OCTOBER 2021

NATIONAL ACTION PLAN

FOR ARTISANAL AND SMALL SCALE GOLD MINING IN THE CO-OPERATIVE REPUBLIC OF GUYANA

ONE PEOPLE ONE NATION ONE DESTINY

gef

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BCRC CARIBBEAN

National Action Plan for the Co-operative Republic of Guyana

Developed under the project:

GEF 10153 – Development of National Action Plan for the Co-operative Republic of Guyana

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The National Action Plan (NAP) for Artisanal and Small-Scale Gold Mining for the Co-operative Republic of Guyana was developed through the provision of funding through the Global Environment Facility (GEF), implementation arrangements by the United Nations Environment Programme (UNEP) and co-execution by the Ministry of Natural Resources and the Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean (BCRC-Caribbean). This project signals the commitment of these agencies and the Government of Guyana towards the global and regional implementation of the Minamata Convention on Mercury as well as positively impacting the lives and livelihoods of artisanal and small-scale miners and mining communities in Guyana.

UNEP acted as the global technical support to provide guidance to the core project team throughout execution, in addition to the expertise provided by the International Consultants, NMutemeri Consulting. The project team also included National Consultants, who conducted the core work of collecting data, assessing the national situation of the ASGM sector and developing key recommended strategies for the NAP. These include:

❖ Mr. Kemraj Parsram	ASGM Inventory and Technical Consultant
❖ Lex Romulus Legal and International Trade Consultants	Legal and Institutional Capacity Consultants
❖ Ms. Sasha Walrond	Public Health Consultant
❖ Ms. Tiffany Daniels-Bailey	Socio-Economic Consultant
❖ Ms. Nadezhda Stephens	Assistant Coordinator

Mention must also be made to the other persons involved throughout the project, who were engaged and assisted in the development of materials for the NAP document, data collection and processing, including field and research assistants, field officers, drivers and other transportation services, accommodations and anyone else who made this project and field research possible. Additionally, we wish to extend sincere thanks to the GGMC Environmental Division and Mines Division for assistance and expertise in making the fieldwork fruitful.

The NAP development was significantly facilitated through the guidance of the National Working Group (NWG). The NWG included members from various organizations, including the Ministries of Health, Labour, Human Services and Social Security, Amerindian Affairs, Education and Natural Resources, the Pesticides and Toxic Chemicals Control Board, Guyana Geology and Mines Commission and the

Guyana Mining School and Training Centre Inc., The Environmental Protection Agency, Office of the President - Department of the Environment, Guyana National Bureau of Standards, Guyana Lands and Survey Commission, Guyana Water Inc., Conservational International Guyana, World Wildlife Fund Guianas, United Nations Development Programme, the National Toshaos Council and the mining organizations, the Guyana Gold and Diamond Miners Association, Guyana Women Miners Organisation and the National Mining Syndicate. The project team sincerely thanks the NWG for the time and effort on the reviews, meetings and overall guidance provided in this process.

Finally, and most importantly, the project team would like to acknowledge and express gratitude to the gold miners, traders and local communities, including the Amerindian Village Councils and Toshaos and the National Toshaos Council involved in the ASGM sector whom the outcomes of this NAP document will impact. We thank these essential stakeholders for their insights, which have been invaluable for the successful development of the NAP, which aims to protect and ensure their well-being and livelihoods, while protecting the environment.

Table of Contents

GLOSSARY

ASGM	In the context of Guyana, Artisanal and Small-scale Gold Mining includes all miners who use mercury in their operations, which include small- and medium-scale miners as well as Pork Knockers/Punters
Amalgamation Sheet	A copper plate rubbed with mercury so that gold particles can easily stick
Backdam	The interior location where mining activities take place
Bahir	A cook for a mining operation (other spellings: Baiir / Baïr)
Batel	A metal pan used to separate gold from gravel and sediment
Batelling/ Panning	A simple method of separating particles of a greater specific gravity (especially gold) from soil or gravel, by washing in a pan with water.
Black Sands	A concentration of fine grains of heavy, darker coloured minerals (such as magnetite, haematite, rutile etc.) with a density higher than quartz. This is the by-product of the first processing of the gold ore and is accumulated after the washdown process. Miners typically add mercury to this to obtain any gold particles present
Boring	Opening small pits
CSEC	Caribbean Secondary Education Certificate - the exam taken after five years of Secondary School education administered by CXC
CXC	Caribbean Examinations Council - the body responsible for Secondary Education examinations in the Caribbean
Dredge	A mechanised set up that contains mining equipment such as pipes, pumps and engines which allow for the extraction of gold from sand, gravel and dirt, using water to create a slurry, and mechanical methods for its separation
Flotation	A mineral processing method used to separate and concentrate ores by altering their surfaces to a hydrophobic or hydrophilic condition
Gazette	The statutory authority which publishes public and legal notices on a periodic basis
Gazetting	To announce or publish in a gazette
Gender Mainstreaming	Gender mainstreaming is the public policy concept of assessing the different implications for people of different genders of any planned policy action, including legislation and programmes, in all areas and levels. It involves the integration of a gender perspective into the preparation, design, implementation, monitoring and evaluation of policies, regulatory measures and spending programmes, with a view to promoting equality between women and men, and combating discrimination
Gender Marker	A common tool used to measure on a 0-3 scale whether a project is well enough designed to ensure women and men benefit equally, or that it will advance gender equality. The higher the score, the more likely the gender marker could predict limited or significant outcomes for gender equality

Gender Neutral	No differential positive or negative impact in terms of gender relations or equality between women and men and refers to programmes which are applicable or common to both women and men
Guyana Gold Board	The agency that is authorised by the Government of Guyana to buy and sell gold
Land Claims	Licenses available to small-scale miners to extract precious minerals covering an area of 27.58 acres or 11.16 hectares
Maximum Permissible Limit	The maximum permissible limit refers to the highest allowable concentration of a toxin that is allowed for consumption in food or water, or by exposure, per serving at given rate of consumption or exposure
Medium-Scale Mining Permit	Licenses available to medium-scale miners to extract precious minerals covering between 150 and 1,200 acres or 61 to 486 hectares.
Middling	That part of the product of a washery, concentration, or preparation plant that is neither clean mineral product nor reject (tailings). The material may be reprocessed
Prospecting Permits	The licences available to the small- and medium-scale miners to prospect for gold - prospecting permits small-scale (PPSS) and prospecting permits medium scale (PPMS).
Pontoon	A flat-bottomed floating structure which supports a mining operation, or the transport of mining equipment
Pork Knocker/ Punter	Operator of a mine from which a volume of less than 20m3 of material, inclusive of any overburden, is processed as an aggregate in any continuous 24-hour period
Primary Tops	A combination of primary and the first three years of lower secondary schools providing the option to students to stay longer within formal education but without the requirement of sitting an exit examination such as the Caribbean Examinations Council's (CXC) Caribbean Secondary Education Certificate (CSEC) examination
Residential Area	A residential area refers to a district where people live; occupied by private residences
Retort	A retort is a system that facilitates the capture and condensation of mercury vapours to liquid mercury
River Claims	Licenses available for small-scale miners to extract precious minerals covering an area of 1 mile or 1.6 km of navigable rivers
Sluice Box	A channel with a flat bottom made of either wood or steel that is usually covered with matting that is kept in place by riffles or wooden strips which are the gold trapping mechanisms. It utilises gravity concentration as the method for gold recovery
SMS	Small- and medium-scale - miners that are included in the already existing and formalised part of the gold mining sector, but does not include the Pork Knockers or Punters
Tailings	The by-products of ore processing which should be stored and treated prior to release into the environment. They are sometimes re-worked/ processed for residual gold particles

Technological Capacity	Technological capacity encompasses change or innovation through technological means such as technology, infrastructure, online access
Vein	A distinct sheet-like body of crystallized minerals within a rock. These may be enriched with valuable minerals (like gold) and are targets for miners

LIST OF ACRONYMS

APA	Amerindian Peoples Association
ASGM	Artisanal and Small-Scale Gold Mining
BCRC-Caribbean	Basel Convention Regional Centre for Technology Transfer and Training for the Caribbean
BIT	Board of Industrial Training
CARPHA	Caribbean Public Health Agency
CHPA	Central Housing and Planning Authority
CHW	Community Health Worker
CI	Conservation International
CPA	Childcare and Protection Agency
CSEC	Caribbean Secondary Education Certificate
CSO	Civil Society Organisation
CVAFS	Cold Vapour Atomic Fluorescence Spectroscopy
CVQ	Caribbean Vocational Qualification
CXC	Caribbean Examinations Council
EPA	Environmental Protection Agency
GAFDD	Government Analyst Food and Drug Department
GEF	Global Environment Facility
GENCAPD	Guyana Environmental Capacity Development
GGB	Guyana Gold Board
GGDMA	Guyana Gold and Diamond Miners Association
GGMC	Guyana Geology and Mines Commission
GLSC	Guyana Lands and Surveys Commission
GMO	General Medical Officer
GMSTCI	Guyana Mining School and Training Centre Incorporated
GNBS	Guyana National Bureau of Standards
GPF	Guyana Police Force
GPHC	Georgetown Public Hospital Corporation
GRA	Guyana Revenue Authority
GWMO	Guyana Women Miners Organisation
IAST	Institute of Applied Science and Technology
IEC	Information Education Communication
LMS	Local Mining Syndicate
MD	Mining District
MIA	Minamata Initial Assessment
MNR	Ministry of Natural Resources
MoA	Ministry of Agriculture
MoAA	Ministry of Amerindian Affairs
MoE	Ministry of Education
MoF	Ministry of Finance
MoH	Ministry of Health
MoHSSS	Ministry of Human Services and Social Security

MoL	Ministry of Labour
MoLA	Ministry of Legal Affairs
MoLGRD	Ministry of Local Government and Regional Development
MoPW	Ministry of Public Works
MOU	Memorandum of Understanding
MP	Mining Permits
NAP	National Action Plan
NAREI	National Agricultural Research & Extension Institute
NGO	Non-Governmental Organisation
NIP	National Implementation Plan
NLUP	National Land Use Plan
NMS	National Mining Syndicate Incorporated
NPAS	National Protected Areas System
NPHRL	National Public Health Reference Laboratory
NTC	National Toshaos Council
NTPYE	National Training Project for Youth Employment
NTU	Nephelometric Turbidity Units
NWG	National Working Group
OSH	Occupational Safety and Health
OSHA PEL	Occupational Safety and Health Administration Permissible Exposure Limit
PAHO	Pan American Health Organisation
PHAST	Public Health Action Support Team
PPE	Personal Protective Equipment
PPMS	Prospecting Permits Medium-Scale
PPSS	Prospecting Permits Small-Scale
PTCCB	Pesticides and Toxic Chemicals Control Board
RDC	Regional Democratic Councils
REO	Regional Executive Officer
SBB	Small Business Bureau
SEA	Strategic Environmental Assessment
SMS	Small and Medium-Scale
SOP	Standard Operating Procedure
TVET	Technical and Vocational Education and Training
UNEP	United Nations Environment Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Emergency Fund
WHO	World Health Organisation
WiM-FM	Women in Mercury-Free Mining
WOA	Whole Ore Amalgamation
WWF	World Wildlife Fund

LIST OF TABLES

LIST OF FIGURES

FOREWORD

The Government of Guyana, on October 10, 2013, in Kumamoto, Japan, made a global pledge to control and address the use of mercury and committed to protecting the environment and human health, for the current and future generations of Guyanese, from the adverse effects of mercury. Our singing on to the Minamata Convention on Mercury and subsequent ratification in September 2014 were the formative actions taken in recognition of our commitment to sustainable development through responsible mining, fostering safer communities and healthier people. Funding from the United Nations Environment Program (UNEP) through the Global Environment Facility (GEF), has allowed the Ministry of Natural Resources (MNR) and the Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean (BCRC-Caribbean), as co-executing agencies to successfully develop Guyana's National Action Plan (NAP) in accordance with Article 7 and Annex C of the Minamata Convention on Mercury.

The development of the National Action Plan for Artisanal and Small-Scale Gold Mining in Guyana through a consultative process involving miners and mining organization has ensured that the NAP responded to the concerns and realities, as expressed by the main stakeholders (artisanal, small- and medium-scale miners, mining communities, gold traders, local and regional-level leaders, mining organisations and key agencies). The strategic objectives, intervention areas and actions outlined in the NAP provide a clear roadmap/foundation that will guide the government as it works through the various agencies to support the phased reduction of the use of mercury in the ASGM sector and ensure compliance with Annex C of the Minamata Convention on Mercury.

The Ministry of Natural Resources expresses its appreciation to all the institutions and people who contributed to the elaboration of this National Action Plan. The completion of National Action Plan is a declaration of our national, regional and global commitment to reducing the use of mercury and mercury compounds in mining, and robustly combatting the effects of mercury use; while safeguarding the health and livelihoods of our people and their future generations and protecting the environment.

Hon. Vickram Bharrat, M.P
Minister of Natural Resources

CHAPTER 1: EXECUTIVE SUMMARY

The Minamata Convention on Mercury was established with the aim to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. In 2013, the Co-operative Republic of Guyana was one of the first countries to sign onto the Convention. In 2016, following the results of the Minamata Initial Assessment (MIA), Guyana notified the Secretariat of the Minamata Convention that artisanal and small-scale gold mining (ASGM) activities in its territory are more than insignificant. Guyana now proudly reports its National Action Plan (NAP) for the phased reduction of the use and effects of mercury in the ASGM sector in accordance with Article 7 and Annex C of the Minamata Convention.

ASGM in Guyana is a critical income-generating sector which continues to contribute to the economy at the national, local and household levels, providing accessible jobs and livelihoods to both rural and coastal citizens in instances where there are few alternative economic opportunities. The sector has provided income and investment capital to miners from the smallest artisanal scale, also known as pork knockers, to the more mechanized and capital-intensive operations of the medium-scale miners. In 2019, approximately 11,160 persons were estimated to be involved directly in small- and medium-scale gold mining in Guyana, based on the Guyana Geology and Mines Commission (GGMC) 2019 census of active operations. In order to develop and implement a successful NAP in Guyana, it is crucial that the recommended activities consider the needs and livelihoods of the miners as well as the protection of national patrimony.

The NAP was developed as a Global Environment Facility (GEF) enabling activity with implementation provided by United Nations Environment Programme (UNEP) and execution by both Ministry of Natural Resources (MNR) and the Basel Convention Regional Centre for Training and Technology Transfer in the Caribbean (BCRC-Caribbean). The project for the development of the NAP began in November 2019 with the engagement of international and National Consultants to conduct data collection on different thematic aspects of the sector such as mercury use in mining processes and techniques, environmental effects of mining activities, public health concerns, socio-economic considerations and legal and institutional capacity arrangements. The assessment of the data collected provided an overarching depiction of the national realities of ASGM, which guided and informed the recommended activities for inclusion in the NAP.

Although the onset of the global Covid-19 pandemic affected the project activities, the National Consultants were able to collect data from three (3) of the six (6) mining districts (MD); MD 2 – Potaro; MD 3 – Mazaruni; and MD 4 – Cuyuni. Guyana practices both alluvial and hard-rock mining and operations of both types were visited and observed. According to the data collection, it was estimated that 18 tonnes mercury was used to produce approximately 344,829 troy ounces of gold for 2019. It was evident that some of the worst practices, as highlighted by the Minamata Convention as "actions to eliminate", occur in Guyana such as whole ore amalgamation and open burning of amalgam. The reduction or elimination of these particular activities can significantly reduce the risks of mercury use in the sector.

The availability of health care services in the mining areas were found to be very limited and where there were provisions for health care, the knowledge and training to diagnose, manage or treat mercury poisoning was minimal. During the data collection activities of the project, an increase of children in and around mining sites and communities was also observed due particularly to the situation with the global Covid-19 pandemic. Based on the findings, there is a need to reduce the exposure of vulnerable populations in and around mining operations and nearby communities to mercury emissions and releases by ensuring social and environmental safeguard standards. It becomes paramount to enhance efforts to support alternative or diversified livelihood options targeting miners and nearby community members, especially women with children, young women, and young men. The findings related to legislation and institutional capacity revealed the need for recognition and regularisation of artisanal miners (pork knockers), the update and consolidation of legislation dealing with the regulation and use of mercury and the increased cooperation and communication between key agencies, especially with regards to monitoring and enforcement.

The assessment of the national situation set the foundation for the development of ten recommended strategic objectives in which twenty-three intervention areas have been proposed with eighty-four activities defined. The Implementation Plan with the associated timeline, estimated budget and agencies responsible for execution are provided in Chapter Five. The strategies and activities presented represent a comprehensive roadmap to guide the national efforts for the Government of Guyana to meet its obligations under the Minamata Convention, phase down the use of mercury in the ASGM sector and subsequently protect the human health and the environment of its nation while also protecting national patrimony.


EL DORADO
RUM

CHAPTER 2: INTRODUCTION AND BACKGROUND

2.1 Background

Artisanal and small-scale gold mining (ASGM) is the largest source of global mercury emissions and releases (UNEP, 2017). In the Co-operative Republic of Guyana, the ASGM sector has been an essential industry for over 100 years and is the largest employer in the hinterland region. Between 1884 and 1914, gold production was equivalent to 1.25M troy ounces and, up to 1900, was equivalent to 22% of colonial exports (Bulkan and Palmer 2016; Collins 2011). Small- and medium-scale operations in Guyana continue to show annual exponential growth since the early 2000s if both gold production and revenue are examined (Hilson and Laing, 2017). While mercury use in ASGM is legal, the law makes prescriptions to safeguard the environment and public health from its use. The World Health Organization (WHO) regards mercury as one of the top ten chemicals or groups of chemicals of major public health concern (WHO, 2017). Exposure to mercury, over prolonged periods of time, may cause serious health problems, especially to vulnerable populations, such as, children, women of childbearing age and pregnant women, as well as other environmental and social concerns.

Elemental mercury is the primary substance used in Guyana's ASGM sector for the procurement of gold through the amalgamation process. The mercury binds to gold particles, creating a mercury/gold amalgam, which can be collected and applied with heat to evaporate the mercury, leaving the gold behind. Mercury is a favoured choice for ASGM miners in Guyana due to its affordability, accessibility, portability, and ease of use.

Mercury and its compounds are known for its toxic and detrimental effects to human health and the environment and global attention was brought to the issue when large cases of mercury poisoning occurred in Japan in the late 1950s. This led to the creation of a global treaty, called the Minamata Convention on Mercury, which aims to reduce and eliminate, where feasible, the effects of anthropogenic releases and emissions of mercury into the land, water and atmosphere. The use of mercury in practices employed in the ASGM sector pose a risk to those acutely involved in the sector and also to many who are indirectly exposed to it's downstream effects. Considering the prominence of mercury use in Guyana's ASGM sector, the Government of Guyana signed the Minamata Convention on 10 October 2013 and ratified it on 24 September 2014. As of September 2021, Guyana is among 128 countries that are current signatories to the Convention which came into force on 16 August 2017.

Under Article 7 of the Minamata Convention, "Each Party that has artisanal and small-scale gold mining and processing … within its territory shall take steps to reduce, and where feasible eliminate the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing." In 2016, the Government of Guyana completed the Minamata Initial Assessment (MIA) which estimated that mercury emissions into air and releases into water and land from gold mining activities correspond to 94% of total annual emissions and releases nationally or 27,134 kg of mercury per year (MIA, 2016). Several priorities were also outlined for action to implement the Minamata Convention's obligations for this sector. As mandated by the Convention, Guyana notified the Minamata Secretariat in 2016 that mercury emissions and releases from ASGM and processing in its territory are more than insignificant and was therefore required to develop and implement a National Action Plan (NAP) to reduce, and where feasible, eliminate the use of mercury in its ASGM sector.

Following this, the first draft NAP (now unofficially referred to as the National Implementation Plan (NIP)), proposed a ten-year phased reduction of the use of mercury in ASGM activities in December 2017, to support the sound management of mercury from all major sources in Guyana. Within that plan, the goal of a phased reduction in the use of mercury in artisanal, small- and medium-scale gold mines to 75% of baseline consumption by 2027 was projected. The strategy and schedule outlined by that plan was assessed and further refined under the development of this NAP.

Guyana's ASGM sector is unique, relative to many other developing countries, in that it is relatively formalised, robust (accounting for the majority of Guyana's total gold production), benefits from high levels of capital investment, considerably mechanised, and it is not necessarily driven by subsistence or poverty (Clifford, 2011). These features equip Guyana with a notable foundation for the development and implementation of the NAP. ASGM activities occur in six (6) mining districts (MDs) in Guyana. It is estimated that the total area of land occupied by the six (6) mining districts spans approximately 45.8 million acres, or approximately 185,346 km^2 (Pasha, Wenner and Clarke, 2017).

Approximately 11,160 persons were estimated to be involved directly in the ASGM sector based on the 2019 census of 1,094 active ASGM operations (GGMC Mines Division, 2019). The ASGM workforce is male dominated, with women being employed primarily as cooks at mine sites, and to a much lesser extent, owners of land and ASGM operations. There are differentiated services required at ASGM sites based on the level of mechanisation at the site, the size of the operation, and the volume of ore to be processed.

ASGM miners may be defined as artisanal miners (referred to as Pork Knockers or Punters; rudimentary, poorly equipped and financed) all the way up to medium-scale miners (very well equipped, financed and managed). The commonality within the broad classification of ASGM, within the context of Guyana, is that at every scale, miners remain heavily dependent on mercury use. For the purpose of the NAP, ASGM is defined to include the miners operating the following categories[1]:

- Pork Knocker/Punter – means the operator of a mine from which a volume of less than 20m^3 of material, inclusive of any overburden, is processed as an aggregate in any continuous 24-hour period.
- Small-scale miner – means the operator of a mine which is the subject of a Claim Licence and from which a volume over 20 m^3 but less than 200 m^3 of material, inclusive of any overburden, is excavated or processed as an aggregate in any continuous 24-hour period;
- Medium-scale miner – means the operator of a mine which is the subject of a Mining Permit and from which a volume of over 200 m^3 but less than 1000 m^3 of material, inclusive of any overburden, is excavated or processed as an aggregate in any continuous 24-hour period;

However, when referring to the formalised sector in the NAP, only small- and medium-scale (SMS) miners will be referenced as Pork Knockers/ Punters are not formalised.

2.2 Development of the National Action Plan

The Global Environment Facility (GEF) funded and United Nations Environment Programme (UNEP) implemented project "Development of National Action Plan for ASGM in the Co-operative Republic of Guyana" was developed to assist the Government of Guyana with meeting its obligation under Article 7 and Annex C of the Minamata Convention. Co-executed by The Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean (BCRC-Caribbean) and Guyana's Ministry of Natural Resources (MNR), the project kick-started in November 2019 with the National Inception and Training Workshop, facilitated by NMutemeri Consulting as the International Expert for the project. Four (4) National Consultants were hired to conduct baseline assessments for their respective thematic areas in order to establish a national overview of the ASGM sector and propose relevant strategies to inform the NAP. These thematic areas were:

[1] In accordance with the Mining Act of 1989 (Cap 65:01) and its regulations.

- ASGM Inventory - focusing on the mining techniques, practices and use of mercury in mining in Guyana;
- Legal and Institutional Capacity - dealing with the legislation, policies and institutional capacity of the agencies responsible for governing the sector;
- Public Health - investigating the capabilities of the health sector in the mining areas, especially as it relates to mercury poisoning and testing as well as the public awareness of the dangers and effects of mercury to human health and the environment; and
- Socio-economic - addressing the social and economic issues that impact miners and those working and living in the mining communities, specifically the impacts on women and vulnerable groups.

An Assistant Coordinator was hired to support the project team on the ground with the logistical planning of data collection field visits and stakeholder engagement. A National Working Group (NWG) on the Minamata Convention exists in Guyana and played an instrumental role in the development of the NAP. The NWG comprises of key stakeholders who possess relevant knowledge and information on mercury management and ASGM activities in Guyana to guide the consultants, and whose collaboration and cooperation ensured the successful formulation of the NAP. The NWG is comprised of key stakeholders from various organisations including:

- Ministry of Natural Resources (MNR)
- Ministry of Health (MoH)
- Ministry of Labour (MoL)
- Ministry of Human Services and Social Security (MoHSSS)
- Ministry of Education
- Ministry of Amerindian Affairs (MoAA)
- Environmental Protection Agency (EPA)
- Guyana Geology and Mines Commission (GGMC)
- Pesticides and Toxic Chemicals Control Board (PTCCB)
- Office of the President - Department of Environment
- Guyana National Bureau of Standards (GNBS)
- Guyana Lands and Surveys Commission (GLSC)
- Guyana Mining School and Training Centre Inc.
- Guyana Water Incorporated (GWI)

- National Toshaos Council (NTC)
- Conservation International – Guyana (CI-Guyana)
- World Wildlife Fund – Guianas (WWF-Guianas)
- United Nations Development Programme (UNDP)

The three (3) Mining Associations, Guyana Gold and Diamond Miners Association (GGDMA), Guyana Women Miners Organisation (GWMO) and the National Mining Syndicate Incorporated (NMS), also sat on the NWG and played a significant role in providing representation for the miners, highlighting the realities of their livelihoods and ensuring the proposed strategies were realistic and inclusive.

The project team held periodic NWG meetings to ensure all stakeholders were aware of the project's progress as well as through monthly project updates in the form of a newsletter. These meetings and frequent communication materials created a channel for the key stakeholders to contribute feedback and provide guidance.

The National Consultants conducted desktop studies to develop their Literature Reviews and collected data from four (4) major mining areas to inform their Assessment Reports. The summarised findings from these reports are presented in the following chapter on the National Overview.


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CHAPTER 3: NATIONAL OVERVIEW

In order to develop sound recommended strategies and activities for the NAP, a clear understanding of the national situation within the ASGM sector was required. This Chapter will highlight the key findings from the four (4) National Consultants hired for their respective components, where they collected data and information via desktop studies, stakeholder engagement sessions and various field research visits for the development of Literature Reviews and Assessment Reports which have been appended in Annex 1 and 2. The field research occurred from November 2020 to March 2021 using a mixed-methods approach, combining quantitative, qualitative and geospatial data collection from primary and secondary sources. The overall methodology followed the guidance from, *inter alia*, UNEP's "Estimating Mercury Use and Documenting Practices in Artisanal and Small-Scale Gold Mining" (O'Neill and Telmer, 2017), "Socio-Economic ASGM Research Methodology" (UNITAR, 2018), "Gender Dimensions of Artisanal and Small-Scale Mining: A Rapid Assessment Toolkit" (Eftimie *et al.*, 2012), "Incorporating Gender Dimensions into National Strategy Setting in Chemicals Management" (UNEP, 2021) and "NAP Guidance Document" (UNEP and Global Mercury Partnership, 2017), along with guidance from the International Experts, NMutemeri Consulting and UNEP's Technical Component[2].

In consultation with GGMC and the Mining Associations as well as considering criteria such as available time and budget, accessibility due to weather conditions and recordings of COVID-19 cases, the National Consultants selected the following areas for the field research:

- Mining District 2 (Potaro): Mahdia, Campbell town, Crown Hill, Red hole, White hole, St. Elizabeth, Stone creek, Tiger Creek, Micobie, Konawaruk, Mowasi;
- Mining District 3 (Upper Mazaruni): Imbaimadai, Jawalla, Kamarang;
- Mining District 3 (Lower Mazaruni): Puruni (Kumung-Kumung, Million Mountain) and Takatu; and
- Mining District 4 (Cuyuni): Bartica, Karrau, Arimu, Arawak.

All key findings from the desktop studies and field research visits were used to inform the development of relevant and recommended strategies, as detailed in Chapter 4, for the Government of Guyana to consider to meet its obligations under the Minamata Convention as well as protect the human health and environment of its nation while also protecting national patrimony.

[2] For a more detailed breakdown of methodologies used and the rationale employed to select target location, please consult the reports contained in Annex 2.

3.1 Profile on Guyana

The Co-operative Republic of Guyana sits on the North-eastern coast of South America and its 214,970 km^2 landmass is home to a diverse population of 746,995 people, according to the most recent population census, most of whom reside on the coastal plains (Bureau of Statistics, 2019 cited in GLSC, 2021). It is bordered by Suriname to the east, Venezuela to the west, and Brazil to the south and southwest. The country is divided into 10 administrative regions (Figure 1). The coastal area includes regions II, III, IV, V, and VI and is more accessible, commercialized, and densely populated. The hinterland, or rural interior, includes regions I, VII, VIII, IX, and X, collectively accounting for 10.9% of the population, spread over 67.6% of Guyana's land area, where gold mining is a dominant economic activity. Georgetown, the nation's capital, is located in region IV, which is the administrative/political centre.

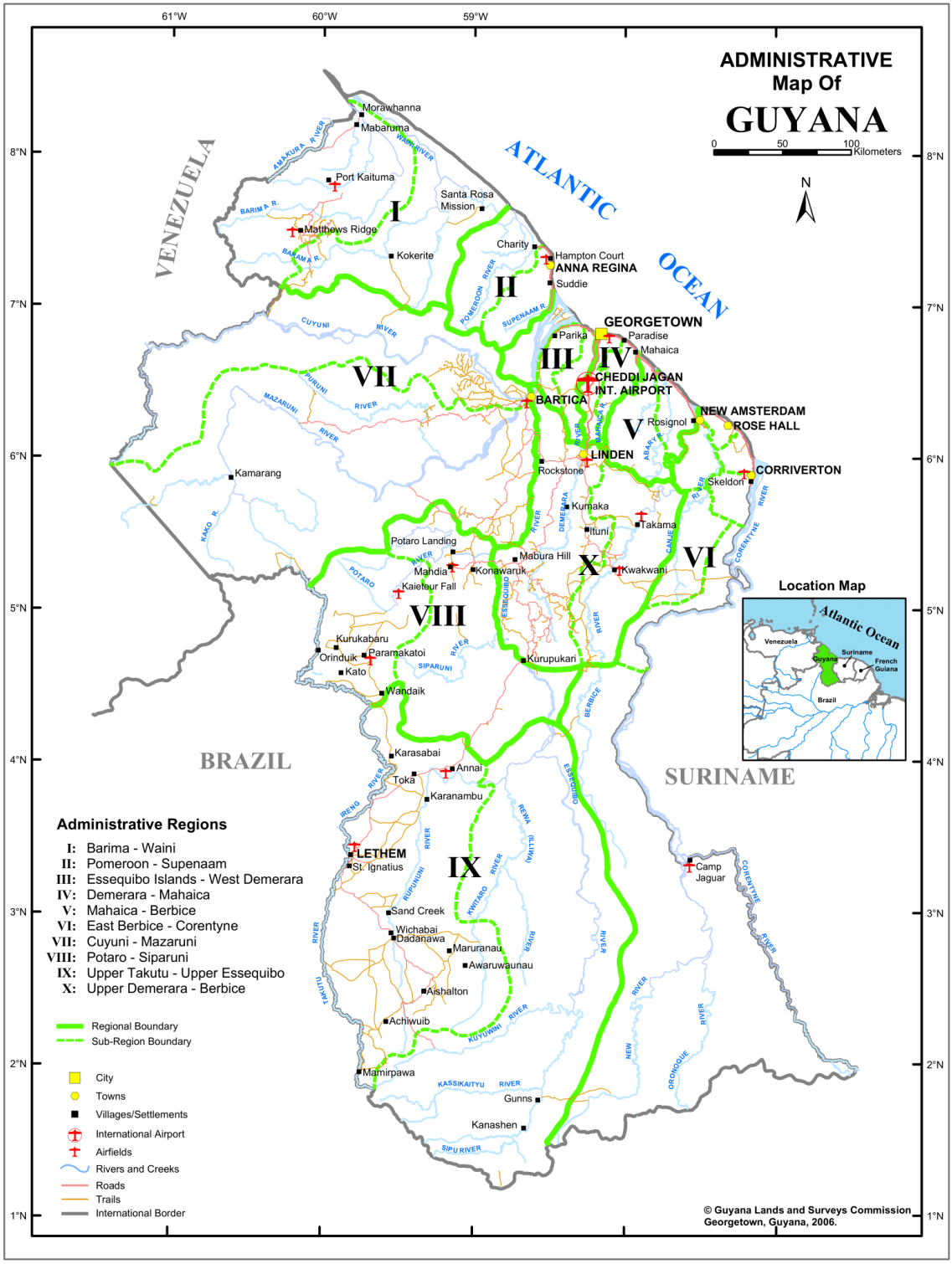

Figure 1: Administrative Map of Guyana (GLSC, 2006)

3.2 Geographic distribution of ASGM in Guyana.

In Guyana, land is classified as Public Land (76%), Amerindian (Indigenous People) Land (14%) and Private Land (10%). Public Land is subdivided into three categories: State Forests (60%), State Lands (23%) and Protected Areas (5%) (Bulkan and Palmer, 2016). There are six (6) geographically delineated mining districts in Guyana (Figure 2):

- Mining District 1 (MD1) - Berbice
- Mining District 2 (MD 2) - Potaro
- Mining District 3 (MD 3) - Mazaruni
- Mining District 4 (MD 4) - Cuyuni
- Mining District 5 (MD 5) - North-west
- Mining District 6 (MD 6) – Rupununi

Although Guyana is divided into 10 administrative regions to assist decentralised political administration and governance, ASGM is discussed and governed by the above six (6) mining district. The Mining Act, which includes the GGMC Act, makes provisions with respect to "prospecting for and mining of metals, minerals and precious stones, for regulating their conveyance and for matters connecting therewith." It gives the Commission the authority (with the approval of the subject Minister) to issue various licenses to prospect for and extract precious minerals on State Lands (Ibid.). The licences available to the small- and medium-scale (SMS) mining sector to prospect for gold are prospecting permits small-scale (PPSS) and prospecting permits medium-scale (PPMS).

The licenses available to the SMS sector to extract gold are:

- Land Claims (covering an area of 27.58 acres or 11.16 hectares);
- River Claims (covering an area of 1 mile or 1.6 km of navigable rivers); and
- Medium-scale Mining Permits (MP) (covering between 150 and 1,200 acres or 61 to 486 hectares).

The Mining Districts cover about 45.8 million acres of public lands in total (Pasha *et al.* 2017). All mining districts consist of Amerindian settlements, and GGMC closed areas totalling 7.1 million acres and 2.9 million acres, respectively. Five protected areas are in three of the mining districts: one in Potaro, one in North-west, and three in Rupununi, which occupy a total of 4.06 million acres of land. Pasha *et al.* (2017) suggested that approximately 33.8 million acres of land across the six districts are available for mining.

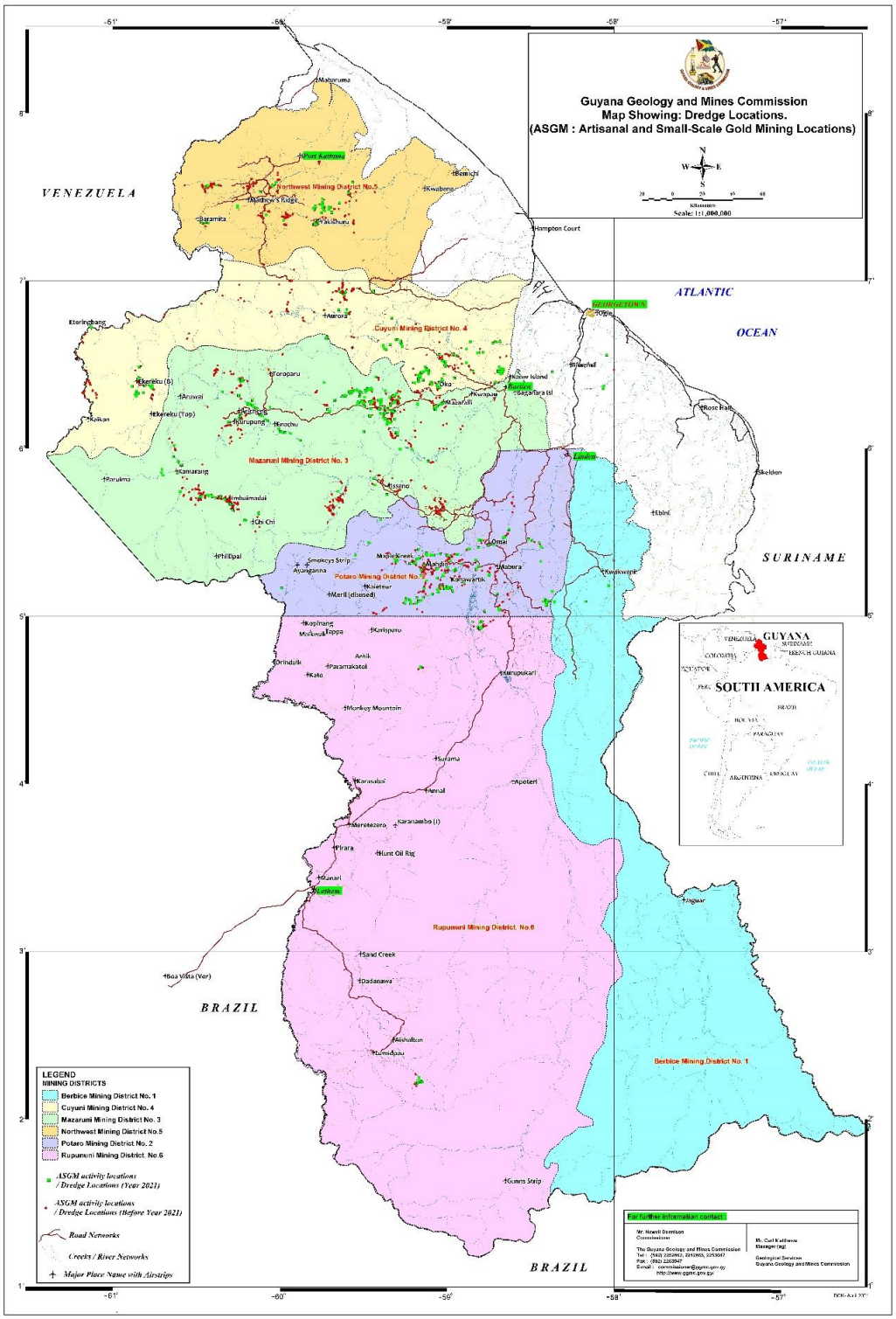

Figure 2: ASGM Dredge Locations in Guyana (GGMC, 2021)

3.2.1 Nomadic Patterns of the Miners

Operators often move in search of profitable or productive grounds or successful operations within which they can commence work (Bynoe, 2016). Bynoe (2016) outlined a movement map that shows that Small-scale miners have a high mobility, with some being able to move as early as two weeks after unsuccessful exploration. The study further indicated that of the 54 locations researched, most miners in the Potaro, Mazaruni and North-west districts change mining locations every 6-12 months, while the majority of miners in the Cuyuni district change mining locations every 3-6 months. Miners in the Rupununi district change mining locations once every year.

The nomadic culture of ASGM in the Guyanese context was found to have grown out of necessity. The MIA (2016) found the main reason cited for location change was gold availability. Other reasons included ease of access and convenience, reopening of locations, low or no production, malaria, flooding, size of earnings, dredge overburden (unwanted material extracted in the digging of the pits), lack of adequate equipment, land issues and/or legal issues/sanctions form GGMC.

In some instances, as revealed by the baseline assessment, the arrangement with claim holders was cited as a key determinant in whether persons remained in gold mining at a particular location. The moving of equipment for those mining with dredges and without excavators (colloquially referred to as “Charlie”) appeared simple, taking one week to move and establish a new camp once new lands were found within the same district. In the riverain Upper Mazaruni areas of Jawalla, it was described by one miner that the rainy season forces miners to go inland due to the high waters, and they migrate closer to the waters during the low season. In Kumung-Kumung (MD 3), it was described by a medium-scale gold miner that the majority of his workers come in the short term to save towards building homes or purchasing vehicles in lieu of engaging the bank. It was clear that dredge owners continued to mobilize their operations not only due to gold availability but also due to land access which is further elaborated in section 3.7.3. This mobility presents a challenge for monitoring and enforcing mercury reduction and safe practices and therefore was considered when developing the proposed strategies for the NAP.

