask probing questions to dig deeper into relevant topics. These may address the subtopics included in Table 1 above, emerging topics, or other topics identified by the national ASGM expert.

In general, as described in Section 4, the interviewers are encouraged to “hand over the stick” to the interviewee

Commission on geosciences for Environmental Management, 2012. A Practical Guide. Reducing mercury use in Artisanal and Small-scale Gold mining. https://www.unido.org/sites/default/files/files/2017-11/ASGM_English%20%281%29.pdf

²⁸ Some questions for investigating environmental impacts are also included in Annex 4 (Guidelines for semi-structured interviews and group discussions) and Annex 5 (Observation forms), which complement the investigation of the health aspects.

as much as possible, and to let the interviewee have considerable power in steering the direction of the interview. Rather than asking the questions one by one, the interview should be like a conversation, with questions and answers on one topic leading naturally to another. As such, the interviewer can generally refrain from asking too many questions and use appropriate non-verbal language (e.g. nodding, humming) to reinforce the interviewees in sharing their worldviews, as long as the interviewee does not shift too far away from the main research topics.

Guidelines that can be used for semi-structured interviews, organised by groups of respondents, are presented in Annex 4. These include questions for interviews with miners, female miners, traders, mining leaders, community and chiefdom leaders, and health workers. Best practices for such interviews and question techniques are respectively listed in Boxes 5 and 6 below.

Box 5. Best practices for interviews

- Engage the interviewee
- Create space to discuss sensitive topics
- Listen with sensitivity and empathy
- Observe body language
- Paraphrase and summarize

Box 6. Question techniques

- Ask simple and concise questions
- Ask open-ended questions (Why? How? For what reasons?)
- Ask probing questions (Can you tell me more? Can you give an example?)
- Avoid interrupting the interviewee
- Probe non-verbally (e.g. nodding, humming)
- Frame questions in a neutral way
- Avoid leading questions
- Avoid double-bared questions

Group discussions

A group discussion involves a group of 6-10 people and is led by a skilled moderator. Like semi-structured interviews, it includes pre-determined questions to focus on particular topics, but the discussion is free-flowing. For each ASGM community visited, the researchers should conduct at least 3-4 group discussions with different groups of people. These discussions can be held with the groups outlined below, or a mix of these (keeping in mind that these groups may vary depending on the local situation):

- Miners (diggers, transporters, and processors, such as crushers, washers, and panners)
- Female miners (see above)
- Traders (small and big)
- Mining leaders (team leaders and association/cooperative leaders)
- Community and/or chiefdom leaders (community leaders, landlords, customary chiefs)
- Health workers (e.g. community health officers, nurses, health volunteers)

The group discussions may be particularly useful for analysing the power dynamics between the various stakeholders, and for learning more about the respondents' different perspectives. The discussions can help to obtain important information on perceptions of governance and formalization of the ASGM sector and the use of mercury, as well as for mapping gold and mercury trade. The discussions can be structured according to the guidelines presented in Annex 4. However, depending on the group composition and the topics of interest, the moderator may choose to focus on specific topics listed in the guidelines to enable more in-depth discussion. Box 7 below highlights the role of the moderator.

Box 7. Role of the moderator

- Engage the participants
- Create space to discuss sensitive topics
- Generate a maximum number of different ideas and opinions
- Listen with sensitivity and empathy
- Paraphrase and summarize, and clarify ambiguous comments
- Analyze power dynamics and body language
- Encourage quiet people to speak
- Maintain structure and ensure research objectives are met, while staying flexible
- Manage time, space, and energy of participants effectively
- Remain neutral: keep personal views and ego out of the facilitation
- Make it fun!

Observations

During visits to the mine sites, researchers should make observations and take general observatory notes. The observations provide a good opportunity to analyse attitudes, behaviour, and power dynamics at the mine site. In addition, they provide an insider's viewpoint and the chance to observe things that are unspoken. This can also help to triangulate data (see Section 7). It is important to conduct observations in a natural way that does not raise suspicion among ASGM actors, which may influence their behaviour (and thereby bias the observations). As appropriate, observations may be made while taking a break, eating a meal, or during informal conversations with local people.

The observations can inform both the socio-economic aspects and baseline estimates of the ASGM study. Regarding the socio-economic aspects, useful observations include general information about the mine

site, such as the number of miners at the site; organization, decision-making, and power dynamics among miners; and amount of women and children present at the site. For developing baseline estimates, the site observations can include specific information about processing and refining techniques used, gold production, and the use of mercury, as discussed in the Baseline Estimates Toolkit. Forms for observations can be found in Annex 5.

Box 8. Best practices in observations

- Narrate observations in detailed field notes
- Spend significant time in the field
- Develop informal relationships based on trust
- Develop a collective, systematic approach to observations
- Cross-reference impressions from different researchers

6. Analyze data and report results



6. Analyze data and report results

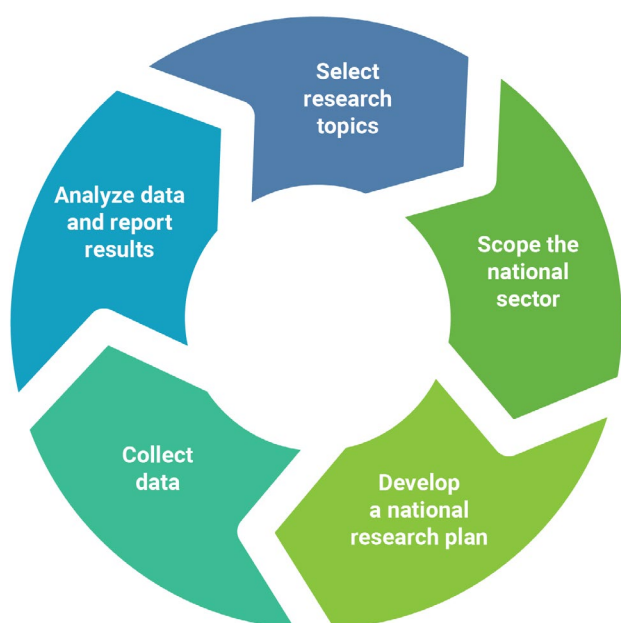
(Baseline Estimates Toolkit: Pages 132-146; 147-165)

The Baseline Estimates Toolkit provides detailed guidance on analysing (largely quantitative) data for developing baseline estimates and extrapolating them to provincial and national levels. However, it does not provide guidance on analysing qualitative data for informing other aspects of the ASGM overview. This section therefore discusses the process for qualitative data analysis, data storage, and reporting. This guidance can be used for the socio-economic, health, and environmental aspects of the ASGM overview.

6.1 The data analysis process

In qualitative research, data analysis is a process of interpretation: attaching meaning to data. It helps in answering and adjusting the research questions and identifying the most effective approaches to data collection. As presented in Figure 5, data analysis is an iterative process.

Figure 5. The iterative process of conducting research



Data analysis contains the following steps:²⁹

- **Step 1.** Storing the data (recording, taking notes)
- **Step 2.** Familiarization with the data (transcribing, reading)
- **Step 3.** Breaking up the data into smaller pieces (coding)
- **Step 4.** Putting the pieces together (comparing, combining, and contrasting)
- **Step 5.** Building the big picture (interpretation)

The researcher moves from the concrete, raw data to more abstract concepts, and progressively engages in interpretation. However, each step also contains some analytical elements, which can be written down in personal memos and used as input for reporting. The steps are explained in more detail below.

Step 1. Storing the data

Storing the data involves writing down information while in the field and taking notes on the observation forms and during interviews and group discussions. It can also involve recording interviews and discussions (but only after obtaining informed consent from the respective respondents). Field notes should follow a clear structure so that they can be understood when they are read afterwards. They can be organized by the topics listed in Table 1 (with possible amendments, as appropriate). The researchers can also include meaningful quotes in their field notes, which could serve as a powerful method of communicating findings in the ASGM overview.

It is important that data is managed well: it should be gathered in a systematic and consistent manner, especially when data is collected by a group of researchers. It is also advisable to establish clear summary and translation procedures and to store all of the data together in one place or, even better, to type it out and store it in a single digital file. Writing down the place and date of each interview/observation, and using a clear file-naming system is also important. The locations of

²⁹ The explanation of these steps is partly based on Handling Qualitative Data: A Practical Guide, by Richards, 2002.

the areas where data is collected should also be precisely recorded (with GPS coordinates) and, if possible, added to the geographic database used for the NAP.

Furthermore, with the oral consent of respondents, field researchers should write down the name, gender, occupation, and contact details of the respondents. This can help to keep track of the respondents interviewed and as input to periodic verifications (e.g. to check that the appropriate ratio of interviewed female to male miners is achieved). It can also help the researchers to contact the respective respondents to ask follow-up questions in light of new findings, or to ask for contact details of new respondents that can be approached in the field study. At all times, the researchers must ensure that the anonymity of the respondents is protected, and should not share these details in documents or with persons outside of the research team, unless explicit consent for this is given.

Step 2. Familiarization with the data

While collecting data in the field, the researchers should already familiarize themselves with the data. During or directly after data collection, when the data is still fresh in their minds, they should summarize the interviews and group discussions. While summarizing, the researchers need to find a balance between maintaining the richness of the data and the labour intensity of the process. Typically, an interview of 30 minutes can be summarized in approximately 500 words (about 1 page). The researchers can also choose to provide more details on the information that is particularly interesting and add something new to the dataset.

