

Institutional Capacity Assessment Report

Nigeria

Piloting a New WHO Framework to Support the Development of Public Health Strategies on Artisanal and Small-scale Gold Mining in the Context of the Minamata Convention on Mercury

May 2020



Institutional Capacity Assessment Report

Nigeria

Piloting a New WHO Framework to Support the Development of Public Health Strategies on Artisanal and Small-scale Gold Mining in the Context of the Minamata Convention on Mercury

May 2020

Authors:

Dr Fritz Brugger
Alexandra von Ow
Edwin Isotu Edeh
Uzoma Nwankwo

This project was funded by the United Nations Industrial Development Organization and benefitted from Technical Assistance from the World Health Organization.

Thanks are extended to Dr Nathalie Roebbel, Coordinator, Air Pollution and Urban Health and Dr Ellen Roskam, Consultant, Chemical Safety and Health Unit, Environment, Department of Climate Change and Health, WHO, Geneva, for their contributions to this report.

Acknowledgement of key team members

- Engr. Fatai Olanrewaju - Federal Ministry of Health, Nigeria
- Dr Nathalie Roebbel - Head, Air Quality and Health, Environment, Climate Change and Health, WHO Geneva
- Dr Ellen Roskam - Consultant, Chemical Safety and Health Unit, Environment, Climate Change and Health, WHO, Geneva
- Mr. Charles Akong - WHO, Regional Office for Africa
- Dr Fiona Braka - Officer-In-Charge, WHO, Nigeria
- Dr Rex Mpazanje - Cluster Lead, Communicable and Non- Communicable Diseases (CND), WHO, Nigeria
- Dr Lynda Ozor - Program Manager, Malaria Control Program, WHO, Nigeria
- Mr. Yomi Banjo - Environment Expert, UNIDO, Nigeria

Contents

List of tables	iv
List of figures	iv
Abbreviations	v
Executive summary	vi
Section	
1 Introduction	1
Mercury use in artisanal and small-scale gold mining	2
Health risks associated with the use of mercury	2
Artisanal and small-scale gold mining in Nigeria	3
The Minamata Convention on Mercury in Nigeria	4
Nigeria's executing agencies	4
2 Objective and questions	5
3 Methodological framework	7
Institutional dimensions: measuring institutional capacity	8
Priority areas: linking capacity with topical issues	9
Topical indicators: characteristics of relevant institutional dimensions	10
Data sources	13
4 Findings, strengths and challenges	15
1 Health hazards in ASGM communities	16
2 Occupational health hazards related to ASGM	24
3 ASGM-related environmental hazards with health implications	29
4 Chemical management related to ASGM	33
5 Recommendations	37
Recommendations at institutional level	38
Recommendations for the Public Health Strategy	39
References	40
Annexes	42
Annex C of the Minamata Convention on Mercury, 2013	42
ASGM Questionnaire Ministry of Mines and Steel Development	43

List of tables

Table 1: Logic of the methodological framework	8
Table 2: Methodological framework applied, linking priority areas, institutional dimensions, and topical indicators	11
Table 3: Value labels used to code the findings on an ordinal scale	12
Table 4: Distribution of primary, secondary and tertiary health facilities in Nigeria	21

List of figures

Figure 1: Institutional capacities to address ASGM-specific health hazards	24
Figure 2: Institutional capacities in place for occupational health hazards related to ASGM	29
Figure 3: Institutional capacities for environmental hazards related to ASGM	32
Figure 4: Institutional capacities for chemical management related to ASGM	36

Abbreviations

ASG	Artisanal and Small-scale Gold
ASGM	Artisanal and Small-scale Gold Mining
BEmONC	Basic Emergency Obstetric and Neonatal Care
CSO	Civil Society Organization
EPHS	Essential Package of Health Services
FMEnv	Federal Ministry of Environment
FMLE	Federal Ministry of Labour and Employment
FMOH	Federal Ministry of Health
FMWR	Federal Ministry of Water Resources
ILO	International Labour Organization
IMCI	Integrated Management of Childhood Illness
LGA	Local Government Areas
MMSD	Ministry of Mines and Steel Development
NAP	National Action Plan
NCDC	Nigeria Centre for Disease Control
NDRP	National Disaster Response Plan
NEMA	National Emergency Management Agency
PHC	Primary Health Care
PPE	Personal Protective Equipment
PRIMASYS	Primary Health Care System
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNIDO	United Nations Industrial Development Organization
WHO	World Health Organization
WIMIN	Women in Mining Nigeria

Executive summary

Artisanal and small-scale gold mining (ASGM) accounts for an insignificant percentage of the Nigerian gross domestic product. However, the sector is growing and thereby creating jobs and promoting the local economy. Gold is predominantly mined on an artisanal and small-scale level. Many of the miners operate illegally with marginal knowledge about the implications unsafe mining practices have on their and their communities' health or the environment. The World Health Organization (WHO) has been requested to assist the Federal Ministry of Health (FMOH) to develop a Public Health Strategy as part of the National Action Plan (NAP) as stipulated in Article 7 of the Minamata Convention.

This report presents the findings from the assessment of the institutional readiness to detect, address and prevent health issues associated with ASGM and aims to provide inputs to the FMOH on how to best define key priorities in the Public Health Strategy on ASGM. Based on the consultation of FMOH representatives and other key agencies and stakeholders, ASGM-related health topics, institutional capacity strengths and challenges in the public health sector were assessed, and key stakeholders identified who appear critical for the development and implementation of a public health strategy tailored to the ASGM sector.

The assessment was guided by the following questions:

1. To what extent are existing regulations, policies, structures and processes in place at the national and sub-national levels to respond to ASGM health-related issues?
2. Are the current institutional capacities at FMOH sufficient to deal with health issues in the context of ASGM?
3. What strengths and opportunities exist that could strengthen capacities and what challenges need to be addressed?

Methodologically, we focus on the following four health priority areas: (1) Health hazards in ASGM communities, (2) Occupational health hazards related to ASGM, (3) Environmental hazards related to ASGM that have implications for health, and (4) Chemical management related to ASGM. For each of those areas, we assess three institutional

dimensions: (1) the policy and regulatory level, (2) the organizational structure and resources, and (3) the procedural setup. The health priority areas and the institutional dimensions result in a matrix with health priorities and institutional dimensions as the axes. Topic specific indicators guide the assessment in each of the cells of the matrix.

The assessment reveals a range of institutional strength on which FMOH can build its ASGM health strategy. To start with, Nigeria's health legislation is quite comprehensive. The legal framework provides a basis that allows it to administer most ASGM-related health issues. Nigeria's health care system is decentralized and health services are provided in a three-tier way. This system is suitable to satisfy ASGM-related health needs. However, the introduction of a chemical law would strengthen the position of the current regulatory basis, which consists of a chemical management plan only. An improved legal basis is particularly needed for mercury and cyanide management.

At the structural level, topics exist where institutional responsibility overlaps or is not allocated; in particular, there is no systematic structure for ASGM specific data collection in place. Those instances should be addressed in the upcoming work on the ASGM strategy. More importantly, there is insufficient consideration of ASGM as a distinct community with specific needs and what this implies for existing administrative units. To some extent this is due to the fact that ASGM has been considered as illegal activity.

Significantly less developed than the regulatory framework are the institutional capacities: Knowledge and expertise is lacking for awareness raising and education of preventive measures regarding ASGM specific health risks, including environmental health risks and the proper handling of chemicals, as well as technical and logistical capacity. This also holds for the knowledge to detect and treat ASGM specific health issues. Instruments are lacking to detect and treat ASGM-relevant health issues, and the logistical capacity is absent to roll out prevention campaigns and health services to those communities.

At the structural and procedural level, the efficient use of scarce resources would benefit from aligning cooperation (a) within ministries at the central level

as well as between the national and sub-national levels, and (b) between the ministries concerned and their departments. Further, institutionalized cooperation and coordination and information sharing with non-state actors working in ASGM areas can help bridge the implementation gap, as well as improve data availability.

In sum, advancing the accessibility of health facilities to ASGM communities irrespective of their

legal status requires primarily action at the level of implementation by prioritizing capacitation of health service providers with knowledge, instruments and logistical resources. Most of this can be done within the existing regulatory framework but requires allocation of sufficient financial means. Harmonization between actors and addressing structural gaps are important but complementary lines of action.

1 Introduction

In this section:

Mercury use in artisanal and small-scale gold mining

Health risks associated with the use of mercury

Artisanal and small-scale gold mining in Nigeria

The Minamata Convention on Mercury in Nigeria

Nigeria's executing agencies

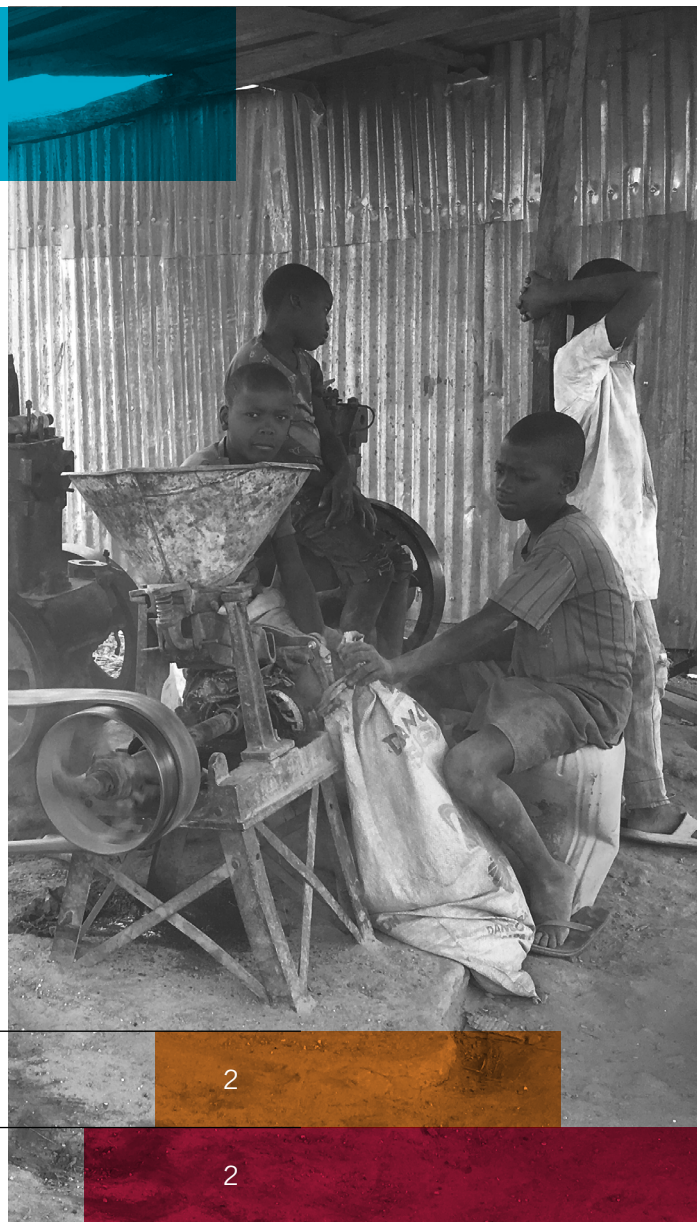
2

2

3

4

4



Introduction

Mercury use in artisanal and small-scale gold mining

The Minamata Convention was adopted by the UN with the objective to “protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds” (United Nations, 2017, S.9). Acknowledging that ASGM is commonly related to the (unsafe) use of mercury the Minamata Convention stipulates specific measures that support the reduction, or where feasible the elimination of mercury use (United Nations, 2017, § 7, Nr. 2). ASGM is characterized by small- to medium-sized groups of individuals or communities applying rudimentary techniques to yield marginal outputs of gold (Veiga, Maxson & Hylander, 2006, p. 436). It is often done in an informal setting with insufficient consideration of the environmental and health impacts. Manual gold mining is hard physical labour profoundly demanding on the human body (Hentschel, Hruschka & Priester, 2003). Generally, five categories of health hazards related to ASGM are distinguished: chemical, biological, biomechanical,

physical and psychosocial. Collapsing tunnels burying miners alive or the spreading of sexually transmitted diseases (STDs) are as common as poisonings due to incautious handling of chemicals. The most common chemical hazards related to ASGM come from the use of mercury and cyanide (World Health Organization, 2016, p. 7). Occurring as a natural component of the earth, mercury is a (heavy) metal element and neurotoxin. Cyanide is a chemical compound of hydrocyanic acid. Amalgamation is a common gold-manufacturing practice in ASGM whereby mercury is used to obtain amalgam, an alloy which consists of approximately equal parts mercury and gold (Gibb & O’Leary, 2014, p. 667). The alloy is then heated while evaporating the heavy metal without much effort due to its high volatility. Left is gold that is quite pure. Mercury is affordable, allowing quick and effortless gold extraction (“Artisanal and Small-scale Gold Mining – Facts and Figures”, 2019, p. 9).