3.3 Legal, regulatory framework for SMS Mining

As detailed in Chapter 2 and in the context of Guyana’s sector, ASGM is defined to include small-scale miners, medium-scale miners and Pork Knockers/Punters. However, the sector is not formally referenced as ‘ASGM’, but rather small- and medium-scale (SMS) mining as Pork Knockers/Punters are not formalised. In order to gain an understanding of the estimated percentage of persons involved in

mining that is not formalised, data was acquired on the miner population by Bynoe (2017) which indicated that 26.9% of the total male miners sampled and 16% of the total females sampled were Pork Knockers/Punters. A detailed assessment will need to be conducted during the implementation stage of the NAP to get an updated estimation of the percentage of Pork Knockers/Punters in the sector.

Guyana's SMS sector is arguably the most comprehensively formalised and regulated with several institutional and legislative frameworks allowing for this status, compared to other countries globally (Hilson and Maconachie, 2017). For example, the SMS sector is recognised and governed by several pieces of legislation and is fully legalised and supported through a licensing system.

In Guyana, regulatory measures to guide the SMS sector have been in force since 1989, with the passing of the Mining Act 1989 Cap 65:01[3]. The SMS sector is recognised and defined in the text of the Mining Act 1989 in terms of 'small' and 'medium' scale gold mining activities. The Mining Act 1989 and its accompanying regulations provide primarily for the administration of prospecting permits[4] and mining licenses for mining operations. The objective of the Mining Act 1989 is "to make provisions with respect to prospecting for and mining of metals, minerals and precious stones, for regulating their conveyance and for matters connected therewith." Further, the Mining Act 1989 addresses aspects such as the ownership and authority over mineral resources; protection of private property, claims and capital; regulation of labour; Amerindian (Indigenous) rights; revenue and other economic considerations; and dispute resolution (Mars, 1998 cited in Pasha *et al*., 2017). Under the Mining Act 1989 (No. 20 of 1989) (Cap. 65:01), GGMC authorises individuals to work in a mining district in the form of a "Privilege", issued after registering with a field officer, station or at head office in Georgetown and paying the requisite fee.

In 2005, the Mining Act 1989 was amended to give further attention to environmental matters of the sector, hence the establishment of the Mining (Amendment) Regulations 2005. According to Pasha *et al.* (2017), the Mining (Amendment) Regulations 2005 conform to international best practices as it promotes environmentally friendly mining activities. Table 1 provides the details of the various permits, licenses and categories outlined in the Mining Act 1989 and Mining (Amendment) Regulations 2005. There are currently no provisions under the legal framework for mining activities conducted by Pork Knockers and as such was not included in the table below. However, it is understood that this is a major gap to be addressed for the successful implementation of the NAP.

[3] The Mining Act 1989 Cap 65:01 is hereafter referred to as the 'Mining Act 1989'.
[4] These allow for mineral exploration activities.

Table 1: Legal categorisation and provisions for small- and medium-scale mining

	Small-Scale Mining	Medium-Scale Mining
Claim Size	Conducted on claims with a size of 1,500 feet long by 800 feet wide (27.5 acres or 11 hectares) and river claim set at a maximum of one mile (1.6km) of navigable river.	Takes place on land of 150 to 1,200 acres (61-486 hectares).
Permits and Licenses required	Small-scale miners require a prospecting permit to locate a claim and a claim license renewed at the end of each calendar year to mine on the property. A claim license is valid up until December 31st of the year it was granted and is renewable for 12-month periods (January 1st to December 31st) (Mining Act 1989, Section 63 (1-2). Small-scale miners with a privilege can be conferred with the right to work on a claim owned by someone else. Mining Concessions awarded at the small-scale are not transferrable through private sale to other concession-holders (Mining Act 1989, Section 58 (2)).	Medium-scale operations require a mining permit. A Mining permit is valid for 5 years and is renewable (Mining Act 1989 Section 63 (1-2)). Mining Concessions (land) awarded at the medium-scale are not transferrable through private sale to other concession-holders. Further, it should be noted that mining permit holders are not authorised to transfer the rights in their Mining Permit without written consent from the GGMC as this would be a breach of the terms and conditions of the permit (Mining Act 1989, Section 58 (2)).
Size of Operation	The small-scale operations tend to use teams of two to four persons (Gregory, 2009) and the MIA (2016) found that small-scale miners used only land-based dredges. 83.8% used 4-inch dredges and 16.2% used 3-inch suction diameter.	Gregory (2009) and Roopnaraine (1996) indicated that medium-scale operations tend to employ a 1) General Manager and 2) Pit Foreman who manage operations and secures the production in the absence of the owner. Further, these operations also include other persons: a marack man, a jet man, a pit man and a bahir (six persons average) (Ibid.).
Royalty Payments and Taxation	**Sale of Gold:** All gold must be sold to the Guyana Gold Board (GGB) or authorized buyers and 5% royalty and a 2-3.5% government tax are levied in addition to a processing fee payable by the ounce of gold processed (GGB, 2021). Individuals who are employed by gold miners (tributors) pay a tributors' tax of 10% (GRA, 1929 Income Tax Act Cap 81:01).	Individuals who are employed by gold miners (tributors) pay a tributors' tax of 10% (GRA, 1929 Income Tax Act Cap 81:01). **Sale of Gold:** All gold must be sold to the GGB or authorized buyers and a 5% royalty and a 2% government tax are levied (GGB, 2021).
Other requirements	**Citizenship:** Only Guyanese or foreigners with a joint venture with a Guyanese can own such a claim. The Guyanese share must be at least 51%. **Documentation:** Must keep production records **Environmental Management:** Small-scale operators must pay a reclamation bond for mining on a claim and retain responsibility for restoring mined-out areas. A clean-up plan in the form of a checklist provided by GGMC is required in the event of a spill.	**Citizenship:** Same **Documentation:** Same **Environmental Management:** An environmental bond to facilitate reclamation is required for all medium-scale operators. A signed Environmental Management Agreement that specifies provisions for tailings management and mercury use and a closure plan is required to acquire a mining permit (Government of Guyana, 2005 Regulation 3).

One critical note on mining legislation in Guyana is the intersection with the regulations of the Amerindian Act of 2006 (Sections 48-55) which manages gold mining on Amerindian Titled lands. The Amerindian Act describes the obligations of GGMC as it relates to issuing permissions (licenses, permits, etc.) to any miner wishing to carry out mining activities on Amerindian Titled lands. Claims on Amerindian titled lands are under the control of the respective village councils. All mining on Amerindian Titled lands or in bodies of water passing through titled lands must obtain the required legal permissions and furnish the Council with written summaries of proposed mining activities (persons involved, duration of proposed activities, etc.). GGMC plays a facilitative role in these meetings but does not participate in the negotiations. In instances where successful negotiations are not reached, Ministers with responsibilities for Amerindian Affairs and Natural Resources may intervene in the best interest of the public.

The Mining Act 1989 and its amendments must be adhered to by miners. Along with requirements, the Act also outlines legal repercussions for non-compliance. For instance, Section 102 indicates that where dredges are unregistered and found in a claim, these dredges and machinery can be forfeited. Further, a miner working in a mining district must have a mining privilege which authorises that miner to work within the district or their mining activities would be considered illegal.

The licenses and prospecting permits issued by GGMC are restricted to Guyanese nationals as mentioned in Table 1; however, provisions are made within the law for Guyanese to enter private contracts or joint ventures with foreign investors. Table 2 highlights the number of prospecting permits medium-scale (PPMS) and mining properties per MD for 2021 as of June 2021. The number of prospecting permit small-scale (PPSS) was excluded as these permits are not specific to mining districts. Due to the nomadic nature of small-scale miners, it cannot be assumed that the sale of a PPSS in a specific MD entails that the miner is working in that same MD.

Table 2: Number of mining properties per mining district in 2021

Mining Districts	SMS Prospecting Properties	SMS Mining Properties	
	PPMS	Claims	Mining Permits
1: Berbice	787	111	154
2: Cuyuni	1,967	268	1,574
3: Mazaruni	2,658	236	1,663
4: Potaro	1,182	65	658
5: North-west	1,177	277	1,011
6: Rupununi	995	66	228
Total	**8,766**	**1,023**	**5,288**

Part XIV (Poisonous Substances) of the Mining (Amendment) Regulations 2005 provides significant guidance on Mercury Management in SMS mining operations – inclusive of mercury use, handling and storage. Regulation 237 of the Mining (Amendment) Regulation 2005 requires the GGMC to prepare a Code of Practice to provide further guidance to the sector on practices involving mercury use, which would form part of the Regulations. The Mining Environmental Management Codes of Practice for Small- and Medium-Scale Mining (draft) were created, but have not been given legal and enforceable authority, since they have not been published in Guyana's Official Gazette[5]. In the strict legal context, they are advisory guidelines and not enforceable if breached. However, authors such as Pasha, *et al.* (2017) described the draft Codes of Practice as "legally enforceable" because they provide details on how the Regulations should be observed. The draft Codes of Practice on Mercury Use in small- and medium-scale gold mining is intended to provide environmental management guidance and promote related best management practices for mercury use. It sets out detailed procedures for the use of mercury in the amalgamation of gold particles, the disposal of black sands after amalgamation as tailings[6] and the burning of amalgam to recover gold. The draft Codes of Practice for Mercury provides the guidance for the worst practices of 'actions to eliminate' under Annex C (b) of the Minamata Convention, such as:

Table 3: Draft Codes of Practice and the corresponding 'Actions to Eliminate' under Annex C (b) of the Minamata Convention

Draft Codes of Practice	Minamata Convention
Prohibit amalgamation in open systems where mercury can be discharged into the environment	Whole ore amalgamation
Do not allow open burning of amalgam of gold amalgam under any circumstances	Open burning of amalgam
Amalgam should not be burnt in living quarters or enclosed areas	Burning of amalgam in residential areas

The Environmental Protection Act 1996 (Cap 20:05) created the Environmental Protection Agency (EPA), and provides for the management, conservation, protection and improvement of the environment; the prevention or control of pollution; the assessment of the impact of economic development on the environment; and the sustainable use of natural resources. Specific to the mining sector, a Memorandum of Understanding (MOU) between the EPA and GGMC was signed in 1997, which delegated environmental responsibilities to the GGMC for environmental management regarding small- and medium-scale mining.

[5] The statutory authority which publishes public and legal notices on a periodic basis.
[6] Tailings are the by-products of ore processing which should be stored and treated prior to release into the environment. They are sometimes re-worked/processed for residual gold particles.

Several regulations have been promulgated under the EPA Act 1996 including the EPA (Hazardous Wastes Management) 2005 and EPA (Water Quality) Regulations, 2000. These regulations were developed to manage the discharge of waste matter into inland and coastal water bodies. Whilst *'waste having as a constituent, mercury or mercury compounds*' is deemed to be hazardous waste and, therefore, subject to the regulations, Regulation 36 of the EPA Hazardous Waste Regulations provides that hazardous waste from oils, gas, mining and mineral processing are not subject to these Regulations. Under these EPA Water Quality Regulations, any person in the pursuance of listed activities, including industries involving extractive minerals and materials, is required to apply for environmental authorisation with the EPA, if that industry discharges any effluent, including mercury. A person proposing to engage in such activity is required to submit an application to the EPA at least 90 days before the date on which the discharge is due to commence. Other legislation relevant to the mining industry include the Amerindian Act 2006, Guyana Gold Board Act 1981, the Protected Areas Act 2011, and subsidiary legislation (regulations).

The Pesticides and Toxic Chemicals Control Board (PTCCB) falls under the Ministry of Agriculture's (MoA) mandate via the Regulations 2000, and the Pesticides and Toxic Chemicals Control Regulations 2004 (No. 8 of 2004). The PTCCB's primary role in relation to the use of mercury focuses on the management of its importation and addresses the storage and transport of mercury in Guyana. The responsibility of training for chemical use also falls under the Board's remit.

In 2019, a MOU was signed between the GGMC, MNR, EPA and PTCCB. The MOU states that its objective is "to coordinate and enhance the procedures for management of the importation, storage, distribution, use and disposal and provisions for clean-up, in the event of an accident or spill of mercury". The MOU is relevant to the use and regulation of mercury in mining. It outlines the adaptive criteria to which all importers, resellers and users of mercury are obligated to adhere, and the procedures with which the GGMC, MNR, EPA and PTCCB must comply. It also seeks to improve communication among the GGMC, MNR, EPA and PTCCB with regards to mercury importation, storage, handling, resale and use in Guyana.

Public health regulations and management for Guyana fall primarily under the purview of the Ministry of Health (MoH). Despite this fact, it is understood that the management of the public health sector requires a multisectoral approach. The GGMC, Ministry of Labour (MoL) - OSH Department and the EPA are the agencies tasked with direct oversight and provision of technical support regarding regulatory compliance related to the handling of mercury, emissions and releases of contaminants, occupational health and safety and disposal of toxic waste.

An overview of the main Legislation governing small- and medium-scale mining in Guyana is presented in Table 4 below:

Table 4: Overview of the legal and regulatory framework of SMS mining and mercury use in Guyana

Legislation	Importance/ Relevance
The Mining Act 1989	This is the principal Act regulating the mining sector in Guyana. It provides the legal basis under which mining exploration, development and production are to be conducted. It defines the rules for granting exploration licences or permits. It provides that all subsurface mineral rights in Guyana are owned by the State and authorises GGMC to manage these resources.
The Guyana Geology and Mines Commission Act (1979), as amended in 1987	This Act established the GGMC and set out its functions and roles. It provides for effective stewardship of all mineral resources by ensuring opportunities for mineral resources development (exploration and extraction) increase by promoting and supporting investment in the mining sector.
Mining (Amendment) Regulations 2005	Promotes environmental standards in the sector, regulating effluent discharge, tailings management, waste management and other measures relating to the environmental management of mining. 'Part XIV Use of Poisonous Substances' speaks extensively to Mercury Management in SMS mining. Establishes the basis for Codes of Practice for the sector, including 'Use of Mercury'.
The Guyana Gold Board Act (1981)	The Act that established the Guyana Gold Board. The GGB grants authorisations to process, sell or export gold extracted from Guyana. The GGB Act was amended in 1987 and in 1994 to strengthen the requirements to sell gold to the GGB.
The Amerindian Act (2006)	Sets the obligations of GGMC when it intends to issue a permit, concession, licence or other permission over or in Amerindian land. It also sets out the requirement for the application for permissions for any miner who wishes to carry out mining activities on Village Lands.
The Environmental Protection Act 1996 Cap 20:05	This Act provides for the management, conservation, protection and improvement of the environment, the prevention or control of pollution, the assessment of the impact of economic development on the environment and the sustainable use of natural resources. It comprises several subsidiary Environmental Protection Regulations enacted in 2000. These are: ● The Environmental Protection Authorizations Regulations ● The Environmental Protection Air Quality Regulations ● The Environmental Protection Water Quality Regulations ● The Environmental Protection Noise Management Regulations ● The Environmental Protection Hazardous Wastes Management Regulations These Regulations were developed to regulate and control the activities of development projects during construction and operation. The EPA has the responsibility to ensure the compliance of all new and existing activities to these Regulations by issuing the required authorisations and monitoring their operations. The EPA via an MOU in 1997 delegated environmental responsibilities to the GGMC for environmental management specifically related to SMS mining. Therefore, following the promulgation of these

Legislation	Importance/ Relevance
	regulations, the EPA continues to collaborate with the GGMC in response to environmental issues related to water pollution and solid waste management in SMS mining.
Protected Areas Commission Act, 2011	The Protected Areas Act 2011 provides for the protection and conservation of Guyana's natural heritage and natural capital and maintenance of ecosystem services through a national network of protected areas, the National Protected Areas System (NPAS). The Act provides penalties for individuals who invade a protected area without the permission from the Commissioner or the Minister.
Public Health Act, 1934	The Public Health Act, 1934 provides for the protection and promotion of the health of the people of Guyana. The goal of the Health and Social services system of Guyana is, "to contribute to improvement in the quality of life and thereby add to the opportunity for the people of Guyana to live a productive life, free from disease and infirmity, characterised by physical, mental and social well-being". This Act allows the MoH to provide the broad overarching and technical support in relation to the management of the health risk associated to the use and exposure to mercury.
Pesticide and Toxic Chemicals Act, 2000 (amended 2007) and Regulations 2004, 2007	The management of chemicals in Guyana is governed by the Pesticides and Toxic Chemicals Control Act 2000 (No.13 of 2000). This Act provides for the establishment of the PTCCB, which comprise representatives from the MoA, MoH, EPA and other representatives from the private sector and nongovernmental organizations. The Board must register all chemicals used in Guyana. Pesticides and Toxic Chemicals Regulations, 2004 were established under Section 32 of the Act and provide the instruments and requirements for the implementation of the Act in the following areas: Toxic Chemical Registration and Classification Procedure; Toxic Chemicals Studies; Transportation, Storage, Disposal and Recall of Toxic Chemicals; Ministerial Emergency Registration and Exemptions. Pesticides and Toxic Chemicals (Amendment) Act 2007 is an Amendment which provides the instruments for regulating exports of pesticides and toxic chemicals. It covers prohibited, restricted and registered products along with information on the monthly import of any chemical into Guyana, vending premises, legislations, reports, and news about current and ongoing developments.

3.4 Institutional Organisation of the SMS Mining Sector

Section 3.3 established the various legislation that governs the sector and provides for the establishment of key entities that regulate and govern the sector. Table 5 shows the leading institutions, as of June 2021, involved in the governance of SMS mining in Guyana and their respective roles and responsibilities.

Table 5: Institutions that Govern the Sector and Their Roles/ Responsibilities

Institutions	Roles/Responsibilities
Parliamentary Sectoral Committee on Natural Resources	The Sectoral Committees, in the exercise of their responsibilities, have the power to examine all policies and administration for each sector to determine whether the execution of Government policy is in consonance with the principle of good governance and in the best interest of the nation.
The Ministry of Natural Resources (MNR)	Established in 2011, seeks to develop, implement and oversee policies for the responsible exploration, development and use of natural resources while ensuring the protection and conservation of the environment. The MNR has a separate compliance and enforcement arm known as the Corp of Wardens established in 2017 to assist with monitoring and enforcing the various mining related laws of Guyana. The MNR also houses the national focal point for the Minamata Convention on Mercury.
The Guyana Geology and Mines Commission (GGMC)	Though the MNR provides policy direction, the GGMC is the mandatory regulatory body for the gold mining sector, established in 1979 (formerly the Department of Geological Surveys and Mines). The GGMC is a self-financed entity mandated by the government with the responsibility of promoting mineral development and providing technical assistance and permissions across various spheres of the mining sector. The GGMC has the most direct control over the mining industry, administering the Mining Act 1989 and the associated regulations. It also has an environmental protection mandate as executed through its Environmental Division. The primary implementing agency for the Minamata Convention is the GGMC.
The Closed Area Committee (CAC)	The CAC was established in February 1994. Its mandate was to identify closed areas, and state reserves that can be open to miners for the location of claims, and approving applications, for grants of Prospecting and Mining Licences, Prospecting Permits and Mining Permits. The CAC also had the responsibility to investigate and resolve any complaints arising from this exercise. It was further authorised to conduct Lotteries and Auctions under regulations.
The Guyana Gold Board (GGB)	Established in 1982, the GGB is Guyana's official marketplace and buyer of gold. The GGB's primary responsibility is to grant authorisations to process, sell or export gold extracted in Guyana. It, and its licensed agents, have the authority to buy, sell and export gold. Gold traders must obtain a trader's license from the GGMC.
Ministry of Labour (MoL), Occupational Safety and Health Department	Responsible for enhancing and promoting OSH in industry and commerce in Guyana, including SMS mining. The MoL developed specific regulations for the mining sector, namely the Draft OSH (Mining) Regulations of 2015 to provide for the protection, safety and health of workers in mines.
The Environmental Protection Agency (EPA)	The EPA was established under the Environmental Protection Act in 1996. The Environmental Protection Act (Chapter 20.05) amended in 2005, provides for the management, conservation, protection and improvement of the environment, and the prevention or control of pollution. EPA has mostly worked in tandem with GGMC to provide technical, educational and enforcement support for the management of the mining sector and the protection of the environment. The EPA controls the information on waste management, especially in the case of hazardous waste with mercury. It is mandated, with key core functions which relate to environmental assessment and described as follows: • To take such steps as are necessary for the effective management of the natural environment to ensure the conservation, protection and sustainable use of natural resources; • To promote the participation of members of the public in the process of integrating environmental concerns in planning for development on a sustainable basis;

Institutions	Roles/Responsibilities
	• To ensure that any development activity which may cause adverse effect to the natural environment to be assessed before such activity is commenced and that such adverse effect is considered in deciding whether such activity should be authorised; and • To prevent or control pollution.
The Pesticide and Toxic Chemicals Board (PTCCB)	This Board was established for the management of pesticides and toxic chemicals and to reduce human and environmental risk. As such, all chemicals used in Guyana are required to be registered by the Board. Licensing, provision of training of use, and inspection are also included in the Board's responsibilities. The PTCCB Regulates importation of mercury and licensing of storage and distribution premises, in collaboration with the GGMC and EPA. The GGMC and EPA also provide services in relation to education, awareness and training on mercury handling based on the Codes of Practice.
Ministry of Health (MoH)	The goal of the Health and Social services system of Guyana is to implement the provisions detailed in the Public Health Act for the improvement in the quality of life. The Ministry of Health provides the broad overarching and technical support in relation to the management of the risk associated to the use and exposure to mercury.
Guyana National Bureau of Standards (GNBS)	Chapter 90.16 Guyana National Bureau of Standards Act 1984 provides for the preparation and promotion of standards in relation to commodities, services, process and practices. The standardisation of services, process and practices of the gold mining sector has not yet been fully achieved. However, work has commenced on draft national standards for mercury emissions and mercury releases (GNBS, no date).
Guyana Revenue Authority (GRA)	Accepts licenses issued by the other Agencies and conducts inspection process pertaining to the entry of mercury in Guyana.
National Toshaos Council (NTC)	The NTC is a semi-autonomous body comprising of all Toshaos in Guyana. It has an executive committee, which includes one Toshao from each of the ten Administrative Regions. This body is responsible for: • promoting good governance in Amerindian villages; • preparing strategies and plans for protection, conservation and sustainable management of village lands and natural resources; and • for reducing poverty and improving access to health and education and other critical services. These village councils are an integral part of the mining sector, as they provide support to the enforcement of government policies, as they have administrative oversight over their pointed Amerindian Villages.
Miners' Organisations	
Guyana Gold and Diamond Miners Association (GGDMA)	The GGDMA was founded in 1984 and registered under the Business Registration Act Chapter 90:05. In 1991, the organisation changed status and registered under the Trade Union Recognition Act as a collective negotiating organisation for gold and diamond producers. Membership covers local small- and medium-scale miners, Pork Knockers and foreign miners/companies. Members are in excess of 100 individuals (GGDMA, 2021). The objectives of the GGDMA include: • protecting and promoting the rights of the mining community as a whole; • negotiating with relevant authorities on behalf of the industry; • obtaining adequate payment for gold and diamond producers; • providing representation for any financial members in need; • advocating for the industry whenever Government triggers legislative and regulatory processes;

Institutions	Roles/Responsibilities
	• negotiating with key government agencies on various issues affecting the industry; and • communicating with members regularly through its members meetings and television programme, miners world.
Guyana Women Miners Organization (GWMO)	GWMO, founded in January 2012, is dedicated to improving the conditions for women in the mining industry and expanding their opportunities to ensure benefits that accrue from the industry are used in ways that are beneficial to both women and the society as a whole. The GWMO currently functions under two divisions: a mining division and a social division. Some functions of the Mining Division are • To represent women in mining as well as male miners; while the membership body comprises of females, the organisation also has male associate members; • To provide its members with entrepreneurial and developmental opportunities, as are provided by the GGMC and any other institution which offers such training; • To advocate for equal treatment and opportunities in the mining sector; seeking to improve the working conditions for women in the mining sector by reducing the incidents of physical abuse and exploitation of women in the industry; and • Provide women with mineral properties that they can work, free from discrimination and the negative effects of Landlordism. Social Services Division Focus Areas: • Trafficking in Persons • Sustainable Development • Education • Child Protection • Rape • Gender-based violence • Abuse • Community Infrastructure and services
The National Mining Syndicate (NMS) Inc.	The National Mining Syndicate Inc. is a gender-neutral, non-political Parent Body of all local mining syndicates in Guyana. Established in 2016, its purpose is to co-ordinate and facilitate, the consultative and participatory process regarding the individual syndicates by assisting miners in finding solutions to problems that may arise. With a membership of over 1,000 miners, the NMS includes the largest number of organised small-scale miners in the country and aims to: • Foster the growth and development of the Local Mining Syndicates both individually and collectively; • Aim for a high level of effectiveness as a body that promotes the interest of miners and the national mining sector as a whole; • Ensure the values of the body are promoted throughout the Organisation. Values include, but are not limited to, effective management, transparency and environmental awareness, to assist in enhancing a green economy while building national trust; and • Ensure equal opportunity for all involved in the sector while protecting the human rights of all miners regardless of race, gender or political and religious convictions.

3.5 Mining methods and practices in ASGM sector in Guyana

Mercury is used by artisanal, small- and medium-scale gold miners in many parts of the world. This method is used by the ASGM community because mercury is easily accessible and cheaper than most alternative methods, and requires limited personnel and time (AMAP and UNEP, 2013).

The steps in the mining cycle commence with exploration/prospecting followed by the extraction of materials (mining) and then mineral processing and recovery (concentration/amalgamation and burning of amalgam). Reclamation and closure are the final steps in the cycle, however not typically practiced in the ASGM sector in Guyana. The ore primarily exploited by Guyana's ASGM sector can be found in either (i) alluvial deposits from the riverbeds and floodplains of both current and dried-up river systems or (ii) hard rock (typically gold in quartz veins).

Data provided by GGMC's Mines Division (December 2019) showed that a total of 1,094 operations were active. Hard rock mining operations were found in mining districts 2, 4 and 6 and river dredges were found in districts 2, 3 and 4. Land dredges were the most common operations active in 2019 accounting for 91% of the total.

3.5.1 Extraction of material – Alluvial deposits

Panning and metal detectors

This a simple method used for both prospecting and as a primary means of capturing gold used by Pork Knockers or Punters. Panning involves the use of aluminium pans/batels of approximately 18-36" diameter and 2-3" depth, with sides sloping about 150° to extract gold from a shallow alluvial deposit (see Figure 3). Panning is typically a one-person business, though sometimes small groups of 2-3 individuals operate as a team. According to Pork Knockers encountered during field visits in November 2019 (Puruni) and February 2020 (Karrau), their mercury use is not consistent and typically involves very minimal quantities. As most Pork Knockers

Figure 3: Panning for Gold by Pork Knockers in Karrau (Source: ASGM Inventory Consultant)

target tailings[7] for prospecting, they tend to recover residual mercury in their findings and therefore do not need to purchase any. Mercury in tailings is often an indication that some form of whole ore amalgamation is occurring. However, these operations require further examination to determine the extent of mercury use and quantities recovered.

Metal detectors are used for prospecting purposes for larger gold nuggets (see Figure 4) and were observed to be a low capital-intensive geophysical prospecting tool used by Pork Knockers/ Punters. The size of nuggets and the depth where it can be detected depends on the device's power. Where metal detectors are used as the primary method of locating gold, they are used to target tailings, worked out pits, new areas, and sometimes the concession areas of large mining operations. Mercury is not often used with metal detectors, as the gold pieces found are large enough to be picked up by hand.

Figure 4: Use of Metal detector by pork-knocker in Mahdia, MD 2 (Source: ASGM Inventory Consultant)

Ground Sluicing

Ground sluicing is performed in low-cost operations by one or two Pork Knockers. In ground sluicing, the gold-bearing material is excavated manually with shovels into a stockpile and processed with small water pumps (usually from 2" to 3" suction intake diameter). An inclined channel is dug in the ground and fitted with magic mats and/or carpet mats which are held in place by rocks and pieces of timber

[7] The waste from previous mining processes.

used as riffles. In some operations, only mats are used. Slurry is fed through this system from water jetting off the pile and channelling it by the way of drains to a ground sluice. In some operations, at the end of the washing cycle, mercury is added to the concentrate obtained from the mats of the ground sluice to amalgamate the gold particles. The workflow related to ground sluicing is explained visually below in figure 5.

2-4" suction pumps used by pump men to work tailings/ mined out pits. Pit edge typically washed using a spurting hose.

Slurry flows off pit face, exposed ground, or pumped to ground sluices or mini sluice box

Amalgam after washing mats in buckets and gathering concentrate and mercury added or recovered from pits

Figure 5: Observed typical workflow related to ground sluices in Karrau (Source: ASGM Inventory Consultant)

Hydraulicking (land dredging)

The most common mining method used in Guyana's SMS sector is hydraulicking (land dredging) and river dredging for alluvial deposits (Legg, Ouboter and Wright, 2015). This is a method of mining where material is excavated by moving a stream of high-pressure water through a nozzle over the mining face, and the resulting slurry then moves into a downgrade channel and into a contained circuit for gravity concentration (Britannica, 2021). The gravity separation method most used in Guyana is the sluice box.

Figure 6: Land Dredging (Source: BCRC-Caribbean)

By definition, a sluice box is a section of an open sloping channel with riffles along the bottom, used to trap heavier gold particles as water washes them and the other material along the box (Lowe, 2006; Vieira, 2014). In land dredging option, hydraulicking with a sluice box includes a combination of manual and mechanised equipment such as water and gravel (suction), pumps and elevated wooden or metal zig-zag sluice boxes. These operations depend on the use of high-pressure water jets to loosen earth, thereafter, the extracted material and the water forms slurry, which moves downslope by gravity or is lifted up slope and away from the working face using gravel (suction) pumps known as Marack pumps (Lowe, 2006). Slurry is pumped to sluice boxes, which separate the lighter clay and sand from the heavier black sands and gravel material (locally known as pay dirt) that are associated with gold (Pasha, Wenner and Clarke, 2017).

The run-off from the sluice is allowed to run into the environment or into settling ponds to recycle the water. At the end of the washing cycle, the riffles are removed and water is allowed to carefully run over the mat in the box to remove oversized particles and clays. The mats are subsequently removed and vigorously beaten to gather the concentrated material, and mercury is added at this point. The material is then panned to further remove gangue minerals. The resulting amalgam is then placed in a cotton cloth and squeezed to remove excess mercury for reuse.

1) Excavator clears vegetation, opens pit and piles material for processing

2) 4-8" suction pumps with 2-4"spurting hoses (jets) create slurry from open pit face or piled material

3) The slurry is directed to the marack hole via sloping channels. Marack pump and suction hose operated by marack man

4) The slurry is loaded onto a sluice box (zig-zag) and the material moves downwards by gravity, where the material is separated into the lighter material and the heavier material which are associated with gold

5) Mats are washed and beaten and materials concentrated. Mercury is then added

6) Concentrated material and mercury is decanted into a 5-gallon bucket, and final mercury amalgamation is done

7) The mercury-gold amalgam is collected in a cloth

Figure 7: Hydraulicking workflow (4,6,8 inch dredges) (Source: ASGM Inventory Consultant)

Hydraulicking mining is also done with the use of a vibrating screen. In these operations, an excavator is used to remove overburden and extract the ore or gold-bearing material, while another excavator loads the ore onto a vertical screen panel (grizzly screen), fabricated of steel to sieve the ore (Figure 8). This technique is used to separate larger rocks (which stay behind) from the fine material. The system comprises built-in spurting jets that washes the material to create a slurry onto the sluice lined with mats. Mercury was typically used at the concentration stage when mats are washed and concentrates gathered into buckets.

Figure 8: Excavator loading ore onto vibrating screen and built in spurting jets wash materials into a slurry at Puruni (Source: BCRC-Caribbean)

River Dredging

River dredging in Guyana previously employed divers to manipulate the intake head underwater but now utilises diver-less technology. The entire operation is housed on pontoons[8], which allow the operations to remain buoyant, and move along the river (Figure 9). Most dredges have a cutter-head system that hits a hard layer of sediment (crust of cemented gravel in a sandy matrix of ferruginous material) in which the gold is immediately below. This system is called a "missile". The slurry material is fed into sluice boxes for processing. Sluice boxes on river dredges are normally much wider than on land operations and are commonly up to 32 feet (approximately 10 metres) in width. At the end of the washing cycle, the procedure is similar to that employed in land dredging operations. However, because of the larger volume of concentrate collected in the sluice, secondary processing is normally employed to reduce volumes.

River dredging operations for gold are on the decline as easily accessible deposits have become worked out. However, the advent of Brazilian miners in Guyana's ASGM sector has seen a resurgence of such operations. Brazilian miners employ missile and cutter-head dredges to break through indurated layers to reach previously inaccessible pay-gravel and also rework tailings left by previous operations (Lowe, 2006).

[8] A pontoon is a type of floating device used to add buoyancy to a structure. The tubes are airtight and hollow, making them water resistant and virtually unsinkable

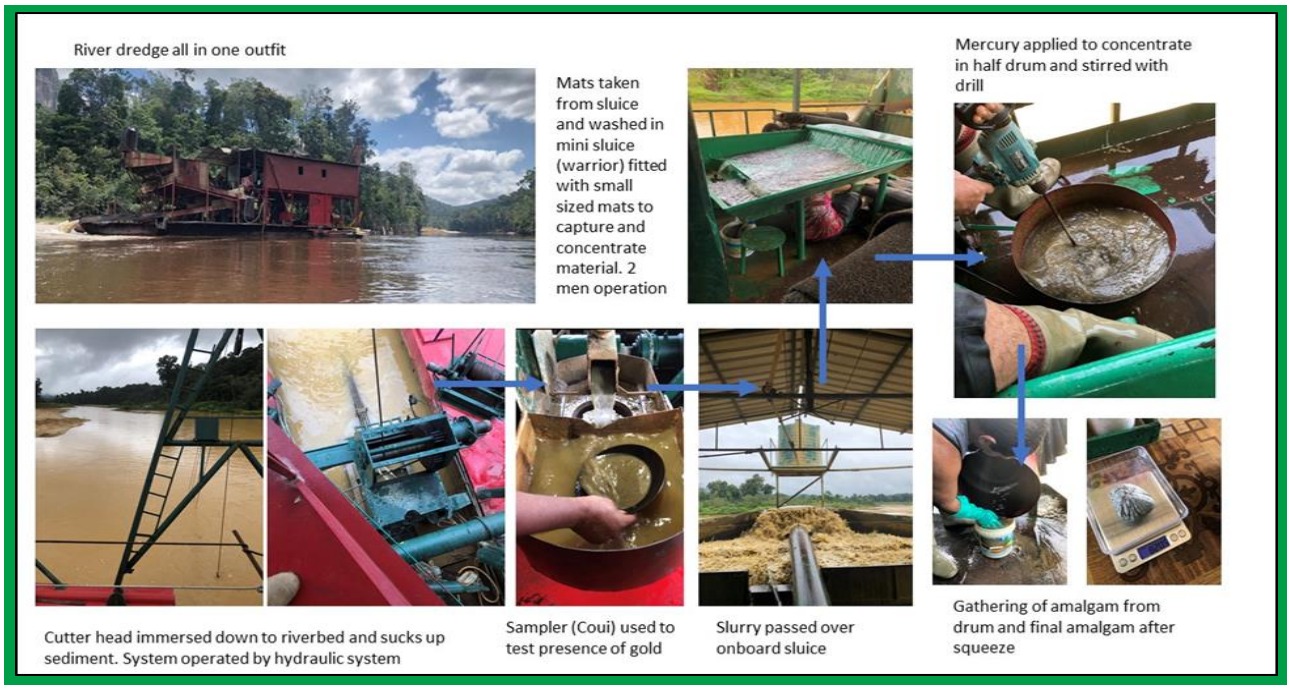

Figure 9: River Dredge Workflow. Arrows indicate stages in the workflow (Source: ASGM Inventory Consultant)

3.5.2 Extraction of material - Hard rock mineralisation

Hammer milling/ Crushers/ Comminution

This is the popular method of liberating gold from quartz stringers and veins. All crushing occurs mechanically, using a hammer mill or a crusher. Crushers increase liberation of gold from other particles, allowing increased amalgamation of gold with mercury, thus increasing gold recovery. It was observed during the field research visits that some small-scale crusher/milling hard rock operations broke up oversized rocks using hammers, and the material washed with a hose before being fed to the hammer mills. A medium-scale hard rock operation was observed to use a separate crusher. The material is then passed through a small sluice or directed to a concentrator(s). The sluice box will usually have multiple compartments lined with fur mats, where gold was trapped, while lighter materials flowed along the length of the sluice box.

The use of an amalgamation sheet[9] placed in the first compartment of the sluice box was observed during the field research at some mining operations. The use of mercury in this way is illegal, as the

[9] A copper plate rubbed with mercury so that gold particles, flattened by the hammer mill, can easily stick to it.

Mining (Amendment) Regulations 2005 only prescribe the use of mercury in the recovery of gold in the final stage of processing.

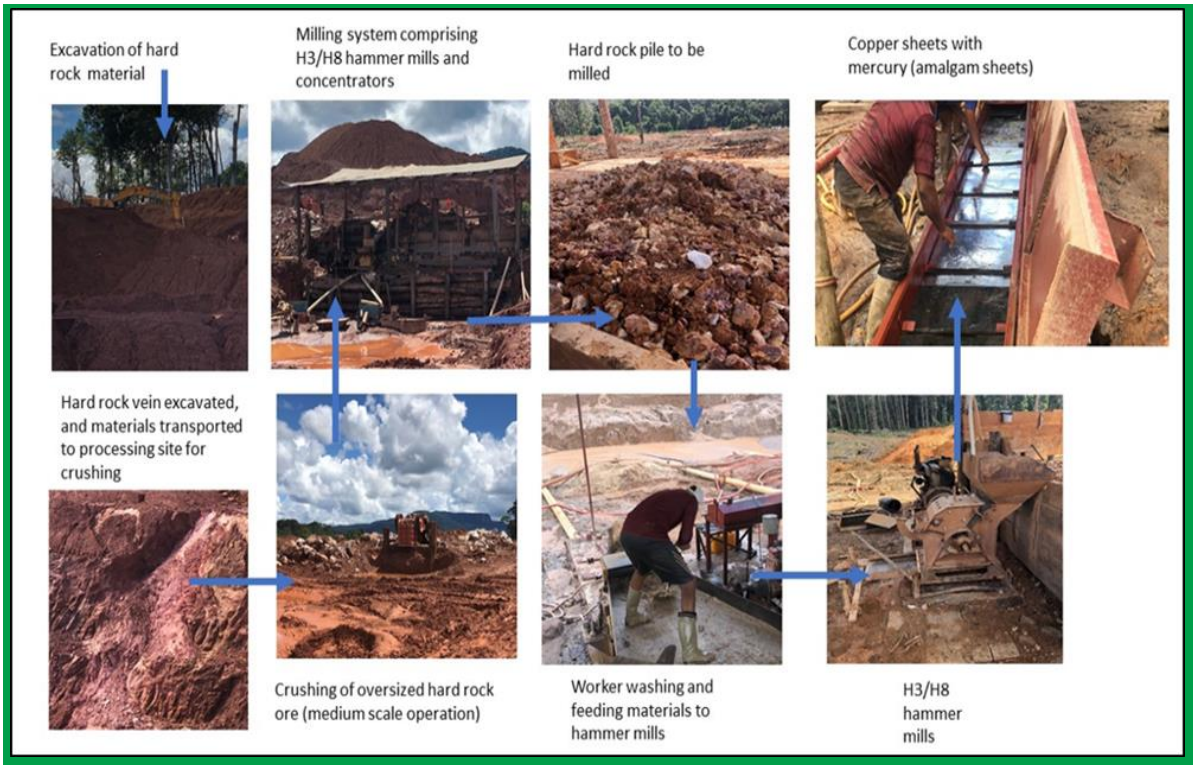

Figure 10: An observed workflow of hard rock mining operation. Arrows indicate stages in the workflow (Source: ASGM Inventory Consultant)

3.5.3 Processing and recovery

Amalgamation

Amalgamation is the process by which mercury is alloyed with gold to produce an amalgam. In the ASGM sector, this process may be conducted in two (2) ways, i.e., concentrated ore amalgamation and whole ore amalgamation (Pasha, Wenner and Clarke, 2017; Legg, Ouboter and Wright, 2015). In Guyana, the ore containing liberated gold is typically concentrated in order to increase the economic value by separating out the unwanted minerals. The end product is known as the concentrate and the waste material is called the tailings.