When reading back their notes, the researchers can assess the quality of the data by asking themselves questions like: (i) Does it provide useful information? (ii) Does it add something new? and (iii) Does it respond to the research questions? Based on these types of questions, the researchers can write personal memos about the data collection process. Personal memos can be understood as personal diaries that individual researchers maintain. They can be used to trace their thoughts and observations throughout the research. The purpose of this can be methodological or analytical. For methodological purposes, they can steer the sampling

of new respondents and collection methods used. For example, a common thought, written in a personal memo, may be that children have not been reported to be involved in the amalgamation process. The researchers may then decide that it might be useful to interview children's parents, or to conduct more observations in gold shops where the amalgamation may take place, to verify if children are indeed not involved in this process.

For analytical purposes, personal memos can facilitate the answering of research questions and relating concepts to each other. For example, regarding children's involvement in the amalgamation process, personal memos can be used to note how children's participation in economic activities, such as ASGM and agriculture, are viewed from local cultural norms. They can also note how these norms might inform appropriate measures to reduce children's involvement in mercury amalgamation in an effective manner. Finally, personal memos can have a reflective nature, helping the researchers to look at their own behaviour and attitudes in the field study and how it affects the data collected. For example, how does the researcher's presence as an observer in gold shops affect the way in which mercury amalgamation is undertaken, and who is involved in this?

Ideally, the researchers continue to familiarize themselves with the data throughout the research process so that it is possible to trace the process and the decisions that were made in it. This can help to improve data transparency and validity by leaving behind a trail of evidence (see Section 7 for more details about validity).

Step 3. Breaking up the data into smaller pieces

Continuing the data familiarization process, researchers can break up the data into smaller pieces through the process of coding. Coding can be understood as an analytical process in which data is categorized under different labels or themes ("codes") to facilitate analysis. The goal is not to reduce or simplify data, but rather to organize data in a system of categorization that enables the researchers to systematically collect, revisit, and make sense of the data. Coding facilitates the process

of comparing data, establishing relationships between categories or concepts of the research, and finding patterns in the data.

It is important to note the difference between “inductive” and “deductive” coding. In inductive coding, codes emerge from field notes and are used to identify themes or develop theories. In deductive coding, codes are established prior to starting the analysis. This may be based on previous research, the research topics and

subtopics, or the researchers’ own experience. In the ASGM field research, researchers should make use of both inductive and deductive coding. This means that the data will initially be categorized according to the research topics and sub-topics (deductive coding), but the researchers should maintain an open mind and add emerging categories based on this raw data (inductive coding). Box 9 below contains a list of possible deductive codes that are based on the research topics presented in Section 2.³⁰

Box 9. Possible deductive codes for socio-economic and health aspects of ASGM

- History of gold mining in the area
- Organization and decision-making
- Social mobility in ASGM
- Local governance
- Gold trade
- Trade relations
- Pricing of gold
- Benefit sharing
- Income of miners
- Involvement of customary authorities
- Licenses
- Fees and taxes
- Capacity and role of provincial mining offices
- Barriers to formalization
- Capacity and role of provincial environment offices
- Industrial mining companies
- Mercury use, knowledge, and perceptions
- Mercury trade
- Motivations to engage in gold mining
- Relevant local cultural norms
- Trends in gold production
- Main local economic activities
- Income and challenges farmers
- Access to viable alternative livelihoods
- Use of revenues earned in ASGM
- ASGM and local development
- Local cost of living
- Profiles of women involved in ASGM
- Role of women and exposure to hazards
- Income women
- Gender disparities
- Women’s access to assets (e.g. land, tools, capital, mining groups, markets)
- Women’s future ambitions
- Women’s opportunities
- Role and future ambitions of youth
- Role of children and exposure to hazards
- Motives and alternatives for children
- Access to assistance
- Access to education
- Access to finance
- Access to health services
- General health concerns in ASGM communities
- Health impacts stemming from ASGM
- Capacity of local health clinics

³⁰ The possible deductive codes listed in Box 9 are purely qualitative. They are based on some of the subtopics in Table 1. It is important to note that the subtopics listed in Table 1 that are more quantitative in nature (e.g. cost of living, GDP per capita) do not need to be coded.

Data analysis (and therefore coding) is an iterative process, where researchers move from the field notes (Step 1) to research questions and abstract concepts (Step 2), and from the latter back to the former again. The researchers should therefore collectively reflect upon their codes at the end of each day of research before they collect new data the next day. They should go back and forth between considering the identified codes, gathering

more raw data, and adjusting and developing new codes. This iterative approach will enable the researchers to sample new respondents (as part of snowball sampling as discussed in Section 4.3 above) or adapt data collection methods in light of preliminary findings. The coding process and its iterative nature are illustrated in Box 10 below.

Box 10. Coding field data: An example from Sierra Leone with a research focus on socio-economic aspects in the ASGM sector

After an intensive day of conducting semi-structured interviews, group discussions, and observations, researchers from Sierra Leone’s Environmental Protection Agency and UNITAR start coding the data they gathered and summarized that day. They listened to the interviews they had recorded, while consulting their notes and reliving certain parts of the interviews and group discussions mentally. During this exercise, they discussed themes that came across

in the field and connected raw data to the abstract concepts that guided their research through coding. They used the deductive codes from Box 9 above to categorize the information, and also to identify several inductive codes. The summarized data for an interview conducted with an ASGM community in Bo district is presented below. In the box on the right side, deductive and inductive codes are attached to the summarized data.

Summarized data from an ASGM community in Bo district

- They do not use mercury, because they extract alluvial gold that is already liberated. They are not aware of the dangers of mercury and do not know much about it.
- They used to work individually before. Now they are organized in a group of seven miners led by one pit boss. The benefit of this is that they can produce more, and that if one group member is sick, the others can replace him and can support the person who is sick. They are still in the process of starting up and evolving as a group.
- They basically work on their own as a group, but sometimes they meet with the other groups.
- They are in the process of forming a larger group with the other groups of miners at the site; they have already elected a chairman.
- Membership to the group is by social contact from people’s social circles.

What is this about?

- Mercury use, knowledge, and perceptions (ded.)
- Organization and decision-making (ded.)

Box 10. Coding field data: An example from Sierra Leone with a research focus on socio-economic aspects in the ASGM sector (cont.)

Summarized data from an ASGM community in Bo district

- Inviting someone to the group depends on trust. Namely, they have to pay back the money to the “supporter” who pre-finances the group’s work (e.g. by providing shovels and water pumps) and buys their gold in return, which requires trust in the group.
- They receive credit from the supporter. They pay in kind: they pay back the supporter in the gold that they have to sell to him. They don’t have a permanent supporter; it may change. A supporter can support up to five groups.
- There are also women who support groups. These women are gold buyers, and according to these miners, they are good sales people.
- They pay taxes to the mines’ warden who comes once a month. In addition, they speak to the tribal authorities, who demand water fees (in return for the water from the land of the community that they use for washing the ore). There is no development/service coming in return from these fees.
- They operate without licenses. They would like to have licenses if this would give them assistance. In addition, they would like to obtain licenses as it would give them authority and better power/ bargaining position.
- The money from mining is used for agriculture, school fees, and to sustain themselves further.
- They sell their gold to the supporter; the supporter sells it to the local dealer in town, who sells it to an external person that exports the gold to Liberia. Once the gold leaves the community, they do not know what happens with it.
- They employ female labour, not as extractors (because it is heavy work), but as transporters and panners. Pregnant women and children often come to the sites to sell food, but they do not engage in extraction or processing of gold.
- Women (who are not part of the group) are paid 15,000 SSL in comparison to men who are also not part of the group, but earn 20,000 SSL because of the unequal physical effort. Alternative arrangement: women are paid in gravel.
- The boss earns a little bit more than the other team members.

What is this about?

- Cultural norms (ded.)
- Trade relations (ded.)
- Position of women (ded.)
- Taxes and fees (ded.)
- Customary taxes (ind.)
- Licenses (ded.)
- Local development (ded.)
- Gold trade (ded.)
- Role of women (ded.)
- Role of children (ded.)
- Gender disparities (ind.)
- Benefit sharing (ded.)

The example above presents one approach to coding. As illustrated, coding is a highly subjective process and some parts of the summarized data can refer to different codes at the same time. There is no right and wrong in coding. There are many approaches to coding and researchers are free to conduct it in a way that is most natural for them. However, it is important that researchers of the same team take a consistent approach to avoid confusion. This could be facilitated by holding a discussion among the researchers about what information would be interesting to obtain through the research questions and worth coding (which can also help to avoid developing too many codes), and what terminology and routines will be used in coding. This discussion in itself facilitates the analytical process.

Step 4. Putting the pieces together

After breaking up the data in different codes, the researchers should put the pieces of the data together again. They should start by comparing and relating the codes to each other to identify differences and similarities, which will help to relate the codes to the different categories of information. These categories will typically be the main socio-economic topics introduced in Table 1, but they can be amended in line with research priorities and findings. For example, when revisiting data and interpreting and comparing codes such as “trade relations”, “gold trade”, and “customary taxes”, the researchers can ask themselves “what topics are these codes addressing?” All of these codes relate to gold trade, so they can be related to the category “gold and mercury trade” (which is one of the nine topics listed in Table 1). However, “customary taxes” is also related to the category of “formality”.