Health risks associated with the use of mercury

Every year approximately 1400 tons of mercury are released into the environment (“UNEP-UNITAR Mercury Platform”, n.d.) Human health is exposed to mercury in two ways when observing the context of ASGM – elemental mercury exposure and organic

mercury exposure (World Health Organization, 2016, p. 7). In order to produce gold amalgam, elemental mercury is used.¹ The heating process evaporates the toxin into the air which is then inhaled. People close to burning sites are likely

¹ The crushed ore is mixed with water and pure mercury. Mercury (Hg 79) has the chemical property of searching for other minerals with a similar chemistry. This is the case for gold (Au 80). The two elements merge this strong bond and form the alloy gold amalgam.

exposed to the mercury vapours. A very low boiling point causes mercury to dematerialize at room temperature. Skin contact, inappropriate storage or handling is an indirect exposure to elemental mercury vapours. Ultimately, residues or disposal of mercury laced water into larger waterbodies contaminate the environment. Under certain conditions anaerobic organisms transform mercury into an organic compound known as methylmercury (Gibb & O'Leary, 2014, p. 667). The Minamata Convention on Mercury owes its name to the first large-scale organic mercury exposure, i.e.

methylmercury poisoning that occurred nearby the Japanese city Minamata in 1956 in a small fishing village. Fish and other seafood were intoxicated by methylmercury after a nearby chemical factory discharged wastewater into the ocean. Locals who typically lived on a seafood diet ate the poisoned fish and were taken ill. Similar symptoms related to what is still known as the “Minamata Disease” continue to show evidence amongst ASGM communities (i.e. nausea, headaches, abdominal pain, seizures, blindness, respiratory difficulties, etc.)

Artisanal and small-scale gold mining in Nigeria

Nigeria's goldmining history began over 100 years ago. After this sector was neglected up to the 1930s, government declared gold as one of seven strategic minerals in 2017 so as to reduce the country's dependency on oil and gas and boost the local economy (Ministry of Mines and Steel Development, 2016, p. 19). Vast reserves of alluvial and primary gold are confirmed in 15 states along the North West to the South West region (Nigeria Natural Resources, 2019). The gold sector is largely underdeveloped and insufficiently administered, and exploitation is predominantly done on an artisanal and small-scale level. In fact, it is estimated that ASGM accounts for 80% of Nigeria's mining, being an important source of income for rural communities (Akwagyiram, 2018).

Mines are often located in extremely remote areas that are hard to reach. Groups of mostly informally active miners and communities living in close proximity to the mines expose themselves to severe health risks on a daily basis throughout the entire gold-production cycle, i.e. extraction, production, transportation, utilization/sale and disposal. In 2010, the North Western Zamfara State was gripped by the sudden illness of hundreds of children suffering from vomiting, abdominal pains, headaches, seizures and other health conditions. What clueless communities first blamed on witchcraft was later confirmed to be lead poisoning. The respective communities had unknowingly dug into a lead-vein while mining the gold ore. Approximately 50% of all recorded cases were fatal,

including the death of 400 children (Médecins Sans Frontières, 2012).

In Zamfara lead-laced dust was released into the air while crushing ore rocks and this lead settled in the nearby waters. Miners would return home, unknowingly exposing their families to health risks, unaware of their clothes and crushing tools being covered with micro lead particles. To make things worse, economic desperation encouraged not only men to mine but also compelled women to partake in ASGM. Since traditionally women in rural Nigerian areas do not leave the domestic premises the gold ore rocks were brought to the homemakers and with it the lead. Inhaling the polluted air, drinking the toxic water and eating poisoned food resulted in endemic phenomena such as blindness, infertility and neurological disorders. Although the timing of the lead poisoning case of Zamfara was rather coincidental, it sensitized the country and set the ground to address ASGM-related risks and health issues. Nigeria became a Signatory Party of the Minamata Convention in 2013 and is currently preparing the National Action Plan that defines national objectives and reduction targets in regard to phasing out the use of mercury within the ASGM sector.

Mercury is the main chemical used amongst small-scale gold miners in Nigeria while cyanide plays a minor role. Chemical gold production is only one of many health issues impacting Nigeria's artisanal and small-scale gold mining sector. Small-scale

gold mining in Nigeria typically involves young and poorly educated men driven by the alleged quick path to wealth. Many of them are migrants from the neighbouring countries far from home with little to lose but much to gain. This economic predicament influences their willingness to knowingly expose themselves to health risks. Mining is hard labour that is very demanding on the human body. Loss of hearing, kidney problems or silicosis are amongst other diseases typically attributed to ASGM

communities. Indulging in drug abuse (alcohol, narcotics, tobacco and others) to numb the burdens, infections with STD and tropical diseases (e.g. malaria, yellow fever) are exacerbating health problems amongst ASGM communities. Insufficient water and sanitation infrastructure and a lack of health facilities further compound the situation. Especially vulnerable groups like women and children are at risk of compromising their well-being.

The Minamata Convention on Mercury in Nigeria

Nigeria notified the Minamata Convention Secretariat confirming that its ASGM activities are more than insignificant. Nigeria signed the Minamata Convention in October 2013 and ratified the legally binding document in February 2018, determined to reduce the use of mercury. The NAP is the provided implementation tool in the context of ASGM while a “Public Health Strategy on the exposure of artisanal and small-scale goldminers

and their communities to mercury” is an inherent element (United Nations, 2017, Annex C, 1.h). All NAPs are due no later than three years after entry into force of the Convention or three years after the notification to the Secretariat, whichever is later (United Nations, 2017, § 7, no. 3, lit. a). Hence Nigeria is to present its NAP by February 2021 unless the Secretariat has been briefed otherwise.

Nigeria's executing agencies

The Nigerian Government is currently preparing the NAP with the support of the United Nations Industrial Organization (UNIDO).

The Federal Ministry of Environment (FME) is the focal point for the implementation of the Convention whereas its Department of Pollution Control and Environmental Health is to establish a Minamata Desk that coordinates all implementing activities nationwide. FME has also set up a Steering Committee with representatives from FMOH, Ministry of Mines and Steel Development (MMSD), UNIDO, members of academia and research, the Mining Association Nigeria, and civil society organizations (Federal Ministry of Information & Culture, 2017).

ASGM activities are administered by the Nigerian MMSD, which is finalizing the initial assessment and mapping of the extent of ASGM activities in the country. This baseline information will support the NAP implementation process.

Finally, the FMOH is the main agency responsible for the Public Health Strategy while also supporting the assessment with data collection, knowledge sharing and strategically supporting involved ministries. In regard to the Public Health Strategy the WHO is an assisting partner.

2 Objective and questions



The institutional capacity assessment has been carried out to determine priority areas of significant importance which should be considered for the Public Health Strategy component of the Nigerian National Action Plan (NAP) on ASGM.



Objective and questions

This report presents the results of the institutional capacity assessment in light of the requirements for an ASGM-related Public Health Strategy as provided for by the Minamata Convention. More specifically, Nigeria – in particular the FMOH – is expected to have in place the capacity to detect, prevent and address the health issues artisanal and small-scale gold miners and their communities are exposed to, including mercury exposure.

The institutional capacity assessment has been carried out to determine priority areas of significant importance which should be considered for the Public Health Strategy component of the Nigerian NAP on ASGM. The main questions guiding this institutional capacity assessment are:

1. To what extent are existing regulations, policies, structures and processes in place at the national and sub-national levels to respond to ASGM health-related issues?
2. Are the current institutional capacities at the FMOH and FMEEnv available to deal with health issues in the context of ASGM?
3. What are the strengths and opportunities to enhance existing capacities and what are the challenges that need to be addressed?

According to the guidance document, the Public Health Strategy for ASGM is expected to address three key issues:

Health data collection.

Taking an integrated public health approach data collection that is not limited to health data related to mercury but covers the public health status of the community generally.

Training for health care workers.

They are often unaware of the effects of mercury and unable to recognize, diagnose and treat mercury poisoning. Health systems should have treatment protocols in place for mercury-related health effects, including exposure to mercury in ASGM.

Awareness-raising and education among miners.

Existing health care structures that are already integrated into and trusted by communities can provide a readily available platform for awareness raising about mercury and its dangers.

In addition, effective intersectoral engagement between health and other relevant ministries and agencies is perceived as essential for ensuring the effective implementation of measures to address the public health impacts of exposure to mercury in ASGM. Ensuring that health issues are appropriately addressed is comparatively essential to measures anticipated in non-health areas.

3 Methodological framework

In this section:

Institutional dimensions: measuring institutional capacity

8

Priority areas: linking capacity with topical issues

9

Topical indicators: characteristics of relevant institutional dimensions

10

Data sources

13



Methodological framework

The methodological framework is based on three complementary components: first, the operationalization of “institutions” (institutional dimensions, horizontal axis); second, the clustering

of health-relevant topics (priority areas, vertical axis); third, indicators which allow assessment of each specific institutional component per content-topic (topical indicators, cells):

Table 1: Logic of the methodological framework

Priority areas	Institutional dimensions		
	Policy and regulatory setup	Structure-level setup	Procedural setup
Health hazards in ASGM communities	Topical indicators (Chapter 1.1)	Topical indicators (Chapter 1.2)	Topical indicators (Chapter 1.3)
Occupational health hazards related to ASGM	Topical indicators (Chapter 2.1)	Topical indicators (Chapter 2.2)	Topical indicators (Chapter 2.3)
Environmental hazards related to ASGM that have implications for health	Topical indicators (Chapter 3.1)	Topical indicators (Chapter 3.2)	Topical indicators (Chapter 3.3)
Chemical management related to ASGM	Topical indicators (Chapter 4.1)	Topical indicators (Chapter 4.2)	Topical indicators (Chapter 4.3)

Institutional dimensions: measuring institutional capacity

The starting point is to understand what is meant by the terms “capacity” and “institutions”.

There is no unilateral definition for the term “capacity”. Hereinafter the report adapts the UN definition, which understands capacity as “The ability of individuals, institutions and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner” (UNDP, 2009, p. 53).

Institutions “constitute humanly devised constraints that structure human interaction. They are made up of formal constraints (rules, laws, constitutions),

informal constraints (norms of behaviour, conventions, and self-imposed codes of conduct), and their enforcement characteristics, a broad term that is understood to comprise both, the formal and informal ‘rules of the game’ that structure human interaction in a society as well as the enforcement characteristics of both” (UNDP, 2009, p. 57).

Operationalizing “institutions” is to render them accessible when assessing a specific institutional scope or issue domain. The concept is typically disentangled into the policy and regulatory level, organizational structure and resources, and the specific procedural setup. In this case

the assessment was conducted along three complementary levels in view of institutional readiness to address ASGM-related health issues:

1. Policy and regulatory setup:

The institutional aspect includes both the laws and regulations which establish an entity's mandate and define its responsibilities, duties, obligations and powers. Some topics addressed in this dimension are: regulations and policies for chemical hazards, such as mercury, cyanide, chemicals contained in dust and toxic gases.

2. Structure-level setup:

The structural dimension looks at organizational aspects, i.e. how are organizations set up and structured to enable them to fulfil their mandate and put objectives into action. This also includes questions of resources and staffing (i.e. sufficient number of employees with adequate capabilities including their knowledge, skills and attitudes). Some topics addressed in this dimension are the responsibilities of organizational units and staff, availability

of primary health facilities and hospitals and technical and laboratory equipment to diagnose, monitor and treat ASGM-related health conditions.

3. Procedural setup:

Procedural requirements determine the way in which critical functions are carried out, including strategic and business planning, managing work flow, communication, budgeting and financial control, reporting, monitoring and performance management, and the recruitment, remuneration, professional development and retention of staff. It further includes the ways in which working relationships are managed between ministries, between ministries and other public bodies, and between different levels of central and decentralized government, and their arrangements for the coordination of activities. Some of the topics addressed in this dimension are mechanisms for responding to health emergencies, preventive mechanisms to address health hazards related to ASGM, and training programs for health staff to detect, monitor and treat health conditions related to ASGM.

Priority areas: linking capacity with topical issues

In a second step regarding the operationalization of institutional capacities, ASGM-related health issues are clustered into four priority areas. The latter are defined in accordance with the WHO's existent issue clusters (WHO, 2016):

Health hazards in ASGM communities,

including chemical hazards (mercury, cyanide, chemicals contained in dust and toxic gases), biological hazards (cholera, malaria, dengue fever, STD and HIV), and

psychosocial hazards (drugs, alcohol, violence and nutritional deficits).

Occupational health hazards related to ASGM,

including chemical hazards (mercury, cyanide, chemicals contained in dust, toxic gases), and biomechanical and physical hazards (musculoskeletal disorders, overexertion, physical trauma, noise, heat and humidity).

Environmental hazards related to ASGM that have implications for health,

including land degradation, mercury emissions/pollution, siltation, erosion and water contamination.

Chemical management related to ASGM,

including mercury, cyanide, chemicals contained in dust, toxic gases.