As the name suggests for concentrated ore amalgamation, mercury is added to the concentrate which is typically produced using gravity concentration methods, such as through the use of a sluice or panning as detailed above. Whole ore amalgamation (WOA), which is illegal in Guyana as per the Mining

(Amendment) Regulations 2005, is a method where mercury is brought into contact with 100% of the ore, i.e. 'whole ore'. There is no concentration involved and WOA may include practices such as pouring mercury into piles of excavated soil, adding mercury in the sluice box, and the use of copper amalgamation sheets (Legg, Ouboter and Wright, 2015; UNEP, 2012).

The sluice box is the principal recovery technology employed by SMS miners since it is relatively inexpensive and easy to use (Pasha, Wenner and Clarke, 2017). However, it is highly inefficient with recovery rates ranging from 20-40 %, with 60-80 % lost to tailings and middlings[10] (Pasha, Wenner and Clarke, 2017), and the use of mercury is required to recover gold in this system. The tailings are typically reworked by Pork Knockers/Punters to recuperate remaining gold.

There exist some other processing techniques such as direct smelting similar to gold assaying, cyanidation and flotation[11] but due to the cost and infrastructure required, the local ASGM miners choose amalgamation.

Burning of amalgam

Once the amalgamation process is complete, the mercury is separated from the gold by heating (Richard, 2014). There are two main approaches used for burning amalgam:

- Opening burning - This is the application of heat directly to amalgam in the open environment. This is considered a worst practice based on Annex C of the Convention and is illegal as the Mining (Amendment) Regulations 2005, and the draft Codes of Practice on Use of Mercury prohibit this practice. Miners burn the gold-mercury amalgam to vaporise the mercury and recover the gold; thus, the miners and local populations can have high exposure to mercury vapours.
- Burning amalgam with retort or other mercury capture system - The burning of amalgam inside a vapor capture system such as a retort is considered best practice according to the draft Environmental Management Code of Practice for the Use of Mercury and the national law further prescribes the use of a mercury retort approved by GGMC to be used at all times when there is burning of mercury gold amalgam. A retort consists of an airtight closed vessel fitted with a condensing tube to recover liquid mercury (GGMC, 2010). When used appropriately, retorts and other mercury capture systems typically recover 80% to 95% of the mercury in the amalgam

[10] Middlings is that part of the product of a washery, concentration, or preparation plant that is neither clean mineral product nor reject (tailings). The material may be reprocessed.

[11] A mineral processing method used to separate and concentrate ores by altering their surfaces to a hydrophobic or hydrophilic condition.

(Richard *et al.*, 2014). The proper use of retorts and mercury capture systems therefore reduces mercury emissions into the environment.

The GGMC tries to mainstream the use of retorts in the SMS sector; however, miners tend to resist, because they find it burdensome, and its use prolongs the process of separating the gold from the concentrates (Thomas, 2009). While the law requires that SMS operations use an approved retort at all times when there is burning of amalgam, it does not require the ownership of a retort. During the baseline assessment of 19 operations observed, 52.6 % (or 10) operations practised open burning of amalgam; and of the remaining 47.4% (or 9) operations using mercury retorts, 42 % of the retorts were found to be inefficient, recovering less than 40 % of the mercury.

3.5.4 Baseline estimates of the amount of mercury used in ASGM

The baseline assessment found that mercury use was widespread in all mining districts as most ASGM operations used mercury amalgamation in the final stage of processing and recovery of gold. Despite some use of concentrators, mercury amalgamation was still the dominant practice. The assessment estimated that in 2019, SMS gold miners consumed 18 tonnes of mercury to produce approximately 344,829 troy ounces at an average mercury (Hg) to gold (Au) ratio of 1.72, 2.01, and 4.25 for land dredges, river dredges, and crusher/milling operations, respectively. Mercury use per system ranged from 1.01 to 4.74. During the data collection field visits, the research team observed and took measurements of quantities of mercury used and recovered during each operation's washdown. The data was recorded and analysed using a mercury to gold ratio form. The detailed technical baseline assessment is provided at Annex 2.

There were reports of whole ore amalgamation occurring in the land dredges, but the research team did not observe this practice among the hydraulic land dredges in the field. However, the use of amalgam sheets was observed in the crusher/milling operations which explains the higher mercury use in these operations. The consultant considered these practices and further estimated that in 2019, SMS gold miners probably consumed approximately 34 t mercury to produce the 344,829 oz gold. The average Hg:Au ratio for land, river and crusher/milling systems was 3.29, 2.01, and 6.28, respectively. Mining districts 3 and 4 had the highest Hg:Au ratios and consumed approximately 2-3 times more mercury than districts 2 and 5.

The presence of mercury was observed at all operations visited. The field research highlighted the average Hg:Au relationship varied across the MDs, with 0.99 in the Cuyuni MD (MD 4), 1.16 in the

Potaro MD (MD 2), and 2.99 in the Mazaruni MD (MD 3). It was determined that the highest levels of mercury use and discharge were associated with systems with limited use of retorts, open burning of amalgam, and the use of amalgam sheets in hammer mill/crusher systems.

3.5.5 Mercury free technology in Guyana's ASGM sector

Mercury free technology in ASGM refers to mining techniques and technology that do not involve the use of mercury to recover gold at any point in the mining cycle, but instead rely on methods that enhance the separation and concentration of gold from ore, such as using gravitational force in centrifugal concentrators, shaking tables, or through chemical leaching with cyanide or chlorine.

One of the other recent efforts to mainstream mercury free technology in Guyana's ASGM sector is the planetGOLD programme that is a GEF funded initiative, led by the UNEP, in collaboration with Conservation International-Guyana, and executed by GGMC. In 2018, approval was granted for the implementation of a GEF Gold Child Project: " A supply chain approach to eliminating mercury in Guyana's ASGM sector: El Dorado Gold Jewelry – Made in Guyana" (GEF, 2020). The objective of the project is to assist Guyana with converting to mercury-free mining by 2025, by directly involving business enterprises with a profit motive in leading the shift towards the development of a mercury-free ASGM supply chain, and downstream El Dorado Gold brand jewelry (Ibid.). A key component of the project is to ensure appropriate mercury free technologies are mainstreamed in Guyana's ASGM sector (Ibid.). The project is currently trialling mercury free technologies at three (3) demonstration sites in MDs 2 (Potaro), 4 (Cuyuni) and 5 (North-west). Three (3) types of equipment, namely, Gold Kacha, Gold Cube, and Blue Bowl, which concentrate gold from alluvial deposits without the use of mercury were demonstrated to miners in Guyana.

In addition to the GEF funded projects, GGMC's annual work programme features technical assistance to miners to improve mineral recovery and is focused on the reduction of mercury use and contamination in mining. In an overview of Mercury Free Mining in Guyana, the GGMC noted some projects which were aimed at reducing mercury use in ASGM: "Introduction of Mercury-free technologies to miners, Improving Sluice Box Designs so as to aid improved mineral recovery", "Promoting the use of Retorts and Personal Protective Equipment whenever amalgamating gold" and "Use of alternative chemicals for gold recovery" (Thom, 2018).

From the baseline assessment, it was found that only 4% of the miners interviewed were familiar with mercury free technology, particularly the concentrator and shaking table. While the majority (96%) of the interviewed miners reported that they were not familiar with these alternate technologies, most (86.7%) indicated interest in adopting these methods. However, it was noted that this interest was conditional and dependent on factors such as affordability and improved gold recovery and the technical assistance and support provided from GGMC and the Government of Guyana. Generally, the factors that prevent the adoption of mercury free technology in ASGM are mainly the lack of knowledge of the technology and its use, lack of access to the technology, lack of financing and nomadic nature of ASGM miners.

The baseline assessment also revealed that various concentrator models and shaking tables were tested and promoted by GGMC over the years. Additionally, assistance has been provided to the miners through the Guyana Environmental Capacity Development (GENCAPD) Mining Assistance Programme, and the GGMC Technical Assistance to Mining Sector Programme. Despite this, observations in the field during data collection found that mercury-free technology was absent in land and river dredges and the mining locations sampled. Concentrators, which are considered part of the suite of mercury-free technology, were observed in only a few crusher/milling operations sampled during the field research. However, these concentrators were used in combination with mercury amalgamation, where mercury was added to the concentrated material, which contained fine gold that was gathered from the concentrators. The use of concentrators as a replacement for sluice box was not observed.

3.6 Demographic and social information

The ASGM workforce comprises persons from the Coastland, Indigenous communities, and immigrants from Brazil (MIA, 2016; Lowe, 2006; Pasha, Wenner and Clarke, 2017). Most of the workers are from the Coastland but there has been an increase in the number of indigenous owners and workers, particularly on communal lands and also an increase in the influx of miners from Brazil (MNR, 2017 now referred to as the National Implementation Plan). Approximately 11,160 persons were estimated to be involved directly in small- and medium-scale gold mining in Guyana, based on the GGMC 2019 census of active operations in this sub-sector (GGMC Mines Division, 2019). This approximation does not include Pork Knockers/Punters. There has also been a notable increase in Venezuelan migrants into Guyana's gold mining areas (UNICEF, 2019). ASGM can be a family-based subsistence activity where

men, women and children participate throughout the mining work process (GGMC Environmental Division, 2020).

Generally, there are rules at operations that guide work practices and set expectations for behaviours and norms. Respondents of the baseline assessment were asked about these rules as it relates to women, children and Punters being on site, as well as use of personal protective equipment (PPE), alcohol, and drugs. Instances of child labour, sex work, and alcohol consumption can amplify the social and health vulnerabilities of miners and mining communities. These questions on rules aimed at understanding the arrangements in place to moderate social deviance and responsibility as well as the mechanisms used to establish operation-level social accountability systems (rules, their enforcement/compliance, chain of authority). Understanding this level of compliance would inform additional measures to be implemented by authorities at the site and sector levels.

3.6.1 Organisation of mining operations

SMS mining operations tend to have a wide range of employees, from four (4) to six (6) workers for small-scale operations, and up to 72 for medium-scale operations. This also varies depending on the type of operation. The organisational chart of a typical SMS mining operation is depicted in Figure 11 below, and the typical roles and responsibilities of individuals involved in these operations are included in Table 6 below, approximately ranked by authority. During the baseline assessment, it was highlighted that all interventions within the SMS sector should be done in partnership with GGMC, the Village Council, and Dredge Owners in order to leverage both trust and respect for enforcement of rules, policies and legislations. It must also be noted that Pork Knockers/Punters tend to operate independently of in small groups with no formal organisation.

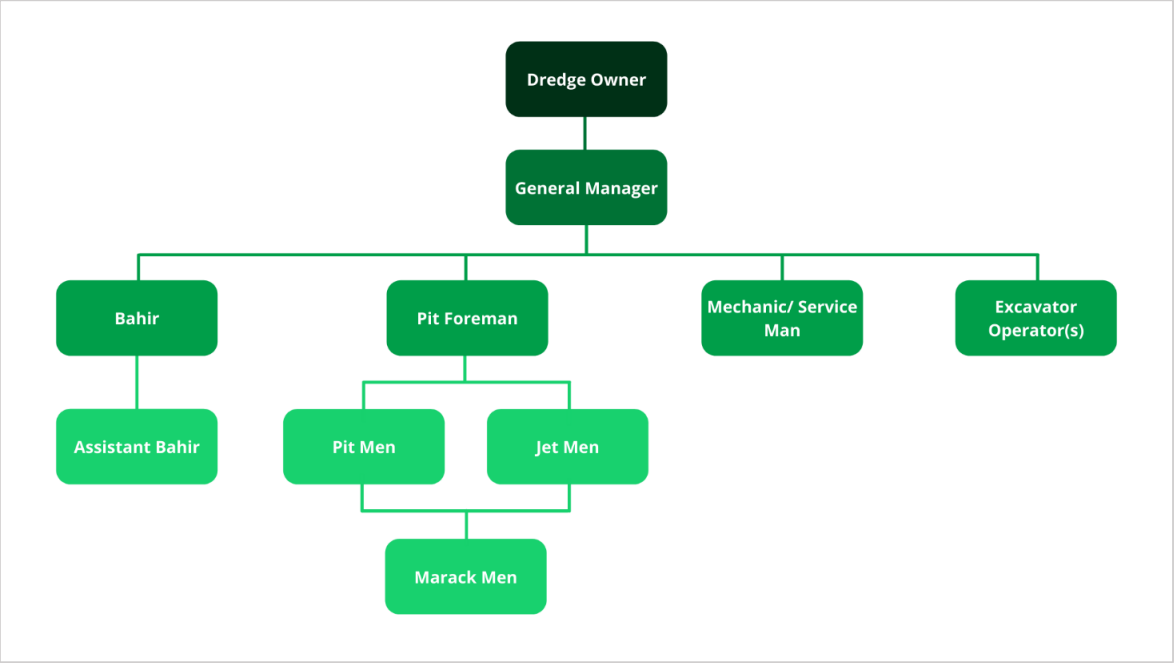

Figure 11: Organisation of a typical SMS operation (excavator assisted)

Table 6: Roles and responsibilities of a typical dredge operation (with an excavator)

Rank	Position	Role[12]
1	Owner	• Obtaining permission to mine (permits, claims, licenses, etc.) • Burning of amalgam and/or selling gold produced by operation • Purchasing essential items (e.g. food, machinery, equipment, fuel) for operation • Recruitment of workers (in some instances) • Record keeping of quantities of mercury received and issued as stated in the Mining (Amendment) Regulations, 2005
2	General Manager (GM)	• Lead operation in absence of owner • Assigns responsibilities to other workers • Maintains records (timesheets, production books, receipts, etc.) • Store and authorise use of mercury • Burning of amalgam (when owner is absent) • Coordinating inflow of stocks/supplies • Recruitment of workers (when owner is absent)
3	Foreman	• Lead operation in absence of GM • Monitors and controls tasks assigned to workers
4	Pitmen	• Clear debris to make-way for suction

[12] Some roles may overlap e.g. Marack men and Jetmen.

Rank	Position	Role[12]
5	Jetmen	• Control high-powered jet or spurt hose to loosen soil material for suction by dredge
6	Marack man	• Control suction hose or pipe
7	Bahir (Cook)	• Prepare meals for all workers
8	Service-men/mechanic	• Maintain and services all machinery (especially dredges) to ensure that they are adequately functioning • Serve as temporary replacements for other workers in cases of shortages
9	All-rounder	• Fill the role of any absent pitman, jetman or marack man

3.6.2 Educational Status

In Guyana, education at state-operated public schools is free and compulsory from age five (5) to age sixteen (16). The Pre-school period, or nursery, is optional. The objective of learning at the primary level is to impart basic literacy and numeracy skills, as well as knowledge of science and society. Table 7 outlines the distribution of schools in Hinterland Regions according to nursery, primary and secondary schools. The number of available primary schools is higher than the number of available secondary schools. Secondary schools are more challenging to access, though there has been a concerted effort to construct secondary schools in Hinterland communities with dormitory facilities. Thus, many adolescents end their formal education before completing secondary school according to the interviews with education sector agencies within Mining Districts 2, 3 and 4, school dropouts are common in mining communities.

Table 7:Number of nurseries, primary and secondary schools in Regions 1, 7, 8 and 9

Region	No. of Nursery Schools	No. of Primary School	No. of Secondary School
1	20	43	36
7	29	28	15
8	15	21	19
9	36	47	42

During the data collection, the educational level of the ASGM workforce in three mining districts (MDs 2, 3 & 4) indicated that out of a total of 260 ASGM workers, 149 (57.3%) completed primary education and only 92 (35.3%) went on to complete secondary education. Of those that went on to attend secondary school, 80.9% left the school system by age 13. Dredge owners were the primary ASGM workers who completed secondary education, as well as those who pursued tertiary or vocational

studies. It was found that 13 of the 19 respondents with tertiary education were in management positions (dredge owners/general managers) as shown in Table 8.

Table 8: Levels of education completion of respondents

Responses	Primary	Secondary	Tertiary (Technical/ Vocational)	Tertiary (University)	Grand Total
All Rounder	27	6	-	-	33
Bahir	10	10	-	-	20
Excavator Operator	2	4	4	-	10
General Manager and/or Dredge Owner	53	68	5	8	134
Jet Man	8	2	1	-	11
Marack Man	6	-	-	-	6
Mechanic	1	1	1	-	3
Pit Foreman	8	1	-	-	9
Pit Man	14	-	-	-	14
Pork Knocker/Punter	20	-	-	-	20
Grand Total	**149**	**92**	**11**	**8**	**260**

According to the respondents, the lack of schools or educational institutes was a major reason for not pursuing further education. The remote location of the mining communities also poses major challenges for further school infrastructure development within the communities. This challenge, along with the low enrolment rate at schools, may not justify increasing the number of schools in the area. For example, it was highlighted during the baseline assessment that Itaballi records an enrolment rate of less than 20 students per grade. Other reasons given for persons not attending school were the need to provide financial support to their families, and to pursue personal income generating activities rather than continuing their education.

For further education, especially as it relates to mining-specific education and training access, the Guyana Mining School Training Centre Inc. (GMSTCI) is the premier local institution. GMSTCI falls within the auspices of the Ministry of Natural Resources through the GGMC school started with basic map reading and navigation courses but now offers robust competency-based technical courses and has a one-year Certificate in Surface Exploration and Mining that focuses on mineral prospecting, best practices in mining methods, exploration technology and computer applications for mining operations and mineral explorations.

The GMSTCI conducts training in mining locations where there are Mines Stations - such as Mahdia, Puruni, and North-west District and also has an ongoing collaboration with the University of Guyana's Faculty of Engineering and Technology to conduct public lectures with the aim to soon implement an online 3-day training in remote sensing which would train learners in using satellite imagery to track illegal mining, multi-spectral analysis and create thematic maps (mercury pollution in waterways, turbidity, oil spills, mine pit collapse and mineral exploration).

The GMSTCI trains both miners as well as other agencies in the ASGM sector and trained 562 persons in 2019, the majority of which are men (57%) and new entrants to the sector (92%). The level of participation of women (43%) was high, though the participation of miners in these programmes was only 7% (GMSTCI, 2020) (See Table 9 below).

Table 9: Gender and occupation distribution of participants on GMSTCI training programmes (Source: GMSTCI 2019 Annual Report)

Course	No. of Locations	Number of Participants	% Women	% Men	% Dredge Owners	% Miners	% New Entrants
Mineral Prospecting and Map Reading (Level I Competency, 2019)	11 locations across Mining Districts	503	43%	57%	1.2%	6%	92.6%
Intermediate Training of Prospectors	1 (Georgetown)	25	24%	76%	0	0	100%
Codes of Practice (2019)	2 (Georgetown, Puruni)	34	53%	47%	5.9%	20.6%	73.5%

The GMSTCI often works in collaboration with the Board for Industrial Training (BIT), which provides technical and vocational training across the country and has remained active within hinterland communities, including areas of ASGM activity such as Kako Village, Jawalla, Waramadong and Mahdia in partnership with the Village Councils and Regional Democratic Councils (See Table 10 below). 33% of those trained were women, and the most popular programme has been Heavy Duty Equipment Operation (68.4%).

Table 10: ASGM-related training conducted in Hinterland Regions by Board of Industrial Training, by sex (BIT intake records, 2017-2019)

Training Area	Administrative Region 1		Administrative Region 7		Administrative Region 8		Total Sum of Male	Total Sum of Female
	No. Male	No. Female	No. Male	No. Female	No. Male	No. Female		
Electrical			5				5	
Heavy Duty Equipment Operation	25	1			114	12	139	13

Training Area	Administrative Region 1		Administrative Region 7		Administrative Region 8		Total Sum of Male	Total Sum of Female
	No. Male	No. Female	No. Male	No. Female	No. Male	No. Female		
Information Technology	19	31					19	31
Mechanic			6	1			6	1
Motor Vehicle Servicing	-	-	-	-	8	2	8	2
Small Engine Repairs	6	5	20	2			26	7
Welding/Fabrication				13				13
Grand Total	**50**	**37**	**31**	**16**	**122**	**14**	**203**	**67**

3.6.3 Women in ASGM and mining communities

Women have been in Guyana's gold mining workforce since at least the 1970s (Osborne and Ramlagan, 2020). There have been and still exist numerous hurdles for women to participate fully in the sector as they tend to work at the lower ends of the production chain performing tasks such as cooking. However, in recent times, the roles of women are evolving from providers of service, such as cooks and hospitality, to administrative roles such as ownership of mine claims/properties, operations, and shops. In some SMS operations, rules and norms still exist which prohibit women and children from being on the site, except for the women working as cooks, or instances where they are relatives of the operation owner. Women are not generally involved in the manual labour aspects (such as working in pits), or technical aspects (such as amalgamation and gold recovery).

In 2016, a Socio-Economic Analysis for the ASGM sector was conducted to inform the MIA-Guyana (Bynoe, 2016). The findings of this study, as it relates to the demographic and social arrangements of mining, indicated that of 200 persons surveyed, 12.5% of respondents were females. Whereas in the context of this current assessment, it was found that 31.79% of the miners surveyed were women, but it must be noted that the increased representation was attributed to focus group discussions that targeted women dredge owners in MD 2 and 3. In Puruni, the probability of engaging a male or a female miner was the same, as no focus groups were conducted here, and 12 of 67 respondents were women, indicating a male to female ratio of 1:0.16, which is similar to the 1:0.14 ratio calculated in the Bynoe (2016) analysis.

It should be noted that Guyana has adopted the principles of the Beijing Platform for Action, and the Constitution of Guyana has enshrined the principle of equality between the sexes under Article 29 (1), Equal Rights Act of 1990, and the Prevention of Discrimination Act (No. 26 of 1987). Women and men have equal rights and the same legal status in all spheres of political, economic, and social life. All forms

of discrimination against women based on their sex are illegal. Despite a sound legal framework for gender equality, engagements with miners indicated that there are several factors of concern that are obstacles to the achievement of true gender equality in ASGM. The ascendancy of small-scale gold mining in Guyana and in the communities participating in the assessment has led to the interplay between women's desire to work and their desire to execute child-care responsibilities. Engagements during Focus Group Discussions found that women/mothers were concerned about taking their child into the site, but this was the only way they could reconcile their child-care responsibilities with their earnings.

In Guyana, commercial sex work, or prostitution, is considered illegal, but is still widespread. During the field research, 17 sex workers were interviewed in Mahdia, Puruni and Arimu to assess their involvement in the ASGM sector and the risks to mercury exposure as a result of their occupation. It was found that commercial sex workers were most likely exposed to mercury emissions given the close proximity of several brothels to areas where gold burning occurred.

This baseline assessment identified five common barriers to women's participation in ASGM: 1) access to finance and land; 2) limited opportunities for gaining experience; 3) low awareness of opportunities for women in ASGM; 4) prevailing stereotypes on women's ability to become involved in the sector; and 5) discriminatory site-level policies preventing women's employment.

3.6.4 Children in ASGM and mining communities

Guyana's Labour and Mining Laws indicate that persons under the age of 18 are not permitted to work in the SMS mining sector. To be an SMS mining worker in any Mining District, persons are required to be authorised by GGMC by acquiring of a valid 'Mining Privilege' (for Guyanese, older than 18 years), or a' Certificate of Registration' (for non-nationals with a valid work permit or Guyanese labourers receiving fixed salaries e.g. cooks).

From the field research, it was reported that children as young as toddlers were present at mining sites as they accompanied their parents, who were Dredge Owners or Punters/Pork Knockers. It was also found that during times when school was not in session, such as during holiday breaks, children were

often in the backdams[13] with their parents due to limited child-care options within the community. The COVID-19 pandemic has exacerbated these occurrences.

Child-care responsibility and the prevailing practice of children accompanying their parents into the backdam has affected the perception of child labour. Such instances are prevalent in communities such as Kamarang, Mahdia and Campbelltown. There was a reported case of one child being born on a mine site and remaining there with his mother who had not left the site since. It is also quite common to find young boys from age 13 getting involved in mining after school and during school holiday breaks.

3.6.5 Indigenous Communities

There are multiple actors, directly and indirectly involved or affected by ASGM activities, including Indigenous peoples. Guyana's Indigenous population is the largest in the Commonwealth Caribbean based on the most recent census (2012) indicating that of Guyana's population, 10.3% are Indigenous (UNICEF, 2017). A great majority (80%) of these Indigenous nations inhabit the sparsely populated, forested and mountainous Hinterland Regions of 1, 7, 8 and 9, where most of the gold mining occurs (Ibid.):

- Region 1 is primarily home to the Arawaks, though the Warrau and Caribs live in smaller numbers;
- Region 7 is primarily home to the Akawaio, though the Arecunas largely reside in Pariuma Village;
- Region 8 is primarily home to the Patamonas; and
- Region 9 is primarily home to the Wapichan peoples, with a smaller population of the Makushi and the Wai Wais – who reside in Konashen (GESIP, 2019)

In the instances where there are mining-involved villages, Indigenous communities tend to have arrangements where they contract their village lands to allow operators to mine gold and diamonds in exchange for a negotiated fee which is intended to contribute directly to the development of these communities (Amerindian Act, 2006). Some rely directly on the ASGM sector, including direct employees (miners), those who provide goods and services to the miners, owners and workers in local shops, bars, restaurants and other businesses in communities where mining revenues are spent (Eftmie, 2012).

[13] Backdam refers to the interior location where mining activities take place

There are indications that Indigenous persons experience 2-5 times the rate of poverty more than the non-Indigenous Guyanese (Austin *et al,* 2007; UNICEF, 2017). Collectively, some studies such (UNICEF, 2017) asserted that these indigenous peoples are deeply vulnerable, often relying on neighbours and non-profit organisations for support in meeting their basic needs such as daily meals and medication.

Other vulnerabilities exist for this group, such as the quantification that arose from the UNICEF study (2017), that 1 in 4 trafficking victims identified in Guyana is an Indigenous person, and most likely a woman. In addition, there are many studies conducted throughout the 2000s that have indicated that the carnivorous catfish (Siluriformes) and aimara (Hoplias aimara) are the main sources of protein for the Indigenous people and, as they are both larger predatory fish, mercury becomes bio-accumulated once they consume on non-carnivorous bottom feeders that would have consumed mercury (Singh *et al*, 2001; Couture *et al*, 2005).

During the baseline assessment, it was revealed that Indigenous communities, such as Kamarang, have a higher presence of authorities and therefore higher level of safety for the community members. The village council and police in Kamarang are able to collectively respond to incidents where miners who have alcohol in their blood or use canabis are a danger to themselves or communities, whereas in other non-Indigenous communities, there were reported challenges moderating such behaviour due to the absence of these authorities. This indicates the need for attention to be placed on strengthening the presence of formal law enforcement authorities closer to mining communities, especially those not within indigenous communities where the Toshao is responsible for maintaining peace, law and order. This also presents the opportunity to have the Toshaos and village councils as local authorities involved in the implementation of the NAP.

3.7 Economic aspect of ASGM

For decades, gold mining in Guyana has been dominated by the ASGM sector, and it continues to be a prime contributor to Guyana's economy, despite the operationalisation of two large-scale gold mining companies in the country. It plays an essential role in the social and economic development of Guyana. This sector accounted for more than 50% of the value created by the extractive industry between 1994 and 2013 (Pasha, Wenner and Clarke, 2017). Employment in the small- and medium-scale sector increased from 7,662 in 2007 to 15,696 in 2013 (Ibid.), and based on the GGMC 2019 census of active operations, approximately 11,160 persons are involved directly in SMS gold mining (GGMC Mines Division, 2019).

3.7.1 ASGM miners' earnings

The average monthly earning per role in an ASGM workforce may vary per operation, as well as per mining district in which these operations occur. As revealed during the baseline assessment, workers within an ASGM operation typically work ten to twelve hours per day between 06:00 hrs to 18:00 hrs for several weeks at a time. Though operations typically ran from dawn to dusk, it was found during the baseline assessment that there were two key roles that worked over 16 hours and sometimes up to 20 hours: excavator operators and bahirs. A fixed monthly salary is normally paid to the excavator operator, security, cook, service, and mechanic, while the general manager and other workers are paid a fixed rate based on gold produced (aka 'per percentage'). In some cases, workers may be paid a monthly salary. From the field research, the average earning per month for workers on an SMS mining operation ranged from GYD 92,000/USD 440 (pitmen) to GYD 483,000/ USD 2,312 (general manager).

Women in ASGM in Guyana, except for dredge owners, tend to work at the lower ends of the production chain and their earnings mirror this. Despite similar or longer working hours and levels of effort, women were often paid only a fraction of what men received. Bahirs earn between GYD 150,000-350,000 (USD 718-1,676) per month depending on the size of the operation. If the operation has 2 dredges, the bahir could earn the equivalent to one ounce of gold per month, approximately GYD 320,000-350,000 (USD 1,532-1,676). Many bahirs do extra tasks to earn more income, such as washing the workers clothes for GYD 10,000-20,000 (USD 48-96) per month.

3.7.2 Cost of living

Several costs must be considered for artisanal and small-scale operations in Guyana: labour, food, fuel, equipment (Walrond, 1986). Later authors such as Thomas (2009) expanded on these by specifying that miners require a range of inputs, including mining equipment, vehicles (trucks, SUVs, excavators, ATVs, bobcats, backhoes), spare parts, food, fuel, lubricants, mercury, transport, equipment repair, metal fabrication, banking, insurance, and security.

The cost of living in mining communities varies between Mining Districts and is mainly influenced by the level of infrastructure and social development of the area. The level of development was measured by access to public services (education, health care and transportation) and basic utilities (telecommunications, water and electricity) within these areas. In Guyana, access to these social

benefits is not equal, and is more challenging for miners due to the limited road network and infrastructure into the remote interior regions. Accessibility influences the level of infrastructural development of the mining communities (Ministry of Health Guyana, 2013). As examples, in the Potaro Mining District, subareas like Mahdia, and in the Mazaruni Mining District, subareas like Imbaimadai, and Kamarang, have relatively more established transportation networks (serviced by roads and air travel) and therefore tend to have relatively more access to social benefits and opportunities for development and investment from commercial sectors, such as tourism.

On average, costs of living in these communities could range from GYD 58,000-86,000 (USD 278-412) weekly based on a typical basket of goods, as described by private sector respondents in the baseline assessment (see Table 11). Prices were sampled in Mahdia, a mining town accessible by road and air; Imbaimadai, a mining landing accessible by air charter; and Kamarang, which is both an indigenous community and a mining hub.

Table 11: Average cost of items in Mining Districts

Items	**Average cost by Mining District (GYD $)**			
Basket of Goods *(Items, based on engagements with miners)*	Unit	**Mining District 2** Location: Mahdia	**Mining District 3** Location: Imbaimadai	**Mining District 3** Location: Kamarang
Chicken	Per lb	$500	$600	$700
Fish	1 fish	$500 (or 3 for $1,000)	$900	$1,000 - $1,200 (lb)
Eggs	1	$50	$100	$100
Vegetables (tomato)	Per lb	$500	$500-$700	$300
Water	1.5 L	$300-$600	$500-$1,000	$1,200
Rice	10kg	$1,700	$5,500	$4,000
Sugar	Per lb	$100	$400	$250
Flour	Per kg	$300	$400	$260
Prepaid Mobile (Digicel Top Up Card)	N/A	Cost Price	Cost Price	Cost Price
Fuel (Gasoline)	Per gallon	$3,500	$2,00	$2,000
Fuel (Diesel)	Per gallon	$5,500	$2,000	$2,000
Flight - One Way (to Georgetown)	One Way	$17,000 (Opt 1)) $15,000 (Opt 2) Minors (under 10) – 50%	$12,000 $130/lb - cargo	$28,000 (Opt 1) $2,000 per lb (passenger) $130/lb - cargo
Charter	1	Air: $19,000 (3 days weekly) Road: $110,000-$130,000	Air: $502,250 (Opt 1) 15lb free, $135/lb after for cargo $340,000 (Opt 2)	$500,000-$600,000

Items	Average cost by Mining District (GYD $)			
Meal at Restaurant	1 person	$500-$2,000	$2,000-$3,000	$1,500
Beer	1	$500	$500-$1,000	$500 - $600
Sex Worker	1 night	$5,000 - $10,000	$10,000 - $15,000	5 dwt
Cigarettes	Per pack	$700	$800	$600
Room Rental	1 night	$2,000	$10,000 - $15,000	$5,000
Room Rental	1 month	$20,000	$360,000	$150,000
Toiletries (Soap)	1	$300	$500	$140
Toilet Paper	1	$300	$500	$200
Malaria Test	1	Free	Free	Free
Condoms	1	Free	Free	Free

3.7.3 Access to resources and financing

As mentioned above, miners have several costs that must be considered when entering into ASGM but there also needs to be an understanding of miners' access to resources such as land and productive capital assets, their access to finance or financial assistance and any factors that may impact their financial decisions. With the cost implications and considerations for transitioning into mercury free mining operations, it was suggested by the National Mining Syndicate Inc that the structured teaming up of ASGM miners with large scale operators to form cooperatives in order to help finance the operations could be a successful option.

Access to land

The ability to access and utilise land within the context of ASGM renders land a productive asset for miners. There are several options for miners to acquire access to mining land in Guyana. Miners can apply to access mining land within any of the six (6) mining districts, and royalties and taxes are paid for this lease-holding. GGMC also makes land available through mining lotteries and auctions (Pasha, Wenner and Clarke, 2017). However, Hook (2018, 2019) established that wealthy medium-scale miners tend to find auctioned land affordable, while small-scale miners are more likely to access lands available through a lottery which are said to be remote with low mineral-bearing prospects.

For the small-scale miner unable to afford land in the aforementioned ways, another option exists where the miner seeks permission from claim holders in return for a negotiated fee. This provides scope for landlordism, and there is some evidence in published literature (Hook, 2018, 2019) that points to practices whereby there is no contract between the miner and the claim-holding landlord. In some

instances, the prospecting small-scale miner in this situation may be removed from the property at the time of their first gold find to make way for the claim holder to commence mining activity. These practices create multi-tiered levels of opportunity for the economic disenfranchisement and abuse of some gold workers who are treated as self-employed and rarely have employment contracts and the benefits, salaries, insurance and health/safety safeguards that accompany formal employment (Bureau of Statistics, 2020).

In 2016, the GGMC introduced another route to access mining blocks by syndicates comprising 15 or more miners (Hook, 2018). The NMS, as a collective of syndicates, play a critical role in the countering of landlordism through promoting the rights of hundreds of small-scale miners and facilitating their access to land.

This pursuit of viable land also reaffirms the fundamental need for the installation or enforcement of property rights as the main source of productive assets, as guided by the needs of the miners. From a regulatory point of view, tenure security is considered essential in helping the state to minimise conflict between land users, which is often caused by overlapping interests. The NLUP (GLSC, 2013) identified competing land management issues as a key barrier to accessing mining lands, along with costs and availability of power, as the main constraints to mining in Guyana. Property rights and security of tenure likely have a major impact on the uptake of mercury free and reducing technologies as well.

Access to equipment

It was suggested that the costs required for maintaining small- or medium-scale operations can discourage operators to comply with registration and other financial requirements to keep their licenses fully compliant and operational (IDB, 2015 cited in Hook, 2019; Thomas, 2009; Hook, 2019).

It should be noted that there are several incentives available to miners that facilitate their access to equipment. This is largely facilitated through the Customs Act (Cap 82:02) which provides an exemption from Customs Duty on a wide range of mining equipment – for sorting, screening, separating, washing, crushing, grinding, among other inputs. There is also partial exemption (8% Rate of Duty) on mining supplies imported by or on behalf of a registered mining company. Protective clothing and personal protective equipment (PPE) attract a 13% rate of duty. Removal of Value Added Tax (VAT) on machinery and equipment, concessions on ATVs, removal of VAT on hinterland travels, and exemption from customs duty on most plant machinery and equipment are concessions also available to miners based on their operation's gold production. There is also a removal of police clearance requirements for miners to transport fuels in their vehicles.

Access to credit and financing

During the baseline assessment, it was revealed that small- and medium-scale miners as well as Pork Knockers are still less likely to attain loans and credit with local banks due to the high risks and economic uncertainties attached to their profession and the limited physical access to banking facilities within the mining districts. They are often of the belief that their loan applications for investment into ASGM will be unsuccessful.

Under the planetGOLD Programme, the GEF and UNEP established that some miners opt to not access financing in formal settings as they do not wish to comply with the conditions of these formal arrangements or are unaware of the accessibility (GEF and UNEP, 2020). The willingness of lenders to engage, the repayment schedules and conditions set, as well as their perception of risk and returns, would need to be understood to determine the extent to which small-scale miners can widely access these. Additionally, some small-scale operators have positive relationships with other more mature operators in the mining industry, such as medium-scale mining operators who offer financial assistance to small-scale miners (Ibid.). Access to finance through this route tends to require that the medium-scale miner or service provider is familiar with the small-scale miner who is seeking to access credit or finance facilities which may not always be accessible to the new entrant. In Guyana, such business cooperation appears to be traditional and not only offered by medium-scale operators but across a wide spectrum of mining entities within Mining Districts who all readily assist small-scale mining operators. This allows these miners access to machinery on credit and through rentals/leasing arrangements within an environment of mutual trust.

3.8 Mercury Trade

3.8.1 Importation of mercury

Mercury importation is strongly linked with the demand from the ASGM sector in Guyana. Whilst there are unconfirmed reports of exports to neighbouring countries, there is a significant demand locally and it is a very lucrative trade. In keeping with its obligations to the Minamata Convention, the Government of Guyana has taken strategic measures to regularise the trade of mercury. Several key agencies, including the MNR, GGMC, EPA, PTCCB and Guyana Revenue Authority (GRA), are working together and have put in place a system for authorising imports based on annual quotas, environmental safeguards, and storage, transport, and handling of the commodity.

Mercury importers who fulfil the regulatory requirements of the GGMC, PTCCB, EPA and MNR are permitted to supply mercury throughout the mining sector in Guyana. As of August 2019, the MNR, EPA, PTCCB and GGMC implemented joint regulatory requirements through an 'MOU For the Management of the Importation of Mercury'. Prior to the establishment of the MOU, the formal process of mercury importation involved obtaining a "no objection" letter from GGMC through the Minister of Natural Resources, information on sourcing and purchase from suppliers, import clearance from the GRA, and a licence from the PTCCB. The process now requires importers to apply for the following prior to importation:

(i) an environmental authorisation (permit) from the EPA;
(ii) a zoning permit from the Central Housing and Planning Authority (CHPA); and
(iii) a licence for mercury storage and distribution from the PTCCB.

All requirements must be met before permission is granted by the Minister of Natural Resources for importation. The MOU also provides a maximum annual quota of 34,500 kg (34.5 t) for mercury importation into Guyana for the use of the ASGM sector, with a gradual reduction that is contingent on the projected gold declaration in the sector and the implementation of alternative techniques and technologies (PTCCB, GGMC, EPA and MNR, 2019).