It is therefore important to remember that the codes can be related to more than one category. At all times, the researchers should keep an open mind about how the codes’ relate to other issues of importance for the ASGM overview, such as youth employment and the relationship

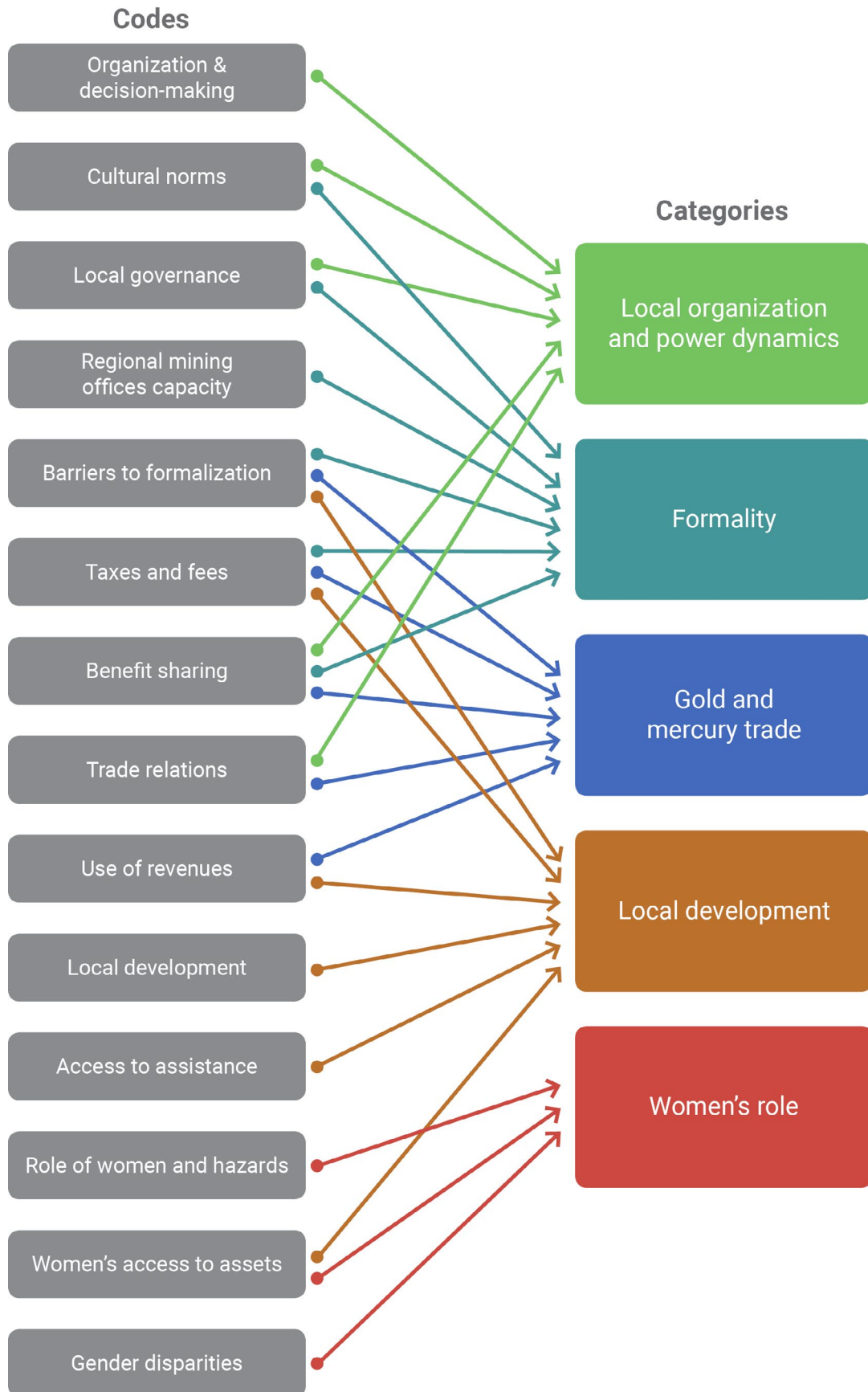
between ASM and LSM operations. Figure 6 below illustrates possible relationships between the codes listed in Box 9 and the various categories of information based on Table 1 (though many more relationships may be possible). Researchers should choose the method that feels the most natural to them and which best serves their research interests.

It is also important to regularly revisit and review the developed codes and categories, ask questions about them, and adjust them according to new research findings and progress in data analysis. Systematic and careful consideration of codes and categories can bring new insights and constitutes an important step in the process of interpretation: attaching meaning to data.

As mentioned earlier, data analysis can be undertaken in different ways and researchers can go far beyond these categories by considering important topics in the national context. While Table 1 can facilitate the development of categories during data analysis, it is important to recognise the value of developing new categories of information based on the data gathered (similar to inductive coding). For example, other relevant categories might include “youth employment” and “ASM-LSM relations”. Similarly, the researchers can consider splitting the suggested categories (based on the topics listed in Table 1) into more specific subcategories. For example, the category “gold and mercury trade” could be split into the subcategories of “gold trade”, “mercury trade”, and “benefit sharing”. The subcategory of “benefit sharing” could be related to codes such as “official fees and taxes” and “customary taxes”.

The processes of developing codes and categories is not only about organizing qualitative data, but constitutes an essential step in data analysis by revisiting and reviewing collected data and giving meaning to it through interpretation.

Figure 6. Putting the pieces together



Step 5. Building the big picture

After the various categories have been established (under Steps 3 and 4), the researchers can start comparing, contrasting, and relating experiences, drawing on the observations and the summarized, coded, and categorized data. The research team can do this in various ways, but ideally they should do it together (including team members that have not focused specifically on the socio-economic aspects). Using the codes and categories from Figure 6 above—presented below in quotation marks and brackets respectively—the researchers could discuss the following questions:

- How does the system of “benefit sharing” (gold and mercury trade), and in particular the levying of customary “taxes and fees” (gold and mercury trade), affect the “formalization” process of mining associations (local organization and power dynamics; formality) in community A? How is this different in community B?
- How does “mercury use, knowledge, and perceptions” (mercury use) affect the exposure of women and children to mercury (role of women; role of children)? How is this different for adult men?
- How does the system of “benefit sharing”, “income earned by miners”, and “use of revenues from ASGM” (gold and mercury trade; local development) affect other livelihoods such as agriculture and local shop holders, and the education of children and youth (local development)?

While conducting this exercise, the researchers need to continuously ask themselves: “is this information of interest for my research questions?” The next question researchers should ask themselves is: “why is this of interest for my research questions?” This adds a deeper layer to data analysis by focusing attention on the fundamental purposes and underlying assumptions for the ASGM overview.

For example, this can be applied to the questions: “How does the system of “benefit sharing” (trade), and in particular the levying of “customary taxes” (trade), affect the “formalization” process of mining associations (organization and formality) in community A? And how is this different in community B?” Considering the effects

of benefit sharing systems on formalization can help researchers to focus on the obstacles to formalization. For example, customary taxes often continue to be levied once miners are formalized, and as such, they would pay double taxes, which may discourage formalization. This should also lead to a focus on the significance of such obstacles for reducing mercury trade and ultimately mitigating related environmental and health impacts. These deliberations, which may be noted in personal memos and meeting reports as appropriate, can inform the structure of the research report, and ultimately support the development of the NAP and related policies.

The five steps discussed above cover the principal steps of the qualitative data analysis process, although it should be underscored once more that various steps and approaches are possible. Further information about qualitative data analysis can be found in Mason, J., 2002. *Making convincing arguments with qualitative data*, Sage Publications, and Richards, L, 2005. *Handling Qualitative Data: A Practical Guide* (see also the references listed below).

6.2 Data storage and analysis with computer-assisted qualitative data analysis software

In principle, qualitative data can be analyzed using simple software such as Excel, where the categories and codes can be organized and summarized data can be inserted. However, considering the intensity of this process and the wide scope of the field study, it is often easier to use computer-assisted qualitative data analysis software (CAQDAS), depending on the national circumstances. Some of the most commonly used software include QSR, NVivo, NUD*IST, Ethnograph, ATLAS, and Hypersoft. Such software can help researchers to organize, analyse, and find insights in unstructured or qualitative data collected through semi-structured interviews, open-ended survey responses, observations, group discussions, articles, and documents. The advantages of this software is that it is portable, time-saving, and provides an overview that

helps the researchers to see links between data that might otherwise not be observed. It also makes it easier to draw linkages between the reported research findings and the original evidence. Some of these software packages can also be used in teams, such as “Nvivo for Teams”.

6.3 Reporting and diffusing data

(Baseline Estimates Toolkit: Page 165)

After undertaking the data analysis process, the coded and categorized data should be summarized and stored in a Research Report by the researchers at the national level. This report could integrate the National Scoping Report (see Section 3) and National Research Plan (see Section 4). Building on these, the Research Report should classify all data per research topic, using the summaries of the interviews, group discussions, and observations, and personal memos, codes, and categories from the data analysis process. It could also contain illustrative quotes of important findings, which can also be used in the final NAP. Based on a discussion of the results and comparisons with the information gathered in the national sector scoping, the Research Report should answer the research questions of the field study (see Table 1), provide recommendations for the NAP, and highlight topics that need to be further investigated to inform the NAP’s implementation. Finally, the Research Report could include annexes that provide more detailed information for each province or for each ASGM community visited

in the field study. A suggested table of contents for the Research Report is presented in Annex 2.