Topical indicators: characteristics of relevant institutional dimensions

The third and final element of the methodological framework consists of indicators describing relevant institutional characteristics for each priority area. They are derived from institutional and organizational theory. The institutional characteristics underlying each indicator are the guiding questions for conducting the assessment.

First, they serve as a heuristic tool to establish to what extent those characteristics are developed or present in the institutional and organizational setup. Typically, the wanted characteristics are present to different degrees – some may be fully developed, some may be rudimentarily available while others may be fully absent.

To reflect these varying degrees of implementation, each topical indicator is scored ordinally (1-5) as shown in Table 3. The criteria involve both the existence of the indicator and the extent to which the indicator is actually implemented (in the case of policies), used (in the case of processes/systems),

and available (in the case of structures). The level of implementation/use/availability implies that there is at least the same level of existence of the indicator. If the level of the existence indicator is higher than the level of implementation/use/availability, it should be recorded in a column for comments that will be included at the right of the table containing the indicators.

The results of this analysis are visualized in one spider diagram for each priority area. Those spider diagrams are intended to be read in conjunction with the text explaining the findings.

Second, the results presented under the different indicators serve as starting points for planning measures to strengthen institutional capacity. They highlight possible entry points, point to potential synergies between organizational units within and across ministries, and provide a sound basis for prioritizing action.

Table 2: Methodological framework applied, linking priority areas, institutional dimensions, and topical indicators

Priority area	Institutional dimension	Topical indicator
1. Health hazards in ASGM communities	1.1 Regulatory and policy level	1.1.1 Regulations and policies for chemical hazards, such as mercury, cyanide, chemicals contained in dust and toxic gases 1.1.2 Regulations and policies for biological hazards such as cholera, malaria, dengue fever, STD, HIV/AIDS 1.1.3 Regulations and policies for psychosocial hazards such as drugs, alcohol, violence, nutritional deficits 1.1.4 Regulations and policies for primary and referral healthcare provision
	1.2 Structure level	1.2.1 Organization and job responsibilities of key institution(s) 1.2.2 Primary health facilities and hospitals 1.2.3 Technical and laboratory equipment to diagnose, monitor and treat ASGM-related health conditions 1.2.4 Knowledge resources to address ASGM issues
	1.3 Process level	1.3.1 Mechanisms for responding to health emergencies (e.g. chemical spills, disease outbreaks) 1.3.2 Preventive mechanisms to address health hazards related to ASGM (e.g. chemical spills, disease outbreaks) 1.3.3 Training programs for health staff to detect, monitor and treat health conditions related to ASGM 1.3.4 Coordination mechanisms among ministries to address health hazards
2. Occupational health hazards related to ASGM	2.1 Regulatory and policy level	2.1.1 Regulations and policies for the following occupational health hazards in ASGM: · chemical hazards (mercury, cyanide, chemicals contained in dust, toxic gases) · biomechanical and physical hazards (musculoskeletal disorders, overexertion, physical trauma, noise, heat and humidity)
	2.2 Structure level	2.2.1 Organization and job responsibilities of key institution(s) 2.2.2 Technical and laboratory equipment to diagnose, monitor and treat ASGM-related occupational health conditions (see also 1.2.3) 2.2.3 Knowledge resources to address ASGM issues
	2.3 Process level	2.3.1 Mechanisms for responding to health emergencies in the workplace (e.g. chemical spills and accidents) 2.3.2 Preventive mechanisms to address occupational health hazards in the workplace (e.g. chemical, biomechanical, physical) 2.3.3 Coordination mechanisms among ministries to address occupational health hazards

Priority area	Institutional dimension	Topical indicator
3. Environmental hazards related to ASGM that have implications for health	3.1 Regulatory and policy level	3.1.1 Regulations and policies for land degradation, mercury emissions/pollution, siltation, erosion, water contamination
	3.2 Structure level	3.2.1 Organization and job responsibilities of key institution(s) 3.2.2 Technical and laboratory equipment to assess, monitor and improve ASGM-related environmental issues 3.2.3 Knowledge resources to address ASGM issues
	3.3 Process level	3.3.1 Mechanisms for responding to environmental emergencies related to ASGM (e.g. mercury pollution, water contamination) 3.3.2 Preventive mechanisms to address environmental hazards related to ASGM (e.g. land degradation, mercury emissions/pollution, siltation, erosion, water contamination) 3.3.3 Training programs for staff to detect and monitor environmental hazards related to ASGM 3.3.4 Coordination mechanisms among ministries to address environmental hazards that have implications for health
4. Chemical management related to ASGM	4.1 Regulatory and policy level	4.1.1 Regulations and policies for chemical management
	4.2 Structure level	4.2.1 Organization and job responsibilities of key institution(s) 4.2.2 Technical and laboratory equipment to identify chemicals (mercury, cyanide, chemicals contained in dust, toxic gases) 4.2.3 Knowledge resources to address ASGM issues
	4.3 Process level	4.3.1 Mechanisms for responding to chemical emergencies 4.3.2 Preventive mechanisms to address chemical hazards 4.3.3 Coordination mechanisms among ministries to address chemical management

Table 3: Value labels used to code the findings on an ordinal scale

Score	Indicators
1	The capacity is <i>absent</i>
2	The capacity exists and it is <i>not available</i>
3	The capacity exists and it is <i>available to a low extent</i>
4	The capacity exists and it is <i>available to a fair extent</i>
5	The capacity exists and it is <i>available to a good extent</i>

Data sources

The Institutional assessment is based on key informant interviews and the review of policy documents. Based on the topical indicators, interview scripts were developed covering all priority areas and institutional dimensions. Questions in the interview scripts were aimed to understand to what extent:

1. Regulations and policies are in place and implemented
2. Relevant elements at the structure level are in place and available
3. Elements at the process level are in place and available

In the cases in which existing regulations, structures or processes exist partially or are not in place, the questions of the interview scripts addressed how they could be enhanced, adapted or expanded to accommodate and address ASGM-related health issues. These findings are reported as well.

Fieldwork for this assessment took place in Abuja between 17 June and 21 July 2019. Semi-structured interviews were conducted with 19 key informants representing the governmental entities such as the FMEnv, FMOH, MMSD and the Ministry of Labour and Employment. Key informants from private or civil society organizations were also interviewed, as well as UNIDO.

The document review consisted of the analysis of information gathered at public institutions, international organizations and nongovernmental organizations (NGO). Relevant information gathered for the assessment includes laws, regulations, decrees, organic statutes, legal resolutions, programs, organizational charts, studies, private and public reports, national and international statistics, information from the census and academic papers. The documents were gathered both in print during fieldwork in Abuja and downloaded from the internet (full list in references section).

4 Findings, strengths and challenges

In this section:

Health hazards in ASGM communities

16

Occupational health hazards related to ASGM

24

ASGM-related environmental hazards with health implications

29

Chemical management related to ASGM

33

Findings, strengths and challenges

Subsequent chapters' structure corresponds with the outline of Table 2 (priority areas, institutional dimensions, topical indicators). Main strengths and challenges are highlighted for each institutional dimension. For each priority area, a radar chart is provided to facilitate the visualization of institutional capacities in place. Options and entry points facilitating the strengthening of institutional capacity identified during the interviews are also reported. Ultimately the section provides recommendations regarding the institutional level in general and the Public Health Strategy for ASGM in particular.

This section summarizes the main findings obtained during the assessment process and are structured categorized as four priority areas:

1. Health hazards in ASGM communities
2. Occupational health hazards related to ASGM
3. Environmental hazards related to ASGM that have implications for health
4. Chemical management related to ASGM

Each of these priority areas is then addressed by reference to three dimensions (regulatory and policy level, structure level and process level) and the implementation capacity findings are presented following the topics for every dimension. Furthermore, this section identifies strengths and opportunities to enhance existing capacities and challenges that need to be addressed.

Health hazards in ASGM communities

1.1 Regulatory and policy level

Priority area	Institutional dimension	Topical indicators	Score
1. Health hazards in ASGM communities	1.1 Regulatory and policy level	1.1.1 Regulations and policies for chemical hazards, such as mercury, cyanide, chemicals contained in dust and toxic gases	1
		1.1.2 Regulations and policies for biological hazards such as cholera, malaria, dengue fever, STI, HIV	3
		1.1.3 Regulations and policies for psychosocial hazards such as drugs, alcohol, violence, nutritional deficits	1
		1.1.4 Regulations and policies for primary and referral healthcare provision	2

1.1.1 Regulations and policies governing chemical hazards such as mercury, cyanide, chemicals contained in dust and toxic gases

Although the constitution mandates the government to “protect and improve the environment and safeguard the water, air and land, forest...” (Constitution of the Federal Republic of Nigeria, 1999, § 20) Nigeria’s legislation does not have a chemicals act. Mercury and cyanide management is also not regulated in other environmental laws or policies.

The act regulating management of solid and hazardous wastes repeatedly refers to the “Agency” being in charge of the hazardous disposal of mercury or cyanide without further specifying this agency. It is assumed that the National Agency for Food and Drug Administration is the qualifying unit (National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations, 2013).

Nigeria’s Minerals and Mining Act further states that mining has to be done in a safe way that is compliant with health and safety regulations (Ministry of Mines and Steel Development, 2007, §70, lit.d).

One key informant from the FMOH, a trained epidemiologist, referred to the “Technical Guidelines for Integrated Disease Surveillance and Response in Nigeria” on numerous occasions. The assessment tool does include the surveillance of chemical health hazards and stresses the essence of institutional cooperation (national, regional, state). Nonetheless, mercury, cyanide or other chemicals contained in dust and toxic gases are not mentioned explicitly.

The “National Action Plan for Health Security” is a multisectoral road map to safeguard public health. This document defines “objectives, strategic activities, costs and focal points” in regard to national health welfare, including prevention and mitigation. The regulation of ASGM-related chemical health hazards is not a specific component within the action plan measures designed to mitigate chemical mining incidents. So far, this document is a strategy paper and its content is yet to be passed into the proposed NCDC Bill.

1.1.2 Regulations and policies for biological hazards such as cholera, malaria, dengue fever, STDs and HIV/AIDS and neglected tropical diseases

There are a number of policies available. The Centre for Disease Control makes policies and working

papers available online. None of them addresses the context of ASGM.

HIV is to be controlled by the designated National Agency. This mandate is regulated in a specific act compelling all tiers of government and all sectors to ensure the control of HIV and AIDS, and other matters connected therewith (National Agency for the Control of HIV/AIDS Act, 2006, § 6).

Biological hazards in the context of ASGM are not a particular subject in any of the identified legislations.

1.1.3 Regulations and policies for psychosocial hazards such as drugs, alcohol, violence and nutritional deficits

The Nigerian constitutions and the Criminal Code Act protect the physical and psychological integrity of every citizen. Yet, civil servants interviewed were not aware of corresponding policies or regulations.

Numerous legislations regulate the production, distribution and consumption of illegal substances. According to our respondents, they are not effectively enforced.

Key informants repeatedly expressed that limited financial sources discourage state agents to adequately attend to psychosocial needs. Consequently, prevention is often lacking, setting grounds for endemic situations.

1.1.4 Regulations and policies for primary and referral health care provision

The Nigerian Health Act extends the right to health care and adequate health facilities to all its citizens (National Health Act, 2014). Accessing basic health care is to be ensured by the establishment of the Basic Health Care Provision Fund. Relevant responsibilities and roles of governing bodies that are to provide primary health care (PHC) or support this provision are an integral part of the National Health Act.

Nigeria’s highest body to draft policies designed to protect, promote, improve and maintain the health of Nigeria’s citizens and to define measures to meet these defined objectives is the National Council on Health.

The Public Health Care Development Agency manages PHC through its PHC guideline.

In Nigeria public health care is provided in a three-tier manner; primary (local), secondary (state) and

tertiary (federal). As for all citizens the first entry for ASGM communities is thus to seek medical attention at a Primary Health Care Facility managed by the local council. Many gold mines are very remote and are hard to reach. Accessing a PHC is thus troublesome.

The National Health Care Development Agency is mandated to provide technical and programmatic support to states, local government agencies in their provision of PHC:

- Controlling of preventable diseases
- Making basic health care accessible to communities on a local level
- Providing basic health care that is people-oriented and delivered according to “established quality standards and protocols”
- Strengthening local structures by communication, monitoring, evaluation and appropriate procurement and finance management
- Continuous development of guidelines and norms
- Strengthening partnerships with government agencies
- Strengthening community engagement based on promoting their participation, ownership and responsibility in regard to applied programs

The presidential administration has published a working paper that addresses the shortcomings of the health-providing agencies and declares “to develop and implement policies and programmes

that will strengthen the national health system for effective, efficient, accessible and affordable delivery of health services in partnership with other stakeholders for the pursuit of accelerated economic growth and sustained” (Federal Ministry of Health, 2017, p. 2).

A draft version of the National Health Policy 2016 is available. However, this document has not been finalized or officially published yet. The policy states that the Nigerian health system is weak and underperforming. The document makes no specific reference to ASGM. Meanwhile the current policy is from 2004 (Federal Ministry of Health, 2004).