The main import sources of mercury in Guyana from 2015 to 2018 were primarily from seven countries: Indonesia, United Kingdom, India, Singapore, Russian Federation, Turkey, and the United States (McRae, 2014). In 2019, there was a substantial increase in mercury importations. Guyana imported a total of 30,130 kg (30.1 t) at a value of US$601,310 (US$19.95 per kg). The main sources were India (13.5 t), China (13.1 t), and the United Kingdom (3.5 t). Before 2016, the UK was the major source of imports accounting for roughly 45% of all mercury imports to Guyana. However, India is now the largest supplier, accounting for roughly 25% of official imports (Ibid.).

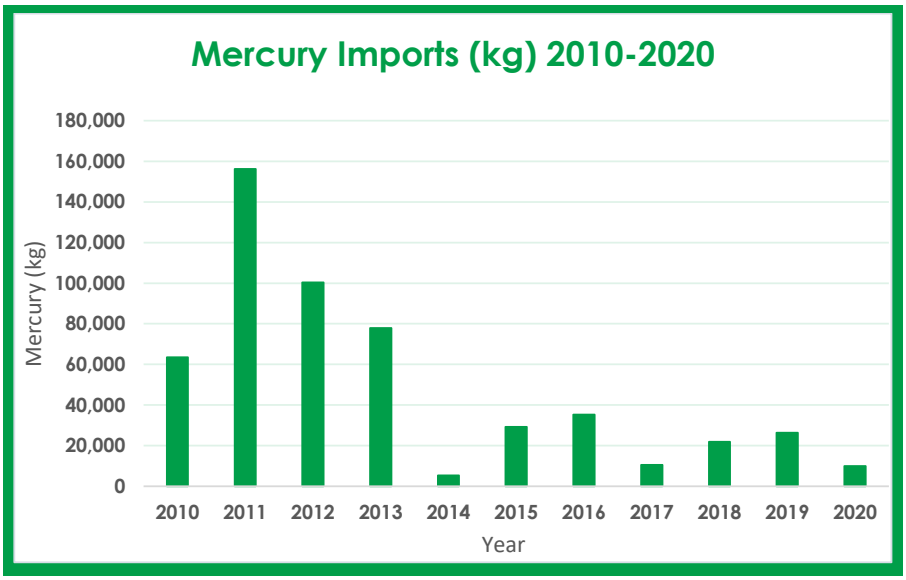

Figure 12: Trends in mercury imports for Guyana from 2010 to 2020 (Source: UN Comtrade, 2021)

3.8.2 Distributors of mercury

Local mercury importers are primarily based in Region 4 (Demerara-Mahaica), with the capital city of Georgetown being the central point of distribution for mercury. Other official import points are Springlands on the border with Suriname and Morawhanna in the North-west District bordering Venezuela. Unofficial entry points may include Lethem on the South-west border with Brazil and Etirinbang on the Mid-west border with Venezuela.

Local distributors/suppliers of mercury mainly comprise a network of retailers and wholesalers, including mining companies, mining equipment suppliers, general stores and gold traders. At the national to local levels, the distribution of mercury to the mining districts was primarily through the communities of Port Kaituma (District 5), Bartica (District 3 and 4), Mahdia (District 2), and Lethem (District 6) (McRae, 2014). Retailers purchased mercury from importers by flasks. The retailers then decanted the mercury into plastic bottles for smaller portions which can range from 0.5 pounds to 10 pounds, and then resold to miners. Mercury is also sold in grocery stores and municipal markets in Bartica and Mahdia as well as travelling vendors in Georgetown (Ibid.). Most shops were observed selling both groceries and mining supplies at the landing; however, it was also reported by gold traders and informal discussions with miners that most, if not all the shops within the mining districts supply mercury. Typically, mercury is sold in ounces at GYD 1,500-2500 (USD 7-12) per ounce or in pounds at GYD 15,000-20,000 (USD 75-100) per pound. There is a regular demand for mercury as it is purchased at a frequency of 1-2 ounces weekly. This often suggests that miners either purchase mercury only when needed or are limited by

cash-flow. However, the results of the data collection suggest that many mining operations across districts 2, 3 and 4 have easy access and can afford to purchase larger quantities to capitalise on the wholesale prices offered in Bartica and Georgetown.

Legg, Ouboter and Wright (2015) reported that the official mercury imports exceeded the demand in the mining sector in 2011 in Guyana. During the period 2008 to 2013, the total unit of mercury import into Guyana was 504 tonnes, which accounted for an excess of approximately 355 tonnes of mercury (Ibid.). The excess mercury may be connected to prohibited/illegal activities. It was also alleged that mercury is smuggled to Suriname and French Guiana to support mining activities, owing to the countries' policies that ban mercury import and use within their mining sector (Ibid.).

3.9 Gold Trade and Export

Guyana's economy is traditionally based on several key export commodities with varying degrees of commercial viability: sugar, rice, timber and minerals such as gold, diamond and bauxite – together accounting for over 50% of the country's economy. Gold accounts for a significant portion of the country's exports and remains the largest exported commodity (IDB, 2017).

Total declarations in 2016 amounted to 712,706 ounces, with SMS miners accounting for 67.7%, while the foreign mining companies accounted for the remaining 32.3%. From 2017 to 2020, there was a steady decline in gold production. This was mainly due to the less gold declarations from SMS miners as a result of inclement weather and poor road conditions, which rendered several mining areas inaccessible, and a decrease in gold prices in the international market. In 2020, production value in the gold mining sector shrank by 7.8%, to slightly below $110 billion. This decline is attributed to the pause in production by a large gold mining company from July to October 2020, to facilitate a transfer of ownership. Meanwhile, the SMS miners saw an output of 485,552 ounces, 8.3% higher than in 2019 (Bank of Guyana, 2020). During the majority of 2020 when Covid-19 restrictions were in place, miners said they operated at reduced capacity, whilst some chose to cease operations, despite mining being declared an essential activity[14].

Miners are required to sell their gold to the GGB[15] or any of the GGB licenced gold dealers and licensed shop keepers operating in the mining districts. Miners must pay a 5% royalty on gold sold to GGB and

[14] https://www.stabroeknews.com/2020/04/27/news/guyana/gold-price-high-but-miners-say-limited-by-covid-19-other-factors/
[15] The Guyana Gold Board (GGB) is the government authorised agency to buy and sell gold.

a 2% government tax. To avoid paying the taxes and royalties, miners may also sell gold to unlicensed gold traders or buyers, instead of the GGB (Pasha, Wenner and Clarke, 2017). In some instances, the gold tends to be smuggled to neighbouring countries, such as Suriname, where export duties and royalties are lower than Guyana's (IGF, 2014).

3.10. Environmental Information

Guyana's ASGM sector is the dominant source of anthropogenic emissions and releases of mercury. ASGM leaves a heavy environmental footprint around mine sites largely due to the nomadic style of miners and the associated lack of formal exploration (ore reserve estimation) and mobility (Hook, 2018). Waste disposal and informal dumping of wastes from mining activities are additional sources of mercury emissions and releases; however, the amounts of these emissions are significantly lower than the gold mining practices itself (MIA, 2016). Irresponsible use of mercury and rudimentary production techniques employed by this sector has caused serious environmental problems in Guyana's interior regions (Roopnarine, 2006).

3.10.1 Water Quality

Water pollution and contamination was a factor present at mining sites due to improper tailings management. An assessment of mining impacts in 2017 found that gold mining activities in Guyana directly impacted approximately 2,533 km of rivers, and another 13,572 km were indirectly impacted (Rahm *et al.*, 2017). The field research observed that tailings were untreated, and in the majority of mine sites, were released directly into the environment, where discharges contribute to increased sedimentation in water bodies. At the specific site level, natural surface waters, mined out pits and tailings ponds were filled with mine water in or near the operations, and recorded varying degrees of turbidity.

Apart from issues of turbidity, abandoned pits contain stagnant water which are breeding grounds for mosquitoes with the consequence of possible outbreaks of Malaria and other vector-borne diseases. Further, mercury present in tailings discharge (where whole ore amalgamation is practiced) may be transported to water bodies leading to possible methylation, bioaccumulation, and subsequent fish contamination.

Damage to and erosion of riverbanks and increased tailings in rivers were observed in the field research visits, primarily from river dredge mining. River dredge mining results in the removal of vegetation giving rise to the riverbanks' exposure to erosion and inundation. The river channels were observed to be obstructed and diverted by tailings in many sections. River dredges were estimated to extract and process over 3,000 tonnes of riverbed sediments per day, leaving behind substantial piles of processed materials in the river itself. Sedimentation from both the discharge of tailings from land and river dredges led to increased turbidity and negatively impacted fish habitats and other aquatic life.

3.10.2 Air Quality

While mercury can be emitted to the air in various forms (usually in divalent or elemental forms), the major source of mercury emissions from the ASGM sector in Guyana stems from the process of heating the mercury–gold amalgams. This poses a particularly high risk when the appropriate techniques to minimize emissions of mercury to the environment are not followed.

There has been limited systematic monitoring or air quality assessments around gold traders and buying shops across Guyana. A short study was conducted in collaboration between GGMC officers and Mercer University by Brown *et al.* (2020) in Bartica and Georgetown that found that emissions of elemental mercury in Bartica generally never exceeded the 100,000 ng/m^3 Occupational Safety and Health Administration permissible exposure limit (OSHA PEL). The low concentration in Bartica at that time was attributed to a combination of installing and using the retort and exhaust system; fewer miners bringing gold production to Bartica due to floods; and reduction in purchases of gold. However, direct measurement during actual smelting showed high concentrations in excess of 100,000 ng/m^3.

Further assessments of mercury air emissions resulting from gold shops in and around mining sites and towns are required to inform the efficiency of the methods and technology used to control emissions.

3.10.3 Deforestation and Biodiversity loss

Previous national assessments concluded that gold mining was the principal driver of deforestation and forest degradation in Guyana (MIA, 2016; Laing, 2015; Sutherland, 2017). A visual review of satellite imagery for the mining sites sampled (inclusive of Arimu, Puruni, Mahdia and Konawaruk River) between the period 2004 to 2021 revealed a significant change in forest cover clearance where it was estimated during the baseline assessment that more than 9,182 hectares were cleared within these sites (Figures

13-15). This impacts local ecosystems through biodiversity loss, habitat loss, migration of species, among other consequences, all common in ASGM clusters within the mining districts.

According to Guyana's fourth national report to the United Nations Convention on Biological Diversity (UNCBD, 2010), inadequate tailings management, little to no rehabilitation of mined out areas, and increased hunting of wildlife typically associated with gold mining in Guyana pose increasing threats to biodiversity and species endemism. Sedimentation from the discharge of tailings from land and river dredges also lead to increased turbidity and impact fish habitats and other aquatic life. Results from a Biodiversity Assessment by WWF-Guianas and national regulatory agencies in 2014 found that the diversity of fishes in the Konawaruk River was impacted due to sedimentation and habitat destruction (WWF-Guianas, EPA, GGMC, MNR, 2014).

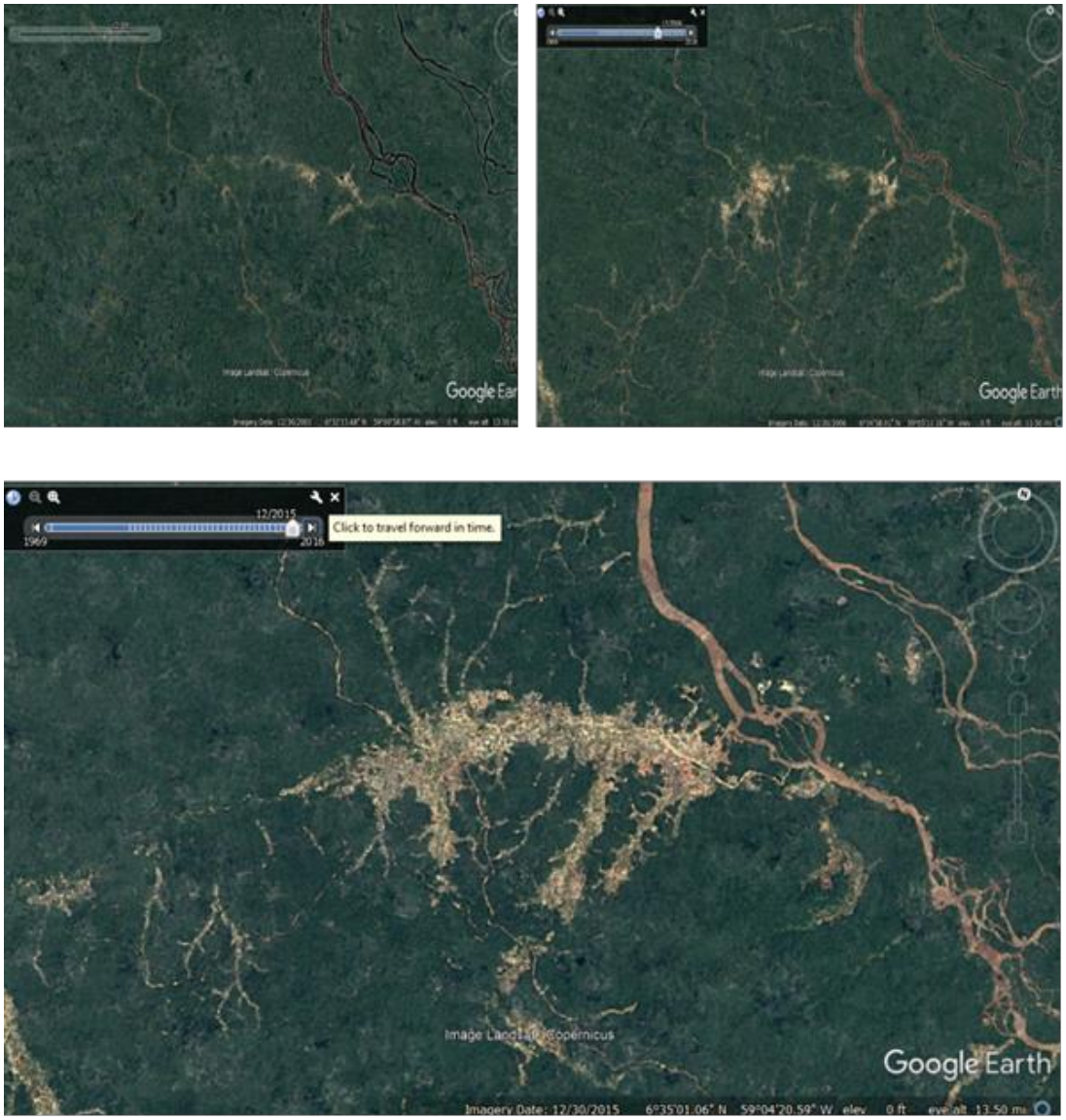

Figure 13: forest cover change 2004-2015 at Arimu, Mining District 4 (Source: Google Earth Pro)

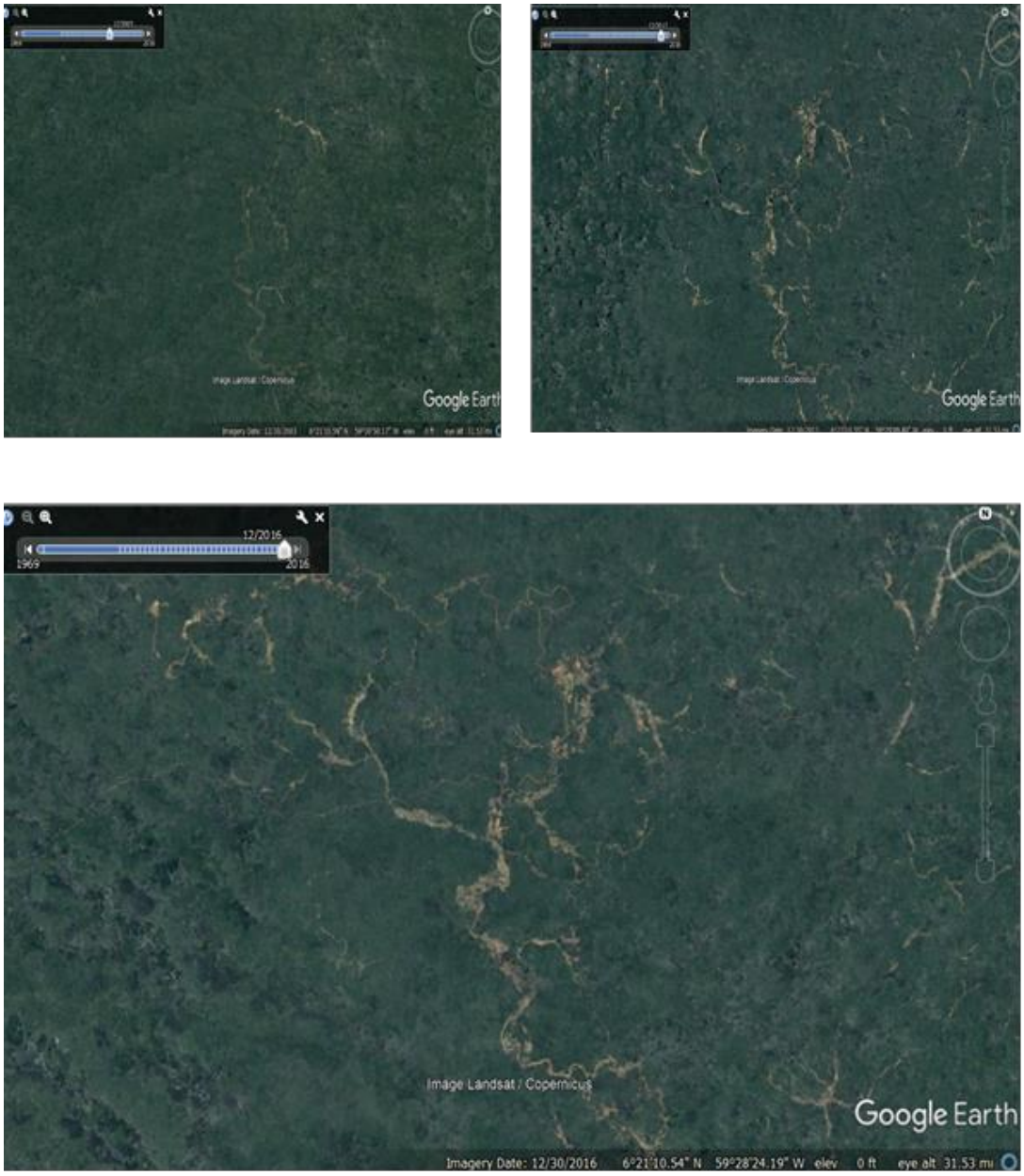

Figure 14: Forest cover changes 2003-2016 Puruni, Mining district 3. (Source: Google Earth Pro)

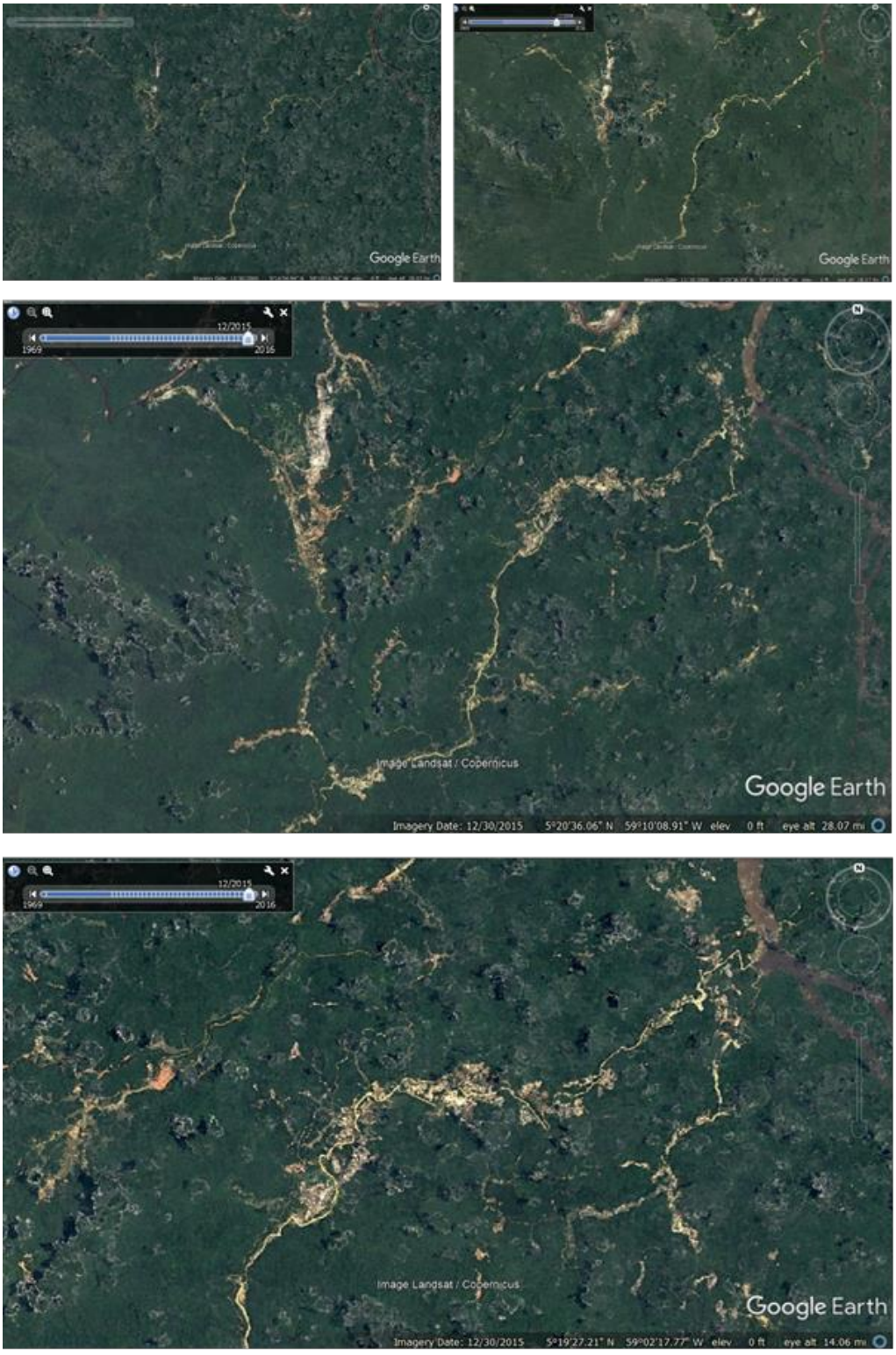

Figure 15: Forest cover changes 2000-2015, Mahdia and Konawarul, Mining District 2 (Source: Google Earth Pro)

3.10.4 Backfilling

Progressive backfilling of mined pits was not observed in any of the operations visited. The result is large expanses of land featuring pits of differing depths and sizes with a void of flora and fauna. The mining technology employed by the ASGM sector contributes to the sites not being permanently closed or rehabilitated as the reworking of 'mined out' sites and old tailings ponds can be profitable ventures. It was observed that excavated overburden from active pits was transferred to previously mined pit(s) nearby. The Mining (Amendment) Regulations, 2005 requires a reclamation and closure plan that includes measures for backfilling and replacement of topsoil for holders of prospecting and mining licences. Medium-scale miners are subject to a different set of requirements (Bulkan and Palmer 2016). This issue of lack of progressive backfilling and reclamation is a long-standing issue. Although an environmental bond (GYD 100,000/ USD 480) was provided under the Mining (Amendment) Regulations, 2005 to be used by GGMC to restore the environment, the cost of reclamation far exceeds this. According to the Commissioner, reclamation work done by GGMC on 44 acres of land cost approximately GYD 100 million/ USD 480, 000.

3.10.5 Tailings Management

Tailings management is one of the most critical aspects of mining and good environmental practice to prevent water pollution. The Mining (Amendment) Regulations, 2005 stipulated that land-based and river operations 'shall discharge tailings into a tailings pond or into a river, creek, or stream where the critical turbidity levels do not exceed 30 NTU[16] and the discharge limit shall not exceed 100 mg/L of total suspended solids or 50 NTU'. The regulations further stipulate that the discharges from tailings pond or river dredges should be released via a conduit under water at a minimum depth stipulated by the Commissioner. The draft Codes of Practice for tailings management under the Mining Amendment Regulations, 2005 provides guidance for land-based operations in terms of site selection, dam construction, and operation. There was no guidance for river dredges/operations. It must be noted that the practice of reprocessing tailings with cyanide is insignificant in Guyana.

During the assessment, when respondents were asked how they discharged tailings, the majority reported that it was normally released to the land. Of the operations, the majority allowed tailings to naturally drain and eventually end up in ravines and creeks nearby. During excessive rain, tailings overflowed. Mercury in tailings discharge may be transferred to creeks and other waterways resulting

[16] Nephelometric Turbidity Units. Units of measuring turbidity

in possible methylation and bioaccumulation in fish. Testing mercury levels in rivers, fish and soil is required to get a full understanding of the situation.

3.11 Health Impacts and Mercury Exposure in ASGM communities

Globally, mercury-based artisanal and small-scale gold mining causes more mercury pollution than any other human activity (UNEP, 2012). The ASGM sector is a significant contributor to Guyana's economy but it presents a significant risk to public health and the environment given the widespread use of mercury (Bynoe, 2016).

3.11.1 Health Concerns

There is a significant number of stakeholders involved in supporting the Public Health sector in Guyana that have not prioritised the provision of health care services related to mercury exposure. In addition, the majority of members of ASGM communities do not believe mercury to be a high priority health risk of concern. The main health concern reported by most miners, goldsmiths and gold/mercury traders was not mercury-related but rather a vector-borne disease, malaria, dermal (skin) problems such as fungal infections or accidents from mining activities. Most miners reported that they have never experienced any of the signs and symptoms which may be linked with mercury exposure, nor have they ever been diagnosed with a health condition that could also potentially be linked to mercury exposure.

3.11.2 Pathways of Mercury Exposure

The baseline assessment showed that some miners, dredge owners/general managers, gold/mercury traders and gold smiths were applying best practices with regard to the handling of mercury, while others were engaged in worst practices which presented critical routes of exposure to themselves and communities (host and downstream) to mercury, potentially resulting in negative health effects, particularly among vulnerable sections of the population.

It was found that the majority of miners and gold/mercury traders respondents understood that mercury was dangerous and strongly believed that inhalation was the main route of exposure, especially during the process of burning mercury-gold amalgams. This practice is particularly high risk and threatening when the appropriate techniques to minimise mercury emissions to the environment are not followed.

Mercury vapour can stick to surfaces such as, walls, floors, and clothing (Richard *et al.*, 2014). It can spread through the community with the wind and through contaminated clothing and other objects that workers take home (Richard *et al.*, 2014). During the baseline assessment, it was revealed that some miners go home with their work clothes on while others burn the amalgam with other community or family members around.

It is important to note that not only are those directly involved in ASGM, but shopkeepers and owners who burn amalgam in their establishments, either without the use of a mercury capture device or with an inefficient retort, are at risk of mercury exposure. Equally vulnerable are those who handle mercury for sale in small flasks or soft drink bottles (also known as mercury traders).

When mercury ends up in waterways, it can react with bacteria to form a highly toxic organic form of mercury, called methylmercury (Hong, Kim and Lee, 2012). Methylmercury is known to bioaccumulate along the sequential order of the aquatic food chain. Fish is a staple in the diet in the mining communities and therefore can be a common route of exposure to community members. However, the complete elimination of fish from the diet is not the recommendation but rather the reduction of the frequency of consumption of larger species that tend to be higher up on the food chain.

A survey of "Methylmercury Exposures and Risk Factors" completed in 2019 in Guyana indicated that mercury contamination cases in indigenous populations close to ASGM activities had been reported since the late 1990s (Watson *et al.*, 2020). The study measured the concentrations of total mercury in hair samples from 99 participants from four indigenous communities. The findings indicated that indigenous people in the south Rupununi region, living close to ASGM activities and who consume high levels of locally sourced fish, are likely to show high concentrations of total mercury. In particular, people from the community of Parabara expressed a record high average level of 26.93 µg/g total mercury. In contrast, the communities of Karaudarnau, Aishalton, and Shulinab, which are further away from ASGM activities, showed low levels of mercury contamination. The low levels of mercury found in these communities may be attributed to their access to alternative sources of protein (i.e. poultry and beef). Raising awareness on the different routes of mercury exposure with associated recommendations or best practices to reduce that exposure is important to protecting the health of ASGM communities.

3.11.3 Access to health care

The health care system in Guyana consists of both public and private sectors, of which the public sector is the major health care provider. The public health service delivery is highly decentralized and managed through the Regional Democratic Councils (ISAGS, 2012). The private health care sector operates independently but is subject to public regulations on standards of care and practice (Commonwealth Health Online, 2020). The distribution and capacity of health centres and service providers are not adequate to provide the appropriate health-care services for prevention, treatment and care for populations affected by the exposure to mercury or mercury compounds (MNR, 2017).

From the baseline assessment, it was found that 93% of persons in the mining districts interviewed did not face any difficulties accessing health care. The choice to access health care for gold/mercury traders, goldsmiths and miners were dependent on several aspects, such as the severity of their health condition, preference of health facility (private versus public), location of the health facility and the mode of transport available. These factors can either deter someone from accessing health services to do normal health checks or it can be detrimental to them in the case of an emergency. In Guyana, there are five levels of health care services:

- Level I - Health posts;
- Level II - Polyclinics and health centres;
- Level III - District Hospitals;
- Level IV - Regional Hospitals; and
- Level V- National referral hospital - Georgetown Public Hospital Corporation (GPHC) (Ministry of Health Guyana, 2013).

Levels I and II offer mainly primary health care services at the community and sub-district levels (Ministry of Health Planning Unit, 2015). Level 1, which is staffed by community health workers, provides preventive and simple curative care for common diseases and focuses on health promotion and education. Health care services in mining communities in regions 1, 7, 8, and 9 are largely provided by level I health posts (Ministry of Health Guyana, 2013).

Level II are ideally staffed with a health care worker, such as a nurse, nursing assistance, Medex, or midwife. They provide ambulatory services along with preventive care, health promotion and education. Most health posts and health centers located in the rural areas of Guyana have limited or no access to physicians and nearby access to district or regional hospitals (Ministry of Health Guyana, 2013).

Levels III and IV facilities provide services at the sub-regional (district) and regional levels while Level V consists of national facilities (Ministry of Health Planning Unit, 2015). The national referral facilities ensure that patients are moved to the appropriate level of care based on their health needs (Ministry of Health Guyana, 2013).

Table 12: Health Facilities targeted during the baseline assessment

Mining District	Health Facility	Level of Health Care Service
Potaro (MD 2)	Mahdia District Hospital	Level III
	Micobie Health Post	Level I
Mazaruni (MD 3)	Imbaimadai Health Post	Level I
	Jawalla Health Centre	Level II
	Kamarang District Hospital	Level III
Cuyuni (MD 4)	Bartica Regional Hospital	Level IV
	Karrau Health	Level I
	Itaballi Health Post	Level I

Four (4) health facilities (Kamarang District Hospital, Mahdia District Hospital, Bartica Regional Hospital, and Imbaimadai Health Post) have General Medical Officers (GMOs) assigned. Bartica Regional Hospital, which is the principal hospital in Region 7, has ten (10) doctors assigned including specialists such as Internal medicine and Orthopaedic-Trauma surgeon. Mahdia District Hospital, the principal Hospital in Region 8 has six (6) doctors, while both Kamarang District Hospital and Imbaimadai have one doctor each.

Findings showed that despite being aware of the dangers of mercury, health workers had limited knowledge on:

- possible routes of mercury exposure in ASGM and communities;
- risks associated with mercury poisoning;
- how to properly diagnose mercury poisoning; and
- local availability of mercury tests.

This lack of knowledge was as a result of no trainings provided for health care workers in most of the above-mentioned areas, except for Jawalla[17]. Consequently, no health facility reported providing health services for diagnosing, managing or providing treatment for mercury poisoning.

[17] The health care workers at Jawalla would have received on-the-job training on mercury and health risks associated with mercury use and exposure which includes mercury poisoning in 2009 which was facilitated by the Ministry of Health.

In Guyana, there are Standard Treatment Guidelines for Primary Health Care (levels I and II) and a Community Health Worker (CHW) training course, both which do not contain any guidance on the diagnosis and management of mercury poisoning. Moreover, interviews conducted during the field research revealed that there were no reported protocols or standard operating procedures (SOPs) for suspected or confirmed mercury poisoning cases.

CHAPTER 4: NATIONAL OBJECTIVES AND STRATEGIES

ASGM is significant in its contribution to Guyana's economic and social development. The use of mercury is widespread in these activities, resulting in substantial emissions and releases with the potential for severe environmental and health impacts. There is an urgent need to promote improved practices in ASGM that ensure efficiency in operations, sound environmental management, reduction of mercury use, and elimination of worst practices, such as whole ore amalgamation and open burning of amalgam.

The overall objective of the NAP is to assist the Government of Guyana in the phased reduction of the use and effects of mercury to human health and the environment in the national ASGM sector. By 2027, the aim is to demonstrate sustainable exploration, extraction and processing practices which would result in efficient, appropriate, and reduced mercury use, including mainstreamed adoption of mercury-free technology towards eventual elimination of the use of mercury where feasible. This will be supported by a comprehensive legal and institutional framework for the formalisation and regulation of artisanal miners, greater national collaboration among agencies involved in the monitoring and enforcement regime of ASGM, as well as creating an enabling frame for the protection of vulnerable persons in society from the dangers of mercury exposure.

The provision of health services to the ASGM sector and nearby communities is critical and should address routes of exposure, strengthen detection, diagnosis and treatment actions and enhance the technical capacity of healthcare professionals to respond to effects of mercury exposure. Aside from ensuring that the health services are available and adequate, efforts towards raising awareness on the effects of mercury exposure on the health of the miners and ASGM population should be increased through the dissemination of information, differentiated by gender and age, and the empowerment of the community to take action to protect the health and wellbeing of their residents.

This proposed shift in the ASGM sector will also need to be accompanied by national policies and actions to protect the livelihoods of miners by reducing the financial barriers faced by both women and men in this sector, building their capacity and resilience to economic shock and establishing financially accessible and efficient solutions. The ASGM sector in Guyana is critical in generating income for the nation and has continued to contribute to the economy of Guyana at the national, local and household levels, and therefore all aspects need to be considered in order to achieve the overarching national objective to protect human health and the environment against the harmful effects of mercury.

4.1 National Strategic Objectives

Based on the data collected, information gathered and stakeholder consultations held with artisanal, small- and medium-scale miners, mining communities, gold traders, local and regional-level leaders, mining organisations and key agencies on the overall situation of Guyana's ASGM sector, strategic objectives were crafted to address the issues related to the use and effects of mercury related to multiple thematic areas such as mining practices observed, legislative and institutional framework, public health and socio-economic. Several intervention areas and activities were proposed for possible solutions to achieve the national goal.

Table 13 sets the foundation by highlighting the main challenges that were identified from the findings mapped against proposed national-level objectives and recommended interventions. Section 4.2 provides the details for the specific activities under each recommended intervention, leading into Chapter 5 which highlights the recommended roadmap for implementation inclusive of responsible agencies, target dates, expected results, measurable indicators and estimated budget needed.

Table 13: National objectives and proposed interventions for Guyana's ASGM sector.

Identified Issues[18]	Strategic Objectives	Recommended Interventions
Reduction of the use of mercury, elimination of worst practices and environmental management		
• Practice of whole ore amalgamation in Hydraulic land dredges • Use of amalgam sheets in crusher/milling operations • Practice of open burning of amalgam (without the use of retorts) or inefficient retorts • Limited knowledge and skills among miners related to the benefits, types, and methods to use mercury-free processing techniques/technology	Reduce mercury use in the SMS gold mining sector, eliminate worst practices and increase management of environmental impacts through technical assistance to miners, building institutional capacity to strengthen monitoring and enforcement, improving processing techniques and adopting appropriate mercury-free techniques and technologies where practicable	Reinforce monitoring and enforcement of Mining (Amendment) Regulations, 2005 by strengthening institutional capacity of government agencies to reduce the risk of exposure of persons involved in ASGM and communities
		Increase the technical capacity of agencies to collect, analyse and improve access of data and sharing of information and provide training and support for compliance assistance across mining districts

[18] The issues and challenges refer to the realities that were identified during the data collection period to detail the national situation in the ASGM sector in Guyana as identified in Chapter 3.

Identified Issues[18]	Strategic Objectives	Recommended Interventions
• Practice of prohibited worst practices despite the presence of legislation banning their usage (whole ore amalgamation, open burning of amalgam, limited use of PPE) • Limited ability to increase monitoring efforts due to limited human resources and technological capacity[19] • Lack of proper exploration/prospecting and planning • Poor tailings management • Turbid waters of the Konawaruk, Cuyuni rivers and other surface waters • Poor waste management, and lack of progressive back filling and land reclamation • Concern over presence of mercury in community waterways due to ASGM activity and limited capacity of community members to play an active and impactful role in monitoring these effects • Nomadic culture of the sector, high mobility of ASGM miners		Strengthen technical assistance and demonstration programmes in SMS gold mining operations, across all mining districts to ensure miners become aware of and adopt techniques to reduce mercury use and promote the use of mercury-free techniques and technology Strengthen environmental management through Strategic Environmental Assessment (SEA) and development of Environmental Management Strategy for SMS gold mining
Formalisation, regulation, and update of legislation		
• Pork Knockers/Punters are not regulated, nor have they been formally recognised as artisanal miners in Guyana • Lack of formalisation makes regulation difficult • The Customs Act Cap 82:01 does not adequately provide	Formalise and regulate the artisanal mining aspect of ASGM	Develop legal, regulatory and policy framework to adequately capture artisanal miners in Guyana's context Give assistance to ASGM associations to provide adequate representation for artisanal miners

[19] Technological capacity encompasses change or innovation through technological means such as technology, infrastructure, online access etc. Organisations with dynamic technological capacity are able to seek new solutions through technology while simultaneously offering high-level services (Lember, Kattel and Tõnurist, 2018).