A first draft of the Research Report should be shared among relevant national stakeholders for their review and input. Such stakeholders can include members of existing structures such as the Stakeholder Advisory Group and National Coordination Mechanism for the NAP project (see also the NAP Guidance for other stakeholders), and relevant international executing or implementing agencies. This consultation process can help to finalize the Research Report and ensure national ownership of the ASGM overview.

Once the Research Report is finalized, a national workshop could be held and the research team could present the data to relevant stakeholders. This provides an opportunity to give back to the ASGM communities, from which representatives may be invited to participate in the workshop. The workshop could further serve to jointly identify data gaps and limitations to the collected data, and to discuss topics and methodologies for future research (see Section 7). This can also help to identify concrete steps for periodically updating the ASGM overview as input to the Minamata Convention requirement to regularly review and report progress made under the implementation of the NAP (Article 7, 3.(c)). Finally, the workshop provides an opportunity to engage stakeholders in the continuous development of the NAP (as required under Annex C, 1.(g)), and may also provide inputs to the various strategies in the NAP (Annex C, 1.(e-k)).

7. Identify limitations and plan future research



7. Identify limitations and plan future research³¹

Notwithstanding the many advantages that qualitative research methods present, it is important to recognize that they also have their limitations, particularly in multicultural societies where people have different ideas of how others perceive reality and can easily misinterpret each other's communication. Indeed, there are many scholars that claim that quantitative research is a more rigorous approach than qualitative research.³² Generally, qualitative research methods are considered to be more subjective, less representative, and less reliable compared to quantitative research methods. First, the number of individuals studied is small and often not randomly selected, which makes it more difficult to generalize them to the wider population with scientific certainty. Second, since respondents are often selected based on the judgements of researchers, local authorities, or other respondents under the study (through snowball-sampling described in Section 4), it is difficult to replicate the sample. Third, the research methodology outlined in this document involves interpretative judgments of a number of researchers, who may arrive at different interpretations.

While the ASGM overview does not need to be a scientifically rigorous study, the national researchers should at least acknowledge these limitations when drawing conclusions, and take appropriate measures to address them. This means that the research should, to the extent feasible, be carried out in a critical way, and that the researchers should identify and address misinterpretations and biases that arise from different sources. They should also take measures to address and assess the validity of research findings. Validity refers to the "approximate truth of an inference" or a judgment about the extent to which empirical data and consistency with relevant theories support an argument.³³ Box 11 below illustrates in theoretical and practical terms respectively what measures researchers can take to improve validity.

³¹ Not covered in the Baseline Estimates Toolkit.

³² Sumner & Tribe, 2004: 7

³³ Shadish, Cook & Campbell, 2002.

The limitations of qualitative research methods can also be partly mitigated when they are used in combination with quantitative research methods. Indeed, the academic world has recognised that the strengths of one approach potentially complement the weaknesses of the other, and vice versa.³⁴ Therefore, just as the largely qualitative socio-economic data can be used to triangulate the largely quantitative data for the baseline estimates, the quantitative data from the baseline estimates could be used to shed further light on interpreting the qualitative socio-economic data.³⁵

Finally, after describing the ASGM overview's limitations, the research team and the national executing agency should identify concrete steps for periodically updating the ASGM overview in order to demonstrate progress made in mercury reduction. This should include an identification of research topics that require further attention, as well as suitable methods (e.g. quantitative or qualitative) that could be used to obtain the required information. This is an important point to consider for all aspects of the ASGM overview, especially in light of the sector's dynamic, rapidly changing nature.

³⁴ Bryman, 2004.

³⁵ As mentioned in Section 1, estimations of the ASGM workforce, annual gold production, and the annual export value of gold produced in ASGM can facilitate the understanding of socio-economic situation of the ASGM sector at the macro level. This information can be collected with the use of the Baseline Estimates Toolkit.

Box 11. Improving validity

Actions to improve validity in qualitative field research

- **Reflect as a team:** The researchers can assess their individual framing of meaning, including the limitations of biased perceptions, by jointly reflecting upon and discussing their interpretations of the same data with other researchers.
- **Spend adequate time in the field:** This will enable a more extensive understanding of the context, which can help to better understand the nature of causal relations and to rule out alternative explanations.
- **Search for discrepant evidence:** This can be achieved by looking for cases that disconfirm the expected or interpreted relations.
- **Triangulate data:** Using multiple methods and multiple sources will help to acquire various points of view, which can expose inconsistencies.

Examples of actions to improve validity

- **Reflect as a team:** After a day of interviewing respondents, the researchers can sit together to

discuss their interpretations of the data to identify any discrepancies in their perceptions. If this is the case, they can discuss where these discrepancies may come from and what other data sources or methods would be necessary to verify the validity of these interpretations.

- **Search for discrepant evidence:** For example, if researchers learn during the national sector scoping that children may be involved in the burning of mercury-gold amalgams, they can further investigate the amalgamation process to verify if there are cases where children are in fact involved.
- **Triangulate data:** For example, if semi-structured interviews with miners at the mine-sites point out that children are not involved in the burning of mercury-gold amalgams, the researchers can verify this by complementing the semi-structured interviews with observations and group discussions (multiple methods). They can also decide to further triangulate the data through interviewing other groups of respondents, such as children's parents and children themselves (multiple sources).

References

- Blackmore, C. and Ison, R. 1998. "Boundaries for Thinking and Action", in: Thomas, A. Chataway, J. and Wuyts M. (eds.) *Finding Out Fast: Investigative Skills for Policy and Development*, London, SAGE Publications, 26-50.
- Bryman, A. 2004. "Combining Quantitative and Qualitative Research" in: Bryman, A. *Social Research Methods* (2nd edition). Oxford, Oxford University Press, 451-465.
- Chambers, R. 1994. Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm. *World Development*, 22(10), 1437-1454.
- Clifford, M. J., 2010. Potential Repercussions of a Mercury Ban on the Artisanal and Small-Scale Gold-Mining Sector: A Viewpoint. *International Journal of Environment and Pollution*, 41(3-4): 229-41.
- De Haan, J.S. & Geenen, S. 2016. Mining cooperatives in Eastern DRC. The interplay between historical power relations and formal institutions, *Extractive Industries and Society* 3(3): 823-831.
- Eftimie, Adriana; Heller, Katherine; Strongman, John; Hinton, Jennifer; Lahiri-Dutt, Kuntala; Mutemeri, Nellie. 2012. *Gender Dimensions of Artisanal and Small-Scale Mining: A Rapid Assessment Toolkit*. World Bank, Washington D.C. <https://openknowledge.worldbank.org/handle/10986/2731>
- Fritz, M. M. C., Maxson, P. A. and Baumgartner, R. J., 2016. The Mercury Supply Chain, Stakeholders and Their Responsibilities in the Quest for Mercury-Free Gold." *Resources Policy*, 50 (December): 177-92. <https://doi.org/10.1016/j.resourpol.2016.07.007>.
- Global Initiative Against Transnational Organized Crime & Levin Sources, 2017. *Follow the Money: A handbook for identifying financial flows linked to Artisanal and Small-Scale Gold Mining*. <http://www.levinsources.com/publications/follow-the-money-financial-flows-linked-to-artisanal-and-small-scale-gold-mining-in-sierra-leone>
- Hilson, Gavin, and James McQuilken. 2014. Four Decades of Support for Artisanal and Small-Scale Mining in Sub-Saharan Africa: A Critical Review. *The Extractive Industries and Society*, 1 (1): 104-18.
- Mason, J. 2002. *Making convincing arguments with qualitative data*. Sage Publications.
- Maxwell, J. A. 2005. "Validity: How might you be wrong?" in: Maxwell, J. A. (ed.) *Qualitative Research Design: An Interactive Approach*, London, SAGE Publications, 105-116.
- National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979. *The Belmont Report. Ethical Principles and Guidelines for the Protection of Human Subjects of Research*. Washington, DC: National Institutes of Health, 1979. <https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html>
- Natural Resources Defense Council, 2016. *NRDC Checklist of Legal Authorities to Implement the Minamata Convention on Mercury*. <https://www.nrdc.org/resources/nrdc-checklist-legal-authorities-implement-minamata-convention-mercury>
- OECD, 2013. *OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Second Edition*, OECD Publishing. <http://dx.doi.org/10.1787/9789264185050-en>

Richards, L. 2005. "Handling Qualitative Data: A Practical Guide". Chapter 5: Coding, pp. 85-103. London: Sage Publications.

Rwegoshora, H. M. M., 2014. "A guide to social science research", Second edition, Mkuki na Nyota Publishers Ltd, Dar es Salaam, Tanzania.

Schwandt, T. 2000. "Three Epistemological Stances for Qualitative Inquiry" in: Denzinn, N. and Lincoln, Y. (eds.) Handbook of Qualitative Research, London, SAGE Publications, 189-213.

Shadish, W. R., Cook, T. D., & Campbell, D. T., 2002. Statistical conclusion validity and internal validity. Experimental and quasi-experimental designs for generalized causal inference, 45-48.

Stylo, M. S., De Haan, J. S. and Davis, K., forthcoming. Collecting, managing and translating data into National Action Plans for Artisanal and Small Scale Gold Mining. Manuscript submitted for publication with The Extractive Industries and Society.