The Second National Strategic Health Development Plan 2018–2022 (successor strategy to the NSHDP 2010–2015) addresses identified gaps such as political will and poor programme ownership at lower levels, especially state and LGA levels; weak donor coordination and harmonization of development and technical assistance; low level of government financing of health care at the three levels of government; weak M&E systems to monitor implementation of the state Strategic Health Development Plans and weak primary health care structures (Federal Ministry of Health, 2019).

In the future emergency medical treatment will also be financed through the Basic Health Care Provision Fund. The status of its implementation could not be established.

Main strengths

In general Nigeria's health legislation is quite comprehensive. The basic legal framework would be well endowed to manage ASGM-related health issues.

Although not every single issue is listed in a bill, the main regulations entitle federal agencies to draft relevant policies and ordinances.

The FMOH is the competent authority and responsible to regulate health topics in regard to ASGM. The gaps have been acknowledged and efforts to bridge these shortcomings are being included in strategic papers and/or policies.

During the preparatory phase of the National Action Plan it has become evident to the key informants that the legal framework and status of ASGM communities needs to be improved.

Challenges

Accessing PHC is not ensured comprehensively across the country.

Many of the facilities are either remotely located or poorly equipped and thus unable to broadly prevent and cure medical issues.

There is no code or policy that regulates ASGM specific health hazards.

There is no document that systematically puts together ASGM-relevant guidelines and norms or identifies legal gaps.

Obtaining current laws and policies involves above-average efforts. Not all documents are available to the public and many documents exist only as hard copy.

Many legal codes or policies are outdated, some of them making reference to almost 20-year-old demographics. Considering Nigeria's growth rate is 2.47% p.a. accurate baselines are critical.

1.2 Structure Level

Priority area	Institutional dimension	Topical indicators	Score
1. Health hazards in ASGM communities	1.2 Structure level	1.2.1 Organization and job responsibilities of key institution(s)	2
		1.2.2 Primary health facilities and hospitals	3
		1.2.3 Technical and laboratory equipment to diagnose, monitor and treat ASGM-related health conditions	2
		1.2.4 Knowledge resources to address ASGM issues	3

1.2.1 Organization and job responsibilities of key institutions

General responsibilities of key institutions (FMOH, National Council on Health) are described in the health act. However, ASGM-relevant functions are not included and a mandate to address health hazards in ASGM communities has not been defined.

The Draft National Health Policy 2016 lists some further institutional responsibilities. Yet they are not always clearly defined. It was difficult to obtain information on specific organizational responsibilities. Many of the promised organograms were never shared.

Nigeria's FMOH is divided into six Technical Departments and six Non-technical Departments. Based on the insight shared by the key informants

the following departments within the FMOH are responsible for addressing ASGM issues:

- Public Health Department
- The Food and Drug Department
- Health Planning Research & Statistics Department

The respective entities are understaffed or have insufficient training allowing them to identify and appropriately address ASGM issues.

1.2.2 Primary health facilities and hospitals

The national health care system builds on the three tiers of primary (local), secondary (state) and tertiary (federal) health care. The country is divided into 774 LGAs or Councils. The latter are further divided into 9565 political wards, which are the smallest political structure. Below the wards, every cluster of villages is to contrive a health post and each ward is to operate a health centre (which is the next first reference to the health posts) that administers the Ward Minimum Health Care Package (Federal Ministry of Health, 2010). Together, they provide primary health care (PHC), also called Primary Level, which is supposed to ensure the Essential Package of Health Services (EPHS), a minimum standard of health care divided into three service delivery modes: family-focused, community-based services; population-oriented, schedulable services; and individually oriented clinical services (Primary Health Care Systems (PRIMASYS): case study from Nigeria, 2017). Reproductive, Maternal, New-born, Child and Adolescent Health, plus Nutrition Services (RMNCAH + N) are considered a critical component of the EPHS that should be facilitated on three levels.

PHC is to administer basic medical needs of preventive, curative, promotive and rehabilitative nature. Services provided in local clinics should include:

- Immunization
- Supply of vitamins
- Family planning
- Prenatal care, including preventive measures towards mother-to-child transmission
- Integrated management of childhood illness (IMCI)
- Integrated community case management of childhood illness (ICCM)
- Nutrition programmes

PHC services provided in local ward facilities include:

- Basic emergency obstetric and neonatal care (BEmONC)

Secondary Health Care is provided on the state/district level and includes specialized services that cannot be covered on the primary local level:

- General medical services
- Minor surgery
- Paediatric care
- Obstetrics
- Specialized laboratory service
- Diagnostics
- Blood bank
- Rehabilitation
- Physiotherapy

Tertiary Health Care is specialized and attends to medical cases of high complexity. Teaching hospitals and other specialized medical clinics are typically the facilitators of this service at the federal level.

A total of 65,759 registered doctors' practices in the country, which equals a ratio of 1:2.572 (Federal Ministry of Health, 2019, p. 34).

Often only nurses are present at the local level to provide health services in health centres or dispensary posts. Facilities that can attend to needs that require the attention of medical doctors are managed on state level. Staff providing health services are not trained to diagnose mercury-related health issues.

PHC is owned and operated by government or private organizations such as NGOs or development partners.

Publicly available numbers of the distribution of health facilities date back to 2015 (Table 4). According to the FMOH the distribution of health facilities is non-uniform, which has serious implications on access to health care. PHCs in more urban areas serve above-average numbers of patients while rural areas are challenged by long distances to reach a PHC. Key informants also shared that PHC centres are often overwhelmed and unable to provide all medical services needed. Typically, they are equipped with basic medicines (e.g. Aspirin, bandages, fever thermometer, Paracetamol etc.) only. Medical needs that are more complex would have to be treated in a secondary health facility.

Table 4: Distribution of primary, secondary and tertiary health facilities in Nigeria

Type of health facility	Public	Private	Total	Percentage	# facilities / 100'000
Primary Health Care Centres (PHC) – Local Level	21,909	8,355	30,345	88.1%	16.6
Secondary Health Care Facilities – District, State Level	963	3030	3993	11.6%	2.184
Tertiary Health Care Facilities – Federal Level	75	10	85	0.3%	0.046
Total	23,028	11,395	34,423	100%	

Source: Makinde, Sule, Ayankogbe & Boone (2018)

1.2.3 Technical and laboratory equipment to diagnose, monitor and treat ASGM-related health conditions

Nigeria's Centre for Disease Control (NCDC) is mandated to "... lead preparedness, detection and response to infectious disease outbreaks and public health emergencies" ("Nigeria Centre for Disease Control", n.d.) The NCDC operates the Public Health Laboratory Services which are all on the federal level.

Nigeria introduced the systematic preparation of laboratories into the Integrated Disease Surveillance and Response Strategy 2001 with the aim of diagnosing, monitoring and curing impacts through adequate screening. This strategy suggests implementing three-tier laboratory capacities in accordance with the health care system.

According to respondents, mobile equipment to diagnose common diseases such as malaria or cholera is available in urban areas, although all primary health services should be equipped to diagnose, monitor and treat basic health needs. Since many ASGM sites are located in very remote areas they have typically no access to PHC equipped with technical and laboratory instruments.

Mercury specific diagnoses or other symptoms possibly occurring amongst ASGM communities (e.g. silicosis, asthma, HIV, yellow fever, etc.) have to happen at teaching hospitals or state general hospitals. FMOH representatives state that technical and laboratory equipment is currently not available to ASGM communities, which means that there is no possibility to diagnose mercury poisoning.

The MMSD is currently conducting a baseline survey that amongst other issues should reveal insight

regarding local health capacities. The questionnaire does not make specific reference to technical and laboratory equipment to diagnose, monitor and treat ASGM-related health conditions, but inquires the level of access to health services. So far data have been obtained from two states.

1.2.4 Knowledge resources to address ASGM issues

The National Steering Committee brings together the key ministries that ought to address ASGM issues. Together, members are drawn from the FMEnv, FMOH, MMSD, UNIDO, academic and research institutes, MAN and civil society organisations (CSO). One of their objectives is to share knowledge and tackle common issues. It was stated that silo thinking often hinders ground setting for mutual strategies.

While all respondents from government agencies are to some extent aware of ASGM-related health issues, the level of knowledge within the ministries is rather general. In comparison, key informants from NGOs and CSOs presented a much broader and more in-depth knowledge and understanding of ASGM-related issues. Knowledge exchange between government and non-governmental is marginal.

Systematic ASGM health data collection is not happening and only sporadic surveys have been conducted. However, longitudinal studies are planned and the FMEnv, MMSD and FMOH have initiated more systematic data collection to build baselines. Specifications regarding these efforts were only provided by MMSD. For example, the FMEnv is conducting an initial assessment to fully comprehend the use of mercury in the country.

Main strengths

The current legal framework is rather comprehensive and defines overall obligations and responsibilities.

Structural gaps have been identified on some level and consequently incorporated into policies or strategic government plans.

Nigeria's health care is decentralized and provided in a three-tier way. This system is suitable to satisfy ASGM-related health needs.

Many ministries are online stating their mandate clearly. Some share organograms, regulations and policies.

Cooperation and interaction with international organizations is strong, based on long-time efforts.

The importance of ASGM issues is increasingly recognized, as is the need for inter-ministerial collaboration.

Challenges

Government service providers are chronically understaffed and ministries are struggling for monetary means, making it more difficult to address additional tasks such as ASGM specific issues.

Specific responsibilities, job descriptions or mandates are not always clearly defined.

Many agents are not fully aware of their duty in view of ASGM issues.

Inter-ministerial coordination and collaboration are poor.

Obtaining organograms and job responsibilities of key institutions was difficult. The FMOH has an organogram online which is known to be outdated.

1.3 Process level

Priority area	Institutional dimension	Topical indicators	Score
1. Health hazards in ASGM communities	1.3 Process level	1.3.1 Mechanisms for responding to health emergencies (e.g. chemical spills, disease outbreaks)	2
		1.3.2 Preventive mechanisms to address health hazards related to ASGM (e.g. chemical spills, disease outbreaks)	3
		1.3.3 Training programs for health staff to detect, monitor and treat health conditions related to ASGM	2
		1.3.4 Coordination mechanisms among ministries to address health hazards	3

1.3.1 Mechanisms for responding to health emergencies (e.g. chemical spills, disease outbreaks)

Nigeria's National Emergency Management Agency is the designated disaster response unit governed by the NEMA act. By amending Act 50 through decree No.12 in 1999 NEMA was established (The Federal Military Government, 1999). Disease management

is clarified in the second part of the decree, whereby the distribution of emergency relief materials to victims of natural or other disasters is included. Furthermore, NEMA is to assist the rehabilitation process of victims where indicated (The Federal Military Government, 1999, §6, lit.a et seq.)

The emergency protocol is meticulously listed in the National Disaster Response Plan (NDRP) and

NEMA has drafted guiding policies for the case of emergency. Responding to health emergencies is considered a Support Service Area by the NDRP whereas deliverables are allocated to suitable ministries i.e. FMOH (National Emergency Management Agency (NEMA), 2002). In the case of a disease outbreak the FMOH, FMEEnv and the FMWR are the primary responders.

Furthermore, the Nigeria Centre for Disease Control is to enhance Nigeria's preparedness and response to epidemics through inter alia control of communicable and non-communicable diseases ("Nigeria Centre for Disease Control", n.d.)

While a sufficient legal framework exists, government officials made no statements about the operational preparedness to respond to such a scenario.

1.3.2 Preventive mechanisms to address health hazards related to ASGM (e.g. chemical spills, disease outbreaks)

Awareness raising campaigns are the most widely applied mechanism when addressing health hazards related to ASGM. MMSD and FMEEnv gave evidence of specific initiatives regarding the use of mercury.

The majority of the awareness raising campaigns and trainings seem to be implemented by CSOs.

There was no evidence of prevention protocols tailored to the context of ASGM.

1.3.3 Training programs for health staff to detect, monitor and treat health conditions related to ASGM

Training of health staff on the primary level i.e. local level is of a generic nature.

No information was obtained that indicates ASGM specific training for health staff.

1.3.4 Coordination mechanisms among ministries to address health hazards

Systematic discussion of health hazards threatening ASG miners is recent within Government. Many ASG miners operate informally and thus outside the rule of law. Given their illegal status the health system has ignored the health issues of ASG miners and communities.

The ASGM health strategy to be developed in the context of the NAP is the first attempt to take a strategic approach with the National Steering Committee as coordination mechanism and with the FMOH in the lead.

Main strengths

Emergency response protocols are in force and provide detailed commands in case of an emergency related to chemicals or a disease outbreak.