Identified Issues[18]	Strategic Objectives	Recommended Interventions
references regarding the phase out of mercury within the Customs regime	Update legislation dealing with the regulation and use of mercury in ASGM	Further develop and update protocols and guidelines related to mercury use and importation
		Develop, sensitise and enforce public and occupational exposure standards (maximum permissible limits) for emissions and releases of mercury in the ASGM sector and in fish
		Introduce laws that require the ownership of a retort
Development of appropriate financial and market-based incentives		
• Lack of financial and technical assistance to miners to transition to mercury-free technologies and techniques • Limited physical access to banking facilities within mining districts • Limited knowledge and support with applying for loans or access to finance opportunities. • Limited options for income generation beyond ASGM for men and women in mining communities	Facilitate small- and medium-scale miners' access to finance to support their transition to mercury-free gold mining	Develop appropriate financial and market-based incentives for the SMS gold mining sector to access and adopt appropriate mercury reduction and mercury-free techniques and technology
		Reduce the barriers to financing mercury-free efficient technologies by improving men and women in ASGM's access to blended finance options, including through market-based interventions
		Increase miners' capacity to reduce mercury use in the ASGM sector through the establishment of the Miners Assistance Fund
	Build the economic resilience of men and women involved in ASGM and mining communities by facilitating their access to alternative or complementary livelihood options	Expand entrepreneurship and employability interventions into mining communities by providing options that stimulate complementary and alternative productive ventures
Management of mercury trade		
• Possibility of illegal imports and exports of mercury • Shops not licensed to store and sell mercury • Issue of improper storage, handling, and transport of	Effectively manage the importation and internal trade of mercury in the SMS gold mining sector, and encourage compliance of relevant regulations of the PTCCB,	Strengthen collaboration among MNR, PTCCB, EPA, GRA, GGMC and the Guyana Police Force (GPF) for improved management and regulation of the importation and internal trade in mercury within the SMS gold mining sector

Identified Issues[18]	Strategic Objectives	Recommended Interventions
mercury in mining towns and landings • Limited and outdated national data and statistics on the destination of mercury after importation in Guyana	GGMC, GRA and EPA with importers and distributors	
Strengthening of Public Health Strategies		
• Lack of a strategic approach to management of health issues associated with ASGM and mercury • Lack of national data and statistics on the current and historical human health impacts of mercury exposure • Lack of data on health seeking behaviours of miners and host communities • Limited technical capacity of health workers in identifying and diagnosing mercury poisoning • Limited to no capacity (technical, human resource and institutional) to treat mercury poisoning • Limited national laboratory capacity to detect mercury levels in humans	Improve health information systems, including the gathering of health data on the impacts of mercury on miners and communities	Conduct situational analysis of public health concerns in relation to mercury in the ASGM sector, host and downstream communities
		Improve surveillance and health information systems to incorporate mercury
	Strengthen the institutional capacity of the public health care system to provide healthcare services (diagnosis, management and treatment) for persons directly or indirectly exposed to mercury (differentiated by gender) in the ASGM sector, host and downstream communities	Build the capacity of public health care workers, on the health effects of mercury, diagnosis, management and treatment of mercury related health issues
		Strengthen laboratory diagnostic and analytical capacities to test and diagnose mercury in humans
		Strengthen the public health medical emergency system to respond to health emergencies including mercury poisoning
Identification and Consideration of Vulnerable Groups		
• Children present at ASGM operations were not directly employed there but accompanied parents working as dredge owners or Punters, putting them at risk of mercury exposure as their parents executed their responsibilities • Limited coordination across national regulatory agencies in monitoring, reporting, and responding to instances where children were found on ASGM operations	Reduce the risk of mercury exposure of vulnerable populations, particularly children and women, to emissions and releases caused by the ASGM sector and improve the opportunities and involvement of women in the ASGM sector to achieve gender equality. *This objective will also be achieved through the gender considerations noted in other intervention areas*	Strengthen multi-agency approaches for monitoring the presence of children living, playing, or working in/near ASGM operations
		Reduce barriers faced by women that limit their earning capacity across the ASGM value chain

Identified Issues[18]	Strategic Objectives	Recommended Interventions
• Burning of mercury-gold amalgam in residential areas within landings, Indigenous villages and towns, which poses additional health risk to women and children • Women in ASGM in Guyana, save and except for the few dredge owners, tend to work at the lower ends of the production chain • Barriers to women's involvement in ASGM due to limited awareness of options, the discriminatory perceptions and gender stereotypes held by men in ASGM of women's capacity to work across ASGM job roles, and women's limited access to finance		
Awareness raising and outreach		
• Limited knowledge and skills among miners on the effects of these bad ASGM practices • Limited knowledge and skills on the benefits of improved environmental management • Misconceptions and lack of awareness on health risks associated with mercury exposure and mercury's effects on the environment especially with the miners, gold/mercury traders, host and downstream communities • Limited resources (IEC materials and human resources) to develop and implement programmes to raise awareness of mercury exposure impacts on health • Lack of communication programs with appropriate messaging for miners and community members	Raise the awareness of small- and medium-scale gold miners and mining communities on the detrimental effects and safe use of mercury, develop health programmes and strengthen education and outreach programmes, including appropriate education programmes for youth, for effective implementation and support of the activities under the NAP	Raise the awareness of mercury's effects on human health and the environment through training and awareness-raising initiatives, targeting both men and women employed directly in ASGM as well as residents of mining communities Strengthen the Mining Organisations' education, awareness and outreach programmes to support the activities under the NAP

4.2 Development of Strategies, Intervention Areas and Activities

The strategic objectives, intervention areas and activities included were crafted to respond to the concerns and realities, as expressed by key stakeholders and the data collected in the different mining areas. The details of each proposed activity presented in this following section represent a roadmap or foundation, to guide the national efforts towards the phased reduction of the use of mercury in ASGM practices and the overall protection of the miners, mining communities, their livelihoods and the environment in Guyana. These activities were developed in accordance with Annex C of the Minamata Convention. The implementation plan, which includes the proposed budget, timeline and responsible agencies for each activity follows in Chapter 5.

Reduction of the use of mercury, elimination of worst practices and environmental management

Strategic Objective 1:

Reduce mercury use in the SMS Gold mining sector, eliminate worst practices and increase management of environmental impacts through technical assistance to miners, building institutional capacity to strengthen monitoring and enforcement, improving processing techniques and adopting appropriate mercury-free techniques and technologies where practicable.

Intervention Area 1.1

Reinforce monitoring and enforcement of Mining (Amendment) Regulations, 2005 by strengthening institutional capacity of government agencies, local authorities and village councils to reduce the risk of exposure of persons involved in ASGM and communities.

The 'worst practices', such as whole ore amalgamation and open burning of amalgam are prohibited by Regulation 127 of the Mining (Amendment) Regulations, 2005; however, the findings during the development of the national overview revealed that such practices are, in reality, still ongoing. One example is that Regulation 128 (2) sets out that a retort approved by GGMC is to be registered and used at all times when there is burning of amalgam. However, it was observed that persons were still participating in open-air burning in some mining communities. Additional unsafe or mercury intensive practices observed or revealed during the data collection were whole ore amalgamation and use of

amalgamation sheets. Eliminating these unsafe practices will significantly reduce the use and effects of mercury at these mining sites.

In order to effectively monitor and enforce the Mining (Amendment) Regulation, 2005 and eliminate these worst practices, the institutional capacity of the agencies involved must be strengthened. The GGMC and EPA are two of the key agencies with responsibility for monitoring compliance of gold mining operations based on mining and environmental standards and regulations. Village Councils mining rangers who are appointed in some indigenous communities also support these monitoring efforts. They are governed by different laws and thus have different mandates. There is a need for a more coordinated approach among responsible authorities that allows for collaborative monitoring of mercury use by SMS gold mining operations and information sharing in this regard.

During consultations, the EPA highlighted that their monitoring and enforcement regime could be improved by, for example, increased administrative powers given to the GGMC and EPA officers, such as the ability to fine persons in relation to infractions (whether mining or environmental) involving the inappropriate use of mercury, as opposed to having to go through the court process after the charging of persons, which can be time consuming. Additionally, the capacity of the MoL should be assessed in its ability in addressing adequate protections for vulnerable persons from exposure to mercury, which includes women (especially women of child-bearing age) and children.

1.1.1 Conduct an institutional needs assessment with regards to the management of the ASGM sector.

This will identify capacity gaps and what is required by the Ministries and/or agencies that play a part in the management of the ASGM sector to perform the requisite functions and contribute to effective monitoring and enforcement as highlighted in the NAP. Whether technical or analytical gaps, an action plan should be provided to implement the recommendations.

1.1.2 Develop an appropriate capacity building plan (including appropriate tools and equipment) to ensure compliance assistance is mainstreamed to include an assessment of mercury use and detection of worst practices such as whole ore amalgamation and open burning of amalgam and the use of retorts and other effective mercury capture devices/techniques.

In order to effectively monitor and identify mercury use and bad practices in the field, the officers of the GGMC and EPA require the tools, equipment and training in order to take appropriate action to eliminate these practices. The approach deals with providing assistance to the miners to achieve compliance rather than increased punishment for failure to achieve

compliance. Reducing the bad practices (such as whole ore amalgamation and opening burning of amalgam) would significantly reduce the use, emissions and releases of mercury to the environment and also improve the recovery of gold. The collaboration between GGMC and the mining organisations is crucial for the success of these activities.

1.1.3 Train inspectors on ASGM sector monitoring, protocols, standards and regulations for environmental, mining and OSH Laws.

Staff within government agencies charged with monitoring and regulation of the ASGM sector, GGMC, MoL, EPA, Ministry of Local Government and Regional Development (MoLGRD) and MoH, will receive the necessary training in accordance with the plan developed under activity 1.1.2 stated above.

1.1.4 Increased frequency of monitoring and inter-agency collaboration.

GGMC and EPA, in particular, should review and strengthen their current joint monitoring programme, ensure compliance assistance is mainstreamed and improve the ability to detect breaches. GGMC and EPA to conduct joint monthly monitoring programmes across all mining districts to produce a more rounded examination of issues and enable agencies to achieve more by maximising resources and minimising duplication of efforts. This will include monitoring of tailings management, water quality and waste management as well as the use of mercury and bad practices.

1.1.5 Enhance Village Councils' capacity to monitor ASGM activities on Indigenous lands.

There is a need for GGMC, Ministry of Amerindian Affairs (MoAA), and EPA to provide technical support to Village Councils to execute their functions as it relates to protecting citizens, particularly women and children, from mercury exposure. The current provisions within the Mining Regulations and the Amerindian Act outline the sanctions and responsibilities for regulating mining activity on Amerindian Village Lands, but there appears to be a gap in the robustness and implementation of these provisions. This process will include the review of a sample of mining contracts used by Amerindian villages to identify areas to be strengthened, technical needs assessment of all village rangers within mining communities, and identification of the strengths and gaps of current villages' arrangements for monitoring mining activity.

The results of this assessment will be compiled in a report which will accompany a Guidance Handbook. The Handbook will highlight laws specific to mining on indigenous lands, good

practices and mechanisms for monitoring and managing mining activities based on findings reported from the strengths and gaps assessment as well as the review of existing mining contracts. This would establish strategies to support capacity-building efforts by the MoAA to strengthen the approaches taken by these villages in managing ASGM activities within their communities. Finally, as villages tend to have youth and women's groups, these groups will be engaged to actively participate in this process to ensure the interests of these groups are represented.

1.1.6 Equip each GGMC Mines Station with unmanned aerial vehicles (AEVs) (drones) to support their monitoring efforts.

Drones should be made available to all field stations to support the efforts of personnel in monitoring and surveillance of mining activity with increased efficiency. Modern drones with the capacity to capture long-range and thermal vision will also support other geological efforts in addition to being able to efficiently capture active dredges. Considering the nomadic nature of mining, leveraging technology in this way will improve officers' ability to efficiently access operations and thereby monitor their mercury use. Officers should be trained in the optimal use of such equipment and the associated legal responsibilities and restrictions (such as flying near designated air spaces or airline paths).

1.1.7 Sensitisation of judicial officers in relation to court matters relating to mercury management.

There should be sensitisation sessions for judges and prosecutors in relation to matters regarding mercury management in particular and environmental administration in general. These sensitisation sessions could be facilitated by the MNR, the GGMC, the EPA, or domestic/international experts who are hired as consultants to conduct the relevant training. The decision made by judges will also provide precedents, which upcoming generations of lawyers and judges can follow thus enabling the effective administration of a compliance culture in this area.

Intervention Area 1.2

Increase the technical capacity of agencies to collect, analyse and improve access of data and sharing of information and provide training and support for compliance assistance across mining districts.

Intervention Area 1.1 illustrated the importance of inter-agency collaboration, and also introduced areas of data collection and information sharing. There exists an MOU between MNR, GGMC, EPA and

PTCCB, which aims to coordinate and enhance procedures for managing the importation, storage, distribution, use and disposal of mercury, and establishes parameters for a national importation register. While miners are required to keep a site-level mercury register, this is rarely adhered to as the Socio-Economic baseline found that miners did not maintain adequate records on their mercury use.

1.2.1 Develop and implement an interagency information system/database.

This shared-access database should include data that is geo-referenced and can allow all inspectors or agencies involved in the management of the ASGM sector to generate geo-referenced reports on mercury use.

1.2.2 Develop a standardised data collection and monitoring tool or checklist for compliance to ensure that relevant agencies are thorough and sufficiently able to capture reliable data on mercury use in the mining districts.

This standardised approach will contribute to the synergies of the joint monitoring approach and assist with the decision-making regarding the use of resources. The tool/checklist should include the amount of mercury purchased and specific details on the source of mercury supply (who, where, when, cost, *inter alia*). It should also capture routine details on mercury that was sold or given to others, the amount of mercury stocked on-site, the amount of mercury recaptured using retorts as well as mercury management practices conducted at mining sites and local distributors of mercury.

1.2.3 Facilitate the creation of robust mercury registers across all ASGM operations and Mining Districts.

The absence of such data limits national efforts to accurately ensure the reduction of mercury use in ASGM mining and limits GGMC's ability to accurately track the amount of mercury being stocked within mining districts. The ASGM sector would benefit from an integrated database/mercury register at retailer/point-of-sale and operational/point-of-use levels that provides holistic information on mercury trade within the ASGM sector.

1.2.4 Provide training to ASGM operations for recording their mercury use, including through the use of checklists for self-monitoring.

Parallel to monitoring efforts highlighted in activity 1.2.3, miners must be empowered and supported in their record-keeping, and operation-level documentation related to mercury purchase and use as these are not currently actively done, though required by mining

regulations. Further, the monitoring approach should include community participation of the Village Councils and Mining Associations – GGDMA, GWMO, and the NMS. Mining organisations should encourage their members to engage in self-monitoring by using these checklists and tools.

1.2.5 Equip government laboratories with tools for testing mercury levels in the environment.

This will require that a needs assessment be conducted to ascertain the current capacity to test/detect mercury levels in the environment and the specific training and equipment needs for laboratories, such as, the Government Analyst Food and Drug Department (GAFDD) and the Institute of Applied Science and Technology (IAST), among others.

1.2.6 Accrediting government laboratories for analysis of mercury in the environment.

Interviews conducted with the GAFDD and the IAST revealed that there is currently no accredited government laboratory in Guyana that can test for mercury in the environment. This hinders the provision of certified results.

1.2.7 Support mining communities in monitoring tailings discharge by providing access to capacity building opportunities and mercury testing kits.

Providing mercury analysers (cold vapour atomic fluorescence spectroscopy [CVAFS]-based[20]) to requesting mining communities across all mining districts will assist with the detection of mercury's presence in water by using catalytic DNA sensors fluoresces when a DNA enzyme comes into contact with mercury. This would be a cost-effective and rapid way for communities to assess potential likelihood of mercury's presence, alongside more robust efforts by the EPA and GGMC. The EPA can procure inexpensive but reliable CVAFS-based mercury-testing kits for provision to communities interested in taking ownership of this testing. Women in the community should be empowered to lead these community efforts and should be the target of training.

Village and town councils in partnership with local women's groups can submit requests for the CVAFS mercury analysers to the EPA through an established application process. The

[20] Mercury is a vapour at room temperature. The CVAFS are a type of atomic fluorescence spectroscopy where no vaporisation step is required because the sample is a volatile heavy metal (such as mercury), which is a vapour at room temperature. The ANDalyze Fluorimeter for Water Testing can be procured for this purpose.

Village or Town Council may decide to provide a stipend, honorarium or payment to the women's group for their routine conduct of these tests.

1.2.8 Conduct rapid baseline assessment of mercury levels in soil, water, air and fish within the mining districts, including communities, and around ASGM sites for compliance with the relevant standards.

In an effort to ascertain current mercury levels in the environment, the potential for human exposure, and to support the identification of potentially contaminated sites (UNEP and Minamata Convention on Mercury, 2019), the NAP proposes to establish key monitoring areas based on mining hotspots and pristine areas (control sites) and to establish monitoring points for the conduct of a rapid baseline assessment on mercury levels in various environmental matrices (UNEP, 2019).

1.2.9 Conduct routine assessment of mercury levels in soil, water, air and fish within the Mining Districts/ around ASGM sites for compliance with the relevant standards.

Using the monitoring points established during activity 1.2.8, the NAP will address routine monitoring of biotic and abiotic matrices in order to continuously monitor environmental contamination. This is a necessary action given that there are currently no agencies involved in routine monitoring of mercury levels in the environment given that most of the work is done in the form of projects.

Intervention Area 1.3

Strengthening technical assistance and demonstration programmes in SMS gold mining operations, across all mining districts to ensure miners become aware of and adopt techniques to reduce mercury use and promote the use of mercury-free techniques and technology.

1.3.1 Review efficiency of existing retorts and identify and promote/demonstrate other innovative mercury capture devices/technology that can be applied in Guyana.

During data collection, many issues were identified with the current retort being used. It is recommended that a review of the current design of the retort is done with the ultimate certification of the retort for use in ASGM activities while investigating other devices/technology. Design specifications for mercury capture systems will be shared with local fabricators for manufacturing and quality control measures, through certification by GGMC, will be employed to ensure proper functioning.

1.3.2 Dissemination of retorts at a subsidised cost to miners by the Government of Guyana.

Cost and accessibility posed a significant challenge for miners and dredge owners in acquiring retorts based on the findings from the Assessment Report. This was articulated by miners, dredge owners, and Village Councils of Indigenous communities. Furthermore, Indigenous leadership expressed their willingness to have retorts available for purchase, at a subsidised rate, at the village office for easy access to miners working on their respective village lands. In accordance with set criteria for eligibility, it is proposed that the Government of Guyana, make retorts available at a subsidised cost to artisanal and small-scale miners who meet the criteria. Said criteria can be based on factors such as, gender, given the vulnerability of women of childbearing age to the effects of mercury exposure, size of operation and compliance in other relevant areas of mercury management and OSH.

1.3.3 Conduct demonstrations on the appropriate use of retorts and mercury capture systems for the burning of gold.

The use of retorts for the burning of amalgam was found to not have been practised consistently. This activity will be in coordination with activity 1.3.2 and Strategic Objective 10 with collaboration among GGMC, the mining associations (NMS, GWMO, GGDMA) and representatives from “best practice operations” so as to ensure the correct usage of the retort and mercury capture systems from the regulatory body and to garner influence from other miners and gold /mercury traders. The results from the assessment on the efficiency of existing retorts will also feed into this activity. The following activities should be completed to achieve this action:

- Identify mining operations with best practices in retort use;
- Identify gold/mercury trader establishments with best practices (mercury capture systems);
- Demonstration and simulation exercises about the process for adopting the best practices with respect to the use of retorts and mercury capture systems; and
- Develop and disseminate communication materials in alliance with Strategic Objective 10 activities.

1.3.4 Implement mining-district-level training interventions on mercury use in ASGM, targeting miners based on their gender and job roles.

This training will target miners based on their roles (dredge owners/GMs, dredge workers, and bahirs) and will include topic areas where gaps in knowledge and competencies have been identified. These include:

- Detrimental impacts of mercury on both human health and the environment, mercury alternatives and environmentally responsible mining practices;
- Miners' rights, opportunities, and benefits (including information on mining organisations and the benefits of memberships/partnerships, income tax/social security, banking services, small business support services), targeting men and women miners separately.

The efforts must align with the decentralised approaches of the Board of Industrial Training (BIT), the Guyana Mining School and Training Centre Incorporated (GMSTCI), and other technical/vocational education and training providers. This approach is encouraged as the baseline assessment found that miners preferred engagement at their operations or at the nearest landing to ensure that they can access these opportunities. This training should prioritise visual data and minimise text-heavy or complex data to ensure accessibility by persons with varying educational backgrounds. Gender-specific approaches will be employed as the risks and symptoms may vary by sex; the risk to exposure varies by job roles. Instructional design models must, therefore, consider that learning occurs naturally through discovery and active participation. Each training intervention must be accompanied by an appropriate monitoring and evaluation framework which assesses behaviour change, where possible. This activity will be supported by the awareness raising materials developed under Strategic Objective 10.

1.3.5 Review of GGMC mercury free programmes to benchmark appropriate (cost and benefits) and effective mercury use reduction and mercury-free techniques and technology are being promoted.

This will include the review of applicable, affordable, efficient and environmentally-friendly techniques and technology that may be suitable for Guyana’s ASGM sector as well as the lessons learned from any previous or ongoing mercury-free demonstration projects and incorporating into existing technical assistance programmes. There are many ongoing initiatives and pilots through GGMC as well as through CI-Guyana and WWF. Of notable mention is the planetGOLD Guyana project where mercury free sites are being installed.

1.3.6 EPA and GGMC to develop pilot projects for use of cyanidation techniques with established medium-scale operations that have the relevant financial, technical and human resources capacity, to implement and evaluate cyanidation techniques as an alternative to mercury use.

Cyanide compounds can be broken down into components, making it more environmentally friendly for disposal as opposed to the use of mercury as the element cannot be broken down further. If tailings are reprocessed with cyanide, the presence of mercury will need to be verified first. If mercury is present, it will need to be removed before adding cyanide to avoid the mobilization of mercury compounds which is defined as a worst practice. The use of cyanide has strict international requirements and regulations for transportation and use which will be incorporated and scaled accordingly to the operation during the pilot projects. It must be noted that this activity should be introduced with caution.

Intervention Area 1.4

Strengthen environmental management in SMS gold mining sector through Strategic Environmental Assessment and development of Environmental Management Strategy for SMS gold mining.

1.4.1 EPA and GGMC to conduct an SEA of the six (6) mining districts to determine the state of the environment and develop an environmental management strategy for the SMS sector.

Guyana's natural environment has been affected by SMS mining operations and activities especially in terms of water quality concerns and deforestation. Assessing the environmental impacts in mining districts can inform development of policies regarding allocation, opening and closing of mining areas.

Formalisation, regulation, and update of legislation

Strategic Objective 2

Formalise and regulate the artisanal mining aspect of ASGM.

Small-scale gold mining has been regularised in Guyana; however, artisanal miners, in the Guyanese context, known as Pork Knockers/Punters, have not been formalised and regulated. Formalising the artisanal mining sector could bring Pork Knocker's/Punter's informal income-earning activities and

economies into the formal sector through legal, regulatory and policy frameworks[21]. Formalisation of artisanal miners can provide opportunities for Pork Knockers/Punters to access mercury free technologies which should also include important areas relating to the maintenance of such technologies, in relation to the access to parts and servicing.

Intervention Area 2.1

Development of legal, regulatory and policy framework to adequately capture artisanal miners in Guyana's context.

The lack of formalisation of artisanal miners in Guyana limits the ability of the GGMC to monitor the number of persons involved in ASGM as artisanal miners. This group of miners also tend to use a relatively large amount of mercury in their operations as identified in the MIA (2016) Report. A definition of artisanal miners would also illustrate to artisanal miners that they are being specifically outlined for improvements, as opposed to being phased out. The recommended activities are:

2.1.1 Provide a definition for artisanal miner in Guyana's context within legislation/regulations.

Legislation, namely the Mining Act 1989 and the Mining (Amendment) Regulations 2005, should be updated in order to provide a definition for artisanal miners/Pork Knockers. This will be on a scale which is less than that of a small-scale miner and could be described as 'an operator that excavates or processes less than 20 m^3 of materials in any continuous 24-hour period.' The revised Mining (Amendment) Regulations 2005 should also develop new frameworks related to sound management of artisanal mining to assist the formalisation process.

2.1.2 Provide a mechanism for the regularisation of artisanal miners through the implementation of a formalised and regulated registration process.

In order to capture relevant data related to persons involved in artisanal mining in Guyana, a registration process should be involved. The names, addresses and contact information of these artisanal miners should then be saved in a database, which would be updated and monitored by the GGMC.

Where there is a need for joint and inter-agency collaboration and cooperation, this information (with the removal of confidential elements) can be shared with other competent authorities

[21] https://www.iisd.org/articles/six-key-factors-formalizing-artisanal-and-small-scale-mining

upon request (e.g. EPA, PTCCB, MoH, MoL). The statistical elements of this information gathered on artisanal miners could also be used by other Ministries and agencies (MNR, PTCCB, GRA, Bureau of Statistics) for adequate reporting in ASGM mercury related matters. This will link to activities 1.1.4 and 1.2.1.

2.1.3 Provide adequate legal protection for artisanal (Pork Knockers/Punters) and small-scale miners.

Consultations with the GGMC have revealed that draft regulations had been developed, regarding the protection of persons involved in ASGM from matters relating to landlordism and labour related matters; however, these draft regulations have not been passed. Legislation should ensure that the current practise of persons (who make applications as 'small-scale gold miners' but are actually 'de facto' medium to large scale gold miners) leasing several small contiguous plots in order to escape more stringent requirements is ceased, supported by regular inspections by the GGMC to verify claims.

These activities could assist in ensuring that ASGM miners are given equitable opportunities in accessing lands in which to ply their trade, thus providing a platform for adequate teaching and training of techniques which has the reduced, or non-use of mercury. These activities by the GGMC also should involve a process where unused claims, after a specific amount of time and notice, should revert to the GGMC to allow for equitable distribution.

There is also a need to ensure that when the Mining Act 1989 and the Mining (Amendment) Regulations 2005 are updated, that these laws also include specific gender related considerations regarding the protection of women in ASGM, especially women of childbearing age, from the effects of mercury use (MIA, 2016). Further consideration for women in relation to access to land and finance are detailed in later activities.

Intervention Area 2.2

Assistance given to ASGM associations to provide adequate representation for artisanal miners (Pork Knockers/Punters)

In order to bolster protection, associations are critical in ensuring that the concerns of Pork Knockers/Punters are heard. The Mining Associations indicated that they assist Pork Knockers/Punters when approached but due to the informal nature of the sector, it can be difficult to attract persons to become members, in order to provide the requisite assistance that may be needed. The Mining Associations can assist the Government in the application of policies in relation to ASGM.

This input by Pork Knockers/Punters through the Mining Associations on matters related to ASGM, could provide useful information on unaccounted instances of inappropriate mercury usage that has not been tracked, and can enable better control over the transition period to mercury-phase out in Guyana (MIA, 2016).

2.2.1 Increase technical and financial capacity of Mining Associations to address the needs of Pork Knockers/Punters.

The Mining Associations already have a framework of representation for SMS gold miners and have indicated that they also assist artisanal miners who require their services. However, there is a need for greater resources, technical assistance and capacity building within these organisations, especially in addressing the needs of miners in remote areas. Further enhancing the technical and financial capacity of Mining Associations to address the needs of Pork Knockers/Punters could be done through grants by the Government of Guyana, technical assistance through partnerships with international organisations and resource mobilisation by way of projects through regional and international donors. Technical assistance should involve on-site training/demonstrations in the use of mercury free technologies, as well as enabling knowledge transfer through information sharing in mining communities.

Strategic Objective 3

Update of legislation dealing with the regulation and use of mercury in ASGM.

Countries preparing the NAP are required to have in place the legal authorities to prevent the diversion of mercury and mercury compounds from the other sectors to ASGM and manage the mercury trade in a manner that is consistent with the NAP. There are a number of Acts, Regulations and Guidelines of which legislative update is required in order to have effective mercury management. These Acts included the Mining Act 1989, the Mining (Amendment) Regulations 2005, The Environmental Protection Act 1996 and its regulations (EP Act), the Customs Act Cap 82:01, the Occupational Health and Safety Act 1997, and the Amerindian Act 2006.

A number of loopholes are also within the legislation, which should be addressed in order to achieve the Convention's objectives; these loopholes involve the need for mercury and mercury compounds to be included in legislation such as the EP Act and regulations, and the improvement of penalties for breaches of the aforementioned Acts. There is a 2019 MOU between the GGMC, the MNR, the EPA

and the PTCCB[22]. The MOU states that its objective is "to coordinate and enhance the procedures for management of the importation, storage, distribution, use and disposal and provisions for clean-up, in the event of an accident or spill of mercury". Despite this, there needs to be more synergy in the monitoring and enforcement process and a need for greater cooperation, as well as joint inspections by Mines Officers, Health Officers, Labour Officers and Environmental Officers, in order to fully monitor and ensure compliance of mercury use in the ASGM sector.

The MNR and the GGMC stated during consultations that there were drafts made with a view to update the Mining Act 1989 and the Mining (Amendment) Regulations 2005, including the Draft Codes of Practice which were not passed into law. As a result, in order to ensure that the update of legislation being proposed is adequate, there should be a review of the aforementioned draft laws, regulations and draft Codes of Practice. This is to ensure that Guyana has the most recent legislation in relation to mercury use and management. Guyana also needs to streamline the consultative process to accelerate the passage of legislation and regulations. Consultations revealed that after legal instruments have been drafted, these instruments remain in abeyance for an inordinate period of time.

Intervention Area 3.1

Further development and update of protocols and guidelines related to mercury use and importation.

3.1.1 Review, finalise and implement draft Code of Practice-Mercury and draft Code of Practice-Tailings Management through consultations with stakeholders including miners, and mining associations.

This will include promoting the finalised COPs across the sector and implementing in collaboration with EPA, and Mining Associations and other key stakeholders to ensure that all relevant aspects are covered and that it is easily understood by the miners.

3.1.2 Update public health, customs and labour related legislation, as well as the Guyana National Bureau of Standards (GNBS) Use of Mercury national standards, with other mercury related standards and guidelines.

Consultations revealed that the Public Health Act 1934, the Occupational Health and Safety Act 1997, and the Customs Act Cap 82:01, are outdated and do not make adequate reference to other mercury control legislation. These laws should be updated to include mercury related standards and guidelines. The Code of Safety for Mercury (GYS 203) was approved in 2001, which was approximately twenty (20) years ago. There are draft Codes of Safety in relation to

[22] https://nre.gov.gy/wp-content/uploads/2019/08/MOU-MNR-GGMC-PTCCB-EPA-1.pdf

mercury releases and emissions since 2019, which were being discussed by stakeholders. In light of such, an overall update and adoption of these Codes of Safety in relation to mercury can provide further guidance to agencies to ensure the most modern national requirements for Guyana in relation to the Convention are adequately reflected in the national standards regarding mercury use, mercury releases and mercury emissions.

3.1.3 Develop protocols for mercury decanting/repackaging at mercury traders/distributors.

According to the PTCCB, the decanting or repackaging of mercury is prohibited[23]. The guidance further states that mercury must be stored, transported, distributed and sold in its original container/flask. However, during the assessment it was observed that many local mercury distributors, such as mining equipment suppliers, general stores, gold traders and grocery stores often repackage the mercury into smaller portions to support the regular demand from some miners purchasing small quantities at a time.

The current procedure for decanting/repackaging of mercury for sale at mercury traders within the mining districts and within communities was described as constituting the pouring out and weighing of mercury into plastic bags or bottles which were tied or capped at the end of the process. Mercury trading was conducted in shops located in residential areas, which often sold other items, such as food, mining equipment products and pharmaceuticals. None of the mercury traders indicated the use of PPE during the decanting/repackaging process. The development of adequate protocols for the repackaging of mercury will provide the guidance for the best practices.

3.1.4 Further develop protocols and guidelines which address the processes to be involved with regard to mercury importation.

There is necessity for a mechanism to enable the monitoring of the destination of mercury that is imported, through a joint effort by the GRA, the PTCCB (importation), the GGMC and the EPA (environmental protection and compliance) after it is released to importers, in order to address issues related to the diversion of mercury or mercury compounds for use in ASGM and processing. This mechanism could entail the use of questionnaires for importers, in order to highlight the districts to which mercury is being sold, which can be followed upon though collaboration with the GGMC and the EPA.

[23] PTCCB; Registration Requirements for mercury; https://www.ptccb.org.gy/documents/Registration%20requirements%20for%20Mercury.pdf

3.1.5 Update of penalties within the Mining Act 1989, the Mining (Amendment) Regulations 2005 and the EP Act 1996 and its regulations.

The penalties within legislation related to ASGM and mercury use are inadequate in achieving compliance with mercury related laws. As indicated with the activities discussing compliance assistance under Strategic Objective 1, the aim of increased penalties should not be done in a manner to drive persons away from becoming a formal part of the sector. Compliance assistance in the form of education and training is vital to successful enforcement; however, these penalties should apply for such persons who continue to recklessly disregard the legal requirements despite efforts being made to bring them into compliance.

Intervention Area 3.2

Develop, sensitise and enforce public and occupational exposure standards (maximum permissible limits) for emissions and releases of mercury in the ASGM sector and in fish.

Consultations revealed that, at present, there are no national maximum permissible limits established for releases and emissions of mercury from ASGM activities or fish, given the bioaccumulative nature of mercury. The Mining (Amendment) Regulations of 2005 limits the use of mercury to closed systems in ASGM mining and mandates the use of a retort when burning the mercury-gold amalgam at mining operations. Gold/ mercury trading operations, the majority of which operate in residential areas[24] within towns, villages or landings, are not regulated by any public or occupational emission standards or release standards for mercury. The procedure for standard development is guided by the GNBS and includes requirements for extensive public consultation and sensitisation prior to the adoption and enforcement of any standard.

3.2.1 Develop national maximum permissible limits for mercury in fish[25], introduced, adopted and enforced by 2024.

The maximum permissible limit refers to the highest allowable average mercury concentration in fish per serving at given rate of consumption, e.g., once per week.

[24] A residential area refers to a district where people live; occupied by private residences (Vocabulary.com, 2021) Available at: https://www.vocabulary.com/dictionary/residential%20area

[25] The majority of countries and global organizations now enforce a maximum concentration of mercury in fish of approximately 0.5 mg.kg-1 (Annals of Agricultural and Environmental Medicine) Kimáková, T., Kuzmová, L., Nevolná, Z., Bencko, V. (2018). Fish and fish products as risk factors of mercury exposure. Ann Agric Environ Med., 25(3), 488-493. https://doi.org/10.26444/aaem/84934

3.2.2 Develop national maximum permissible limits for mercury releases from ASGM activities, introduced, adopted and enforced by 2024.

The baseline study revealed that there is scope for the development of standards under the Environmental Protection Act of 1996. Activities in this area have commenced and there is currently a Draft Guyana Standard that is yet to complete the process outlined for development of standards by the GNBS[26].

3.2.3 Develop national maximum permissible limits for public and occupational exposure to mercury emissions from ASGM activities, introduced, adopted and enforced by 2024.

Activities in this area have commenced and there is currently a Draft Guyana Standard that is yet to complete the process outlined for development of standards by the GNBS[6].

Intervention Area 3.3

Introduce laws that require the ownership of a retort.

Mining Regulation 128 (ii) and the draft Codes of Practice on Mercury Use outline standards and make provisions that enforce the use, but not ownership, of GGMC-approved retorts. This strategy includes an approach for enforcing the use of retorts through revising the law to introduce a requirement that each operation using mercury also owns a retort.

3.3.1 Make non-ownership of a retort illegal.

It is proposed that it should be a legal requirement for all operations to own at least one operable retort, with stringent fines and sanctions established for non-ownership. While it cannot be assumed that non-use and non-ownership are mutually exclusive, the two legislations need to be synchronised in support of each other to ensure a more robust legislative response. This new law would need to align with the current requirement that operators use a retort or other approved capture system.

Sufficient time, such as a grace period or moratorium, must be allowed to ensure that SMS operators are able to procure retorts. Should GGMC Field Stations continue to provide retorts for sale to miners, they would need to have adequate supplies available to sell to operations to facilitate this process. Discounts or subsidies could be considered to make the cost of retorts even more accessible, though they are currently inexpensive. Following this grace period, the

[26] Please see resource on the steps involved in Standard development as stipulated by the GNBS – Available at: https://gnbsgy.org/standards-development-process/

effected legislation can consider banning defaulters, once found culpable, from mining activities for some time. The penalty for non-ownership of retorts, once introduced, should be more stringent than those currently in place for non-use[27].

3.3.2 Raise awareness on the benefits of a retort and the change of legislation prior to enactment.

Before enactment of any legislative change, there should be awareness-raising efforts to provide sufficient time for Action by ASGM operators. These awareness-raising efforts should also include targeted messages and demonstrations on the benefits of using a retort. For this, and all other awareness-raising efforts proposed within Strategic Objective 10, Mining Associations must play a leading role in determining the messaging and modality of delivery to ensure that adequate efforts are in place to reach miners.

Development of appropriate financial and market-based incentives

Strategic Objective 4

Facilitate small- and medium-scale miners' access to finance to support their transition to mercury-free gold mining.

Small- and medium-scale miners have limited finances to leverage when making decisions on their operations. This makes it increasingly necessary for this strategic objective responding to paragraph 2 of Annex C of the Minamata Convention on introducing standards for mercury-free ASGM and market-based mechanisms to fill this gap. This will be done by supporting SMS gold miners in boosting their financial literacy and capacity through de-risking measures which target women and men involved in the sector. It will also focus on increasing the lending appetite of banks and promoting miners' savings clubs. These approaches will not only improve access to capital to invest in mercury-free technologies but will also provide a more secure income for SMS miners.

[27] The Mining Regulations also make provisions for cease work orders of no more than 7 days and a fine of $25,000 (Mining Regulation 127 (8)) in instances where there is non-use. This fine is comparable to or less than, the amount that operators typical expend on mercury monthly.

Intervention Area 4.1

Develop appropriate financial and market-based incentives for SMS gold mining sector to access and adopt appropriate mercury reduction and mercury-free techniques and technology.

4.1.1 Policy to provide technical and financial assistance incentives to artisanal miners to aid their registration.

These incentives, which can be done through the Government or in collaboration with international donors/partners, can involve monetary grants, technical assistance in the use of best practices, as well as demonstrations in the use of mercury free technology in ASGM. The Government of Guyana could also consider the creation of a business unit (World Bank, 2015) within the GGMC which may offer services in small business advisory services including mining-venture financing, technical assistance for the preparation and evaluation of projects, business finance, including arranging loans with financial institutions for the implementation of mining development plans and marketing assistance provided by the GGB, in collaboration with the GGMC, in order to facilitate access to the market by means of ore purchases.

4.1.2 Research and develop financial and market-based incentives for adoption of mercury reduction and mercury-free techniques and technology and mechanisms for access and terms and conditions.

Intervention Area 4.2

Reduce the barriers to financing mercury-free efficient technologies by improving men and women in ASGM's access to blended finance options, including through market-based interventions.

The main idea behind this Intervention Area is to promote financial inclusion in the mining sector through blended finance options (investments and credit) in the ASGM sector for supporting SMS miners' development. Efforts will be made to increase the information available to miners on currently available financing that target investments in ASGM for green loans and green technology. Following this, sector-wide measures must be implemented to bridge the gap between gold miners and creditors by ensuring that ASGM operators are compliant with required documentation to facilitate their successful applications for financial services.

4.2.1 Assess the legal and financial constraints that limit financial institutions' service provision to men and women in the ASGM sector.

Financial entities may employ de-risking strategies in instances where they have challenges managing the money laundering risks associated with a high-risk customer or business relationship. These de-risking efforts may disproportionately affect some entities such as those involved in ASGM. Efforts are required to create an enabling environment that increases the lending appetite of financial institutions for ASGM by improving the understanding of the sector and its operations, on the part of lending agencies and possible financiers/investors. A rapid assessment must be done across financial institutions of Guyana to determine legal and financial constraints that limit their ability to provide services to the ASGM sector, as well as to women to reduce barriers to accessing finance. The rapid feasibility assessment will also capture actionable recommendations to be implemented by both the bank and gold miners to reduce potential risks. These measures must be appropriate for the realities of men and women miners and target supporting transition to mercury-free ASGM. Additionally, feasibility assessments must be encouraged for the establishment of physical commercial bank facilities within Mining Districts (e.g. Mahdia).

4.2.2 Identify and share information on financial products available in the financial system (investments and credit) and existing tax incentives that could be accessed by SMS gold miners, as individuals or as established associations or syndicates.

Emphasis will be placed on improving the awareness of existing green loan and financing programmes. Commercial banks will be supported by the Mining Associations in targeting the promotion of these opportunities in ways that are accessible to miners while also remaining aligned with the code of conduct established for Guyana's Association of Bankers (provision of credit; advertising). Further, men and women in ASGM need to be aware of the financial benefits and access to be derived from membership in a mining association/syndicate. Banks may be encouraged to conduct outreach activities to these MD, in collaboration with the Mining Associations, to initially target the members of these associations. This will be done in accordance with the code of conduct established for Guyana's Association of Bankers.