Sumner, A. and Tribe, M. 2004. The Nature of Epistemology and Methodology in Development Studies: What do we mean by rigour?, London, Paper prepared for: The Nature of Development Studies, DSA Annual Conference, Bridging research and policy, Church House, 01-27.

Tripathy, P., & Tripathy, P. K. 2015. Fundamentals of Research: Dissective View. diplom. de.

UNDP, 2017. Minamata Initial Assessment Suggested Structure and Contents. http://www.undp.org/content/undp/en/home/librarypage/environment-energy/chemicals_management/undp-minamata-initial-assessment-guidance-.html

UNITAR & UN Environment, 2018. Handbook for Developing National ASGM Formalization Strategies within National Action Plans. UNITAR & UN Environment, Geneva. <http://www.unitar.org/cwm/portfolio-projects/artisanal-and-small-scale-gold-mining-asgm>

UN Environment, 2018. Guidance document. Developing a National Action Plan to Reduce, and Where Feasible, Eliminate Mercury Use in Artisanal and Small Scale Gold Mining. https://wedocs.unep.org/bitstream/handle/20.500.11822/25473/NAP_guidance2018_EN.pdf?sequence=1&isAllowed=y

UN Environment, Global Mercury Partnership, Artisanal Gold Council, UNIDO, University of Victoria and International Union of Geosciences Commission on geosciences for Environmental Management, 2012. A Practical Guide. Reducing mercury use in Artisanal and Small-scale Gold mining. https://www.unido.org/sites/default/files/files/2017-11/ASGM_English%20%281%29.pdf

Verbrugge, B., and Besmanos, B., 2016. Formalizing Artisanal and Small-Scale Mining: Whither the Workforce? Resources Policy 47 (C): 134–41.



Annexes



Annex 1: Key questions for the national sector scoping

The questions below address the basic information that could be collected in the national sector scoping, as a preparation for the ASGM field study.³⁶ The questions are meant to be used for interviews with key informants, and should be complemented with demographic information required for the socio-economic aspects of the ASGM overview as listed in Table 1. Some of the questions can be addressed through the information that is already available in the literature review and policy, regulatory, and institutional capacity assessment. The questions that remain unanswered or unclear should be highlighted in the National Scoping Report and further investigated in the field study.

General questions for key informants:

- **Could you tell us about the history of ASGM in this country?**
- **How many people are estimated to be involved in ASGM production and trade?**
 - How has this changed over the years? Why?
 - In which districts does most of the ASGM activity take place?
 - How are ASGM miners and traders organized?
 - Do you know how many women are involved in ASGM activity?
 - Do you know how many children are involved in ASGM activity?
 - Have any mining entities have been established? How many?
 - How many mining licenses have been granted?
 - How much land has been allocated for ASGM activity?
- **How much gold is exported annually?**
 - How do you think this compares to actual gold production and trade?
 - What is the average, or range, of the purity of gold produced in this country?
 - At what price is it exported?
- **How important is the ASGM sector in your country?**
 - How does the ASGM sector contribute to employment generation and local development?
 - How does the ASGM sector relate to other local economic activities, such as agriculture?
 - What are other positive impacts?
- **What are negative impacts from the ASGM sector?**
 - What are the reported or observed health impacts?
 - What are the reported or observed environmental impacts?
 - What are the negative social and economic impacts?
- **How would you describe the relationship between ASGM miners and industrial mining companies?**
- **Is there a national vision or strategy towards ASGM or ASM in general that guides its governance?**
 - How do you think the sector will evolve in the next 5-10 years?
 - What are some challenges in governing the sector?
 - What are any recent changes in policy, and what changes can soon be expected?

³⁶ This list of questions is not exhaustive and should be used in combination with other guidelines, such as the NAP Guidance (pages 23- 24).

- **What are the past and ongoing initiatives to engage ASGM miners and traders?**
- **What types of assistance have been delivered to ASGM miners and traders?**
- **What types of studies have been conducted about the sector so far?**
 - What are the knowledge gaps?
- **Can you describe the current process of becoming formalized as a gold miner or trader?**
 - What are the requirements?
 - What are the costs?
 - What are the incentives to become formalized as an ASGM miner or trader?

Annex 2: Suggested table of contents for the National Scoping Report, National Research Plan, and National Research Report

A) National Scoping Report

1. Research topics

Description of the chosen research questions and subtopics (amended to reflect the national situation)

2. National scoping of information

- a. Description of the procedure and data sources used
- b. Policy, regulatory, and institutional capacity assessment [Summary of the assessment's key findings]
- c. Literature review [Summaries of each research topic]
- d. Interviews with key informants [Summaries of each research topic]
- e. Analysis of data gaps and subsequent directions for the field study

B) National Research Plan

3. Research approach

- a. Description of the general research methodology used (i.e. qualitative and/or quantitative methods)
- b. Description of the approach used in data collection (e.g. Participatory Research Methods, or other approaches)

4. Sampling method

- a. Description of criteria used for province and community selection
- b. List of the selected provinces, communities, and nearby ASGM sites
- c. List of the selected groups of respondents
- d. Final sample size (in terms of communities and respondents, disaggregated by sex)

5. Data collection process

- a. Description of the procedures used for data collection at different levels
- b. Ethical considerations that were included in this approach, including obtaining informed consent
- c. Description of the use of data collection tools (e.g. semi-structured interviews, group discussions, observations)

6. Data analysis, storage, and reporting

- a. Brief description of the steps of the data analysis and data storage process used (including the coding process used)
- b. Brief description of the computer-based qualitative data analysis tools used (if applicable)
- c. Description of the reporting and (potential) stakeholder engagement process

C) National Research Report

7. Previous experiences in addressing ASGM

8. Summary of results

Extensive discussion of results, drawing links with the national sector scoping. Depending on the selected topics in the ASGM overview (including all key aspects), this could include:³⁷

³⁷ This list includes topics that are not extensively discussed in this methodology, in particular: ii) Size and geographical distribution of the ASGM sector; vi) Mining and processing information; vii) Baseline estimates of mercury use; and xi) Environmental information. Guidance on what could be summarized under those topics is presented in the UN Environment NAP template (<http://web.unep.org/globalmercurypartnership/template-nap>).

- i) Demographic information
- ii) Size and geographical distribution of the ASGM sector
- iii) Local organization and power dynamics
- iv) Gold and mercury trade
- v) Formality
- vi) Mining and processing information
- vii) Baseline estimates of mercury use
- viii) Local development
- ix) Women's role
- x) Children's role
- xi) Environmental information
- xii) Health information

9. Concluding remarks and recommendations for the NAP

Summary of key findings and concrete recommendations regarding the objectives, targets, and strategies of the NAP

10. Limitations and directions for future research

- a. Description of the limitations of the chosen research approach, methods, and sampling frame, and a reflection on the generalizability of findings
- b. Outline of the research topics that need further research, and identification of possible appropriate steps to realize this

11. References

Annex 1

Forms used for interviews, group discussions, and observations

Annex 3: Annotated bibliography for the literature review

Theme	Reference	Scope
Mercury	Minamata Convention on Mercury	The Minamata Convention on Mercury is a global treaty to protect human health and the environment from the adverse effects of mercury. It was agreed at the fifth session of the Intergovernmental Negotiating Committee on mercury in Geneva, Switzerland at 7 a.m. on the morning of Saturday, 19 January 2013 and adopted later that year on 10 October 2013 at a Diplomatic Conference (Conference of Plenipotentiaries), held in Kumamoto, Japan.
	2013 Global Mercury Assessment	This provides UNEP's global assessment of sources of mercury, emissions to the atmosphere, releases to water and land, and environmental transport of mercury. It is an overall summary report for policymakers based on a technical background report. The report also presents the latest information on atmospheric and aquatic chemistry, fate, and transport, and highlights major gaps in knowledge.
	MercuryWatch	Mercury Watch is an interactive monitoring system for global mercury use in the ASGM sector. It maps and illustrates mercury use estimates in artisanal mining globally, while providing information on mercury and ASGM related projects around the world. The database is based on the most recent mercury estimate as reported in the Technical Background Report for the Global Mercury Assessment (AMAP/UNEP, 2013) and builds on those estimates using updated data from researchers and other actors involved in the sector. Mercury Watch is maintained by the Artisanal Gold Council
	Technical Background Report for the Global Mercury Assessment	This report contains detailed studies that have been used for the 2013 Global Mercury Assessment described above, and can be useful for a deeper understanding of the assessment.
	Visualization of Global Mercury Emissions by Country and Sector	This visualization produced by UNEP shows estimates of anthropogenic mercury emissions by country, region, and industry sector. The data is from 2010, based on the 2013 UNEP Global Mercury Assessment.
	US Geological Survey	The US Geological Survey provides global data and tools for the environment. The section on mercury includes a large collection of publications on various aspects of mercury. Although most of the data comes from the US, it includes many publications that are also relevant for MIA development as it provides deeper insights, for example, regarding cement production and gold mining.
	UN Comtrade	UN Comtrade is a repository of official international trade statistics and relevant analytical tables. It provides free access to detailed global trade data, and insightful visualizations of these data, including trade in mercury and mercury-added products such as batteries.