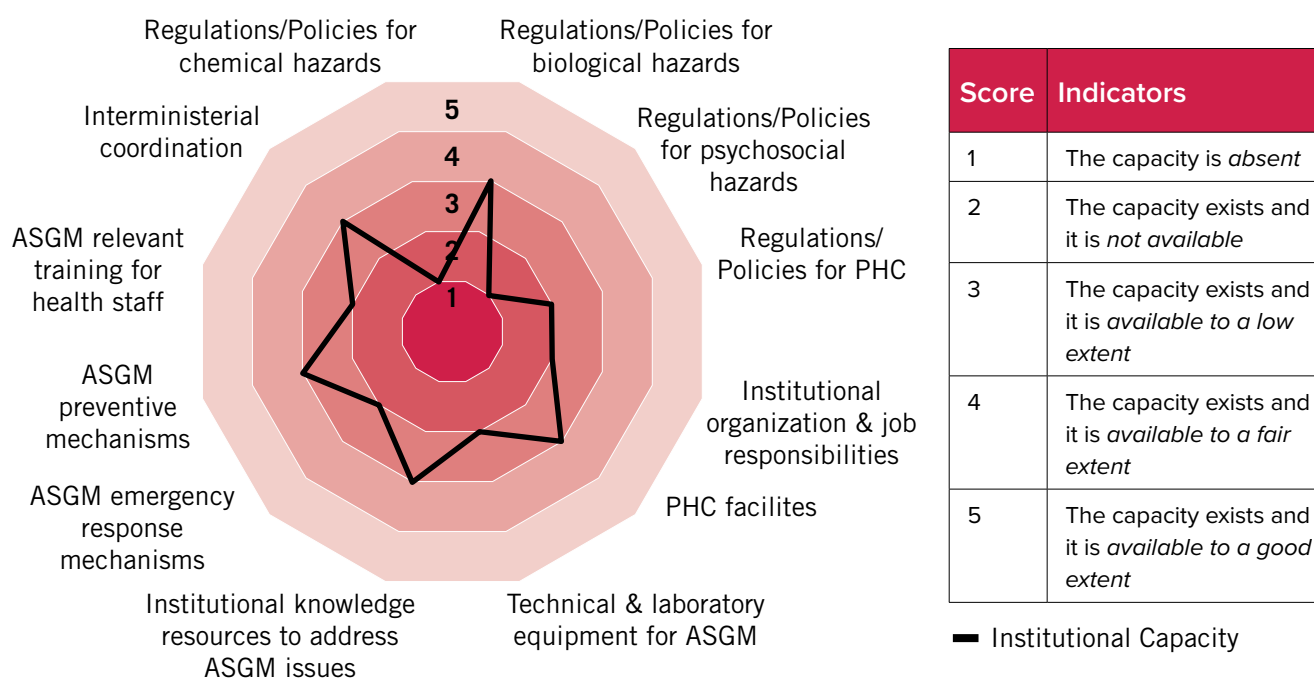
Although it is over 10 years old, the NDRP is detailed and includes response measures to chemical disasters.

Establishing the National Steering Committee has set grounds to streamline ministerial capacities. The regular exchange enables each governmental stakeholder to become aware of requirements and calls for action.

Challenges

In 2017 FMEEnv together with UNIDO and UNITAR conducted the Initial Assessment Report for Nigeria in regard to the country ratifying the Minamata Convention. In Chapter 5.2 of the report, training and education of target groups and professionals is stated as imperative (Federal Ministry of Environment, 2017). However, access to track records of any health training programs or awareness raising efforts were not available.

While the NSC is improving inter-ministerial coordination, a more proactive approach seems advisable in order to sustain the momentum.

Figure 1: Institutional capacities to address ASGM-specific health hazards

Occupational health hazards related to ASGM

2.1 Regulatory and policy level

Priority area	Institutional dimension	Topical indicators	Score
2. Occupational health hazards related to ASGM	2.1 Regulatory and policy level	2.1.1 Regulations and policies for the following occupational health hazards in ASGM: ■ chemical hazards (mercury, cyanide, chemicals contained in dust, toxic gases) ■ biomechanical and physical hazards (musculoskeletal disorders, overexertion, physical trauma, noise, heat and humidity)	4

2.1.1 Regulations and policies for the following occupational hazards in ASGM

The laws that relate to labour and employment include:

- Constitution of the Federal Republic of Nigeria 1999
- The Labour Act 2004
- National Policy on Occupational Safety and Health
- National Employment Policy – The NEP sets specific targets for the Nigerian mining sector without suggesting how or by whom these objectives are to be achieved (Federal Ministry of Labour and Employment, 2017, p. 37/p. 74)
- List of Hazardous Child Labour in Nigeria with concrete reference to gold mining and the handling of mercury (Federal Ministry of Labour and Productivity, 2013, p. 6)
- Employment compensation Act 2010
- Child's Right Act
- Industrial Training Fund Act 2004
- National Health Insurance Scheme Act 2004
- National Housing Fund Act 2004
- Pension Reform Act 2014
- Personal Income Tax Act 2004

- Trade Disputes Act 2004
- Trade Unions Act 2005
- Nigeria Data Protection Regulation 2019
- Jurisprudence and prejudices of Nigeria's courts of law
- International conventions, treaties or protocols

Since Nigeria knows no Chemical Act chemical hazards related to the transport, use and disposal of mercury or cyanide are not regulated. Human physical and psychological integrity is protected by the Constitution, while this guarantee is specified occasionally (Chapter L1 Labour Act, 1974, §46, sec.2)

Child labour is a common phenomenon within ASGM. Regulations concerning child labour in ASGM are to be subsumed under the Constitution, Child's Right Act and international regulations.

Factory operators (which also includes mine operators) are required by law to equip their employees with (free) PPE (Factories Act, 2004, §§47, 48).

Main strengths

When studying legislations relevant for adult labour, terms and expression are very clearly defined (e.g. occupational health or major hazard accident).

Labour-related health protection is guaranteed in numerous codes and policies.

Some documents make specific reference to mining if not artisanal and small-scale gold mining.

The National Policy on Occupational Safety and Health includes both the formal and the

informal sector while defining the scope of the policy to cover: "Location, design, construction, testing, choice, substitution, installation, arrangement, use and maintenance of workplace, work environment, tools, machinery and equipment, chemical, physical and biological agents and work processes" (Federal Ministry of Labour and Employment, 2014, §4.1, lit.a).

Some argue that occupational exposure to potentially health-impairing toxins such as mercury are even prohibited by the Harmful Waste (Special Criminal Provision) Act.²

² §15 Interpretation: "harmful waste" means any injurious, poisonous, toxic or noxious substance and, in particular, includes nuclear waste emitting any radioactive substance if the waste is in such quantity, whether with any other consignment of the same or of different substance, as to subject any person to the risk of death, fatal injury or incurable impairment of physical and mental health; and the fact that the harmful waste is placed in a container shall not by itself be taken to exclude any risk which might be expected to arise from the harmful waste (Harmful Waste Act, 1988).

Challenges

Coordinated action and enforcement between the key agencies is insufficient.

Some paragraphs or codes refer to mining, but small-scale and informal mining, however, is not explicitly regulated.

Women are particularly impacted when freely exposed to mercury. Measures specifically designed to tackle ASGM-relevant issues are insubstantial.

The legal framework concerning child labour shows inconsistencies and does not correspond entirely with ratified occupational international standards (e.g. minimum age of work).

According to the key informant at the Federal Ministry of Labour and Employment (FMLE), an occupational law that regulates the ASGM sector, especially the inspection of ASG mining sites, is currently awaiting passage in the National Assembly. Its content was not shared.

2.2 Structure level

Priority area	Institutional dimension	Topical indicators	Score
2. Occupational health hazards related to ASGM	2.2 Structure Level	2.2.1 Organization and job responsibilities of key institution(s)	2
		2.2.2 Technical and laboratory equipment to diagnose, monitor and treat ASGM-related occupational health conditions (see also 1.2.3)	1
		2.2.3 Knowledge resources to address ASGM issue	2

2.2.1 Organization and job responsibilities of key institution(s)

FMOH reported the Chemical Unit at the Department of Food and Drug Services as the agency supervising the handling of mercury. Any occupational incidents when handling hazardous chemicals are reported internally. The applied response mechanism was not shared, though it was stressed that the focus lies in awareness raising activities. UNIDO supports these efforts and guides thematically.

Based on the conversation with the key informant representing the Ministry of Labour and Employment, occupational issues in regard to ASGM are not of high priority. Hence, tailored organizational and job responsibilities are yet to be developed within the ministry. According to the Factory Act, a mine (even if operating on a small-scale level) qualifies as a factory.

FMLE states that the responsibility descriptions are available. However, a permanent lack of funding as well as lack of technical capacity inhibits implementation of legal provisions, including the inspection of mines.

CSOs claim to observe deficient efforts from governmental institutions and poor definition of organizational and job responsibilities. Representatives interviewed state that when they report observations and incidences from the field there is no response or follow-up from the administration.

2.2.2 Technical and laboratory equipment to diagnose, monitor and treat ASGM-related occupational health conditions

See also 1.2.3

2.2.3 Knowledge resources to address ASGM issues

While ASGM specific issues regarding occupational hazards are not on the radar of the Ministry of Labour and Employment (and other key governmental agencies), all other

governmental key informants are fully aware of the occupational risks ASG miners expose themselves to.

Knowledge is not managed systematically, i.e. it is not strategically obtained, edited and translated into action.

Main strengths

The FMLE has been rearranged internally and is determined to accelerate its mandate.

Eradicating child labour in the ASGM sector is one of the ministry's priorities.

Challenges

Coordination between ministries is underdeveloped, restricting the effective use of public funds.

Cooperation/coordination between government agencies and NGOs could increase the effectiveness of the efforts.

The lack of comprehensive baseline data hinders prioritization of government interventions.

2.3 Process level

Priority area	Institutional dimension	Topical indicators	Score
2. Occupational health hazards related to ASGM	2.3 Process Level	2.3.1 Mechanisms for responding to health emergencies in the workplace (e.g. chemical spills and accidents)	1
		2.3.2 Preventive mechanisms to address occupational health hazards in the workplace (e.g. chemical, biomechanical, physical)	2
		2.3.3 Coordination mechanisms among ministries to address occupational health hazards	2

2.3.1 Mechanisms for responding to occupational health emergencies related to ASGM (e.g. chemical spills and accidents)

The Factory Act determines occupational emergencies and outlines response liabilities. Mentioned explanations are subject to legal interpretation given their general definition.

Occupational health is first and foremost the responsibility of the factory owner or manager; the latter is obliged to operate the factory in a

manner that presents no risk to workers' integrity. Emergency response protocols are thus to be drafted accordingly. According to §23 the employee (i.e. also the miner) must be acquainted with potential health hazards related to their work before commencing operations and employees must be trained in regard to preventive measures that ensure health and safety at the work station (Factories Act, 2004).

No specific legislation for the ASGM sector exists.

Representatives of the FMLE shared that awareness raising workshops have been conducted, with the objective to educate miners about minimal emergency response mechanism. Specific teaching content was not shared.

2.3.2 Preventive mechanisms to address occupational health hazards related to ASGM (e.g. chemical, biomechanical and physical hazards)

Refer to previous paragraph.

2.3.3 Coordination mechanisms among ministries to address occupational health hazards

The Federal Government has no mechanism in place to coordinate occupational health hazard management. In 2017 the Occupational Safety and Health Bill (SB 200) had undergone its second reading in the Senate, where the process has stalled ever since. The bill's objective

was, inter alia, to provide a legal framework that promotes occupational safety in regard to chemical, biological and physical hazards. Furthermore, it was an attempt to reinforce child labour prohibition. The bill also includes a harmonization mechanism for the strategic coordination amongst ministries addressing occupational health hazards (Maina, 2017).

In 2016 the Ministry of Labour and Employment together with the ILO developed a framework for national Occupational Health and Safety. One of many propositions was that the FMOH set up an Occupational Health and Safety Division. This draft includes tangible tools and measures that would contribute towards prevention as well as maintenance of occupational health and safety (Federal Ministry of Labour and Employment, 2016). The current implementation status is unknown.