4.2.3 Support small- and medium-scale miners' financial literacy and business capacity.

ASGM-based entrepreneurship is proliferous within mining communities; this does not necessarily indicate financial responsibility regarding business and personal growth. While most gold miners have ASGM activity as their sole source of income and actively remit their

earnings to their households for subsistence, the promise of employment does not necessarily translate to long-term economic security. Training content will target, inter alia:

- miners' attitudes towards spending;
- risk analysis (product risk);
- relationship with suppliers;
- financial responsibility;
- budgeting;
- investments;
- savings and building credit portfolio;
- interest rates;
- debt; and
- revenue and insurance compliance.

These behaviours would need to be cultivated to counter the habit of instant gratification and to ensure business growth. This will be fostered by empowering miners through financial literacy training and capacity building conducted by the Mining Associations, Small Business Bureau (SBB) in partnership with commercial banks. SMS operators and workers will also be encouraged to actively save in credit unions and banks as part of this pilot. Training sessions will take place over multiple weekends, with each weekend focusing on a module that allows SMS miners to gain experiences in better managing their finances. Pilots will occur simultaneously in each Mining District, with multiple cohorts, to ensure that as many miners as possible will access this free training.

Intervention Area 4.3

Increase miners' capacity to reduce mercury use in the ASGM sector through the establishment of the Miners Assistance Fund.

The Miners Assistance Act (Cap 65:08) makes provisions for the state's establishment of a Miners Assistance Fund deposited within the Bank of Guyana. Among other purposes in accordance with Section 5 of Cap 65:08, these funds may be applied to miners interested in purchasing equipment for use in mining operations. A robust legislative framework is present to establish optimal standards for mercury-free ASGM operations in Guyana, and a similar framework (Cap 65:08) exists to facilitate the state providing funds in this regard.

4.3.1 Legislative review and enactment of the Miners Assistance Act.

The Laws of Guyana include provisions for financial assistance for Miners under the Miners Assistance Act. This Action will see the review of the legislation and a more meaningful sum is to be agreed, through consultation with miners and Mining Associations, based on the realities of the ASGM sector of Guyana. The sums to be made available to miners should consider the financial costs to be incurred by miners for procuring mercury-free technologies. Implications for this change should be assessed across all other sections of the Act (for example, Repayment of Assistance (Section 14) will also be reviewed to ensure that the expectations of the repayment timeline align with the sums to be made available to miners).

4.3.2 Establishment of Advisory Committee to facilitate Miners Assistance.

The Advisory Committee, by law, is responsible for making recommendations to the Minister for the establishment and operation of a scheme to assist miners and operate the fund which grants assistance to them. This Committee may consider that an immediate funding priority would focus on assisting operations interested in transitioning to mercury-free ASGM. The Committee will, in accordance with Section 9 (Functions of the Committee) of Cap. 65:08, routinely make recommendations on the areas of priority for the improvement of the sector and make recommendations on the granting of assistance to miners. The Act also makes provisions for the Committee to make recommendations on the improvement of the mining industry and can consider the feasibility of interventions such as revolving funds and tax exemptions.

Strategic Objective 5

Build the economic resilience of men and women involved in ASGM and mining communities by facilitating their access to alternative or complementary livelihood options.

This strategic objective aligns with Paragraph 1 (j) of the Minamata Convention (Annex C) in support of the provision of information to persons in ASGM and affected communities. Young men, young women, and mothers with children from rural communities need a livelihood, and beyond ASGM, there are limited options. Few miners have alternative sources of secondary income, which means that they are entirely dependent on their ASGM operations for employment and household economy, leaving them susceptible to economic shocks. This makes it urgent that national efforts are focused on building the

economic resilience of miners and mining communities. Financial capital, comprising the financial resource available to people such as savings, credit, remittance and pensions, provide the community with different livelihood options (Teklemariam, 2015). Service and infrastructure gaps within many mining communities limit the access of these vulnerable groups to such financial capital, as well as in available options for employability, especially for women, and must be addressed to provide alternative or complementary livelihood options.

Inequalities between men and women tend to be a persistent form of power distribution and limit the options available to women even further. Gender roles tend to perpetuate the power inequalities that they are based on and often extend into the public sphere, mirroring the power dynamics within the household, with women being involved in the lower ends of the gold value chain. The barriers to women's involvement in ASGM include their access to information, men's perceptions of women's roles and capacities based on gender stereotypes, and women's access to finances for investing in ASGM. The interventions proposed will provide opportunities for men and women miners and men and women within mining communities to enhance their earning capacity both within and beyond the ASGM sector.

Intervention Area 5.1

Expand entrepreneurship and employability interventions into mining communities by providing options that stimulate complementary and alternative productive ventures.

5.1.1 Improve miners' access to currently available training to boost their employability within and beyond ASGM.

Currently, there are agencies such as BIT[28], SBB, and GMSTCI that are already actively providing capacity-building focused on employability skills and financial empowerment within mining communities. Formal education and competency-based training based on occupational standards for mining are occasionally accessible for free within MDs on the weekends and evenings through GMSTCI and BIT for a myriad of topics such as surface exploration, mineral prospecting, best practices in mining, codes of practices, map reading and GPS navigation, planning mining operations, heavy-duty equipment operation, mercury-free alternatives, tailings management, among others.

[28] BIT runs a National Training Project for Youth Employment (NTPYE) which consists of short-term training programmes (6 – 12 months) for out-of-school youth who are not likely to succeed at entrance tests for formal TVET institutions or the Ministry of Labour's apprenticeship scheme. This includes structured paid on-the-job training, and employment offers following training. Short programmes are available in different regions and allow trainees to acquire skills in various occupations through on-the-job training in companies. Work experience is supplemented by classroom teaching which offers students entrepreneurial training and life skills education. (World TVET Database Guyana, 2012)

This action proposes partnerships across these three (3) agencies to synergise their delivery of training at the mining district and site level. It also calls for targeted marketing of programmes to men and women across all job roles at ASGM operations. Miners indicated that training is best done at the sites where feasible and at landings where this is not possible. Proposed topics included map-reading/prospecting, heavy-duty equipment operation, book-keeping, and business/financial management. It should be reiterated that women tend to be at the lower end of the ASGM value chain. Training which targets women in ASGM (specifically cooks and Punters) should aim to increase their earning capacity. For example, this can be done through marketing heavy-duty equipment operation training to women.

5.1.2 Strengthen collaboration among the GMSTCI, GGMC, GGDMA, NMS, and GWMO for provision of training and technical assistance in prospecting and mine planning directly with SMS gold mining operations in the field.

Further to the efforts proposed in activity 5.1.1, a strengthened partnership among these agencies and mining organisations is recommended. This will include a review and update of the training curriculum and preparation of a plan to provide theoretical and practical courses in geology, mineralogy of respective mining districts, ore grade prospecting survey and sampling methods. GMSTCI will collaborate with GGMC, GGDMA, NMS, GWMO and Amerindian Village Councils in respective mining areas to host and conduct regular in-field training and provide technical assistance as needed.

5.1.3 Expand TVET institutions located within mining communities to deliver high-value programmes aligned with local labour market needs.

The suite of available training options mentioned in 5.1.1 provided by BIT and GMSTCI must be expanded to offer high-value training alternatives aligned with local labour market needs, community interest, and development plans to guarantee secure and stable sources of income. This Action focuses on expanding the number of training facilities offering high-value TVET options within hinterland communities. These options will align with the realities of the community job markets and improve the direct links and benefits of academia to job markets and must, therefore, be based on updated and localised labour market information.

This infrastructure expansion will be positioned within the Guyana Skills Development and Employability Project efforts. This project is powered through international co-operation with the Caribbean Development Bank (2021) to construct practical instruction centres as

extensions of an existing secondary school in the Northwest District of Region 1 and will see the completion of workshops such as motor vehicle repairs and commercial food preparation.

A replication of this project's approach would target unused state buildings within Mining District 2, 3 and 4. This refurbishment will include an Instruction Facility that will be used as a permanent training site by the BIT and GMSTCI, with other agencies having conditional access to conduct training within ASGM. The programmes will focus on employability skills appropriate to these communities, as identified by needs assessments, and will offer Caribbean Vocational Qualification (CVQ) level training based on competency-based models. It will see the expansion and retrofitting of departments within each identified building. Further, establishing dedicated permanent facilities for the BIT is a critical step in facilitating its applications for accreditation, as these require human resource and facility audits, among others, against the established regional quality assurance standards.

5.1.4 Institutional commitment and action by ASGM stakeholders to streamline employability interventions targeting women in mining communities.

Efforts targeting the resilience-building of community members and families should prioritise poverty alleviation by providing income-generating alternatives and micro-enterprise training that are complementary or supplementary to ASGM involvement. Targeting families from mining communities, or families of active gold miners would be a mechanism for creating secondary streams of income for secondary breadwinners in homes dependent on ASGM.

This Action will see the execution of targeted research and feasibility analyses within Mining Districts and communities to explore opportunities for introducing and increasing access to part-time jobs for women, both in ASGM and non-ASGM spaces. This should be a process led by the MoL (including BIT) and SBB, in collaboration with relevant Town and Village Councils, National Mining Syndicates, GGDMA, GWMO and GMSTCI as critical ASGM stakeholders.

This Action will also encourage the commitment of these agencies to increase their targeting of women in mining communities through the coordination of their activities, programmes, and policies for providing employment, business development training and funding, and financial empowerment opportunities to women. The streamlined efforts of GMSTCI and BIT would better enable them to collaborate to design programmes that align training with the requirements and conditions of funding provided by SBB's micro-enterprise services.

Finally, the partnership between the BIT and SBB, in collaboration with the mentioned stakeholders, will deliver micro-enterprise training delivered to women from households in ASGM communities that are solely dependent on mining. This training will focus on developing alternative livelihoods. This should be delivered with sustainability as a focus and should, therefore, include continued or period medium-term mentorship and technical assistance provided to recipients to address emerging challenges and needs.

5.1.5 Conduct feasibility analysis on community-based credit union/saving clubs.

The idea is to conduct a feasibility assessment of introducing community-based credit union/savings clubs in mining communities through collaborative efforts of the GGDMA, GWMO, the NMS (including Local Mining Syndicates (LMS)), and the town/village councils.

A community-based credit union would seek to improve financial responsibility, improve access to capital to invest in ASGM entry and transitions to mercury-free technologies as credit unions tend to have lower rates on loans and higher rates on savings as compared to banks. This approach can provide more personalised and localised credit support to gold miners and mining communities that consider their contexts and realities. The final proposed model must comply with the Co-operative Societies Act (Cap 88:01), which requires a minimum of seven members, and should be piloted within at least one mining district for viability. Active stakeholder engagement and awareness efforts would need to accompany this intervention.

Management of mercury trade

Strategic Objective 6

Effectively manage the importation and internal trade of mercury in the SMS gold mining sector, and encourage compliance of relevant regulations of the PTCCB, GGMC, GRA and EPA with importers and distributors.

Intervention Area 6.1

Strengthen collaboration among MNR, PTCCB, EPA, GRA, GGMC and the GPF for improved management and regulation of the importation and internal trade in mercury within the SMS gold mining sector.

6.1.1 Review and strengthen the licensing system towards a single window platform, with allocation of annual import quotas that are consistent with the objectives of the NAP, through collaboration between GGMC, EPA, PTCCB, GRA, MNR and Mining Associations.

6.1.2 Review and strengthen the system for tracking distribution and trade of mercury including data collection and reporting.

6.1.3 Joint monthly monitoring and enforcement in collaboration with GGDMA, NMS, GWMO, to detect breaches of respective regulations (PTCCB, GGMC, EPA) in terms of handling, storage and transportation of mercury, including licensing of traders.

6.1.4 Undertake collaborative surveillance of porous borders (Corentyne river, Lethem, Iteringbang, Northwest) to strengthen identification and tracking of any illegal mercury exports and imports; this will also include training of surveillance officers.

Public Health

Strategic Objective 7

Improve health information systems, including the gathering of health data on the impacts of mercury on miners and communities.

Intervention Area 7.1

Conduct situational analysis of public health concerns in relation to mercury in the ASGM sector, host and downstream communities.

Given the lack of information about the health impacts of mercury exposure in the ASGM sector, host and downstream communities, this intervention discusses actions in support of gathering data on the current health situation related to mercury to inform strategic planning for the ASGM Sector at the national level.

7.1.1 Assessment of prevalence and disease burden of mercury in ASGM sector, host and downstream communities.

Prevalence is a measure of the burden of disease in a population in a given location at a particular time, as represented in a count of the number of people affected. Counts of the number of people affected with a disease are required to plan appropriately for their health care needs (Ward, 2013). Given the lack of national data on mercury prevalence, it is recommended that an assessment of the health impact of mercury, common symptoms displayed by the communities involved in the use of mercury, the levels of poisoning differentiated by geographical locations, gender, and age and the identification of high-risk populations be conducted. The assessment will focus on hotspot mining areas and will be led by the MoH.

According to Public Health Action Support Team (PHAST) (2020), it is important to measure prevalence and disease burden for the following reasons:

- Prioritising actions in health and the environment
- Planning for preventive action
- Assessing performance of healthcare systems
- Comparing action and health gain
- Identifying high-risk populations
- Planning for future needs
- Setting priorities in health research

7.1.2 Disseminate results of the assessment of prevalence and disease burden of mercury to national and local stakeholders.

The results of the study will be widely disseminated to raise awareness about the dangers of mercury and its effects on public health, enriching research on mercury poisoning and to guide policy and plans related to the health of the ASGM sector, host and downstream communities for mercury.

Intervention Area 7.2

Improve surveillance and health information systems to incorporate mercury.

With the aim of maintaining records of pathologies and treatments related to ASGM workers, it is necessary to create a system that will enable monitoring of the community's health status, especially for those communities in which possible mercury poisoning cases have been detected.

7.2.1 Develop and implement a health surveillance system for mercury.

It is proposed that a health surveillance system be developed and implemented to help identify pathologies suffered by workers in ASGM sector, host and downstream communities, differentiated by gender. This data will enable adequate surveillance, monitoring and medical response in different communities and categories of workers in the ASGM sector, taking into account vulnerabilities to mercury exposure differentiated by gender.

With the implementation of the surveillance system for mercury, authorities will be aware of:

- Miners, dredge owners and gold/mercury traders exposed to occupational hazards;
- Communities potentially affected by exposure to chemical substances, especially mercury;
- Mercury health risks derived from working in mines;
- Identification of vulnerable persons working in the ASGM sector, host and downstream communities, especially women;
- Reporting of signs and symptoms related to mercury;
- Reporting of potential occupational hazards, or those made worse by work in the ASGM sector; and
- Creating a data base of persons exposed to mercury, particularly from work in the ASGM sector.

Strategic Objective 8

Strengthen the institutional capacity of the public health care system to provide healthcare services (diagnosis, management and treatment) for persons directly or indirectly exposed to mercury (differentiated by gender) in the ASGM sector, host and downstream communities.

Intervention Area 8.1

Build the capacity of public health care workers, on the health effects of mercury, diagnosis, management and treatment of mercury related health issues.

8.1.1 Train public health care workers, including community health workers, on the effects of mercury and how to diagnose, manage and treat mercury-related complications.

Training of public health personnel will form the foundation of institutional strengthening of the public health care system. The baseline assessment identified that public health workers and public health care facilities in Guyana do not have the capacity to detect, diagnose, manage and treat mercury health-related complications and ailments. The signs and symptoms associated with acute and chronic mercury exposure, such as chest pain, coughing, nausea, vomiting and diarrhoea can also be associated with common illnesses among ASGM and their communities, such as malaria, dengue and typhoid, thus increasing the potential for misdiagnosis.

Health care workers require capacity building in the routes of mercury exposure, health effects, detection, diagnosis, management and treatment of mercury poisoning. This will be done by training health care workers, including CHWs. CHWs operate at Level 1 health care facility[29] – Health Posts, which are often nearest to mine sites and situated in communities within mining areas. Given these factors, the CHWs will potentially be the first point of contact with the public health care system for the ASGM sector and members of host and downstream communities.

8.1.2 Create standard operating procedure (SOPs) and protocol/guideline for diagnosis, management and treatment of acute and chronic mercury poisoning.

Within the public health system, SOPs and protocols/guidelines for acute and chronic cases of mercury poisoning do not exist. Therefore, health workers, currently, do not have any guidance on the diagnosis, management and treatment of mercury poisoning. These documents will be drafted as part of the NAP implementation.

Intervention Area 8.2

Strengthen laboratory diagnostic and analytical capacities to test and diagnose mercury in humans.

Apart from capacity building, it is important to acquire the necessary equipment and procedures to support the diagnosis of mercury poisoning. At present, Guyana does not have a national laboratory that is accredited to test human tissue (blood, urine, hair) for mercury.

[29] Levels 1 and 2 health facilities offer mainly primary health care services at the community and sub-district levels. Level 1 which is staffed by community health workers provides preventive and simple curative care for common diseases and focuses on health promotion and education (Ministry of Health Planning Unit 2015).

8.2.1 Assess existing technical capacity of both private and state-run laboratories, to offer services for identifying or determining mercury content in tissue, hair, blood and urine.

Despite the lack of laboratory capacity to test for mercury in the public sector, the baseline assessment revealed that some private local laboratories and regional bodies, such as, the Caribbean Public Health Agency (CARPHA), can conduct mercury testing. The assessment will include research and academic entities and regional/international laboratories.

8.2.2 Establish a network of state-run and private laboratories and institutions, that can offer support to routine testing for mercury, through the execution of working agreements.

Based on the assessment conducted in activity 1.2.5, and in order to address the lack of national testing capacity, a network of laboratories and institutes that can offer support to routine testing and research related to the presence and effects of mercury will be established. A key component of this support would entail the execution of working agreements to formalize collaboration.

8.2.3 Equip and accredit state-run laboratories for testing mercury levels in humans.

Steps will be taken to enhance the capacity of the national laboratories to carry out mercury tests in humans. While public-private partnerships with local, regional and international laboratories and institutes will assist in filling the gap in the public health system, it is critical to the provision of timely and accessible public health service, that national capacity be developed. This action will be guided by the results of the assessment in activity 1.2.5 which will provide information on the current capacity of public laboratories and the basis for the provision of training, mercury testing tools and equipment which will enable the laboratories to provide reliable and valid results. This activity will be done in alliance with activity 1.2.6.

Intervention Area 8.3

Strengthen the public health medical emergency system to respond to health emergencies including mercury poisoning.

The public health consequences of emergencies initially affect local jurisdictions. For ASGM communities, this usually constitutes access to a Level 1 or Level 2 health facilities, i.e., Health Posts and Health Centres which provide primary care services (Ministry of Health Guyana, 2013). During the initial response, the people and communities that are impacted must rely on local community resources. Most health posts and health centres located in the rural areas of Guyana have limited or no access to

physicians and nearby access to district or regional hospitals (Ministry of Health Guyana, 2013). As a result, all regional and national emergency response stakeholders must be prepared to coordinate, cooperate, and collaborate with cross-sector partners and organizations at all governmental levels when emergencies occur, particularly given that referrals to regional or national public health facilities are usually required for instances beyond the capacity of said health facilities and health care workers to diagnose and treat, such as suspected cases of mercury poisoning.

8.3.1 Assess emergency transport requirements for public health facilities servicing ASGM communities.

The extent to which the currently available emergency transport is adequate, given the population size being serviced (ASGM sector, host and downstream communities) and main transportation links, will be addressed through an assessment. This assessment will determine the requirements for land and water ambulances, medevac services needed by public health facilities in ASGM areas.

8.3.2 Strengthen the emergency network with large-scale mining companies located in close proximity to ASGM, host and downstream communities.

Private-public partnerships with larger scale mining companies located in close proximity to ASGM, host and downstream communities in order to increase the emergency network by tapping into the resources available from said companies, particularly, in the area of transport and high-level medical personnel that may be onsite. The baseline assessment revealed that some medium- and large-scale mining companies were equipped to support ASGM and nearby communities with health care services related to malaria and other communicable and non-communicable diseases common within the mining sector.

8.3.3 Develop a contingency and emergency plan, including mercury, proposed by the MoH for the public health system.

Contingency planning aims to prepare the public health system to respond efficiently to an emergency and its health consequences. Developing a contingency plan involves making decisions in advance about the management of human and financial resources, coordination and communication procedures, and being aware of a range of technical and logistical responses to instances of health care emergencies in ASGM communities. This planning requires the involvement of all sectors, which can assist in ensuring timely and effective

provision of health care services when required. The baseline study revealed that in many instances, local governance structures, such as the Mayor's Office, Indigenous Village Councils, and Regional Democratic Councils, often played a major supporting role in assisting the local public health facilities with resources when required. The objective of the contingency and emergency response plan is to document and coordinate these local actors and community members support in the event of a medical emergency, including mercury, in the ASGM sector, host and downstream communities.

The results of the activities in 8.3.1 and 8.3.2, which address emergency transport requirements and strengthening of emergency networks with medium- and large-scale mining companies, respectively, will be considered in the execution of this action.

Vulnerable Groups

Strategic Objective 9

Reduce the risk of mercury exposure of vulnerable populations, particularly children and women, to emissions and releases caused by the ASGM sector and improve gender mainstreaming (or equality).

Intervention Area 9.1

Strengthen multi-agency approaches for monitoring the presence of children living, playing, or working in/near ASGM operations.

The baseline assessment of the ASGM sector found that child labour is both normalised and misunderstood within the socio-cultural environment of mining and hinterland communities. The Employment of Young Persons and Children Act (Cap 99:01) defines children as persons under 14 years of age and young persons as under 16. Child labour, and early entry into the workforce, compromises a child's well-being, especially their education and health. In addition to children with parents at mining operations and limitations in options for trustworthy and reliable child-care within communities, many adolescents in mining communities end their formal education before completing school to work in ASGM. There are both supply and demand-side barriers to this trend:

- the number of available primary schools is higher than secondary schools within hinterland communities where ASGM tends to occur. There are limited secondary and TVET options. (supply);
- there are rampant situations of poverty, economic instability, and limited livelihood options for families, which encourage boys' early involvement in ASGM for earning. (demand)

It is essential to employ an integrated approach to address the factors that lead to child labour by comprehensively addressing economic instability, early identification of children and families vulnerable to child labour, addressing challenges in child protection[30], and increasing opportunities for schooling by addressing the lack of accessible quality education in these rural mining areas. A multi-agency approach requires that the MoL, the MoHSSS, and the Ministry of Education (MoE) coordinate efforts with the GGMC and mining organisations, especially the GWMO, to strengthen the accessibility of child protection and welfare within more far-flung mining communities. It should be noted that GGMC does not have the mandate to enforce labour laws, so the approach must be an integrated one, to consider the mandates of these individual agencies and to bring about compliance related to relevant labour, education, and child protection laws such as Child Labour Policy, Education Act, Employment of Young Persons and Children Act, Child Protection Act, Occupational Health and Safety Act and the Combating of Trafficking in Persons Act.

9.1.1 Establish an inter-agency task force for Child Protection in Mining.

A task force will assist in the reduction of the presence of children and their exposure to risks, such as mercury poisoning. Membership of the Task Force will include the participation of a variety of state and non-state actors at the community, mining district, and administrative region levels and should be embedded within the Child Labour Policy, supported by an inter-ministerial MOU.

The agencies to be involved are the GGMC, the GPF, the GWMO, the NMS, the GGDMA, Welfare and Probation Officers, MoHSSS, MoE, MoL, Regional Executive Officers, teachers/head-teachers, locally active civil society organisations (CSOs)/ NGOs with strong and existing governmental partnerships (such as Blossom Inc.10), faith-based organisations,

[30] Child Protection refers to efforts targeting children at higher risk of harm. Safeguarding refers to the protection of all children. The terms are sometimes used synonymously. Child-care and protection policies are embedded within the protocols and policies of the Ministry of Human Services and Social Security, Ministry of Labour, and Ministry of Education. They outline the legal duties with which agencies and individuals must comply in order to keep children safe. By law, child protection is everyone's responsibility.

and village/town councils. The Task Force will be under the purview of the MoL and complement their ongoing efforts of bolstering the labour-related child protection interventions.

9.1.2 Standard Operating Procedures introduced to guide reporting and response to child labour incidents.

The SOP will ensure that reporting and response are conducted in a structured and standardised manner. These SOPs should include good practice standards for information-sharing among agencies and include early detection systems to identify children and adolescents at risk of academic disengagement and of becoming involved in ASGM-related activities.

9.1.3 Expand the response to truancy through outreach efforts that raise the awareness of child protection within the context of ASGM.

The Schools Welfare Department of the Ministry of Education conducts ongoing truancy campaigns as a welfare intervention for increasing school attendance and preventing school-aged children's absenteeism from school. This activity aims to support students' attendance not through penalising their non-attendance but by bolstering the protective factors that encourage their attendance.

The expanded response will include:

- interventions to expand current systems within the education system for responding to truancy, as determined by the task force (activity 9.1.1);
- reporting and referral mechanisms that will support efforts to identify children at risk;
- outreach programmes such as parenting education and public awareness campaigns to sensitise parents and residents of mining communities on the importance and benefit of school participation and the harms of absenteeism. As there are cultural nuances to the communities' understanding of child protection and the effects of child labour, it is important that outreach and awareness-raising interventions conducted as part of this activity address this information gap. These should, therefore, highlight definitions of child labour and practical instances where it occurs or can be prevented. This activity will also include a baseline assessment of reports and observations of child labour in different mining districts as well as a post-assessment following the execution of the outreach activities.

9.1.4 The MoL to recruit and train labour inspectors from mining communities.

These inspectors would have a unique mandate in effectively monitoring and investigating children's presence at ASGM operations, labour practices, and labour issues/violations within the ASGM sector. This should target women community members for training as labour inspectors to expand their options for income generation within hinterland/indigenous/mining communities. The Labour Inspectors would fall within the auspices of the MoL, along with their other labour inspectors. These inspectors would be able to enforce fines and sanctions applicable to operations where children's presence is observed.

9.1.5 Expand Hinterland School Feeding Programmes to all schools within mining communities in Regions 7 and 8 (Mining Districts 2, 3, 4 and 6).

The Government of Guyana commenced a National School Feeding Programme in February 2010, which targets students in all nursery schools and all primary schools in Grades 1 and 2 for administrative regions 1, 2, 3, 4, 5, 6, and 10[31]. This Action will expand Hinterland School Feeding Programmes (SFPs) to primary, primary tops[32], and secondary schools within mining communities of Regions 7 and 8 to cover portions of Mining Districts 2, 3, 4 and 6, to provide at least one daily balanced meal to students. This will aim to improve the school attendance of children in poor homes by providing them with a daily balanced meal and has a low cost-per-child programme cost. A healthy basic meal will be provided by local women's groups utilising locally available produce sourced from the communities.

This action would also consider the absence of reliable electricity within these communities and ensure that schools participating in the SFP should benefit from the provision of a solar fridge/freezer system[33]. A solar-powered freezer is environmentally sustainable and would operate on energy provided by the sun and photovoltaic cells to be capable of keeping perishable items to avoid spoilage. The entire solar freezer system will include the procurement of a solar freezer (5.8-8.0 cubic feet), PV panels (140-275 Watts), deep cycle batteries (100 Ah-245Ah), battery banks, and a charge controller[34]. The Guyana Energy Agency should play

[31] Impact Evaluation of Hinterland School Feeding Programme piloted 2007-2009

[32] Primary Tops are more proliferous than secondary education institutions within rural locations. They are a combination of primary and the first three years of lower secondary schools providing the option to students to stay longer within formal education but without the requirement of sitting an exit examination such as the Caribbean Examinations Council's (CXC) Caribbean Secondary Education Certificate (CSEC) examination.

[33] The Guyana Energy Agency has conducted pilots of projects installing solar freezers in Shulinab and Moraikobai (2017) which has been proven to increase the economic activities of these villages.

[34] The Guyana Energy Agency estimates the cumulative cost of procuring and installing a solar freezer system as $1M, this does not include transportation costs to respective communities.

a leading role in the set-up of these facilities and also provide training to local women's groups in the maintenance, repair and inspection of the equipment.

Further, in instances where the community is unable to provide vegetables or poultry due to the absence of functioning farmlands, then secondary schools and/or women's groups should be provided with the technical and financial support to develop sustainable Cooperative farms. A feasibility assessment must be conducted for each site and include consideration for the farms to supply produce to both the community and the gold mines at a lower cost[35]. The farms can also be provided with seedlings for revegetation of mines as has been the case with St Elizabeth (Mining District 2), and other areas such as Isseneru and Matthew's Ridge, earmarked for revegetation projects.

These approaches generate income for women not involved in mining, guarantees social protection safety nets for children in mining communities, and supports the local agriculture sector. The programme will be co-managed at the community level through the respective Village Council as part of their mandated commitment to community development and in collaboration with formal or informal groups of women from these communities. The operational guidelines for the SFP will follow the standard regulatory guideline already established by the MoE for programmes of this nature. International agencies such as United Nations Population Fund (UNFPA), UNEP and United Nations Children's Emergency Fund (UNICEF) may be potential partners.

9.1.6 Pilot a programme in Mining District 2 that aims to improve community-based access to social safeguards such as guidance and counselling services and day-care services to reduce children's presence at ASGM operations.

A system of support within a preventative paradigm goes beyond response and should also consider protection. School-based guidance and counselling services, including career guidance, will enhance the protective environment for children at risk of early entry into ASGM. These guidance counsellors will assist and advise students on their academic and personal decisions, needs, and options. In this way, the counsellors will contribute to decreased school attrition and academic disengagement by identifying potential factors that may positively and

[35] Amerindians in Guyana have a mixed livelihood that involves both subsistence and cash earning activities (Altman 2006) which includes farming and the selling of farm crops, meat and poultry, among others. This proposal would rely on this mixed model that blends traditional and market-driven livelihoods, with the need for food security by providing food to communities that rely on importing, and also provide alternatives to fish for communities which rely on consuming fish, which could have the presence of bioaccumulated or biomagnified mercury.

negatively impact a child's school attendance. For instance, some communities such as Mabura and Jawalla have been able to identify transportation as a factor that limits school attendance and have been able to provide bus service and bridges, respectively, to successfully address this issue.

Further, there needs to be an assessment of the viability of community-based day-care services attached to schools designed to respond to situations where both parents are involved in ASGM. Institutional child-care access was proposed by women miners and community leaders in Mining District 2 (Mahdia, Campbelltown) as a method for directly supporting maternal employment for women involved in ASGM. This method was previously piloted in Mining District 3 (Jawalla) with little success. To contextualise the potential impacts, the NAP will pilot this model within MD 2 to understand the benefits that institutional child-care may have on employment quality outcomes for women – specifically, their earnings and employment in ASGM. It may require that teachers receive specialist training in counselling and child-care. As positive youth engagement was also continuously raised as concerning within this Mining District, the NAP proposes that the child-care services also include a youth service centre that will provide curricular, extra- and co-curricular support to youth from these communities.

9.1.7 Conduct a feasibility study to expand secondary schools in mining communities in Regions 7 and 8 (Mining Districts 2, 3, 4 and 6).

There is a paucity of accessible schools and social services within mining communities. There is evidence of decreased engagement of adolescent boys who opt to enter ASGM. This intervention will increase the number of secondary institutions available to hinterland/mining communities. As a first step, the state should conduct feasibility studies through the Ministries of Education (Hinterland Development), Labour, Finance, and Local Government to expand education services to hinterland/mining communities to determine the locations of these new secondary schools. This would consider areas with the highest or growing demand based on primary school enrolment rates and distance to secondary school options.

9.1.8 Expand secondary school availability in mining communities in Regions 7 and 8 (Mining Districts 2, 3, 4 and 6).

Based on the results of the feasibility study conducted at 9.1.7, a phased approach of expanding the availability of secondary schools in mining communities in Regions 7 and 8 will commence.

Intervention Area 9.2

Reduce barriers faced by women that limit their earning capacity across the ASGM value chain.

As the employability of women in mining operations is premised on gender, it is essential to reduce the five common[36] barriers to ensure that women are provided with opportunities to participate in critical points in the ASGM sector, especially with higher profitability. The NAP proposes a programme to reduce these five barriers for women's optimal involvement in ASGM to enhance their economic contributions and ensure their continuous and increasing involvement in the sector. This would address demand- and supply-side barriers. These efforts will benefit from the involvement of a wide variety of partners, including GWMO, GGDMA, NMS, EPA, GGMC, MoL, GMSTCI, BIT, SBB, Ministry of Finance (MoF). The proposed Women in Mercury-Free Mining (WiM-FM) programme will encompass the following activities.

9.2.1 Launch programming to increase women in mining and reduce stereotypes related to women in ASGM.

This programme should target women miners interested in upscaling their ASGM efforts. This should focus on tackling gender stereotypes and creating counter-narratives that challenge current norms about women's involvement in ASGM.

9.2.2 Provide robust and competency-based training programme to identified women miners in the WiM-FM Programme.

These should be full suite training that covers both technical competencies and business management skills (record-keeping, investments, financial management, budgeting, procurement, application processes for mining lands, supply chain logistics/management, among others). Some possible training pathways targeting women should include:

- gold trading business development;
- SMS mining operation management;
- excavator training;
- GPS/prospecting, safe mining practices, among others;

[36] These barriers were: 1) access to finance and land, 2) limited opportunities for gaining experience, 3) low awareness of opportunities for women in ASGM, 4) prevailing stereotypes on women's ability to become involved in the sector, 5) discriminatory site-level policies preventing women's employment.

- jewellery-making/gold-smithing training programmes targeting women in mining communities[37].

Mining-district-level feasibility studies would need to be conducted on each pathway. For example, assessing the viability of a training specific to jewellery-making would need to consider the mineralisation and the availability of both gold and precious/semi-precious stones within the Mining District.

9.2.3 Provide opportunities for women to gain practical on-the-job experience.

The Action will provide opportunities at the mining-district level to encourage mentorship of women in ASGM by more successful or established gold miners. This can be facilitated through the mining associations. They will also receive mentorship from the Mining Associations and GGMC in areas such as: registering mining equipment, accessing lands[38] and obtaining their relevant licenses and permits.

9.2.4 Implement programming to facilitate access to financing of efficient technologies and other inputs targeting women entering the ASGM sector.

Upon successful completion of the components of the WiM-FM programme in activity 9.2.3, recipients will be supported in applying for funding through partnerships (SBB, financial institutions, and GGMC) to purchase gold mining and processing equipment, including mercury-free technologies.

The hiring of staff will be the responsibility of the programme participants and should take an affirmative action approach where at least 30% of the dredge or other workers on the operation are required to be women. This approach not only guarantees women's participation but shows women's leadership in successful mercury-free operations. The model woman-run and operated small- and/or medium-scale mercury-free operations will embrace the power of representation to address these barriers. Select operations within each MD should be identified as potential recipients of seed-funding provided by the MNR and/or MoF.

[37] This can be done in partnership with the GGMC and the Burrowes' School of Arts

[38] Considering the traditional gender roles that women still subscribe to in many rural communities, access to viable lands near schools and other social-services will ensure that women are able to adequately reconcile their child-care responsibilities with their earning commitments, without compromising either. Mahdia, as a mining town could be considered as an appropriate site for this pilot as it has accessible social services such as schools, law enforcement, health services, among others. Administrative support can also be provided by Mining Associations to ensure there are robust formalised arrangements (permission to operate) between claim holder and women miners, with adequate protections and redress measures for reneging on arrangement. Additionally, while legally there is no timeframe for using mining land for which one has a claim, GGMC should remain proactive in gazetting and reclaiming abandoned claims for non-payment of rent, in accordance with Regulation 26 (2) of the Mining Regulations.

9.2.5 Provide mercury-free gold certification for women miners' access to markets.

Further to action 9.2.4, this Action aims to incentivise these operations by providing market-based benefits in the form of facilitating market access for the sale of mercury-free gold produced by the women participating in the WiM-FM programme. This would require that the GGB identifies different certification levels for mercury-free gold, along with the evaluation system and requirements for this certification to be awarded for gold produced by mercury-free or mercury-reduced operations. It will also require the execution of a feasibility study for the establishment of a national certification for gold produced in sustainable manners and for the awarding of ASGM-specific green certification of operations. This certification can also be used to further access financial products.

9.2.6 Enforce applicable fines for gender-discriminatory labour practices.

There were instances found where ASGM operations prohibit women from being employed or offer unfair wages to women employed in ASGM. There are operations with "no women allowed" work policies that are in breach of equal employment opportunity and anti-discriminatory legislation in Guyana. Sanctions included in labour legislations should be enforced to prevent these instances to ensure women are empowered to work in ASGM.

Awareness Raising and Outreach

Strategic Objective 10

Raise the awareness of SMS gold miners and mining communities on the detrimental effects and safe use of mercury, develop health programmes and strengthen education and outreach programmes, including specific education programmes targeting youth, women and indigenous communities, for effective implementation and support of the activities under the NAP.

The baseline assessment found that there was limited awareness of the effects of mercury on people and the environment and a lack of formal training in any area related to ASGM, as education does not pose a barrier to entry into the sector. For those who did receive training, this was done on-the-job and facilitated informally by more experienced miners or on-site and

facilitated by the GGMC. Mining Regulation 236 makes provision for GGMC to conduct training efforts and provide technical assistance to miners. It is necessary to address worst practices in the ASGM sector, by sharing information and discussing the pros for the use of PPE, retorts, and mercury capture systems, while handling mercury as they are designed to protect human health.

Against the backdrop of these findings, the two strategies proposed for this objective seek to raise the awareness of miners and mining communities on mercury's effects, safe use of mercury, and pathways for mercury exposure in ASGM. The intervention areas tailored to advance this strategic objective will take gender-specific approaches. The sharing of information on ways to reduce contamination will be done by the community facilitators and health care workers through face-to-face talks, and group discussions within the communities (community centres, schools), towns, and landings, using videos and other materials, such as brochures.

Intervention Area 10.1

Raise the awareness of mercury's effects on human health and the environment through training and awareness-raising initiatives, targeting both men and women employed directly in ASGM as well as residents of mining communities.

Across all mining districts during the baseline assessment, SMS miners were aware of one main adverse effect of mercury, which was that it could lead to male erectile dysfunction or impotence (65.36% of miners provided this response). Despite this fear, there were misconceptions and malpractices related to the use of mercury in ASGM activities. For instance, bahirs, or cooks, reported that it was common to burn gold in or near the kitchen on the same fireside used to cook food. These trends indicate the need for awareness-raising efforts to be conducted on a wide scale across Mining Districts, including those workers who are not directly involved in the extraction and processing of gold or use of mercury.

10.1 Design and develop Information Education Communication (IEC) and gender-targeted material aimed at raising the awareness of men and women working is ASGM activities on the effects of mercury on the human body and environment.

There is a need to tackle misinformation and provide additional information to men and women directly involved in mining as it relates to mercury and its effects on the human body and environment. This Action includes the design of a suite of digital media, audio-visuals, simple brief messaging, posters, short 2-D and 3-D animations. Short videos will also be created explaining mercury-free alternatives and methods for reducing the use and effects of mercury. These videos will be developed using video length and formatting guides appropriate for common social media platforms for ease of dissemination and for use on multiple platforms such as local television stations, DVDs and adapted for audio sharing on radio channels.

Further, material created will target women and men separately by developing key messaging related to the effects of mercury on women, the effects on men, the effects on children, and the effects on the environment. Catchy jingles[39] will be created, which can be used to disseminate information on the beliefs, myths, and facts related to mercury use. These can be made accessible to shops on landings and in towns/villages. Messaging will adequately cover, inter alia:

- general information on mercury;
- health effects of mercury exposure;
- pathways, signs and symptoms related to mercury exposure;
- information regarding testing facilities and actions to take once there is a suspicion of mercury poisoning.
- appropriate use of PPE;
- practice of gold burning at home using household utensils and/or without protective gear;
- use of retorts and mercury capture systems;
- options to minimise the effects of mercury on people and the environment and the rationale behind these options; and
- techniques, protocols, laws, regulations related to reducing the use of mercury in ASGM.