Theme	Reference	Scope
Health	UNEP & WHO, 2008. Guidance for identifying populations at risk from mercury exposure. UNEP DTIE Chemicals Branch and WHO Department of Food Safety, Zoonoses and Foodborne Diseases, 2008	<p>This guidance is intended to inform countries concerned about the potential health impacts of mercury pollution and, if necessary, to assist in identifying specific subpopulations that may be at risk. The document describes approaches that have been used to estimate exposure to mercury, including biomonitoring and methods that use data on fish consumption and mercury levels in fish. It also describes various environmental models that can be useful in predicting exposure to mercury.</p>
	World Health Organization. Technical paper #1: Environmental and occupational health hazards association with artisanal and small-scale gold mining	<p>This document is part of a WHO technical series on ASGM and health developed in response to World Health Assembly Resolution 67.11. It seeks to inform public health ministries of the roles that they can play in supporting the implementation of ASGM-related provisions of the Minamata Convention on Mercury, and pays particular attention to training healthcare providers.</p>
	Richard, M., Moher, P., and Telmer, K. 2014. Health Issues in Artisanal and Small-Scale Gold Mining: Training for health professionals, (Version 1.0), Artisanal Gold Council. Victoria, BC.	<p>This document guided the training of health practitioners on certain health risks that are common in the ASGM sector.</p>
	Gibb, H. & Keri Grace O’Leary, K. G. 2014. Mercury Exposure and Health Impacts among Individuals in the Artisanal and Small-Scale Gold Mining Community: A Comprehensive Review. Environmental Health Perspectives, volume 122, number 7, July 2014	<p>This paper provides an evaluation of the academic literature between 1990 and 2012 regarding the health effects of mercury among those working and/or living in or near ASGM communities. Studies reporting health assessments, kidney dysfunction, neurological disorders and symptoms, and immunotoxicity/ autoimmune dysfunction in individuals living in or near an ASGM community were identified.</p>
Legal/ institutional review	NRDC, Guide to Checklist of Minamata Convention on Mercury Obligations Which May Require New Legal Authority	<p>This guide provides a simplified list of legal authorities needed to comply with the Minamata Convention, and brief accompanying explanations. It is intended to facilitate Minamata Convention legal capacity assessments, including those performed as part of MIAs. The guide should be used in conjunction with the Convention text and related materials addressing Convention obligations such as UNDP’s Minamata Initial Assessment Report – Suggested Structure and Contents (pages 10-17) and the NAP guidance (page 40).</p>

Theme	Reference	Scope
ASGM	UNITAR & UN Environment, 2018. Handbook for Developing National ASGM Formalization Strategies within National Action Plans. UNITAR & UN Environment, Geneva	The Formalization Handbook provides step-by-step guidance for developing a national ASGM formalization strategy. It outlines key concepts, best practices, and a human rights-based approach. The various issues and approaches are illustrated with case studies from developing countries.
	The Global Initiative Against Transnational Organized Crime & Levin Sources, 2017. Follow the Money: A handbook for identifying financial flows linked to Artisanal and Small-Scale Gold Mining	This handbook provides detailed guidance for investigating ASGM value chains and in particular the identification of financial flows. It can be used to complement UNITAR's Methodology for a Qualitative Socio-economic ASGM Study.
	Eftimie, A.; Heller, K.; Strongman, J.; Hinton, J.; Lahiri-Dutt, K.; Mutemeri, N., 2012. Gender Dimensions of Artisanal and Small-Scale Mining: A Rapid Assessment Toolkit (World Bank)	This assessment toolkit provides detailed guidance for investigating the role of women in ASM, and can be used as an important complementary tool to UNITAR's Methodology for a Qualitative Socio-economic ASGM Study.
	Noetstaller, Richard, et al. 2005. Toolkit for Implementing of Artisanal Small-scale Mining Baseline Surveys in Africa.	This toolkit provides general guidelines for conducting baseline surveys in ASM communities.
	UNEP, 2012. Analysis of formalization approaches in the artisanal and small-scale gold mining sector based on experiences in Ecuador, Mongolia, Peru, Tanzania and Uganda	This analysis document was developed for policymakers and other interested stakeholders on formalization of the ASGM sector. It is based on an analysis of case studies developed by international experts for Ecuador, Peru, Tanzania, Uganda, and Mongolia and also draws upon examples from other countries.
	AGC UNEP. A practical guide: Reducing Mercury Use in Artisanal and Small-scale Gold Mining	This practical guide, produced by the Artisanal Gold Council with assistance from UNEP and UNIDO, provides a solution-based approach to managing mercury. Using simple language and descriptive illustrations, it introduces good practices for reducing mercury use, and presents several mercury-free gold processing methods.
	UN Environment, 2018. Guidance document. Developing a National Action Plan to Reduce, and Where Feasible, Eliminate Mercury Use in Artisanal and Small Scale Gold Mining.	This document provides guidance to countries to develop NAPs that are compliant with the requirements of the Minamata Convention. It provides technical, legal, and policy information on issues related to ASGM, which can be useful when preparing and implementing the NAP.
	OECD, 2013. OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Second Edition, OECD Publishing	This guidance document on due diligence includes a supplement on gold. There are measures in the appendix to protect vulnerable groups from adverse consequences of formalization. Only formalized ASM enterprises are required to carry out due diligence responsibilities. All artisanal miners are encouraged to formalize.
	Stylo, M. S., De Haan, J. S. and Davis, K., forthcoming. Collecting, managing and translating data into National Action Plans for Artisanal and Small Scale Gold Mining. Manuscript submitted for publication with The Extractive Industries and Society	This article reviews the progress that various NAP-executing agencies are making in developing ASGM overviews. It discusses challenges, opportunities, and best practices, and shares preliminary trends that are observed in ASGM overviews. It includes a case study based on the ASGM overview developed by EPA in Sierra Leone with the assistance of UNITAR.

Theme	Reference	Scope
ASGM	Maconachie, R., & Hilson, G. 2011. Safeguarding livelihoods or exacerbating poverty? Artisanal mining and formalization in West Africa. In <i>Natural Resources Forum</i> (Vol. 35, No. 4, pp. 293-303). Blackwell Publishing Ltd.	This article draws upon empirical data collected in Sierra Leone. By analyzing different livelihood strategies that are used in Sierra Leone, it underscores the potential of the ASGM sector to reduce unemployment among youth, and illustrates its proven potential to empower women who play a special role in Sierra Leone's ASGM sector.
	Hilson, G., Hilson, C. J. & Pardie, S., 2006. Improving awareness of mercury pollution in small-scale gold mining communities: Challenges and ways forward in rural Ghana. <i>Environmental Research</i> 103 (2007) 275–287.	This paper examines the approach taken by the Government of Ghana to address awareness raising and manage mercury pollution in the ASGM sector. It outlines the importance of careful analysis of mine community dynamics, the organization of activities, operators' needs, and local geological conditions. It concludes by providing guidelines and best practices for addressing the mercury problem in ASGM.
	Davies, G., 2014. A toxic free future: is there a role for alternatives to mercury in small-scale gold mining? <i>Futures</i> 62, 113–119.	This article examines alternatives to mercury in the ASGM sector, and questions the feasibility of alternatives. It presents case studies of three countries in sub-Saharan Africa (Mozambique, Ghana, and Tanzania), arguing that there is a place for mercury-free technologies in these countries and potential for extending these across the developing world, but that it is not yet so evident.
	Garcia, O., Veiga, M.M., Cordy, P., Suescún, O.E., Molina, J.M., Roeser, M., 2015. Artisanal goldmining in Antioquia, Colombia: a successful case of mercury reduction. <i>J.Clean. Prod.</i> 90, 244–252.	This article presents a successful case study from Colombia that shows how the integration of improved production techniques and education and engagement of stakeholders can successfully reduce mercury use in ASGM.
	Hilson, G., Pardie, S., 2006. Mercury: an agent of poverty in Ghana's small-scale goldmining sector? <i>Resour. Policy</i> 31, 106–116.	This case study from Ghana highlights the negative economic impact that mercury trade can have when it is not regulated in line with an in-depth understanding of the realities on the ground.
	Labonne, B., 1996. Artisanal mining: an economic stepping stone for women. <i>Nat. Resour. Forum</i> 20 (2), 117–122.	This article discusses ASM's potential to empower women economically.
	Dreschler, B., 2001. <i>Small-Scale Mining and Sustainable Development Within the SADC Region</i> . London, International Institute of Environment and Development (IIEC/World Business Council for Sustainable Development.	This paper analyses small-scale mining activities in six Southern African countries and investigates the role of women and children.
	Veiga, M. M., Angeloci-Santos, G. & Meech, J. A., 2014. Review of barriers to reduce mercury use in artisanal gold mining. <i>The Extractive Industries and Society</i> 1 (2014) 351–361	This article reviews the use of amalgamation in artisanal gold mining and the barriers to reducing mercury use and emissions from the sector. It brings to light the perceptions of different stakeholders, including governments, communities, academics, and the artisanal gold miners themselves, all of whom have impeded progress towards improved gold processing practices.

Annex 4: Guidelines for semi-structured interviews and group discussions

A. Guidelines for a semi-structured interview/group discussion with miners (diggers, processors, and transporters) – 1 hour

1. Background information

- For how long have you been mining gold?
- What motivates you to mine gold?
- What is your role in gold mining?
- What is the role of your family members in gold mining?