Main strengths

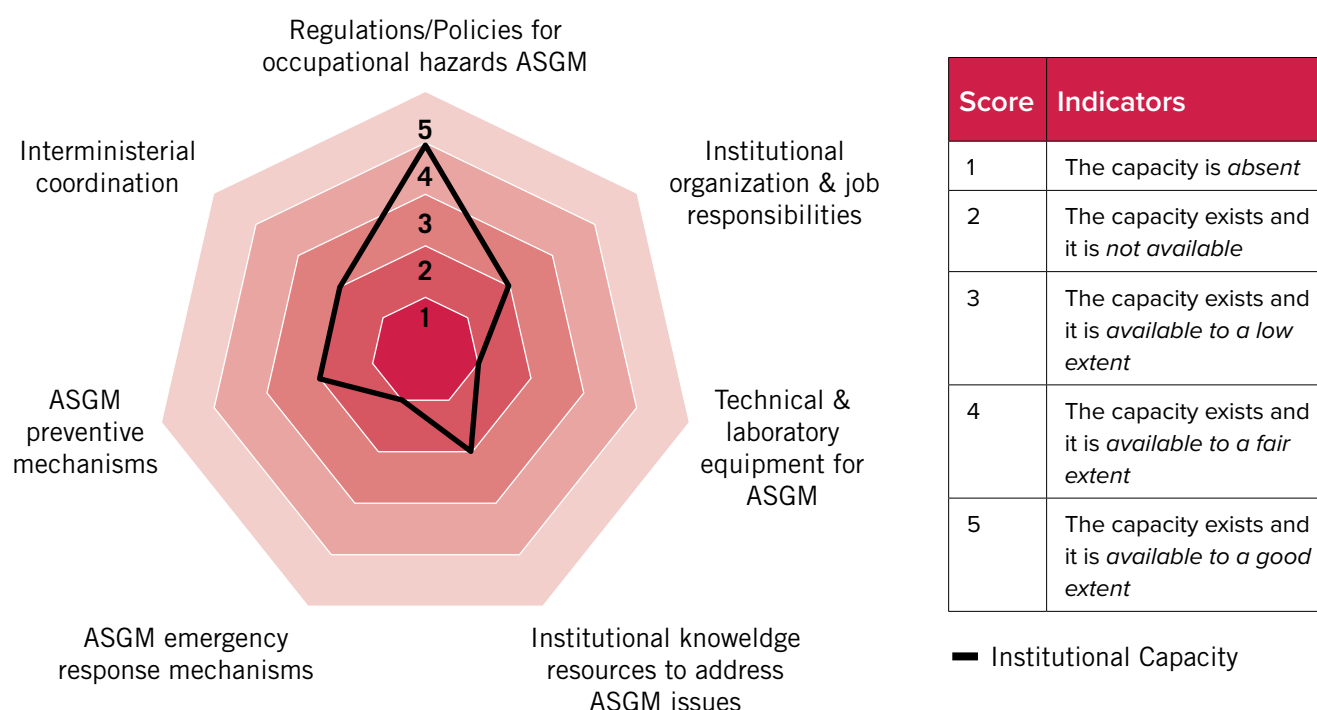
Occupational health and safety hazards are on the ministries' radar due to the economic importance of the sector.

Field work from CSOs identifies concrete needs for action. International organizations with broad ASGM expertise contribute to the policy process with data and strategy proposals.

Challenges

Moving from strategy papers, NS policy briefs, to practical action and effective implementation remains difficult.

Tailored laws or policies that guide on how to adequately respond to an emergency occurring at a mine are non-existent.

Figure 2: Institutional capacities in place for occupational health hazards related to ASGM

ASGM-related environmental hazards with health implications

3.1 Regulatory and policy level

Priority area	Institutional dimension	Topical indicators	Score
3. Environmental hazards related to ASGM that have implications for health	3.1 Regulatory and policy level	3.1.1 Regulations and policies for land degradation, mercury emissions/pollution, siltation, erosion, water contamination	2

3.1.1 Regulations and policies for land degradation, mercury emissions/pollution, siltation, erosion and water contamination

In Nigeria the FMEnv is mandated to coordinate all environmental matters. It is eligible to draft regulations, monitor and inspect compliance, and prosecute fallible conduct. Some of NESREA's measures to safeguard the environment are: issuing licenses, license revocation, penalty fees, remedial work and implementing the "polluter pays" principle ("NESREA Official Website | Our Functions", 2017). Each of the 36 states has its own environmental protection body as well as its own legal framework that regulates chemical emissions, pollution, siltation, erosion and water contamination. On the federal level the following laws and policies regulate prior listed eco-hazards:

- Constitution of the Federal Republic of Nigeria
- National Environmental Standards and Regulations Enforcement Agency (Establishment) Act, 2007
- Federal Environment Protection Agency Act, 1999
- Environmental Impact Assessment Act, 1992
- Nigerian Minerals & Mining Act, 2007
- Federal Environmental Protection Agency Act, 1999
- National Policy on Chemical Management
- Water Resources Act, 2004
- National Water Resources Policies, 2016
- Harmful Waste (Special Criminal Provision, etc.) Act, 2004
- Common law and jurisprudence of the federal courts of law

None of the key informants was able to reference applicable laws that explicitly consider environmental issues in the ASGM sector.

3.2 Structure level

Priority area	Institutional dimension	Topical indicators	Score
3. Environmental hazards related to ASGM that have implications for health	3.2 Structure level	3.2.1 Organization and job responsibilities of key institution(s)	2
		3.2.2 Technical and laboratory equipment to assess, monitor and improve ASGM-related environmental issues	1
		3.2.3 Knowledge resources to address ASGM issues	1

3.2.1 Organization and job responsibilities of key institution(s)

On a federal level, job responsibilities are not clearly defined. While many key informants are aware of ASGM in general and the use of mercury, departments and agents are not mandated to address ASGM. Federal agencies seem preoccupied with overarching agenda setting. This might be due to the decentralized structure of environmental protection, with 36 environmental protection bodies.

3.2.2 Technical and laboratory equipment to assess, monitor and improve ASGM-related environmental issues

The Federal Ministry of Water Resources (FMWR) is well equipped with mobile laboratory instruments and does some random and some strategic water sampling. The FMWR takes water samples on a

regular basis specifically targeting the mining environment. Beyond that, there is no evidence of systematic surveillance of soil, air and water in ASGM mines and proximate lands.

CSOs and international NGOs do regular eco-analysis in ASGM areas.

3.2.3 Knowledge resources to address ASGM issues

Knowledge of environmental (health) hazards jeopardizing ASGM communities is limited to sanitation-related issues. The impacts of mercury or cyanide on the habitat are not a focal topic and therefore not included in political or legislative agendas and programs.

Many agencies seem to rely on CSOs for knowledge concerning ASGM.

3.3 Process level

Priority area	Institutional dimension	Topical indicators	Score
3. Environmental hazards related to ASGM that have implications for health	3.3 Process level	3.3.1 Mechanisms for responding to environmental emergencies related to ASGM	2
		3.3.2 Preventive mechanisms to address environmental hazards related to ASGM (e.g. land degradation, mercury emissions/pollution, siltation, erosion, water contamination)	2
		3.3.3 Training programs for staff to detect and monitor environmental hazards related to ASGM	1
		3.3.4 Coordination mechanisms among ministries to address environmental hazards that have implications for health	1

3.3.1 Mechanisms for responding to environmental emergencies related to ASGM

Please refer to 1.3.1.

3.3.2 Preventive mechanisms to address environmental hazards related to ASGM (e.g. land degradation, mercury emissions/pollution, siltation, erosion, water contamination)

FMOH states that regular mercury workshops are held so as to educate ASGM communities. These workshops also highlight the importance of adequately disposing chemicals. Statistics that reveal frequency and/or coverage were not available.

The FMEnv did not share any activities or preparatory legislations targeting environmental hazard prevention.

NESREA is endowed with both regulatory and executive powers and thus is the designated agency to develop preventive mechanisms. NESREA has launched numerous environmental prevention programs, none of which target ASGM.

3.3.3 Training programs for staff to detect and monitor environmental hazards related to ASGM

Key informants from CSOs reported to have a broad portfolio of trainings to educate mining communities in preventing and detecting environmental hazards.

Such include enhanced sanitation standards (open defecation, enhanced hygiene around waterbodies, burning of waste, etc.) However, no particular reference to mercury or cyanide being a topic was made.

Women in Mining Nigeria (WIMIN) facilitates workshops and trainings that are segmented by topic with a focus on female needs and specifics.

Evidence of governmental programs drafted for ASGM communities cannot be found. Oral confirmation of such efforts was not supported by underlying documentation. The FMEnv repeatedly highlighted its waste management program without explaining its nexus to ASGM.

The FMOH together with NCDC are either actively executing or promoting sanitation programs that are related to the environmental within their mandate of awareness raising.

3.3.4 Coordination mechanisms among ministries to address environmental hazards that have implications for health

There is no mechanism in place to align and mainstream the management of environmental hazards in general or ASGM in particular. Although many regulations and policies exist, they have not led to coordinated efforts.

Main strengths

The federal environment protection code reveals a contemporary and well-designed framework.

Water is broadly and meticulously regulated. Some paragraphs of the Mining Act make reference to ecologically relevant issues such as the diversion of waterbodies.

The Ministry of Water Resources is well equipped with mobile laboratory instruments and samples waterbodies on a regular basis.

NESREA was established, acknowledging the importance of environmental protection, and its setup appear reasonable.

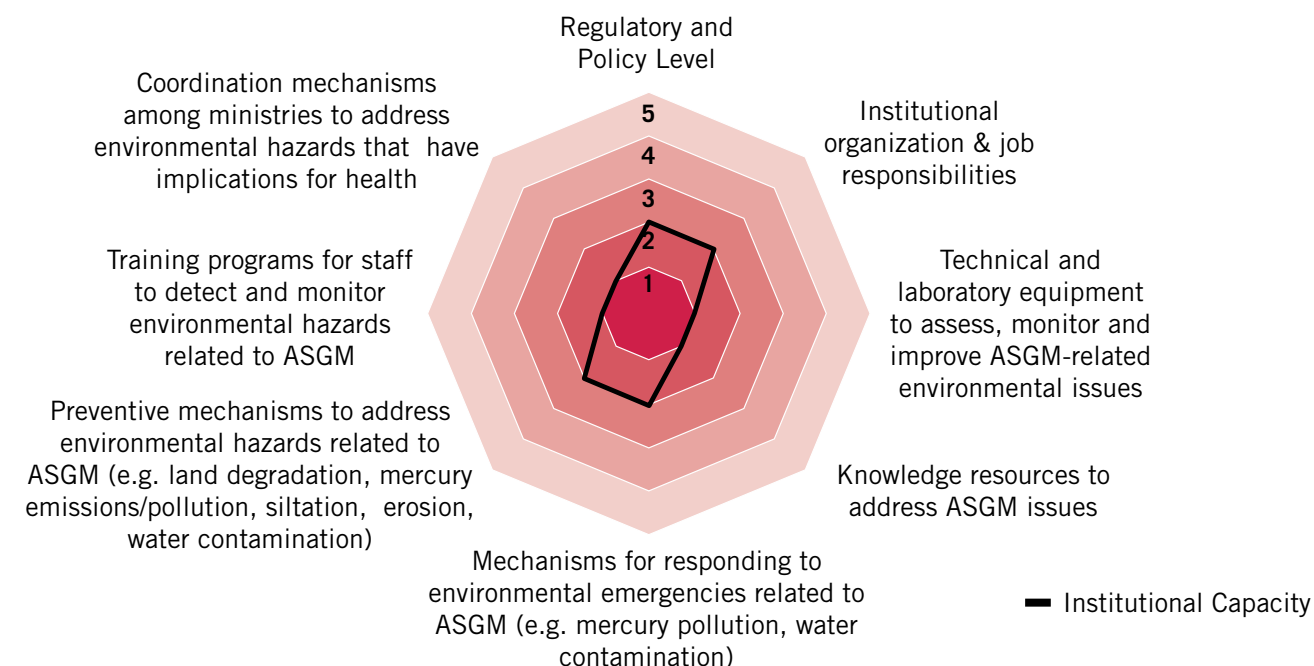
Challenges

Environmental issues are not a top priority for policy-makers. Topics such as degradation, water pollution or deforestation are neglected. Currently, formalization of ASGM and child labour receives more attention.

Silo mentality within the ministries was criticized in almost all interviews. Although many ministries are aware of the environmental hazards, they do not know what action other agencies are taking in regard to those topics.

Land degradation continues to be a major problem when mine pits are abandoned. Land is left infertile, which renders communities with no alternative livelihood and perpetuates the cycle of poverty.

Figure 4: Institutional capacities for environmental hazards related to ASGM



Score	Indicators
1	The capacity is <i>absent</i>
2	The capacity exists and it is <i>not available</i>
3	The capacity exists and it is <i>available to a low extent</i>
4	The capacity exists and it is <i>available to a fair extent</i>
5	The capacity exists and it is <i>available to a good extent</i>

Chemical management related to ASGM

4.1 Regulatory and policy level

Priority area	Institutional dimension	Topical indicators	Score
4. Chemical management related to ASGM	4.1 Regulatory and policy level	4.1.1 Regulations and policies for chemical management	2

4.1.1 Regulations and policies are clearly defined for chemical management

Nigeria has no chemical act but has a Chemical Management Policy (CMP). The following codes and regulations govern chemical handling:

- Constitution of the Federal Republic of Nigeria, 1992
- National Policy on Chemical Management (CMP), 2010
- List of Restricted Chemicals
- National Environmental Standards and Regulations Enforcement Agency (Establishment) Act, 2007
- Nigerian Minerals & Mining Act, 2007
- Federal Environmental Protection Agency Act, 1999

- Water Resources Act, 2004
- National Water Resources Policies, 2016
- Harmful Waste (Special Criminal Provision, etc.) Act, 2004
- Common law and jurisprudence of the federal courts of law

The Chemical Management Policy is the most specific document governing the handling of chemicals. It covers general risks related to chemicals, their handling, storage and disposal. It also applies to the mining sector. Furthermore, it proposes a strategy for capacity development, the availability of laboratory and testing equipment, and for risk management in the form of an emergency response protocol.