[39] Jingle competitions may expand this awareness efforts to the general population to also include persons not ordinarily involved in ASGM.

The idea is to support inter-agency collaboration through consistent messaging across government and non-government agencies that conduct awareness-raising activities with SMS miners. This would ensure that social, legal, health and environmental information is delivered using a unified approach with agreed simple messaging and using the same resources. This would allow for increased opportunities for collectively accessing miners to share or reinforce knowledge and is a form of cost/resource sharing across organisations such as GMSTCI, BIT, GGMC, GWMO, GGDMA, NMS, EPA, MoE, Child Protection and School Welfare agencies. Materials developed would be used by each of these organisations as they execute their individual mandates. Guidance on best practices for reaching miners should be provided by the Mining Associations[40].

The GGDMA, GWMO and NMS will participate in the outreach programme by developing and maintaining a database with members' information and distributing messages related to effects of mercury prepared by MoH/EPA/GGMC, through WhatsApp, Telegram and mass text messages and also the sharing of videos through both Facebook and WhatsApp.

The development of the print materials (brochures/pamphlets, posters) will be done collaboratively between the relevant units of the GGMC/MoH/EPA. The electronic materials will be done with assistance of NCN and other selected media houses. All material should be translated to Portuguese and Spanish in order to ensure that non-national persons within the ASGM sector can also be reached.

10.1.1 Provide gender-specific information on the detrimental effects of mercury use on humans and the environment that target residents of mining communities.

This information should be community-friendly and target community members, especially parents, and in-school and out-of-school children/youth who may consider entry into the ASGM sector. Information provided must target all literacy/competency

[40] These joint efforts can capitalise on activities such as Mining Week. One example of awareness raising could include a commemoration of a "Day of Action Against Mercury Pollution" on the occasion of Guyana's commitment to the Minamata Convention on Mercury to raise national-level and mining district-level awareness on the importance of transitioning to mercury-free ASGM. This should be integrated into Mining Week activities. Further, localised mining fairs across mining districts could be considered for inclusion in mining week activities.

levels. It must be presented in various languages to respond to the growing diversity of the interiors of Guyana (Spanish, Portuguese, English and Guyanese Creole, and indigenous languages).

Further, these initiatives must be participatory and appropriately targeted to children, youth and adults. The training and information provision should encourage interaction, active participation, understanding and explanation at the highest levels of experiential learning, and not one-way learning.

10.1.2 Train community members to become community facilitators and disseminate information about mercury and promote practices to reduce mercury exposure.

There is a need for additional human support, in the form of community facilitators, to disseminate information on how to protect oneself and reduce exposure. The community facilitators will be trained in communication techniques and be provided with other relevant skills intended to be able to share the information effectively. This can follow mechanisms such as 'train the trainers' to encourage sustainability of education in not only methods of reduced or no mercury usage, but also of the impacts of mercury use on health and the environment. They will also be assigned to specific areas which will enable them to establish a rapport with their target group. Establishing these personal relationships will provide further channels to share and give information. Members of the community will be encouraged to speak with facilitators on a one-to-one basis. The facilitators will meet with the health workers and others monthly to discuss the progress of the educational activities and any problems encountered. The following activities should be completed to achieve this action:

- Identify and train selected persons, including teachers, from the communities in proximity to mining operations about the ways in which mercury contamination takes place and methods of reducing exposure.
- Assignment of community facilitators to specified mining areas, host and downstream communities within the mining districts. A resource document with all identified and trained personnel in the delivery of the outreaches with their assigned areas / districts will be prepared.

- Disseminate information to miners, residents, children on the topics and through the mediums listed in activities 10.1.1 and 10.1.2.

Intervention Area 10.2

Strengthen the Mining Organisations' education, awareness and outreach programmes to support the activities under the NAP.

In collaboration with all other agencies supporting the implementation of the NAP activities, awareness should be raised on the purpose and benefits of implementing the NAP and the obligations of the Government of Guyana to make this transition to phase down the use and effects of mercury at a national level in ASGM activities for the protection of human health and the environment while also protecting livelihoods and patrimony. This will include assessing previously developed communications materials and strategies and implementing lessons learned.

10.2.1 GGMC and mining associations include technical assistance activities in their communication strategy to be developed under Strategic Objective 10 to promote uptake of mercury reduction and mercury-free techniques and technology across mining districts including demonstration. This action is linked to the overall objective of increasing awareness as detailed in the upcoming Strategic Objective 10.

10.2.2 Increase education and awareness for the promotion of elimination of worst practices such as whole ore amalgamation and open burning of amalgam as well as improved tailings management, waste management, implementation of EMP and progressive backfilling/reclamation (medium-scale).

GGDMA, NMS, GWMO review their education and awareness programme and develop communication strategy that includes activities for promoting and monitoring compliance with draft Code of Practice-Mercury and draft Code of Practice-Tailings Management and Mining (Amendment) Regulations across their membership and SMS gold mining sector in general. This activity will be incorporated with activity 10.2.1.

CHAPTER 5: IMPLEMENTATION PLAN

This Chapter focuses on providing the specific foundation and roadmap for the implementation of the National Action Plan in Guyana. It includes the lead and collaborating agencies responsible for spearheading the activities, target timelines, measurable indicators, and proposed budget. The overall responsible agency for coordinating implementation is the Ministry of Natural Resources. The total plan comprises of ten (10) recommended strategic objectives with twenty-three (23) intervention areas and eighty-four (84) proposed activities costing an average estimated total of USD 150,000,000.

The overall estimated cost per strategic objective is provided in Table 14 below. Some potential sources of financial resources to fund the implementation of the activities include allocations from the national annual budgets for the respective responsible lead and collaborating agencies where possible, private banks and relevant financial institutions can be engaged, bilateral and multilateral donors and regional and international funding agencies, especially during the first few years of implementation. For the long term, a self-sustaining mechanism, such as licence fees, taxes, and royalties, will need to be put in place to finance ongoing activities.

Table 14: Overall estimated costs for each proposed strategic objective

	Strategic Objective	Estimated Cost (USD)
1	Reduce mercury use in the ASGM sector, eliminate worst practices and increase management of environmental impacts through technical assistance to miners, building institutional capacity to strengthen monitoring and enforcement, improving processing techniques and adopting appropriate mercury-free techniques and technology where practicable.	4,350,000
2	Formalise and regulate the artisanal mining aspect of ASGM.	685,000
3	Update of legislation dealing with the regulation and use of mercury in ASGM.	1,226,000
4	Facilitate small- and medium-scale miners' access to finance to support their transition to mercury-free gold mining.	11,065,00
5	Build the economic resilience of men and women involved in ASGM and mining communities by facilitating their access to alternative or complementary livelihood options.	122,470,000
6	Effectively manage the importation and internal trade of mercury in the SMS gold mining sector, and encourage compliance of relevant	231,000

	Strategic Objective	Estimated Cost (USD)
	regulations of the PTCCB, GGMC, GRA and EPA with importers and distributors.	
7	Improve health information systems, including the gathering of health data on the impacts of mercury on miners and communities.	328,000
8	Strengthen the institutional capacity of the public health care system to provide healthcare services (diagnosis, management and treatment) for persons directly or indirectly exposed to mercury (differentiated by gender) in the ASGM sector, host and downstream communities.	615,000
9	Reduce the risk of mercury exposure of vulnerable populations, particularly children and women, to emissions and releases caused by the ASGM sector and improve gender mainstreaming (or equality).	10,002,000
10	Raise the awareness of small- and medium-scale gold miners and mining communities on the detrimental effects and safe use of mercury, develop health programmes and strengthen education and outreach programmes, including specific education programmes targeting youth, women and indigenous communities for effective implementation and support of the activities under the NAP.	910,000

The strategies and activities presented represent a comprehensive roadmap to guide the national efforts for the Government of Guyana to meet its obligations under the Minamata Convention, phase down the use of mercury in the ASGM sector and subsequently protect the human health and the environment of its nation while also protecting national patrimony.

Reduction of the Use of Mercury, Elimination of Worst Practices and Environmental Management Strategy

Strategic Objective 1:

Reduce mercury use in the ASGM sector, eliminate worst practices and increase management of environmental impacts through technical assistance to miners, building institutional capacity to strengthen monitoring and enforcement, improving processing techniques and adopting appropriate mercury-free techniques and technology where practicable.

Table 15: Intervention Areas and Activities for Strategic Objective 1

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
1.1 Reinforce monitoring and enforcement of Mining (Amendment) Regulations, 2005 by strengthening institutional capacity of government agencies, local authorities and village councils to reduce the risk of exposure of persons involved in ASGM and communities.									
1.1.1: Conduct an institutional needs assessment with regards to the management of the ASGM sector.	Action plan to improve capacity for monitoring and enforcement of the ASGM sector. Enhanced technical capacity to manage/monitor the ASGM sector	GGMC, EPA	MoL, MoH, GNBS, MNR	Mines Officers, Labour Officers, National Standards Officers, Health Officers, Environmental Officers	2022: Capacity needs report submitted	Capacity needs report Implemented		Capacity Needs Assessment Report	20,000
1.1.2: Develop an appropriate capacity building plan (including appropriate tools and equipment) to ensure compliance assistance is mainstreamed.	SMS gold mining operations use effective retorts or other appropriate mercury capture techniques/technology SMS Gold mining operations across all mining districts receive appropriate guidance (from GGMC, EPA) understand and comply with Mining (Amendment Regulations, 2005; Environmental Protection Regulations, 2000; and draft Code of Practice-Mercury	GGMC, EPA	MNR	SMS gold mining operations across all mining districts	Capacity building plan developed	Capacity building plan shared with mining operations		Capacity building plan Number of mining operations that receive compliance assistance	10,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
1.1.3: Train inspectors on ASGM sector monitoring, protocols, standards and regulations for environmental, mining and OSH Laws.	Improved monitoring and reporting of ASGMs activities by government inspectors Improved observance of OSH standards at ASGM sites by miners and gold/mercury traders Enhanced technical capacity of government inspectors to manage/monitor the ASGM sector Increased awareness of government inspectors on ASGM best practices and alternative technologies	GMSTCI, MNR, MoL, MoH	GGMC, EPA, MoLGRD	Inspectors in ASGM monitoring	2023: Training conducted with at least 50% of current inspectors from relevant agencies	Training conducted with remaining inspectors from relevant agencies		Documented Training Module Number of ASGM inspectors trained	50,000
1.1.4: Increased frequency of monitoring and inter-agency collaboration	GGMC's and EPA's officers have the capacity and tools to implement joint monitoring and enforcement and are better able to detect incidences of worst practices and take appropriate actions to eliminate these practices where identified Improved interagency coordination on monitoring of mercury	GGMC, EPA	MoH, MoL, MoLGRD	SMS gold mining operations across all mining districts	2022: Report developed on review of joint monitoring and enforcement programme between GGMC and EPA and recommendations 2023:	Ongoing increased frequency of monitoring and analysis in ASGM sites and communities (monthly monitoring)		Report on review of joint monitoring and enforcement programme and recommendations Number of inspectors assigned to each Mining District as guided by Action 1.1.1;	600,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	use in ASGM operations Efficient and continuous monitoring of compliance in the ASGM sector regarding mercury use through increased administrative powers Increased compliance with OSH and Mining Laws and regulations at ASGM operations Reduced mercury exposure to miners, dredge owners and gold/mercury traders, particularly, women of childbearing age and children Reduced environmental contamination at ASGM sites and nearby communities				Ongoing increased frequency of monitoring and analysis in ASGM sites and communities (monthly monitoring)			Number of inspections carried out; Percentage of ASGM operations in compliance with Mining and OSH laws in relation to mercury.	
1.1.5: Enhance Village Councils' capacity to monitor ASGM activities on Indigenous lands.	Completion of a review of the technical needs of Village Rangers Identification of the strengths and gaps of current mechanisms, including mining contracts, used by indigenous communities to	APA	GGMC, EPA, MoAA, NTC, MNR, GGDMA, NMS, GWMO, Village Councils	SMS gold mining operations across all mining districts	List of mining involved communities produced Technical needs assessment of village rangers and	Toolkit created and piloted in at least 1 community in each MD Training conducted with village rangers (at	Training conducted with village rangers (at least 90% of target communities)	Number of training events conducted (by MD) Number of persons trained (by MD and gender)	500,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	regulate ASGM activities on Amerindian Village Lands Creation of a Mining toolkit targeting Amerindian villages that includes a suite of robust templates and recommendations on mechanisms for monitoring ASGM activity by Village Councils Village Rangers and Village Councils trained to adequately monitor and govern ASGM activities on village lands.				monitoring mechanisms commences Technical/ legal review of mining contract samples initiated Stakeholder consultations Report of findings	least 50% of target communities)			
1.1.6: Equip each GGMC Mines Station with unmanned aerial vehicles (AEVs) (drones) to support their monitoring efforts.	GGMC Mines Stations across all districts equipped with at least one modern AEV with long-range and thermal vision Officers with monitoring responsibilities trained and licensed in the optimal use of these AEVs (drones) for enhanced compliance monitoring of mining activity Increase in officers' ability to more	GGMC	-	SMS gold mining operations across all mining districts	2022: AEVs (drones) incorporated into the budget 2023: AEVs procured for field stations in at least 3 MDs, and at least 90% of field officers trained and licensed	AEVs procured for remaining field stations and at least 90% of field officers trained and licensed		% of field offices with functioning AEVs % of field workers/inspectors trained (by Gender and MD)	50,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	efficiently monitor locations of ASGM operations and monitor mercury emissions, as facilitated by these AEVs (drones)								
1.1.7: Sensitisation of judicial officers in relation to court matters relating to mercury management	Judicial offers sensitised on the obligations of the Minamata Convention and related environmental protection legislation Prosecutors sensitised on presenting cases in relation to infractions in the Mining Act, Environmental Protection Act, and other related legislation and regulations involving mercury use and management Judicial guidelines provided on dealing with matters relation to mercury exposure from mercury usage	GGMC, MNR	Int'l partners, MoAA, GGDMA, GWMO, NMS, EPA, MoH, MoL	Judicial officers	2023: A programme for judicial sensitisation developed and approved	One training session annually		Programme of training developed Number of judicial officials trained Judicial guidelines created	150,000
1.2 **Increase the technical capacity of agencies to collect, analyse and improve access of data and sharing of information and provide training and support for compliance assistance across mining districts.**									
1.2.1: Develop and implement an interagency information system/ database.	Increased information sharing for decision making among lead and collaborating partners	MNR	EPA, GGMC		2023: Recruitment of tech consulting company to create a	Information system/database available and		Information system available and implemented	65,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
					platform to host mercury register/ database	implemented			
1.2.2: Develop a standardised data collection and monitoring tool or checklist for compliance to ensure that relevant agencies are thorough and sufficiently able to capture reliable data on mercury use in the mining districts.	Standardised data collection and monitoring tool in the form of a checklist for monitoring mercury use in ASGM Standardised and comprehensive monitoring and reporting of ASGM compliance Harmonised monitoring, reporting and increased ease of data sharing on mercury use amongst regulatory institutions	GGMC, EPA	PTCCB, MNR, MoH, GNBS, GRA, MoL, MoLGRD	Mines Officers, Labour Officers, National Standards Officers, Health Officers, Environmental Officers	2022: Review of current approach Inter-agency approaches streamlined 2023: Monitoring tool developed and piloted	Monitoring tool applied for OSH Compliance inspections		Creation of monitoring tool for standardized monitoring and inspection actions related to OSH compliance in ASGM	15,000
1.2.3: Facilitate the creation of robust mercury registers across all ASGM operations and Mining Districts.	A database of geo-referenced findings from monitoring and compliance checks, co-created by the GGMC and EPA and their officers/inspectors in tandem with activity 1.2.1. Creation of database that includes operation-level and Mining District-level mercury registers (inclusive of data on mercury purchased, used and	GGMC, EPA	MNR, EPA, PTCCB	SMS gold mining operations across all mining districts	2023: Recruitment of tech consulting company to create a platform to host mercury register/ database Database/ mercury register creation and piloting	Training of all field officers/ inspectors conducted. Mercury register available and implemented		Mercury register operationalised Number of officers trained (by MD)	100,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	recovered and details on the source of mercury supply, mercury sold or given, amount of mercury stocked on-site)								
1.2.4: Provide training to ASGM operations for recording their mercury use, including through the use of checklists for self-monitoring.	Miners empowered to routinely monitor and record their mercury use through maintaining their own operation-level mercury register.	GGMC, EPA	MNR, Village Council, GGDMA, GWMO, NMS	SMS gold mining operations across all mining districts		Standardised checklist and tools adapted for voluntary use by ASGM operators.	Miners trained to checklist	Number of training events delivered (by MD) Number of men and women in ASGM trained (by gender, job role and MD)	125,000
1.2.5: Equip government laboratories with tools for testing mercury levels in the environment.	Increased national capacity of government laboratories for mercury testing in the environment Report on needs assessment for building laboratory capacity to test for mercury Reliable and valid results for mercury testing in the environment	MoH, EPA, MNR	GAFADD, IAST, MoA, NGOs and other development partners (PAHO/WHO, CARPHA)	Laboratories	Needs assessment conducted to ascertain the current capacity and the specific training and equipment needs for laboratories	At least 1 laboratory equipped to conduct mercury testing in soil, water, sediment, air and plant and animal tissue		Needs Assessment Report prepared Number of laboratories equipped to detect mercury levels in the environment	130,000
1.2.6: Accrediting government laboratories for analysis of	Reliable, valid and certified results for mercury tests conducted in various environmental matrices	MoH, Laboratory to be accredited	GAFADD, IAST, Regional Accreditation Body	Chosen laboratory			Accreditation process completed for at least	Number of government laboratories accredited	20,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
mercury in the environment.							1 laboratory		
1.2.7: Support mining communities in monitoring tailings discharge by providing access to capacity building opportunities and mercury testing kits	Women in mining communities equipped with the technical and technological capacity to monitor tailings through CVAF-based mercury testing Enhanced tailings management due to increased mercury testing of mining effluents	EPA	APA, Village Councils, Town Councils, Women's Groups, GGDMA, GWMO, NMS	Mining Community	2022: Mercury testing kits incorporated into budget 2023: Mercury testing kits procured Process for requesting and disseminating kits established Awareness raising on process commenced	Project initiated in MD 2 and 3 with at least 20% of mining communities Training conducted with 3-5 women in each of the target communities[41]	Reports compiled with results from mercury tests for national review Project evaluated and assessed for scaled continuity	No. of communities in receipt of mercury testing kits (by MD) No. of training events conducted in communities (by MD) No. of women trained. No. of community-generated reports on mercury tests. % change in reports on tailings mismanagement	500,000
1.2.8: Conduct rapid baseline assessment of mercury levels	Improved knowledge of baseline mercury levels in the environment	EPA, GGMC, MoL, MoH	University of Guyana, IAST, GAFDD,	Mining districts	Rapid baseline study designed	Rapid baseline study executed	National advisory on the consumpti	Rapid Baseline Assessment of mercury levels in soil, water,	175,000

[41] Actions which target areas where there are catchment villages or satellite communities should consider each community/village as its own community and not treat the villages as a collective. There is sometimes vast distances to travel between communities and their situations may differ (For Example, training targeting Campbelltown would have 3-5 recipients for Campbelltown, and 3-5 for the satellite village of Princeville, etc would be trained). This is applicable for all proposed strategies which identify the number of participants to be trained per village.

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
in soil, water, air and fish within the mining districts,	Detection of potentially contaminated sites and mediums Improved reporting on mercury levels in the environment National advisory on the consumption of fish from inland waters		Civil Society (GGDMA, GWMO, NMS), NGOs (CI, WWF) and development partners (PAHO/WHO, CARPHA)		and execution commenced	Final report shared with the public	on of fish (by type) from inland waters	air and fish report prepared National advisory on consumption of fish (by type) from inland waters prepared	
1.2.9: Conduct routine assessment of mercury levels in soil, water, air and fish within the Mining Districts/ around ASGM sites for compliance with the relevant standards.	Improved monitoring of mercury levels with reference to the relevant standards Early identification of potentially contaminated sites and mediums Improved reporting of mercury levels in the environment Reduced public and occupational exposure to mercury emissions from ASGM activities	EPA, GGMC, MoL, MoH	University of Guyana, IAST, GAFDD, Civil Society (GGDMA, GWMO, NMS), NGOs (CI, WWF) and development partners (PAHO/WHO, CARPHA)		At least 2 assessments on Hg levels in air (public and occupational) conducted in communities where gold/ mercury traders operate	At least 2 assessments of levels of Hg in water/sediment/soils conducted in at least 2 hotspot ASGM areas Atleast 4 studies on Hg levels in air (public and occupational) conducted in communities (towns, indigenous communities, landings)	National advisory on the consumption of fish (by type) from inland waters	Number of routine mercury assessments conducted; Assessment reports	150,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
						where gold/ mercury traders operate within ASGM hotspot areas			
1.3 **Strengthening technical assistance and demonstration programmes in SMS gold mining operations, across all mining districts to ensure miners become aware of and adopt techniques to reduce mercury use and promote the use of mercury-free techniques and technology.**									
1.3.1: Review efficiency of existing retorts and identify and promote/ demonstrate other innovative mercury capture devices/ technology that can be applied in Guyana.	The most efficient applicable retort and/or other mercury capture devices/technology are in use by mining operations, gold buyers and shops across all mining districts	GGMC, GMSTCI	EPA, MNR, GGDMA, NMS, GWMO, NTC, Amerindian Village Councils, NGOs, other orgs working on mercury reduction initiatives	Mining operations, gold buyers and shops across all mining districts	2022: Report of efficiency of existing retorts 2023: Report on possible alternatives suitable for Guyana or best retorts to use	Demonstrations Mining operations begin to adopt and use these devices		Report on efficiency of existing retorts in use and recommendations Report and list of innovative mercury capture devices/technology and justification Number of mining operations, gold buyers /shops that adopt and use these devices	100,000
1.3.2: Dissemination of retorts at a subsidized cost to miners by the	Reduced incidence of worst practices Increased compliance with OSH and Mining	GGMC, MNR	MoL MoAA, NTC, GGDMA, GWMO,	SMS gold mining operations across all	2023: Development of eligibility criteria for disseminatio	Dissemination of retorts to those eligible		Documented eligibility criteria	30,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
Government of Guyana.	Laws and regulations at ASGM operations Improved health and environment in communities Increased recycling of mercury Reduced public and occupational exposure to mercury emissions from ASGM activities		NMS, NGOs and development partners	mining districts	n of retorts at subsidized cost			Number of retorts disseminated at subsidized cost	
1.3.3: Conduct demonstrations on the appropriate use of retorts and mercury capture systems for the burning of gold.	Increased procurement/ ownership and appropriate and consistent use of retorts and capture systems among miners and gold/ mercury traders and gold smiths	GGMC, GMSTCI	MoH; NGOs (WWF, CI); Civil society (NMS, GWMO, GGDMA)	SMS gold mining operations, gold traders and gold smiths across all mining districts		Identification of mining operations and gold traders with best practices based on assessment done in 1.3.2.	Demonstations on the use of these efficient retorts and best practices and communication via videos	Number of demonstrations conducted	40,000
1.3.4: Implement mining-district-level training interventions on mercury use in ASGM, targeting miners based on their gender and job roles.	Men and women in ASGM benefitting from targeted training and capacity building efforts accessible within their mining districts or at their operations Men and women in ASGM aware of their rights, opportunities and benefits applicable to them	GGMC, GMSTCI, BIT	MNR, EPA, GGDMA, NGOs, MoL, MoLGRD, NWG stakeholders	SMS gold mining operations across all mining districts	2023: Training piloted with at least 10% of ASGM operators in each MD. Training package updated based on pilot	Training conducted with at least 90% of ASGM operators in each MD by end of 2025.		Number of training events delivered (by MD) Number of men and women in ASGM trained (by gender, job role and MD)	1,000,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
1.3.5: Review of GGMC mercury free programmes to benchmark appropriate (cost and benefits) and effective mercury use reduction and mercury-free techniques and technology are being promoted	Affordable, suitable, and effective mercury reduction techniques and mercury-free techniques and technology are identified SMS gold mining operations across all mining districts adopt techniques for reduced mercury use and where applicable mercury-free techniques and technologies	GGMC	CI, WWF, EPA, MNR, GGDMA, NMS, GWMO, NTC, Amerindian Village Councils in mining areas	SMS gold mining operations across mining districts	Review GGMC's mercury-free programme and recommendations	Identify affordable and suitable techniques and technology Review lessons learned from existing efforts		List of affordable and suitable and effective mercury reduction techniques and mercury-free techniques and technology available	20,000
1.3.6: Develop pilot projects for use of cyanidation technique with established medium-scale operations that have the relevant financial, technical and human resources capacity, to implement and evaluate cyanidation techniques as an alternative to mercury use.	Demonstrate the effectiveness of cyanidation as an alternative gold recovery process and determine the ability of medium-scale operations to implement environmental safeguards	EPA, GGMC	Interested medium-scale operations, GGDMA, NMS, GWMO	Medium-scale gold mining operations				Number of medium scale operations participating in pilot Appropriate environmental safeguards and guidelines available at GGMC and EPA provided to guide implementation of pilot Number of cyanidation processing pilots developed and	TBD

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
								implemented and evaluated Evaluation reports of the cyanidation pilot	
1.4 **Strengthen environmental management in SMS gold mining sector through Strategic Environmental Assessment (SEA) and development of Environmental Management Strategy for SMS gold mining.**									
1.4.1: Conduct an SEA of the six mining districts to determine state of the environment and develop an environmental management strategy for SMS gold mining sector.	Assess environmental impacts in mining districts to inform policy regarding allocation/opening of mining areas	EPA	GGMC, MNR, GGDMA, NMS, GWMO	GGMC, EPA, MNR	2023: Report and recommendations of SEA			Report and recommendations of SEA Environmental Management Strategy Available by end of 2023	500,000

Formalisation, Regulation, and Update of Legislation

Strategic Objective 2:

Formalise and regulate the artisanal mining aspect of ASGM.

Table 16: Intervention Areas and Activities for Strategic Objective 2

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
2.1 Development of legal, regulatory and policy framework to adequately capture artisanal miners in Guyana's context.									
2.1.1: Provide a definition for artisanal miner in Guyana's context within legislation/regulations.	The update of existing legislation, or the development of new legislation and/or regulations which recognises and formalises artisanal miners in Guyana's context This updated/new legislation will assist Guyana to achieve compliance with Article 7 (4) (a) and (f) of the Minamata Convention.	MNR, GGMC	EPA, MoL, MoLA	Artisanal miners/Pork Knockers	Update of legislation and creation of policy framework commences Consultations towards legislative amendments Amendments passed in law			Amendments to Mining Act, Mining (Amendment) Regulations References to ASGM and mercury use in other mercury related environmental and health protection laws	25,000
2.1.2: Provide a mechanism for the regularisation of artisanal miners through the implementation of a formalised and regulated registration process.	The development of a regulatory framework and registration process that captures the artisanal miners (ie Pork Knockers/Punters) Provision of Guidelines for applying for an artisanal mining licence	GGMC	EPA, GGDMA, GWMO, NMS, NGOs and other development partners	Artisanal miners/Pork Knockers	2023: Dissemination of information to ASGM and communities Collection of information and nominal registration fee	Collection of information and nominal registration fee		Creation of register of artisanal miners Number of artisanal miners captured by the register	35,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
2.1.3: Provide adequate legal protection of Pork Knockers/Punters.	The Mining Act 1989 and the Mining (Amendment) Regulations 2005 are updated to provide strict penalties for persons who use unfair practices that may increase their exposure to mercury use, with recognition of the unique challenges that may be faced by women in ASGM Update on the claims and licencing regime within the GGMC with regard to ASGM, to ensure that there is proper distribution of lands according to the technical and financial capacity of applicants	GGMC	EPA, GGB, MoH, GGDMA, GWMO, NMS and NGOs	Artisanal miners/Pork Knockers	Update of legislation/draft legislation commences	Completion of update of claims/licencing regime and passage of updated legislation		Law created or updated to provide adequate protection to artisanal and small-scale miners, including women miners	25,000
2.2 **Assistance given to ASGM associations to provide adequate representation for artisanal miners (Pork Knockers/Punters)**									
2.2.1 Increase technical and financial capacity of Mining Associations to address the needs of artisanal miners.	Technical and financial capacity of Mining Associations bolstered and improved to address issues faced by artisanal miners Increased resources and technical capacity of Mining Associations	GGMC, GGDMA, GWMO, NMS	GMSTCI, MNR, EPA, GGB, MoH, MoL	Artisanal miners/Pork Knockers; Mining Associations	Ongoing technical and financial assistance			Developed mechanisms for training in use of mercury free technology Number of inspector/association reps in each mining district	600,000

Strategic Objective 3:

Update of legislation dealing with the regulation and use of mercury in ASGM.

Table 17: Intervention Areas and Activities for Strategic Objective 3

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
3.1 Further development and update of protocols and guidelines related to mercury use and importation.									
3.1.1: Review, finalise and implement draft Code of Practice-Mercury and draft Code of Practice-Tailings Management.	Approved Code of Practice-Mercury and Code of Practice-Tailings Management promoted and implemented across the SMS gold mining sector (including awareness and understanding of obligations from mining operations)	GGMC	MNR, EPA, GGDMA, NMS, GWMO, NTC, Amerindian Village Councils	All SMS gold mining operations				Finalised Codie of Practice-Mercury and Code of Practice-Tailings Management available Number of SMS gold mining operations that receive compliance assistance for implementation of Code of Practice-Mercury and Code of Practice-Tailings Management	66,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
3.1.2: Update public health, customs and labour related legislation, as well as the GNBS Use of Mercury national standards, with other mercury related standards and guidelines.	Public Health, OSH and Customs Acts revised/updated to include relevant mercury related standards and guidelines Update of GNBS' Codes of Safety in relation to Mercury Adoption of draft GNBS Codes of Safety in relation to mercury releases and emissions Increased knowledge on the extent of public health concerns surrounding mercury and the ASGM sector	MoL, MoH	GRA, GNBS, MNR, GGMC		Update of legislation/draft legislation commences Consultations towards legislative amendments	Amendments passed in law		Legislative Amendments/ regulations/ guidelines to existing Acts	20,000
3.1.3: Develop protocols for mercury decanting/ repackaging at mercury traders/ distributors.	Improved OSH practices at mercury traders based on the established protocols Reduced public and occupational exposure to mercury emissions from mercury traders, due to decreased emissions from the repacking/decanting process	EPA, PTCCB	GGMC, MoL	Mercury traders	Development of protocol			Protocol for mercury repackaging Percentage compliance of mercury traders	20,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
3.1.4: Further develop protocols and guidelines which address the processes to be involved with regard to mercury importation	Further development of public health protocols/guidelines for acute and chronic cases of mercury poisoning Provision of a mechanism for the monitoring of the destinations of imported mercury in Guyana to prevent its diversion into ASGM and processing	MoH, PTCCB	EPA, GGMC, MNR, MoH, GRA, GNBS, MoL	Importers; public health officials, artisanal miners, residents of mining communities	The process of reviewing the regulations initiated	Development of protocols ongoing Dissemination of approved Protocols		Regulatory review report and updated regulatory framework Number of updated laws and regulations that speak to worst practices in artisanal mining	15,000
3.1.5: Update of penalties within the Mining Act 1989, the Mining (Amendment) Regulations 2005 and the EP Act 1996 and its regulations.	Greater compliance with the Mining Act 1989, the Mining (Amendment) Regulations 2005, the Environmental Protection Act 1996 and its regulations due to increased penalties	GGMC, EPA	MNR, GGB, MoAA, MoL, MoH	Mines Officers, Labour Officers, National Standards Officers, Health Officers, Environmental Officers, Importers, Artisanal miners, residents of mining communities	Update of legislation/ draft legislation commences Consultations towards legislative amendments	Amendments passed in law	Dissemination of information to ASGM and communities	Updated legislation with increased penalties (Mining Act, EP Act, Amerindian Act and related regulations)	25,000
3.2 **Develop, sensitise and enforce public and occupational exposure standards (maximum permissible limits) for emissions and releases of mercury in the ASGM sector and in fish.**									

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
3.2.1: Develop national maximum permissible limits for mercury in fish	Maximum permissible limits developed in accordance with the procedure outlined by the GNBS Reduced exposure to mercury from fish	GNBS, GAFADD, MoH, MoA	EPA, MoAA, NTC, APA,		Development and consultation on National Standard for Mercury releases from ASGM commenced	National Standard for Hg in fish developed		Establishment and operationalisation of National Standard on permissible levels of mercury in fish	10,000
3.2.2: Develop national maximum permissible limits for mercury releases from ASGM activities	Maximum permissible limits developed in accordance with the procedure outlined by the GNBS Reduced exposure to mercury releases from ASGM activities	GNBS, GGMC, EPA, MoL	GGB, PTCCB, MoH, Civil Society and NGOs and other development partners		Development and consultation on National Standard for Mercury releases from ASGM commenced	Commencement of Monitoring and Enforcement in Accordance with the National Standard		Operationalisation of National Standard on mercury releases to the environment from ASGM sector	10,000
3.2.3: Develop national maximum permissible limits for public and occupational exposure to mercury emissions from ASGM activities,	Maximum permissible limits developed in accordance with the procedure outlined by the GNBS Reduced exposure to mercury releases from ASGM activities	GNBS, GGMC, EPA, MoL	GGB, PTCCB, MoH, Civil Society and NGOs and other development partners					Operationalisation of National Standard on mercury releases to the environment from ASGM sector	10,000
3.3 Introduce laws that require the ownership of a retort.									
3.3.1: Make non-ownership of a retort illegal.	Improved regulatory framework to enforce the use of mercury capture systems by ASGM operators through mandating the ownership of retorts	MoLA, GGMC	MNR		Regulatory review process initiated (inclusive of stakeholder consultations)	The regulatory framework created and updated, where applicable	Introduction of regulatory framework (inclusive of sanctions)	Number of retorts sold, by MD Regulatory framework reviewed and formalised.	950,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	Increased efficiency of ASGM operations through mandated access to mercury capture systems						Introduction of sanction component of regulatory framework	Law introduced to make non-ownership of a retort illegal Number of operations receiving sanctions related to retorts (% change) Number of operations using mercury capture systems (by MD and % change)	
3.3.2: Raise awareness on the benefits of a retort and the change of legislation prior to enactment.	ASGM operators aware of the benefit of mercury capture systems and the legal requirement to both own and use one.					Awareness-raising targeting miners to inform of regulatory changes and benefits of mercury capture system		Number of awareness-raising events conducted (by MD)	100,000

Development of Appropriate Financial and Market-Based Incentives

Strategic Objective 4:

Facilitate small- and medium-scale miners' access to finance to support their transition to mercury-free gold mining.

Table 18: Intervention Areas and Activities for Strategic Objective 4

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
4.1 Develop appropriate financial and market-based incentives for SMS gold mining sector to access and adopt appropriate mercury reduction and mercury-free techniques and technology.									
2.2.1: Policy to provide technical and financial assistance incentives to artisanal miners to aid their registration	Increase in the ability to monitor ASGM due to capturing as many artisanal miners as possible via the registration process. Assist in the reduction of mercury use and worst practices by artisanal miners Creation of a business unit within the GGMC to provide technical and financial assistance	GGMC, GGDMA, GWMO, NMS	MNR, EPA, GGB, MoH, MoL	Artisanal miners/Pork Knockers; Mining Associations	Policy initiation and consultation Sensitisation and information dissemination	Operation of incentives regime		Number of artisanal miners trained on ASGM sector protocols, standards and regulations including Environmental, Mining and OSH Laws	400,000
2.2.2: Research and develop financial and market-based incentives for adoption of mercury reduction and mercury-free techniques and technology and	SMS gold mining sector access and utilize available financial and market-based incentives for adoption of mercury reduction and mercury-free techniques and technology	MNR, GGMC	GGDMA, NMS, GWMO, CI, WWF, Financial institutions	All SMS gold mining operations across mining districts	Financial and market-based incentives programme developed and implemented by 2025			Financial and market-based incentives programme	50,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
mechanisms for access and terms and conditions.									
4.2 Reduce the barriers to financing mercury-free efficient technologies by improving men and women in ASGM's access to blended finance options, including through market-based interventions.									
4.2.1: Assess the legal and financial constraints that limit financial institution's service provision to men and women in the ASGM sector.	Rapid feasibility assessment conducted for expanding financial services to the ASGM sector and to Mining Districts. Gender-targeted risk reduction measures identified from the assessment to be simplified and published in a brief video and flyer and disseminated through social media and at public buildings in mining communities across all Mining Districts. Increased appetite for financial institutions lending to the ASGM sector.	MoF	Financial Institutions (Guyana Associaton of Bankers), Go-Invest, GGMC, MNR, Mining Associations	Financial Institutions	Feasibility assessment commenced, completed and presented. De-risking measures identified and negotiated.	Information disseminated to miners. Media outputs created on Guyana's ASGM sector At least 1 financial institution commencing infrastructural or technological work to facilitate expansion into ASGM community	At least 2 financial institutions complete infrastructural or technological works to facilitate expansion into ASGM community.	Feasibility assessment completed No. of financial institutions expanding services to mining communities (by MD) No. of financial institutions removing gender discriminatory restrictions limiting women miners' access to finance No. of miners accessing financial services (by gender, type	500,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	Established commercial bank facilities accessible by men and women within MDs.					Media outputs targeting financial institutions on Guyana's ASGM sector disseminated		of project, type of service, and MD)	
4.2.2: Identify and share information on financial products available in the financial system (investments and credit) and existing tax incentives that could be accessed by SMS gold miners, as individuals or as established associations or syndicates.	Publishing of identified financial products accessible to ASGM through financial institutions. Financial institutions are more aware of effective pathways for sharing information with men and women in ASGM. Instructional material that explains the advantages and benefits of ASGM miner associations. Men and women in ASGM are more aware of available financial benefits.	MoF	Financial Institutions (Guyana Associaton of Bankers), Go-Invest, GGMC, MNR, Mining Associations	SMS gold miners	Existing financial products packaged for dissemination to miners. Marketing material on Mining Associations created	Marketing/ messaging created for engaging financial institutions on accessing ASGM. Dissemination of information to ASGM community	Dissemination of information to ASGM community	Number of financial services targeting ASGM Number of miners applying for financial services, by gender and MD Number of miners being approved for financial services, by gender and MD Number of ASGM members in Mining Associations	95,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
								Number of financial institutions implementing targeted services for the ASGM Sector	
4.2.3: Support SMS miners' financial literacy and business capacity.	Financial Literacy training package developed to target the realities and behaviours of SMS gold miners Financial Literacy training targeting SMS gold miners piloted in each Mining District Miners' enhanced capacity to manage their own personal and business finances following their participation in training sessions delivered by Mining Associations, the SBB, and financial institutions.	MoF/SBB	Mining Associations	SMS gold mining operations across mining districts	Robust financial literacy and business training created to target ASGM miners.	Training delivered to at least 40% of current miners in each MD.	Training delivered to at least 90% of current miners in each MD.	Number of training events delivered (by MD) Number of men and women in ASGM trained (by gender, job role and MD)	950,000
4.3 Increase miners' capacity to reduce mercury use in the ASGM sector through the establishment of the Miners Assistance Fund.									