2. Organization

- How do you organize yourself as artisanal miners?
 - What structure does your mining group take? (E.g. association, cooperatives, committee, enterprise)
 - How many people do you work with?
 - How are decisions made?
 - Do you have opportunities to have influence in the decision-making your organization? Could you give an example of how this takes place?
- What is the role of local authorities in your work?

3. Mercury use

- Do you use mercury?
 - For what reasons do you use mercury?
- Are you aware of effects related to the use of mercury?
 - Could you outline any such effects?
 - Have you seen any such effects in your community?
- What measures are taken at your mine site to mitigate such negative effects or other health effects?
- How does the use of mercury affect your economic position?

4. Trade

- Could you explain and draw for me the structure of the domestic gold supply chain?
- Could you indicate/illustrate how the revenue is distributed among the stakeholders in the supply chain? (either in the local currency or in percentages)
 - How do you divide the revenue in your team?
 - What is your average monthly income?
 - What taxes do you pay, if any?
 - What services are delivered in return for these taxes?
- How do you buy mercury? Could you explain and/or draw for me the structure of the domestic gold supply chain?
- Could you explain your relationship and the agreements you make with traders?

5. Local development

- How do you spend your income earned from gold mining?
- How does your family benefit from gold mining?
- How does your community benefit from gold mining?
- Besides gold mining, do you do other things to earn a living?
- Does gold mining give you the opportunity to pursue other things that you would like to do in your life?

6. The role of women

- What is the role of women in gold mining at your site?
 - What kind of activities do they generally perform?
 - Are they in touch with mercury?
 - Are there differences between pregnant women, child-bearing women, and other women?

7. The role of children (for adults as well as for children)

- What is the role of children in gold mining at your site?
 - What kind of activities do they generally perform?
 - Are they/you in touch with mercury?
 - What alternatives do children/you have to mining?

8. Formalization and aspirations for the future

- How have recent changes in government policies and rules affected your life?
- How do you expect to see the artisanal gold mining sector change?
 - How would you like to see it change?
 - How can the government improve its rules and services?
- Are you interested to participate in the development of government policies?
- What are your ambitions for the future?

B. Guidelines for a semi-structured interview/group discussion with female miners (diggers, processors, and transporters) – 30-60 minutes

1. Background information

- Could you please tell us something about yourself, about your family situation, and where you are from?
- For how long have you been mining gold?
- What motivates you to engage in artisanal gold mining rather than other sectors?
 - What are advantages for you as a woman?
 - What challenges do you face?
 - What specific needs do you have as a female miner?
- Do you have a license?

2. Role

- What role do you have in mining?
 - (If applicable) How do you process the ore? Can you explain the process and the steps involved?
 - How are these roles affected by other roles and responsibilities in the household and in the community?
 - What role would you like to have in the future?

3. Potential of gold mining

- To what extent do you feel that artisanal gold mining provides women like yourself with opportunities to reduce poverty?
 - Can you give an example of how it has helped you?
 - Are there any women mining groups? Do women participate in decision-making groups?
 - Can you grow in the gold mining and trade, by taking on different roles (for example, moving from extraction or processing to transporting or selling gold)? Could you explain?
 - What obstacles hinder you from doing so?
 - Can you identify any opportunities to grow?
 - How do you see your role in protecting the health of miners in your community, e.g. with regards to mercury?

4. Gender equality

- What general challenges do you face in gold mining?
- Do you face any specific challenges as a woman?
 - Is it more difficult for you as a woman to be recognized as an artisanal miner? Can you explain?
 - Is there a difference between men and women in participating in decision-making at the mine site/ organization, for example, when selling gold?
 - Is there a difference between men and women in revenue sharing or when negotiating fair prices? Can you give an example?
 - Is it possible for you to have access to land?
 - Is it possible for you to have access to working materials and tools?
 - Is it possible for you to have access to finance?
 - Is it possible for you to have access to information and training?

Finally, what are your ambitions for the future?

C. Guidelines for a semi-structured interview/group discussion with traders (small and big traders) – 1 hour

1. Background information

- Can you tell us something about your history as a gold trader, and how you became a trader?
- What motivated you to enter into the gold business?
- What is the role of your family members in the gold business, if any?
- What different activities do you undertake as a gold trader?

- Are you also involved in processing gold?
- (If yes) What processing methods do you use?
- Do you know anything about mercury use?
- Do you have a license?

2. Organization and trade relations

- How do you organize yourself as gold traders?
 - Are you organized in any structure of traders such as associations or small groups?
 - Can you explain how you work together as a group?
 - Do you have fixed buyers you work with, or do you generally sell to anyone?
 - Where are they from?
 - Could you explain the relationship?
 - How are prices set?
 - Do you have space for negotiation?
 - Do you have fixed miners/smaller traders you buy from?
 - Where are they located?
 - Could you explain the relationship?
 - What kind of arrangements do you make with miners (e.g. pre-financing, supply of extraction or processing materials)?
 - How are prices set?
- Are there women involved in gold trade?
 - If yes: How many (in relation to men)?
 - If not: Why not?
 - What obstacle do women face in involving themselves in gold trade?
- What do you usually spend your money earned from gold trade on?
- Do you make any investments with the money earned in gold trade? Can you give an example?

3. Gold supply chain

- Could you explain and/or draw for me the routes of gold trade and the various people involved in supplying and selling gold?
- Could you explain or illustrate how the revenue is distributed among the stakeholders in the supply chain (in the local currency or in percentages)?
 - Do you divide the revenue with other traders? How?
 - Do you pay any official or unofficial taxes? Which ones?
 - What is your average monthly income?

4. Other trade

- Are you involved in trade other than gold trade? What goods or services?
- Do you also trade mercury?
 - If yes:
 - Could you explain where you get mercury from? How much does it cost?

- How are the mercury and gold prices related to each other?
- If no:
 - Do you know where mercury comes from and the persons involved?
 - What do you know about the relationship between gold and mercury trade?

5. Alternatives (if applicable)

- Do you think it would be feasible to stop or significantly reduce the mercury trade?
- How would a reduction of mercury trade affect you?
- What do you think could be alternatives or other better practices that miners can use to replace or reduce mercury use?

Finally, what are your ambitions for the future?

D. Guidelines for a semi-structured interview/group discussion with mining leaders (pit bosses, team leaders, and presidents of cooperatives or associations) – 1 hour

1. Background information

- Can you tell us something about your history in gold mining, and how you became a pit boss/group or association leader?
- What motivates you to work in gold mining?
- What different activities do you undertake in your work?
- What is the role of your family members in gold mining, if any?
- Do you have a license?

2. Mercury use

- How is the ore processed at your mine site/community?
 - Is mercury used? Are you involved in its trade or use?
- Are you aware of effects related to the use of mercury?
 - Could you describe any such effects?
- What measures are taken at your mine site(s) to mitigate such negative effects or other health effects?
 - Do you/does your community know of better practices or alternatives to the use of mercury? If so, which ones?
 - Would you be interested to promote better practices and/or techniques in your community? Any ideas on how to do this?

3. Organization

- Could you explain to me how you work together with your colleagues (e.g. how you divide tasks and responsibilities, how you sell as a group or individuals)?

- Could you explain to me the structure of your mining team/group (e.g. association, cooperative, committee)? How was this structure decided upon?
- How are decisions made? Are miners involved in this? How?
- Do you organize meetings and/or training sessions? What do you discuss?
- Do you deliver any other services to the miners?

4. Trade

- Could you explain and/or draw for me the routes of gold trade and the various people involved in supplying and selling gold?
- Could you explain or illustrate how the revenue is distributed among the stakeholders in the supply chain (in the local currency or in percentages)?
 - How do you divide the revenue in your team/group?
 - What is your average monthly income?
 - Do you pay any official or unofficial taxes? Which ones?
 - (If yes) What services are delivered in return for these taxes?
- How do you buy mercury? Could you explain and/or draw for me the structure of the domestic gold supply chain?

5. Local development

- What do you usually spend your revenues earned in gold mining on?
- Do you combine this activity with any other economic activities? What are the advantages of this?
- How does your team/group contribute to the development of the community?
- Are there any plans to contribute to development of the community?

6. Health aspects

- What is the general health status of your team/group?
- What happens if someone gets sick or wounded?
- What health challenges does the ASGM community faces?
- What opportunities exist to improve the health situation?

7. Women's role

- How do you see the role of women in your team/group?
- In which activities are they generally involved? Does this include mercury use?
- Are there differences between pregnant women, child-bearing women, and other women?
- Do they have the same opportunities as men? For instance, to grow in the miner organization/cooperative, or to become a trader?

8. Formalization and future aspirations

- How have recent government policies affected your team/group?

- How would you like to see the artisanal gold mining sector improve?
- Would you like to get a license?
 - Do you understand the process to get a license?
 - Are there any (other) obstacles that hinder you in obtaining a license?
- How do you see the future of your team/group?
 - What are your plans to grow as a business?
 - What obstacles need to be overcome?

E. Guidelines for a semi-structured interview/group discussion with community or chiefdom leaders (community leaders, landlords, customary chiefs, etc.) – 1 hour

1. Background information

- What are the various economic activities in your community/chiefdom?
- Are there primary and secondary schools in your community/chiefdom?
 - Are they accessible for everyone?
 - What are the education fees?
- Could you tell us about the history of gold mining in your community/chiefdom/land?
- How many people are practicing mining in your community/chiefdom/land?
 - How many of them possess licenses?
- What is your role regarding gold mining?