Main strength

The CMP contains an extensive list of services and duties regarding the handling of chemicals. Licensing is defined clearly and the requested forms can be accessed online.

Challenges

The legal framework regulating chemical management is incoherent. Nigeria has no chemical code and many of the regulations are outdated according to respondents.

There was no supporting documentation or other evidence of the implementation of the CMP provision with reference to ASGM, mercury or cyanide.

4.2 Structure level

Priority area	Institutional dimension	Topical indicators	Score
4. Chemical management related to ASGM	4.2 Structure level	4.2.1 Organization and job responsibilities of key institution(s)	2
		4.2.2 Technical and laboratory equipment to identify chemicals (mercury, cyanide, chemicals contained in dust, toxic gases)	1
		4.2.3 Knowledge resources to address ASGM issues	2

4.2.1 Organization and job responsibilities of key institution(s)

The National Agency for Food and Drug Administration and Control (NAFDAC) under the FMOH is the appointed agency to govern chemical management in the country, including mercury, cyanide or other chemicals used amongst ASG miners. According to the key informant the NAFDAC's mandate is to develop policies and initiate legislation relating to food, drugs, chemicals, cosmetics, water and medical devices and also provide pharmaceutical services. Currently effective legislations confirm these mandate components. Furthermore, managing supply chains and administering the Chemical Management Program (CMP) is stated to be part of the mandate.

Documentation that substantiates both the mandate and the CMP (policies or strategic papers) are inaccessible. The same applies for the relevant outline of the agency's organizational setup.

It was not possible to get information on the agency's organizational setup.

The person responsible for the ASGM focal point in the chemical unit of NAFDAC stated that they have a supervisory role. This means that proactive involvement (e.g. for training and prevention) is the exception. Apparently, this concept is currently being modified; no further details were provided.

NAFDAC implements a program for ASGM together with WHO. Stakeholder meetings and two health facility assessments in two states (ongoing at the

time of the interview) are the only specific initiatives that were mentioned in regard to this engagement. These assessments are health specific only and are mentioned earlier in this report (A.2.3).

4.2.2 Technical and laboratory equipment to identify chemicals (mercury, cyanide, chemicals contained in dust, toxic gases)

There is little to no equipment available to identify/analyse chemicals in rural areas where ASG mining takes place. Specific testing for mercury or cyanide ingestion or poisoning respectively are not possible. According to NAFDAC the traditional healer is the first responder in case of emergency. When symptoms or assumptions of chemical-related health problems persist a regional health facility has to be consulted.

4.2.3 Knowledge resources to address ASGM issues

Little is known about the supply chains of mercury and cyanide. A large amount of mercury is imported illegally since the number of licenses do not correlate with the volumes that are being used in the sector. A CSO key informant claims the mercury is imported from Niger and Togo.

Mercury appears to be sold openly in village kiosks nearby mines, usually tightly sealed in small plastic bottles wrapped in a plastic bag. It is very easily purchased. Consumers of mercury are aware of its volatility and handle it with great care to avoid spilling or evaporation. However, their knowledge is limited to those few facts.

Main strengths

NAFDAC is the appointed agency to govern chemical management in the country, along with implementing the CMP that provides an extensive list of services and duties for the agency.

There is a well-established relationship with UNIDO.

Challenges

NAFDAC is chronically understaffed and lacks both human and technical capacities.

Data mapping the chemical landscape of ASGM is limited. Infrequent efforts are made to systematically surveil the sector. Current findings in relation to the knowledge base are grounded

on assumptions, given the scarcity of the revealed insight.

Suggestions for chemical alternatives that ought to be made available to ASGM miners include Borax, a boron compound. Governmental subsidies will have to be considered though due to Borax's expensive price.

Many other key informants quote silo thinking and isolated operations within ministerial agencies as major obstacles making it difficult to strategically negotiate the challenges related to ASGM. And finally, financial constraints make it impossible to perform any indicated measures (testing, identification of chemical contamination, etc.). Government will have to address budget allocation, operations and human resource planning if phasing out the use of mercury is to be achieved.

Priority area	Institutional dimension	Topical indicators	Score
4. Chemical management related to ASGM	4.3 Process level	4.3.1 Mechanisms for responding to chemical emergencies	2
		4.3.2 Preventive mechanisms to address chemical hazards	2
		4.3.3 Coordination mechanisms among ministries to address chemical management	2

4.3 Process level

4.3.1 Mechanisms for responding to chemical emergencies

The CMP suggests collaboration with NEMA in the case of a chemical emergency. However, no definition of a chemical emergency is provided.

Chapter A.3.1 applies here accordingly ("Food and Drugs Services", n.d.).

4.3.2 Preventive mechanisms to address chemical hazards

No prevention national level protocols were shared. It is assumed that Chapter A.3.1 applies accordingly.

4.3.3 Coordination mechanisms among ministries to address chemical management

The CMP makes reference to existing international collaborations. Moreover, it suggests FMOH interacts with the FMEEnv, NESREA and "other stakeholders" ("Food and Drugs Services", n.d.). No further details were provided.

Main strengths

The CMP (available online) lays out some basic principles of chemicals management, including integrating chemical management into existing health programs or the necessity of awareness raising programs. It also encourages cooperation and coordination.

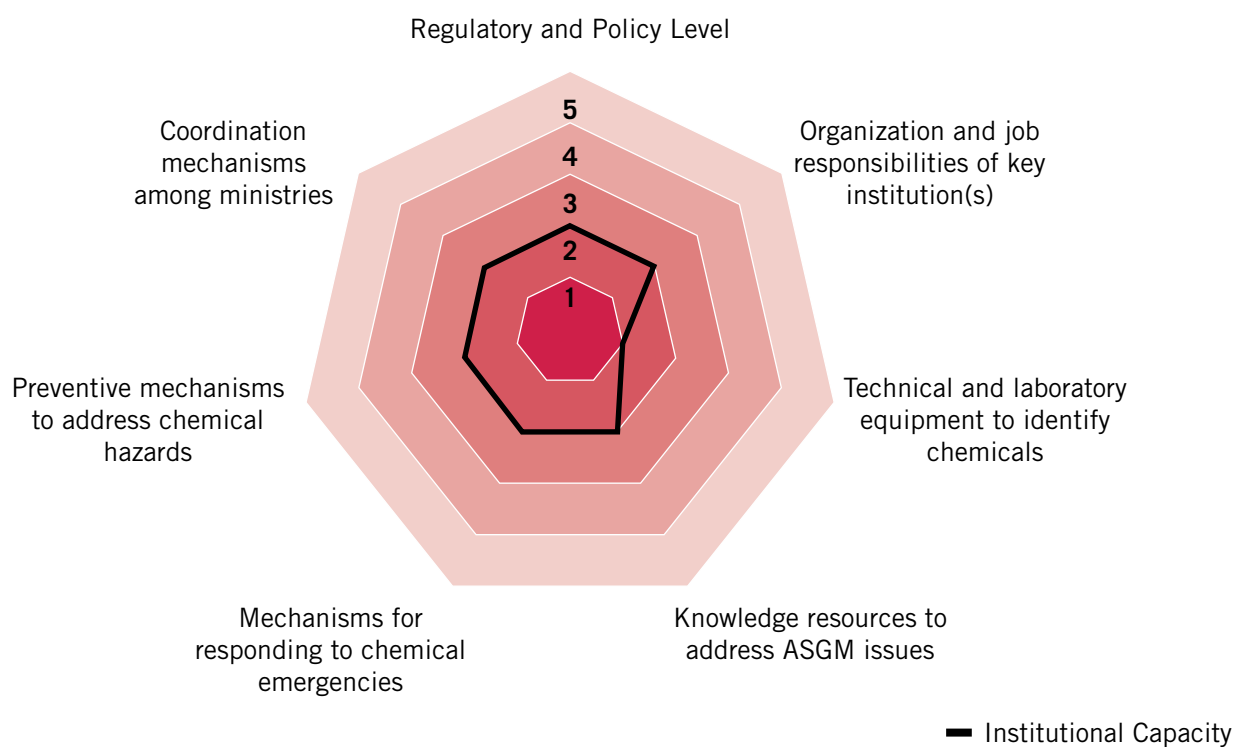
NEMA's protocol can be applied analogously to other emergencies.

Challenges

A protocol developed specifically for the case of chemical emergencies does not exist.

There is no definition of a chemical emergency. The amounts of mercury already polluting waterbodies may qualify as a chemical emergency. The lack of human resources, financial capacities and technical equipment prevents such an assessment.

Figure 4: Institutional capacities for chemical management related to ASGM



Score	Indicators
1	The capacity is <i>absent</i>
2	The capacity exists and it is <i>not available</i>
3	The capacity exists and it is <i>available to a low extent</i>
4	The capacity exists and it is <i>available to a fair extent</i>
5	The capacity exists and it is <i>available to a good extent</i>

5 Recommendations

In this section:

Recommendations at institutional level

38

Recommendations for Public Health Strategy

39

Recommendations

We first present recommendations for the three institutional dimensions: regulatory and policy level, structure level and process level. Second, we present recommendations for the three strategic

objectives established for the Public Health Strategy in the context of the National Action Plan: health data collection, training of health care workers, and awareness raising and education.

Recommendations at the institutional level

Regulatory and policy level:

- Develop a national ASGM policy based on existing regulations. Overall, Nigeria has a comprehensive regulatory framework for health, environment and occupation. However, the degree of specification varies. ASGM specific issues are not explicitly addressed but have to be inferred from more general principles defined for the respective area. Rather than developing an ASGM specific law it might be more pragmatic to develop an ASGM policy that (a) summarizes the relevant laws and codes (health, environment, occupation, chemicals), (b) derives interpretative propositions for the case of ASGM, and (c) identifies gaps in the framework to be filled.
- Introduce a Chemicals Act. The purchase, transport, use and disposal of mercury is only lightly regulated through the CMP. This is insufficient for the effective regulation of chemicals in general and mercury in particular and enforcement thereof.

Structure level:

- Review the distribution of responsibilities. The implementation of the Minamata Convention offers an opportunity to review institutional responsibilities, remove over- and underlaps, as well as duplications.

- Define coordination mechanisms in sufficient detail. Efficient coordination is essential for effective regulation. Unambiguous distribution of responsibilities (see above), competencies for the coordination mechanism, and an assigned lead for the coordination mechanism improve the functioning.

Process level:

- Prioritize the implementation of existing regulations and their rollout to ASGM.
- Use synergies between governmental actors to boost effectiveness. The lack of funding is a chronic issue. The coordinated rollout of activities allows more effectiveness with the same funding. Proper information across institutions and awareness are key requirements.
- Institutionalize cooperation and coordination with not-for-profit actors, including academia and civil society. Strategic cooperation with academia and civil society also help to overcome budget restraints, particularly in the areas of data collection and knowledge generation.

Recommendations for the Public Health Strategy

Strategic objective 1:

Gathering data

- Move beyond baseline data. Baseline data that are representative for the mining community are an essential starting point for developing an ASGM strategy. It would be worthwhile checking whether the baseline that is currently being prepared is sufficient.
- Integrate ASGM data collection into DHIS2. Data that overlap information about ASGM communities with health facility information are crucial to understanding needs and access, to plan health services strategically, and to monitor ASGM specific health trends. Nigeria uses DHIS2 as a clinic-level data collection system. We suggest integrating ASGM-specific data into DHIS2 to guarantee continuous and comprehensive data collection as well as guaranteeing comparison with non-ASGM areas.

Strategic objective 2:

Training for health care workers

- Develop ASGM training program for health workers in mining areas. Health workers at all three tiers should be trained in ASGM-related issues regularly, including emergency response. These programs should enable health workers to identify, treat and monitor ASGM specific health problems, especially those related to mercury. Adequate data collection would be an inherent component of monitoring.

- Include traditional doctors. Often, the traditional healer's wisdom is consulted first when health issues occur. It is important to include chiefs and traditional healers to improve the effectiveness of ASGM health education.
- Invest in building relationships with mining communities. At times, the relationship between miners and government officials is tense due to the illegal nature of many aspects of ASGM, affecting the health seeking behaviour of mining communities. Addressing the attitude of all government officials towards the mining community will be a precondition for their inclusion into the health system.

Strategic objective 3: Awareness raising through facilities

- Improve accessibility of health care in mining areas. Availability of health facilities in mining areas is a key priority, as is the admission of ASGM patients irrespective of the formal status a miner has.
- Focus on occupational health and vulnerable target groups. Sensitization and awareness raising should include ASGM specific issues related to mercury and occupational health and safety, as well as general issues regarding sanitation, reproductive health, STDs and HIV. Women, children and adolescents should be addressed explicitly as target groups.
- Create strategic alliances to increase outreach. Cooperate and coordinate with civil society and increase outreach and effectiveness of training and education efforts.

References

- Akwagyiram, A. (2018). Nigeria's first gold refinery plans to triple capacity in five years. Retrieved 21 July 2019, from <https://www.mining.com/web/nigerias-first-gold-refinery-plans-triple-capacity-five-years/>.
- Artisanal and Small Scale Gold Mining - Facts and Figures. (2019). Retrieved 20 July 2019, from http://cwm.unitar.org/cwmplatformscms/site/assets/files/1272/globalmercurypartnership_asgm_20facts_20and_20figures_final_asgm-big.gif.
- Federal Government of Nigeria. CHAPTER L1 Labour Act (1974). Abuja.
- Federal Ministry of Environment. (2017). Minamata Convention on Mercury - Initial Assessment Report for Nigeria. Abuja: Federal Ministry of Environment.
- Federal Ministry of Health. (2004). Revised National Health Policy. Abuja: Federal Republic of Nigeria.
- Federal Ministry of Health. (2010). National Strategic Health Development Plan (NSHDP) 2010-2015. Abuja: Federal Ministry of Health (FMOH).
- Federal Ministry of Health. (2017). Nigeria Progress Towards Universal Health Coverage. Abuja: Federal Ministry of Health.
- Federal Ministry of Health. (2019). Second National Strategic Health Development Plan 2018 - 2022. Abuja: Federal Government of Nigeria.
- Federal Ministry of Information & Culture. (2017). Federal Ministry of Environment sets up Steering Committee for the execution of the national action plan on mercury use. Federal Ministry of Information & Culture.
- Federal Ministry of Labour and Employment. Factories Act (2004). Abuja.
- Federal Ministry of Labour and Employment. (2014). National Policy on Occupational Safety and Health. Abuja: Federal Republic of Nigeria.
- Federal Ministry of Labour and Employment. (2016). Nigeria Country Profile on Occupational Safety and Health 2016. Abuja: FMLE/ILO.
- Federal Ministry of Labour and Employment. (2017). National Employment Policy. Abuja: Federal Republic of Nigeria.
- Federal Ministry of Labour and Productivity. (2013). List of Hazardous Child Labour in Nigeria. Abuja: Federal Republic of Nigeria.
- Federal Republic of Nigeria. Constitution of the Federal Republic of Nigeria (1999). Nigeria.
- Federal Republic of Nigeria. National Agency for the Control of HIV/AIDS Act (2006). Abuja.
- Federal Republic of Nigeria. National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations (2013). Nigeria.
- Federal Republic of Nigeria. National Health Act (2014).
- Food and Drugs Services. Retrieved 18 August 2019, from https://www.health.gov.ng/index.php?option=com_content&view=article&id=130&Itemid=496.
- Gibb, H., & O'Leary, K. (2014). Mercury Exposure and Health Impacts among Individuals in the Artisanal and Small-Scale Gold Mining Community: A Comprehensive Review. *Environmental Health Perspectives*, 122(7), 667-672. doi: 10.1289/ehp.1307864.
- Hentschel, T., Hruschka, F., & Priester, M. (2003). *Artisanal and small-scale mining*. London: IIED.
- Kessler, R. (2013). The Minamata Convention on Mercury: A First Step toward Protecting Future Generations. *Environmental Health Perspectives*, 121(10), 304-309. doi: 10.1289/ehp.121-a304.
- Lead Poisoning Investigation in Northern Nigeria. (2016). Retrieved 21 July 2019, from <https://www.cdc.gov/onehealth/in-action/lead-poisoning.html>.
- Maina, W. (2017). Nigeria Occupational Safety and Health Bill on Course | Occupational Health and Safety. Retrieved 14 August 2019, from <https://www.hse.co.ke/articles/occupational-health-safety/nigeria-occupational-safety-and-health-bill-on-course/>.

- Makinde, O., Sule, A., Ayankogbe, O., & Boone, D. (2018). Distribution of health facilities in Nigeria: Implications and options for Universal Health Coverage. *The International Journal of Health Planning And Management*, 33(4), e1179-e1192. doi: 10.1002/hpm.2603.
- Médecins Sans Frontières. (2012). Lead Poisoning Crisis in Zamfara State northern Nigeria. Sokoto: Médecins Sans Frontières.
- Mercury and health. (2017). Retrieved 22 July 2019, from <https://www.who.int/news-room/fact-sheets/detail/mercury-and-health>.
- Ministry of Mines and Steel Development. (2007). *Nigerian Minerals & Mining Act*. Abuja: Federal Republic of Nigeria.
- Ministry of Mines and Steel Development. (2016). *Roadmap - On the Road to Shared Mining Prosperity*. Abuja: Nigerian Ministry of Mines and Steel Development.
- National Emergency Management Agency (NEMA). (2002). *National Disaster Response Plan*. Abuja: Federal Republic of Nigeria.
- National Emergency Management Agency (NEMA). (2013). *National Disaster Response Plan*. Abuja: NEMA.
- NESREA Official Website | Our Functions. (2017). Retrieved 15 August 2019, from <https://www.nesrea.gov.ng/our-functions/>.
- Nigeria Centre for Disease Control. Retrieved 10 August 2019, from <https://www.ncdc.gov.ng/preparednes>.
- Nigeria Centre for Disease Control. Retrieved 10 August 2019, from <https://www.ncdc.gov.ng/ncdc>.
- Nigeria Natural Resources. (2019). Retrieved 20 July 2019, from <http://www.nigeria.gov.ng/index.php/2016-04-06-08-38-30/nigeria-natural-resources>.
- Parties. (2019). Retrieved 22 July 2019, from <http://www.mercuryconvention.org/Countries/Parties/tabid/3428/language/en-US/Default.aspx>.
- Salati, L., & Eshun, P. (2016). An Integrated Management Model for Artisanal and Small-scale Gold Mining in Northern Nigeria. *International Journal of Advanced Research*, IJOAR .Org, 4(12).
- The Federal Military Government. (1999). *National Emergency Management Agency*. Abuja: The Federal Military Government.
- U.S. Department of Labor. (2017). *Findings of the Wors Forms of Child Labour – Nigeria*. U.S. Department of Labor.
- UNDP. (2009). *Capacity Development: A UNDP Primer*. New York: United Nations Development Program (UNDP). Retrieved from https://www.undp.org/content/dam/aplaws/publication/en/publications/capacity-development/capacity-development-a-undp-primer/CDG_PrimerReport_final_web.pdf.
- UNEP-UNITAR Mercury Platform. Retrieved 28 July 2019, from <http://mercury.unitar.org/site/document/1272>.
- United Nations. (2017). *Minamata Convention on Mercury*. Nairobi, Kenya: United Nations Environment Programme.
- Veiga, M., Maxson, P., & Hylander, L. (2006). Origin and consumption of mercury in small-scale gold mining. *Journal Of Cleaner Production*, 14(3-4), 436-447. doi: 10.1016/j.jclepro.2004.08.010.
- WHO. (2016). *Environmental and occupational health hazards associated with artisanal and small-scale gold mining*. Geneva: World Health Organization (WHO). Retrieved from <https://apps.who.int/iris/bitstream/handle/10665/247195/9789241510271-eng.pdf>.
- World Health Organization. (2017). *Primary Health Care Systems (PRIMASYS): case study from Nigeria (1st ed.)*. Geneva.

Annexes

Annex C of the Minamata Convention on Mercury, 2013

Artisanal and small-scale gold mining

National action plans

1. Each Party that is subject to the provisions of Paragraph 3 of Article 7 shall include in its national action plan:
 - (a) National objectives and reduction targets;
 - (b) Actions to eliminate:
 - (i) Whole ore amalgamation;
 - (ii) Open burning of amalgam or processed amalgam;
 - (iii) Burning of amalgam in residential areas; and
 - (iv) Cyanide leaching in sediment, ore or tailings to which mercury has been added without first removing the mercury;
 - (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.
2. Each Party may include in its national action plan additional strategies to achieve its objectives, including the use or introduction of standards for mercury-free artisanal and small-scale gold mining and market-based mechanisms or marketing tools.

ASGM Questionnaire Ministry of Mines and Steel Development



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

QUESTIONNAIRE FOR FIELD WORK ON NATIONAL ACTION PLAN ON MERCURY USE IN NIGERIAN ASGM SECTOR

QUESTIONS PER MINING SITE

A. Basic sectoral profile questions of Site:

Name of Site LGA State

1.0 How many people are engaged in ASGM mining at the Site ?

Miners..... Women..... Children.....

1.1 Estimated population/Demographic size of Site

1.2 Are women and children involved in the work? Do they work as individuals, collectively, or how?

2.0 Who does the mining and gold buying/processing – family landowners, migrant workers, immigrant workers, workers hired by landowners?

2.1 Are some of the miners foreigners? If yes, from where?

2.2 For foreign(ers) miners, are permits required for them to perform mining activities? Do they have it?

3.0 How much gold do these miners produce each year? What price do they get for gold?

4.0 How much are they typically earning per year (or day)?

5.0 How do the miners get access to mercury? Where do they get Mercury from?

5.1 At what price?

5.2 What sort of cross-border trade or activities are involved at ASGM sites or in ASGM activities (List types, countries..... etc)

MERCURY USE

6.0 How much mercury do they use to produce gold? [(K)g/mercury per (k)g/gold produced is most useful metric.] **What is the amount of Hg used per unit gold produced?**

7.0 What are the common technologies and practices used by the miners?

8.0 Which of these use the most mercury?

9.0 How is crushing performed?

10.0 Is mercury added to the whole ore (before or during crushing) or to concentrates?

10.1 How is amalgamation performed? How is the amalgam burnt?

11.0 How do they purify the gold (if they do) – charcoal stove, gas torch, other?

12.0 What is the local availability of alternative technologies eg **Do Miners use retorts or recycle Hg in other ways?**

12.1 What is the level of local knowledge of Miners about alternatives?

13.0 Are the miners aware of the health and environmental effects of mercury?

14.0 What do the miners think about mercury versus alternatives?

15.0 Who buys the gold from the miners? Where does the purchase take place? Do the buyers process the gold? If so how – do they use any environmental protection methods when processing the gold?

16.0 Are government officials, agencies, or statutory bodies involved in mercury and/or gold trade?

17.0 What is the pathway for mercury supply?

18.0 Is there large scale gold mining in the country? Name the companies.

C. Socio- Legal/social questions about Site:

- 1.0 Are the miners at this Site organized in cooperatives ?
 - 1.1 Or any other arrangements?
- 2.0 Do miners have access to capital?
- 3.0 What is the current system by which miners get gold to market (Who do they sell gold to?)
- 4.0 Where do they get their mercury? Who are the final exporters?)
- 5.0 Are miners sensitive to price of mercury OR ARE THEY WORRIED ABOUT THE PRICE OF MERCURY?
- 6.0 Does the price of Mercury affect their activities at anytime?
- 7.0 Does their mining assist in reducing poverty in the family?

D. Education/Health Care opportunity questions

- 1.0 Has there been any miner environmental awareness raising campaigns and/or worker health and safety campaigns?
- 2.0 Has there been any environmental awareness raising campaigns and/or worker health and safety campaigns for gold processors or buyers ?
- 3.0 Are there any existing health care or social service programs geared towards the miners and/or gold processing communities (such as AIDs awareness, health promotion, water sanitation and/or worker health and safety programs)?
- 4.0 What is the average miner's education?
- 5.0 What is the average gold buyer/gold processor education level?
- 6.0 Are there incentives for children to stay in school in your country?
- 7.0 Are there schools or learning institutions near the Mining Site?

19.0 Are any of these companies currently working with ASG miners? Are any in direct conflict with ASG miners?

B. Mining Site Environmental and Health Impact Questions:

1.0 What is the scale of the impacts the MINING is having on the landscape and other environmental media (take photos, Environmental samples- soil & water- for Lab analysis)?

2.0 Is there intensive deforestation, conflict with protected areas, land use conflicts with farmers, rising unemployment etc.?

3.0 Do Miners throw away "dirty" Hg?

3.1 Is all Hg used released to the environment? What % approximately?

4.0 What is the available capacity for environmental monitoring?

5.0 What is the available capacity for human bio-monitoring of mercury exposure?

6.0 Do you know current level of environmental contamination (or) exposure at this Site?

7.0 How many environmental media (air, land and water) have been impacted?

8.0 Are there any communities or areas **NEAR MINING SITE** or **BENEFICIATING SITE** considered to be particularly impacted or vulnerable to health effects of ASGM?

8.1 Is any burning of the amalgam in residential areas or burning the amalgam in open areas? How many and how close –within 500metres?

8.2 If yes, are women and children around the open burning?

8.3 How many- estimated numbers? **Photos**

9.0 Are there any studies or data on environmental contamination or health impacts from ASGM at the SITE?

10.0 Are there plans (**if any**) for rehabilitation of any resulting contaminated areas?

11.0 Do you have an estimate for mercury emissions or releases at this Site?

11.1 What are the estimates (**if any**)

11.2 How were the estimates obtained?