2. Local development

- How does artisanal gold mining impact development in your community/chiefdom/land?
- How is it related to other economic activities, such as agriculture?
- How is it related to education?
 - Is it possible for miners to combine their mining activities with education?
 - Is it possible to access more informal forms of education (e.g. participation in community meetings)?

3. Gold trade

- How is gold traded here? Where does it go?
- Do the miners pay taxes to the community/chiefdom? How much?
 - What are these taxes used for?
- Do miners receive any services from the community/chiefdom?

4. Mercury use and trade

- Do miners use mercury in gold mining in your community/chiefdom/land?
 - If yes:
 - Have there been concerns in the community/chiefdom about possible health or environmental effects from mercury?

- Have the miners or the community/chiefdom taken any measures to mitigate these negative effects?
- Does the community/chiefdom or miners know of better practices or alternatives to the use of mercury? If so, which ones?
- How does mercury enter your community/chiefdom?
- If no:
 - How do they process gold instead?

5. The role of women

- What is the role of women in gold mining in your community/chiefdom/land?
- Do women have the same opportunities as men in gold mining? Why (not)?
- What kind of activities do they generally perform? Does this include mercury use?
- What alternatives do women have to mining?

6. The role of children (questions for adults)

- What is the role of children in gold mining in your community/chiefdom/land?
- What kind of activities do they generally perform?
- What alternatives do children have to mining?
 - Are children of the community/chiefdom involved in other types of work?
- What are the children's revenues earned in gold mining used for?

7. Health and environmental impacts

- Have there been concerns in the community about possible health effects from gold mining? Could you describe such effects?
- Have there been concerns in the community about possible environmental effects from gold mining? Could you describe such effects?
- Could you think of any ways in which they can improve their practices?

8. Formalization and aspirations for the future

- How do you expect to see the artisanal gold mining sector transform?
- What issues need to be addressed in this transformation?

F. Guidelines for a semi-structured interview/group discussion with health workers (health experts or health care providers at the mining site level) – 1 hour

1. Health capacity

- How many healthcare facilities are there in this province/district/chiefdom?
- What is the average distance from the gold mining communities to the nearest healthcare facility?
- How many healthcare workers are there in this facility?
 - What is their level of education/training?

- For how many communities/people does this facility serve?
- What healthcare infrastructure do you have (e.g. how many delivery beds, what types of medicines, what types of tests, access to water)?
- What are challenges you are faced with as a healthcare officer/worker?
- What are the main healthcare services that the healthcare facility provides?

2. Community health

- Generally, what are the community's main health concerns?
- Are there any health concerns that come from gold mining in the community? What are they?
- Do you see a difference in the health complaints from miners, compared to other community members?
- Do miners often seek help from the healthcare facility?
- Generally, how do miners seek healthcare assistance? Who do they go to? Are there any boundaries (e.g. is it difficult for them to speak about it)? Could you explain the process?

3. Mercury use

- Do you know if mercury is used in this or nearby gold mining communities?
- Are you aware of the health effects of mercury?
 - Could you describe such effects?
- Are miners aware of the adverse health effects of mercury?
 - Are there miners seeking help for mercury-related health effects?
- Which communities (if any) are particularly affected by mercury?
- Have you observed any effects from mercury use? (If yes) What have you observed?

4. Vulnerable groups

- Who are the community's most vulnerable populations?

5. The role of women

- What are some of the main health complaints reported by women?
- What is the role of women in gold mining in the community?
- What kind of activities do they generally perform?
- Are they in touch with mercury? Are they affected by mercury differently than men?
- What alternatives do women have to mining?

6. The role of children

- What are some of the main health complaints reported by children?
- Do you know if children engage in gold mining in the community?
- What kind of activities do they generally perform?
- Are they in contact with mercury?
 - Have you seen any effects from this?
- What alternatives do children have to mining?

Annex 5: Observation forms

Researcher:

Date and time:

Email address:

Site location

Region	•	Closest community	•
Country/District	•	Latitude	•
Site name	•	Longitude	•
Contact details	•	GPS & datum	•

Community information

Estimated total population	•	Average income – male	•
Education facilities	•	Average income – female	•
Health facilities	•	Typical occupation – male	•
		Typical occupation – female	•
General description of the history and main economic activities in the community	•		
Description of community governance (police, mayor, council, other authorities)	•		

General site information

Extraction type: (hard/soft)	•	Miner population	•
Processing steps:	•	No. of diggers:	•
No. of processors:	•	No. of traders	•
Use of mercury	Yes/No	No. of women	•
Mining permit	Yes/No	No. of children	•
General description of the mine site (e.g. number of pits, presence of facilities)	•		

See next page for social and environmental observations

Observed social dynamics at mine site and community

Description of site governance (e.g. individual miners, association, cooperative)	•
Power relations (e.g. who makes decisions in practice; does everyone have the opportunity to participate in decision-making, what are the relationships between diggers, processors, pit bosses, etc.)	•
Attitudes and behaviours towards mercury	•
Role of women and children (e.g. are they involved in the treatment of mercury)	•
Other observations on socio-economic and health aspects	•

Observed environmental impacts at mine site and community

Are there large water bodies, such as rivers or lakes, close to the mining site?	•
How has the colour and smell of water bodies changed due to gold mining activity?	•
Has the drinking water quality changed due to the mining activity? How?	•
How has the amount of forests around the mining site changed due to mining activity?	•
Has the amount of farmland around the mining site changed due to gold mining activity? How much?	•
General comments on environmental impact	•

Annex 6: Questionnaire to assess the risk of contributing to conflict finance and violation of human rights through gold production and trade

The OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas clarifies how companies can identify and better manage risks throughout the entire mineral supply chain, from miners, local exporters, and mineral processors to the manufacturing and brand name companies that use these minerals in their products.

The Guidance aims to help companies respect human rights, observe applicable rules of international humanitarian law in situations of armed conflict, avoid contributing to conflict, and cultivate transparent mineral supply chains and sustainable corporate engagement in the mineral sector. The objective of the Guidance is ultimately to promote responsible private sector engagement in post-conflict fragile states.³⁸

How to use this questionnaire for risk assessment at mine sites

The purpose of this questionnaire is to collect on-the-ground information on allegations and reports of gold extraction contributing to (governmental forces or non-states) armed groups; violations of human rights; and corruption and bribery.

The questionnaire could be used by consultants assessing mercury use in artisanal gold mining sites, in the context of preparing a National Action Plan to implement the Minamata Convention.

The collected information should be shared with governments, international organisations, and international private sector companies sourcing gold globally, to support raise awareness and global due diligence efforts in gold supply chains.

1. CONFLICT RISKS

Presence and interference of armed groups with production and trade of gold:

- State armed groups are stationed on/near mine site? **yes / no**
- Non-state armed groups are stationed on/near mine site? **yes / no**
- Public/private security forces are stationed on/near mine site? **yes / no**
- Any of the above groups participates in:
 - illegally controlling mine site access? **yes / no**
 - illegally taxing/extorting minerals or money from the mine site (e.g. from workers)? **yes / no**
 - illegally taxing/extorting minerals or money from the mine site owner or operator? **yes / no**

If possible, specify number (i.e.no. of officer/troopers spotted on site or observed to be participating in mining production and trade) and type (i.e. state or non-state armed forces).

³⁸ For additional background information, see OECD (2017), A Global Standard Towards responsible mineral chains. OECD Publishing. http://mneguidelines.oecd.org/Brochure_OECD-Responsible-Mineral-Supply-Chains.pdf

- Have your sources of information (either miners interviewed or documents checked such as photos, etc.) demonstrated that any of the above groups are involved in human rights violations such as:
 - Any forms of torture, cruel, inhumane, or degrading treatment? **yes / no**
 - Any other gross human rights violations and abuses such as widespread sexual violence? **yes / no**
 - War crimes or other serious violations of international humanitarian law, crimes against humanity, or genocide? **yes / no**

Which sources of information have been used to fill in this section?

2. PAYMENTS and TAXATION

- Government officials are reported to extract unauthorized payments from the mine site? **yes (specify) / no**
- Mine site operator/owner is observed or reported to be making payments to political parties or organizations? **yes (specify) / no**
- Are there any indications (e.g. reports, whistle blowing) that the mine site operator/owner is making payments to illegal/criminal organizations? **yes (specify) / no**
- Are there any indications (e.g. reports, whistle blowing) that the mine site operator/owner is bribing a person/organization to:
 - conceal the origin of minerals? **yes / no**
 - evade official tax payments? **yes (specify) / no**

Which sources of information have been used to fill in this section?

3. CHILD LABOR/FORCED LABOR

On-site, have you witnessed:

Child labour (<16 years)

- children participating in mining activities? **yes / no**
- children provide supplementary services (e.g. water transport)? **yes / no**
- children present in mine sites (e.g. for playing)? **yes / no**

Forced labour:

- mining is (even partly) associated with forced or compulsory labour? **yes / no**
- minerals or money is extorted from mine workers? **yes / no**

For more information, contact:

United Nations Institute for Training and Research

Division for Planet

Chemicals and Waste Programme

International Environment House 11-13, Chemin des Anémones 11-13,

CH-1219 Châtelaine, Geneva, Switzerland

E-mail: cwm@unitar.org

Web: <https://www.unitar.org/cwm/mercury-0>