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
4.3.1: Legislative review and enactment of the Miners Assistance Act.	Legislative review of the Miners Assistance Act, specifically related to "Amount of Assistance (Section 13 (1)) and Repayment of Assistance (Section 14) Enactment of legislation to provide financial assistance to miners Men and women in mining receiving access to finances made available by the state, as provided for in Section 5 of Cap 65:08 (Miners Assistance Act)	MNR	Mining Associations		Legislative review commences, inclusive of stakeholder engagement Legislative review completed and enforced Reviewed sums of funds available to facilitate ASGM miners' access to mercury-free technology determined Information dissemination to ASGM community commences, across all MDs	Miners Assistance Fund established and introduced		Legislative review of the Miners Assistance Act completed (including updated Sections 13 and 14) Miners Assistance Fund established No. of men and women in ASGM receiving information on the Act and Fund (and as % of registered men and women miners in MD)	70,000
4.3.2: Establishment of Advisory Committee to facilitate Miners Assistance.	Establishment of a Miners Assistance Advisory Committee Processes established to facilitate women and men in ASGM's access to financial assistance	MNR	Mining Associations, Ministry of Finance		2023: Miners Assistance Advisory Committee established and at least	Information dissemination to ASGM community commenc	Request for funding applications received from all MDs	Miners Assistance Advisory Committee established No. of applicants	9,000,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	provided by the state, for improvement of their operations.				1 meeting completed Process, with related SoPs and protocols, identified for receiving and responding to applications for funding requests Budget for Miners Assistance Fund proposed	es, across all MDs	Funding awarded to at least 50% of qualifying ASGM applicants	(and % of applicants receiving funding, by gender and MD)	

Strategic Objective 5:

Build the economic resilience of men and women involved in ASGM and mining communities by facilitating their access to alternative or complementary livelihood options.

Table 19: Intervention Areas and Activities for Strategic Objective 5

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
5.1 Expand entrepreneurship and employability interventions into mining communities by providing options that stimulate complementary and alternative productive ventures.									
5.1.1: Improve miners' access to currently available training to boost their employability within and beyond ASGM.	Consolidated and published calendar of training events (COTE) provided by participating agencies available to ASGM miners across mining districts. Increased access to training for men and women employed at ASGM operations Streamlined programme of work across BIT, GMSTCI and SBB, as evidenced by a signed inter-agency MOU Men and women in ASGM who access training from BIT and GMSTCI are further able to access some financing of their developed business plans from SBB through grants or loans	GMSTCI, BIT	SBB/ MoF, Mining Associations	SMS gold miners	System identified for consolidating and publishing joint COTE Co-operation agreement in place. COTE publicized to ASGM stakeholders (miners, associations, and mining communities) Framework and Operational guidelines created for the Fair Consideration for Employment of Locals Strategy	Joint training delivered to target ASGM-involved participant Annual programmes evaluation conducted 50% of large-scale operations with Fair Consideration for Employment of Locals Strategies	Joint training delivered to target ASGM-involved participants All large-scale operations with Fair Consideration for Employment of Locals Strategies	No. of training events delivered (by MD) No. of men and women in ASGM trained (by gender, job role and MD) No. of men and women in mining communities benefitting from employment at large-scale mining operations No. of large-scale operations creating Fair Consideration for Employment of	2,000,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	Men and women in mining communities benefitting from employment provision at large-scale mining operations Large scale operations with Fair Consideration for Employment of Locals Strategies, supporting the local economy through provision of jobs				targeting large-scale operations			Locals Strategies No. (and %) of large-scale operations implementing Fair Consideration for Employment of Locals Strategies No. (and %) of staff at large-scale gold mining operations who originate from nearby communities (by gender and MD)	
5.1.2: Strengthen collaboration among the GMSTCI GGMC, GGDMA, NMS, and GWMO for provision of training and technical assistance in prospecting and mine planning	SMS gold mining operations access and receive training in the field in geology, mineralogy, ore grade, prospecting survey and sampling methods All SMS gold mining operations across all mining districts implement improved prospecting and mine planning into their operations.	GMSTCI	GGMC, GGDMA, NMS, GWMO	GMSTCI, Mining Associations	Assessment of gaps in current training curriculum Update in training curriculum	New training sessions commence		Updated training curriculum and plan available Quarterly reports on number of training sessions and number of mining operations that received training	20,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
5.1.3: Expand TVET institutions located within mining communities to deliver high-value programmes aligned with local labour market needs.	Identified high-value training options to be developed for mining communities. Public buildings in each MD repurposed for use by TVET institutions. Increased access of miners and mining communities to high quality training aiming to boost their employability. Established accredited TVET institutions accessible across all MDs.	MoE	MoL, GMSTCI, BIT	Mining districts	Identification of potential public buildings to facilitate permanent facilities for TVET institutions Assessment conducted at each facility to cost expansions. Infrastructural work commenced in at least 2 MDs Evaluation team recruited to design methodology for assessing outcomes of 5.1.1 and 5.1.3	Gap Assessment conducted to identify potential high-value programmes that align with local labour market opportunities and needs in each MD conducted alongside programme evaluation in 5.1.1 Curriculum Development team recruited/assembled and curriculum development commenced Infrastructural work for expanding	Curriculum consultations and piloting Introduction of new programming Recruitment and training of staff TVET institutions commence process for CXC's CVQ accreditation.	No. of TVET institutions constructed in MDs (by MD)	120,000,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
						TVET services completed in remaining MDs.			
5.1.4: Institutional commitment and action by ASGM stakeholders to streamline employability interventions targeting women in mining communities.	Feasibility analysis within each Mining District on opportunities for increasing access to part-time jobs for women in ASGM communities Secondary breadwinners of ASGM households increasing their access to secondary streams of income. Micro-enterprise training provided to women from households in ASGM communities that are solely financially dependent on gold mining Commitment to a partnership established between GMSTCI, BIT, Mining Associations and the SBB to coordinate efforts	GMSTCI, BIT	SBB, Mining Associations	Relevant Institutions	MoU across agencies negotiated and signed. At least one co-ordinated intervention targeting women in 2 MDs	At least two co-ordinated intervention targeting women in at least 2 MDs per year		Feasibility Analysis Report MOU developed and signed No. of trainings co-ordinated	400,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	through coordinated training plans								
5.1.5: Conduct feasibility analysis on community-based credit union/saving clubs.	Men and women in ASGM accessing capital for investment in their operations through local formalised co-operative models Feasibility analysis conducted on viability of community-based credit union or savings clubs	MoL	Mining Associations Town Councils Village Councils	Credit union/saving clubs.	Feasibility analysis completed and findings presented Credit Union institutional and financial frameworks and protocols established an formalised	Recommendations piloted in at least 3 MDs Information disseminated to ASGM community End-of-year evaluation of pilot completed.	Expansion of programme into all MDs. Information disseminated to ASGM community	Summary Report of feasibility analysis disseminated to men and women in ASGM. No. of credit unions established (by MD) No. of members of credit unions (by MD and gender)	50,000

Management of Mercury Trade

Strategic Objective 6:

Effectively manage the importation and internal trade of mercury in the SMS gold mining sector, and encourage compliance of relevant regulations of the PTCCB, GGMC, GRA and EPA with importers and distributors.

Table 20: Intervention Areas and Activities for Strategic Objective 6

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
6.1 Strengthen collaboration among MNR, PTCCB, EPA, GRA, GGMC and the GPF for improved management and regulation of the importation and internal trade in mercury within the SMS gold mining sector.									
6.1.1: Review and strengthen licensing system toward single window platform with allocation of annual import quotas that are consistent with the objectives of the NAP.	Appropriate and fair single window licensing system and allocation of annual importation quotas for mercury	PTCCB	GGMC, MNR EPA, GRA, GGDMA, NMS, GWMO, NTC	Importers, GGDMA, NMS, GWMO	Update of strengthened licensing system and allocation of annual import quotas by end of 2023.			Licensing system and method for allocation of annual import quotas published Publication of annual import quotas, licenses issued, and annual imports	6,000 Recurring cost approx. 2,000 per annum
6.1.2: Review and strengthen system for tracking distribution and trade of mercury including data collection and reporting.	Effective tracking, data collection and reporting system in place for tracking distribution and trade of mercury in SMS gold mining sector	PTCCB	GGMC, EPA, MNR, GGDMA, GWMO, NMS	Mercury traders, sellers, PTCCB, GGMC, EPA, GGDMA, NMS, GWMO	Development of reports on implementation of tracking system Create list of traders/sellers			Reports from respective agencies (PTCCB, EPA, GGMC) on implementation of tracking system List of traders/sellers, quantities of mercury	25,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
								traded and sources and sinks	
6.1.3: Joint monthly monitoring and enforcement to detect breaches of respective regulations in terms of handling, storage and transportation of mercury, including licensing of traders.	Mercury traders, sellers comply with regulations	GGMC	PTCCB, EPA, MNR, GGDMA, NMS, GWMO	Mercury traders, sellers in mining towns and landings across all mining districts	Ongoing monitoring efforts			Monitoring reports and status of compliance by traders/sellers	100,000
6.1.4: Undertake collaborative surveillance of porous borders to strengthen identification and tracking of any illegal mercury exports and imports	Determination of any illegal export/reduced illegal exports/imports and appropriate actions taken to address/deter same	GRA	MNR, GGMC, GPF	Importers/ exporters	Increase training, transport provisions and equipment			Reports on any illegal exports/ imports	100,000

Public Health

Strategic Objective 7:

Improve health information systems, including the gathering of health data on the impacts of mercury on miners and communities.

Table 21: Intervention Areas and Activities for Strategic Objective 7

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
7.1 Conduct situational analysis of public health concerns in relation to mercury in the ASGM sector, host and downstream communities.									
7.1.1: Assessment of prevalence and disease burden of mercury in ASGM sector, host and downstream communities.	Existing cases of mercury poisoning determined Health impact of mercury exposure on the population measured Increased knowledge on the extent of public health concerns surrounding mercury and the ASGM sector, host and downstream communities to guide planning and the direction of resources (financial, human, technical, among others)	MoH	NGOs and development partners (PAHO/WHO, CARPHA)	ASGM sector, host and downstream communities.	Assessment ongoing and completed by 2026			A baseline survey report produced and published	300,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
7.1.2: Disseminate results of the assessment of prevalence and disease burden of mercury to national and local stakeholders.	Increased national stakeholder awareness on the severity and extent of public health concerns, and effects of mercury on human health	MoH	GGMC, EPA, GGB, MoAA, GGDMA, GWMO, NMS, Local Governance Bodies (RDC, Mayor's Office, Indigenous Village Councils), NGOs and other development partners (PAHO/WHO)	National and local stakeholders			Dissemination of assessment report	Number of national stakeholders in receipt of survey report Number of survey reports published and disseminated	8,000
7.2 Improve surveillance and health information systems to incorporate mercury.									
7.2.2: Develop and implement a health surveillance system for mercury.	Development of a surveillance system for mercury to identify pathologies in the ASGM sector, host and downstream communities	MoH	NGOs and development partners (PAHO/WHO, CARPHA)	Health sector	Development of improved surveillance system	Improved surveillance system in pilot mode	Improved surveillance system in permanent mode	Implemented surveillance system for mercury	20,000

Strategic Objective 8:

***Strengthen the institutional capacity of the public health care system to provide healthcare services (diagnosis, management and treatment) for persons directly or indirectly exposed to mercury (differentiated by gender) in the ASGM sector, host and downstream communities*.**

Table 22: Intervention Areas and Activities for Strategic Objective 8

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
8.1 Build the capacity of public health care workers, on the health effects of mercury, diagnosis, management and treatment of mercury related health issues.									
8.1.1: Train public health care workers, including community health workers, on the effects of mercury and how to diagnose, manage and treat mercury-related complications.	Increased capacity of all categories of public health care workers to diagnose and treat mercury related health issues Early diagnosis and treatment of mercury related health issues	MoH	NGOs and development partners (PAHO/WHO, CARPHA)	Health care workers	50% health care workers trained by 2024; 90% health care workers trained by 2026			Document that describes the training programs related to the diagnosis, management and treatment mercury-related health issues Number of health care workers trained	100,000
8.1.2: Create standard operating procedure (SOPs) and protocol/ guideline for diagnosis, management and treatment of acute and	Early and efficient diagnosis, management and treatment of mercury-related complications	MoH	NGOs and development partners (PAHO/WHO, CARPHA)	Health care system	The process of creating protocols commenced	Development and Dissemination of approved protocols		Diagnosis, management and treatment protocols for cases of acute and chronic mercury poisoning established	10,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
chronic mercury poisoning.									
8.2 Strengthen laboratory diagnostic and analytical capacities to test and diagnose mercury in humans.									
8.2.1: Assess existing technical capacity of both private and state-run laboratories, to offer services for identifying or determining mercury content in tissue, hair, blood and urine.	Assessment of national laboratory capacity to test for mercury in humans List of potential laboratories with current technical capacity for testing mercury levels in humans Reliable and valid results for mercury levels in humans	MoH, GNBS	NGOs and development partners (PAHO/WHO, CARPHA)	Laboratories	Detailed information available about laboratories that have the capacity to determine or investigate mercury levels in humans			Capacity of laboratories identified in the assessment report prepared	15,000
8.2.2: Establish a network of state-run and private laboratories and institutions, that can offer support to routine testing for mercury	An established network of laboratories and institutions for mercury testing, formalized through working agreements Reliable and valid results for mercury levels in humans	MoH, GNBS	EPA, GGMC, NGOs and development partners (PAHO/WHO, CARPHA)	Laboratories	Review process for laboratory and institute evaluation commenced	Laboratory network established		Network of laboratories identified and formalized through written working agreements for research and routine analysis of mercury levels in	10,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
								specific parameters	
8.2.3: Equip and accredit state-run laboratories for testing mercury levels in humans.	Increased public health capacity for mercury testing in humans Reliable and valid results for mercury	MoH, GNBS	NPHRL, IAST, GAFDD, NGOs and development partners (PAHO/ WHO, CARPHA)	Laboratories			At least 1 laboratory equipped and accredited to conduct mercury testing in humans (tissue, hair, blood, urine)	Number of Government laboratories equipped to detect mercury levels in humans	250,000
8.3 Strengthen the public health medical emergency system to respond to health emergencies including mercury poisoning.									
8.3.1: Assess emergency transport requirements for public health facilities servicing ASGM communities.	Adequate emergency transport services by public health facilities provided to ASGM communities Improved national response to health care emergencies in ASGM areas.	MoH, MoPW	MNR, GGMC, EPA, GGB, MoAA, GGDMA, GWMO, NMS, Local Governance Bodies (RDC, Mayor's Office, Indigenous Village Councils) and NGOs and other	Public Health Facilities in mining districts	Assessment of emergency transport services commenced		Selected ASGM sites equipped with emergency transport units in line with the assessment	Presentation of the analytical report explaining the need for emergency transport and routes in ASGM sites	160,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
			development partners (PAHO/ WHO, CARPHA)						
8.3.2: Strengthen the emergency network with large-scale mining companies located in close proximity to ASGM, host and downstream communities.	Adequate emergency transport services provided to ASGM communities Improved response to health care emergencies in ASGM areas.	MoH, MNR	GGMC, EPA, MoAA, MoH, GGDMA, GWMO, NMS, APA, Local Governance Bodies (RDC, Mayor's Office, Indigenous Village Councils) and NGOs and other development partners (PAHO/ WHO, CARPHA)	Large scale mining operations		At least one agreement has been implemented for strengthening emergency services in ASGM communities	At least three agreements have been implemented for strengthening emergency services in ASGM communities	Number of agreements for strengthening emergency service cooperation with medium- and large-scale companies and ASGM Associations, ASGM and community members Existence of community relations and healthcare assistance by Mining Companies for the community	10,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
8.3.3: Develop a contingency and emergency plan, including mercury, proposed by the MoH for the public health system.	Consolidated and/or updated plan for contingencies and emergencies in ASGM sites Improved national response to health care emergencies in ASGM areas.	MoH	GGMC, EPA, GGB, MoAA, GGDMA, GWMO, NMS, Local Governance Bodies (RDC, Mayor's Office, Indigenous Village Councils) and NGOs and other development partners (PAHO/ WHO, CARPHA)	Health care system	Development of contingency and emergency plan		Disseminate contingency and emergency plan	Contingency and emergency plans for ASGM areas	60,000

Vulnerable Groups

Strategic Objective 9:

Reduce the risk of mercury exposure of vulnerable populations, particularly children and women, to emissions and releases caused by the ASGM sector and improve gender mainstreaming (or equality).

Table 23: Intervention Areas and Activities for Strategic Objective 9

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
9.1 Strengthen multi-agency approaches for monitoring the presence of children living, playing, or working in/near ASGM operations.									
9.1.1: Establish an inter-agency task force for Child Protection in Mining.	Enhanced inter-agency approach to responding to child labour incidents involving ASGM operations.	MoL	GGMC, GPF, Mining Associations Welfare and Probation Officers of MoHSSS and MoE MoL, REOs, Schools CSOs/ NGOs actively involved in child protection.	Children in ASGM communities	Inter-agency Task force created Inter-ministerial MOU signed	At least 12 meetings of Inter-agency Task Force completed over 2-year period		Task Force institutionalised.	24,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
9.1.2: Standard Operating Procedures introduced to guide reporting and response to child labour incidents.	Enhanced approach to reducing the presence of children on ASGM operations.	MoL	CPA GGMC GPF Mining Associations Welfare and Probation Officers of MoHSSS and MoE MoL REOs Schools CSOs/NGOs actively involved in child protection.	-	SoPs drafted, reviewed, formalized and introduced within each agency			SOPs operationalised.	95,000
9.1.3: Expand the response to truancy through outreach efforts that raise the awareness of child protection within the context of ASGM.	Enhanced community and parental awareness of child labour and child protection within the context of ASGM activities.	MoE	MoHSSS/CPA Mining Associations GGMC MoL MoE	SMS gold mining communities	Conduct a baseline assessment of child labour in ASGM activities	At least one intervention to respond to truancy in ASGM communities introduced and piloted Referral and reporting mechanism introduced	Outreach programmes conducted Conduct a post-assessment on child labour in ASGM activities following the outreach activities	Number of interventions aiming to target child labour (by MD) Number of agencies implementing programmes to target child labour % change in reports and observations of	480,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
						across agencies Outreach programmes conducted		child labour (by MD)	
9.1.4: The Ministry of Labour to recruit and train labour inspectors from mining communities.	Increased human resource capacity for monitoring the adherence of labour laws at ASGM operations and curbing labour infractions Increased compliance monitoring and regulatory enforcement of protocols, standards, regulations, and laws governing children's presence on ASGM operations.	MoL	Village Councils Town Councils	Mining communities	Labour Inspectors recruited in all MDs			Number of labour inspectors recruited (by MD and gender)	480,000
9.1.5: Expand Hinterland School Feeding Programmes to all schools within mining communities in Regions 7 and 8 (MDs2, 3, 4 and 6).	Increased school attendance by students of nursery and primary schools in mining districts identified as recipients of the School Feeding Programme Decreased presence of children at ASGM operations Markets provided for women's groups and local farmers in mining	MoE	Village Councils Women's Groups in mining communities Guyana Energy Agency MoA/ NAREI GWMO MNR MoHSS	Youth in Mining Communities	Expansion of Hinterland School Feeding Programme into at least 10 schools in Regions 7 and 8 Procurement and installation of solar freezer	Continued expansion of programmes, procurement of freezer systems and training of women Programme evaluation (annual) and assessment of phases continuity at the beginning of 2026		No. of programme evaluations completed. No. of schools where Hinterland SFPs were introduced. % of hinterland schools with SFPs (by MD)	4,000,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	communities in support of livelihood options beyond ASGM Schools participating in the SFP equipped with solar freezer systems Women in mining communities provided with technical equipment and training to repair and maintain the SFP's solar freezer systems Feasibility study conducted for the establishment of co-operative farms ran by women and youth groups in schools and communities participating in the SFP Co-operative farms established in mining communities where agricultural activity is minimal, through financial and technical support		UNFPA, UNEP and UNICEF		systems for the SFPs 3-5 Women in mining communities provided with technical equipment and training to repair and maintain the SFP's solar freezer systems			No. of student beneficiaries to the Hinterland SFP and (% of school population benefitting) No. (and %) of schools with SFPs benefiting from solar freezer systems No. of women trained % of inputs into the SFP (vegetables, poultry etc.) procured from community farmers (by gender) No. of feasibility studies conducted aimed at creating community co-operative farms No. of community co-operative farms established	

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
9.1.6: Pilot a programme in Mining District 2 that aims to improve community-based access to social safeguards such as guidance and counselling services and day-care services to reduce children's presence at ASGM operations.	Programme piloted in MD 2 for school-based guidance and counselling services Programme piloted in MD 2 for community-based day-care services Decreased presence of children at ASGM operations	MoHSSS	Town Council Village Council GGMC MoE	Children/ youth in mining communities	Programmes piloted		Programme evaluation conducted Programme impact evaluation conducted and recommendations for expansion presented	Number of children from ASGM-involved families using the services of community day care centres. Impact on child labour trends at the community level (% change)	380,000
9.1.7: Conduct feasibility study to expand secondary schools in mining communities in Regions 7 and 8 (Mining Districts 2, 3, 4 and 6).	Mining communities identified as beneficiaries for the expansion of secondary education institutions.	MoE (Hinterland Development)	MoLG Mining Associations	Youth in mining communities	Feasibility study conducted Budget proposals drafted based on feasibility assessment			Feasibility assessment disseminated to bilateral funding agencies or IFIs	1,000,000
9.1.8: Expand secondary school availability in mining communities in Regions 7 and 8 (Mining Districts 2, 3, 4 and 6).	Decreased presence of children at ASGM operations through improved access to secondary education in mining communities Decreased presence of children at ASGM operations as a result of	MoE (Hinterland Development)	MoLGRD Mining Associations	Youth in mining communities (2,3,4 and 6)	Infrastructural works commenced in at least one MD	Infrastructural works continued		Number of secondary schools accessible in MDs (and % change) Number of students registered for	2,300,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	increased academic engagement of adolescent boys							attendance t secondary schools (by gender and MD; % change)	
9.2 Reduce barriers faced by women that limit their earning capacity across the ASGM value chain.									
9.2.1: Launch programming to increase women in mining and reduce stereotypes related to women in ASGM.	Programme targeting stereotypes related to women in ASGM launched Work/implementation agreement, as evidenced by an MOU, established across the Mining Associations, EPA, GGMC, MoL (including BIT) and the MoF (specifically SBB) An increased presence of women in ASGM through targeted awareness efforts aimed at decreasing stereotypes	MNR	GWMO and other Mining Associations in collaboration with NWG	Women in mining	Consultations to determine final programme design and pre-requisites completed by 2023 Programme launched and marketing commences. Awareness raising and recruitment			No of programme applicants (by administrative region)	48,000
9.2.2: Provide robust and competency-based training programme to identified women miners in the WiM-FM Programme.	Improved technical competencies and business management skills of new entrant women in ASGM Programme recipients of the WiM-FM programme introduced	MNR	GWMO and other Mining Associations in collaboration with NWG	Women in mining	Participants screening and selection complete. Project team assembled or recruited.	Trainings conducted and evaluated (annually)		Number of training events delivered (by MD) Number of women in ASGM trained (by MD)	720,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	to an array of pathways for income generation within the ASGM sector								
9.2.3: Provide opportunities for women to gain practical on-the-job experience.	Formalised work partnerships and technical agreements established between new persons entering and seasoned/mature ASGM operations. Women entering into ASGM accessing mentorship to improve the efficiency of their operations.	MNR	GWMO and other Mining Associations in collaboration with NWG GGMC	Women in mining		Mentorship/ OTJ component of training complete and evaluated (annually)		Number of programme participants accessing mentorship (%) % of programme participants reporting value for time	70,000
9.2.4: Implement programming to facilitate access to financing of efficient technologies and other inputs targeting women entering to the ASGM sector.	Improved technical and technological capacity for new entrant women in ASGM through financial support from the GGMC	MNR	GWMO and other Mining Associations in collaboration with NWG GGMC MoF	Women in mining	Financial institution's 2-year commitments to funding participants negotiated and secured.	At least 10% of programme participants procure mercury-free technology through available funding. Financial institution's 2-year commitments to	At least 50% of programme participants procure mercury-free technology through available funding.	Number of financial institutions committing to funding efforts in ASGM Number of recipients of funding (by MD, type of funding, and gender)	95,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
						funding participants negotiated and secured.			
9.2.5: Provide mercury-free gold certification for women miners' access to markets.	Establishment of an evaluation and certification system for ASGM that includes recognition of gold produced by mercury-free operations Women in ASGM accessing financing or markets using their mercury-free gold certification	GGB	NWG MNR	Women in mining	Evaluation and certification system established.	Information disseminated to general ASGM community, with specific efforts to target women miners, in all MDs.	At least 30% of programme participants accessing global markets for mercury-free gold.	Certification system established and operationalised Number of miners applying for certification (by MD and gender) Number of miners approved for certification (by MD and gender)	240,000
9.2.6: Enforce applicable fines for gender-discriminatory labour practices.	Reduced barriers and fair work conditions for women seeking employment in ASGM.	MoL	GGMC	Women in mining	Sanctions reviewed. Information disseminated to ASGM community	Sanctions enforced. Information disseminated to ASGM community.		National operationalised standards governing ASGM, specific to mercury use.	70,000

Awareness Raising and Outreach

Strategic Objective 10:

Raise the awareness of small- and medium-scale gold miners and mining communities on the detrimental effects and safe use of mercury, develop health programmes and strengthen education and outreach programmes, including specific education programmes targeting youth, women and indigenous communities for effective implementation and support of the activities under the NAP.

Table 24: Intervention Areas and Activities for Strategic Objective 10

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
10.1 Raise the awareness of mercury's effects on human health and the environment through training and awareness-raising initiatives, targeting both men and women employed directly in ASGM as well as residents of mining communities.									
10.1.1: Design and develop Information Education Communication (IEC) and gender-targeted material aimed at raising the awareness of men and women working is ASGM activities on the effects of mercury on the human body and environment.	A suite of gender-targeted messaging/ IEC material created on mercury's effects on people and the environment Synchronised messaging and approaches related to the detrimental aspects of ASGM accessible to, and used by, ASGM stakeholders during their education and awareness efforts.	MNR	MoH, GGMC, EPA, MoL, MoLGRD, NMS, GGDMA, GWMO, NGOs (WWF, CI), other developmental partners; PAHO/ WHO	ASGM communities	Gender-targeted training package created		Training evaluation conducted to assess behaviour change	Training package distributed.	100,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
10.1.2: Provide gender-specific information on the detrimental effects of mercury use on humans and the environment that target residents of mining communities.	Men and women, including children, youth and parents, of mining communities benefitting from targeted training and capacity building efforts Gender-specific and community-friendly information on the detrimental effects of mercury created in various languages (Spanish, Portuguese, English, Creole and Indigenous)	MNR, GGMC	Town Councils Village Councils GGDMA, GWMO, NMS, NGOs (WWF, CI), other developmental partners; PAHO/ WHO	ASGM communities	Adaptation of material created for use in communities	Gender-specific information on effects of mercury disseminated to residents in at least 90% mining communities.		Number of communities benefiting from gender-specific information on mercury effects. Number of beneficiaries (by MD and gender)	200,000
10.1.3: Train community members to become community facilitators and disseminate information about mercury and promote practices to reduce mercury exposure.	Increased human resources to disseminate information about mercury in ASGM communities Improved knowledge and consistent use of PPE among ASGM Reduced prevalence of burning at home without a retort. Increased compliance with OSH and Mining Laws and regulations at ASGM operations Increased knowledge transfer in communities between trainers and	GGMC, GMSTCI	EPA, MoL, MoH, GNBS, MNR, GMSTCI, Int'l partners	ASGM Mining communities	Development of training programme and identification of persons to be trained	Ongoing training and collaboration. At least 2 sessions in each MD per annum and 1 session for the Mining Associations per annum.		Training document produced Number of training sessions per annum Number of persons trained	300,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
	stakeholders in the proper and reduced use of mercury.								
10.2 Strengthen the Mining Organisations' education, awareness and outreach programmes to support the activities under the NAP.									
10.2.1: Technical assistance activities included in communication strategy to promote uptake of mercury reduction and mercury-free techniques and technology across mining districts.	Increased awareness, and technical knowledge, and access to mercury reduction and mercury-free techniques and technology among mining operations	GGMC	GGDMA, NMS, GWMO, CI, WWF, EPA, NTC, Amerindian Village Councils in mining areas, Int'l funding orgs	SMS gold mining operations	Development of communications strategy	Outreach efforts and demonstration pilots		Communication strategy available Number of SMS gold mining operations receiving technical assistance Number of demonstrations pilots across all mining districts	210,000
10.2.1: Increase education and awareness for the promotion of elimination of whole ore amalgamation and open	Promotion and monitoring of compliance with regulations and Code of Practice-Mercury mainstreamed in education and awareness	GGDMA, NMS, GWMO	GGMC, EPA, MNR, NTC, Amerindian Village Councils	SMS gold mining sector	Development of communications strategy	Outreach efforts		Communication strategy available Reports on number of members reached and	50,000

Activities	Expected Results	Lead Agencies	Collaborators	Target Population	Targets			Indicators	Estimated Budget (USD)
					2022/2023	2024/2025	2026/2027		
burning of amalgam.	programmes of GGDMA, NMS, GWMO GGDMA, NMS, GWMO membership increased compliance with regulations and Code of Practice-Mercury							status of compliance	
10.2.3: Strengthen education and awareness for the promotion of improved tailings management, waste management, implementation of EMP and progressive backfilling/reclamation (medium-scale).	Promotion and monitoring of compliance with regulations and Code of Practice-Mercury mainstreamed in education and awareness programmes of GGDMA, NMS, GWMO GGDMA, NMS, GWMO membership comply with regulations and Code of Practice-Mercury	GGDMA, NMS, GWMO	GGMC, EPA, MNR, NTC, Amerindian Village Councils	SMS gold mining sector	Development of communications strategy	Outreach efforts		Communication strategy available Reports on number of members reached and status of compliance	50,000

CHAPTER 6: MONITORING AND EVALUATION

Article 7 (c) of the Minamata Convention stipulates that member countries "provide a review every three years of the progress made in meeting its obligations" and includes submission of a report identifying the progress made on the activities highlighted in the NAP related to the use of mercury in the ASGM sector. Each lead agency will be required to adopt a monitoring, reporting and evaluation (MRE) mechanism for the activities for which they are responsible, as aligned with their ongoing mandate and responsibilities related to the ASGM sector, miners, and mining communities. This is further detailed in Table 25.

The MNR will maintain oversight on compiling National Reports under the guidance of Guyana's National Focal Point for the Minamata Convention on Mercury. This will be done in partnership and consultation with the National Working Group as detailed in Chapter 2, which comprises representatives from state and non-state stakeholders (GGMC, EPA, GGDMA, NMS, GWMO, GLSC, CI-Guyana, *inter alia*). The inclusion of other stakeholders on the NWG as included in the implementation plan should be considered.

Evaluation activities will be carried out using the targets and indicators as outlined in the implementation plan (Chapter 5) and, reporting on progress towards the achievement of the NAP should be guided by an annual work plan, with progress updates and semi-annual reporting provided at scheduled 6-month intervals at meetings of the NWG. The agenda for these meetings should follow: (a) review and approve annual work plan, (b) assess progress against monitoring and evaluation targets as indicated in the Implementation Plan, (c) approve interim and final reports, and (d) assess any gaps or weakness in the implementation of the strategies. Meetings of the NWG may be called, outside of bi-annual meetings, by the National Focal Point of the Minamata Convention for urgent matters related to the implementation of the NAP. Status reports on NAP implementation will be shared with the NWG on a quarterly basis and should also be distilled and shared publicly especially with the communities and wider stakeholders to which the NAP is relevant.

Table 25: List of Agencies and their Corresponding Responsibilities in the Guyana NAP Project

Agency	Responsibility
Ministry of Natural Resources (MNR)	• General monitoring of the Minamata Convention's implementation • Validate the implementation report of the NAP in coordination with GGMC, EPA, MoL, MoLGRD, MoH • In coordination with the GGMC, EPA, MoL, MoH, propose adjustments to the implementation processes of the NAP and the corresponding evaluation mechanisms • Monitoring of compliance with NAP strategies • Monitoring and evaluation of activities on data collection and interagency information system in coordination with GGMC and EPA • Monitoring and evaluation on activities related to Miners Assistance Act • Monitoring and evaluation of intervention for the protection and support of women in ASGM in coordination with GGB and MoL • Monitoring and evaluation of activities for raising awareness and outreach in coordination with GGMC and the Mining Associations
Guyana Geology and Mines Commission (GGMC)	• Monitoring and evaluation of the activities on enforcement and monitoring efforts and capacity building in collaboration with MNR and EPA. • Monitoring and evaluation on activities related to compliance assistance • Monitoring and evaluation of the activities for the reduction of mercury use and worst practices, including assessments/piloting alternative techniques and technologies and incentives for transition • Monitoring and evaluation of activities addressing data collection methodologies and tools in coordination with EPA. • Monitoring and evaluation of activities involving training • Monitoring and evaluation of activities on formalisation of artisanal miners • Monitoring and evaluation of finalisation of draft Codes of Practice activities • Monitoring and evaluation for the activities on raising awareness and outreach
Environmental Protection Agency (EPA)	• Monitoring and evaluation of environmental management activities • Monitoring and evaluation of activities addressing data collection methodologies and tools
Ministry of Health (MoH)	• Monitoring and evaluation of the public health strategy

Agency	Responsibility
	• Monitoring and evaluation of activities pertaining to laboratories and testing
Pesticides and Toxic Chemicals Control Board (PTCCB)	• Monitoring and evaluation of activities associated with the development of protocols related to mercury in collaboration with the EPA and MoH • Monitoring and evaluation of activities for management of mercury trade in coordination with GGMC and GRA
Guyana National Bureau of Standards (GNBS)	• Monitoring and evaluation of intervention pertaining to standards/maximum permissible limits
Ministry of Finance (MoF)	• Monitoring and evaluation of intervention area on access to finance and market-based incentives
Mining Associations (GGDMA, GWMO, NMS)	• Monitoring and evaluation of the intervention for adequate representation for artisanal miners • Monitoring and evaluation for the activities on raising awareness and outreach
Guyana Mining School and Training Centre Incorporated (GMSTCI)	• Monitoring and evaluation on activities related to training initiatives and technical assistance
Ministry of Education (MoE)	• Monitoring and evaluation of activities related to education institutions
Ministry of Labour (MoL)	• Monitoring and evaluation on the intervention for child protection in collaboration with MoE and MoHSSS • Monitoring and evaluation on activity addressing feasibility of community-based credit unions

Additionally, a gender-responsive NAP would require an approach whereby the strategies proposed are assessed for their contributions to gender equality within the ASGM sector. A modified gender marker[42], created for use in this NAP's MRE process, is outlined in Table 26 and is adapted from the gender markers used by UNEP and IASC. A code (as shown in column 1 in the below table) should be applied to each project by the design/execution team prior to implementation to assess the gender equality potential of the activities based on the gender equality objectives identified for that project or activity. It is necessary that a rapid gender analysis is conducted for all projects/programmes within the NAP to ensure that there are outcomes for women miners and women from mining communities. Findings from this gender analysis should be used to ensure, at minimum, that the project/programme does no harm and does not reinforce gender inequalities. The code should be referred to at the time of monitoring, reporting, and evaluation of each activity to indicate how each NAP activity contributed to the empowerment of women. The application of this tool for each of the NAP activities will support country

[42] A gender marker is a common tool used to measure on a 0-3 scale whether a project is well enough designed to ensure women and men benefit equally, or that it will advance gender equality. The higher the score, the more likely the gender marker could predict limited or significant outcomes for gender equality.

and project-level reporting and encourage effective gender mainstreaming. Sex-disaggregated monitoring and reporting should be practised for all NAP activities.

Table 26: Gender Marker for the Guyana NAP MRE Process

Code	Meaning	Criteria
0	Gender-Blind (not gender targeted)	Gender relevance is evidence but not at all reflected in the project document or design. There are no signs that gender issues were considered in the action or intervention design, and there is, therefore, a risk that the project may unknowingly nurture existing gender inequalities or deepen them if gender-specific realities or barriers are not considered. The reporting on projects coded as gender blind should mention why the project/programme was unable to include gender mainstreamed or targeted actions.
1	Gender partially mainstreamed[43]	Gender is reflected in the context, implementation, log frame, or budget in a limited way. The design could be stronger and advance gender equality further. The realities of women, as determined by gender assessments, is not meaningfully reflected in activities. Interventions/ activities coded as "Gender Partially Mainstreamed (Code = 1)" are designed to have a positive impact on advancing gender equality by reducing gender discrimination against women or women-miners, empowering women miners or women/girls of mining communities, or meeting gender-specific needs. This would be a minor expected result of several expected results of the intervention.
2a	Gender well mainstreamed	Gender is reflected in the context, implementation, log frame, and the budget of the NAP activity. The project's design contributes significantly to gender equality, and the different needs of women and men have been well integrated into activities and evidenced in outcomes. Interventions and actions coded as "gender well mainstreamed" have multiple instances where the different needs of men and women are considered. Gender equality is not a priority for this intervention or action. (Example: Activity 5.1.1 would be coded as 2a)
2b	Targeted action on gender	The principal purpose of the intervention is to advance gender equality within ASGM sector through the NAP activity. The entire activity/project was designed to target men or women to create a more level playing field, address inequalities or vulnerabilities identified for men or women, or foster more equal relations between men and women. (Example: Activity 9.2.5 would be coded as 2b for its outcomes for women; Socio-Economic Action 9.1.8 would be coded as 2b for its outcomes for vulnerable adolescent boys)
N/A	Gender neutral[44]	A gender analysis reveals that the project does not have direct interactions with, and or impacts on people, therefore gender is considered not applicable.

[43] Gender mainstreaming is the public policy concept of assessing the different implications for people of different genders of any planned policy action, including legislation and programmes, in all areas and levels. It involves the integration of a gender perspective into the preparation, design, implementation, monitoring and evaluation of policies, regulatory measures and spending programmes, with a view to promoting equality between women and men, and combating discrimination (UNEP 2020 and EIGI)

[44] Gender Neutral: "Policy, programme or situation has no differential positive or negative impact in terms of gender relations or equality between women and men and refers to programmes which are applicable or common to both women and men."

Reference List

AMAP and UNEP (2013) *Technical Background Report for the Global Mercury Assessment 2013*. Artic Monitoring and Assessment Programme, Oslo, Norway/ UNEP Chemicals Branch, Geneva Switzerland. Available at: https://www.amap.no/documents/doc/technical-background-report-for-the-global-mercury-assessment-2013/848 (Accessed: 21 July 2021).

Austin, S., Kaufman, J., & Schwartz, B. (2007). All that Glitters. Gold Mining in Guyana. The Failure of Government Oversight and the Human Rights of Amerindian Communities. Available at: http://hrp.law.harvard.edu/wp-content/uploads/2013/02/959_file_AllThatGlitters_FINAL_.pdf

Bank of Guyana (2020) *Annual Report 2020*. Guyana: Bank of Guyana. Available at: https://bankofguyana.org.gy/bog/images/research/Reports/ANNREP2020.pdf.

Britannica (2021) 'Hydraulicking'. Available at: https://www.britannica.com/technology/hydraulicking (Accessed: 21 July 2021).

Brown, S.T. *et al.* (2020) 'A Collaborative Training Program to Assess Mercury Pollution from Gold Shops in Guyana's Artisanal and Small-Scale Gold Mining Sector', *Atmosphere*, 11(7), p. 719. doi:10.3390/atmos11070719.

Bulkan, J. and Palmer, J. (2016) 'Rentier nation: Landlordism, patronage and power in Guyana's gold mining sector', *The Extractive Industries and Society*, 3(3), pp. 676–689. doi:10.1016/j.exis.2016.05.001.

Bureau of Statistics (2019) *National Population Summary*, *Guyana Lands and Surveys Commision's Fact Page on Guyana*. Available at: https://factpage.glsc.gov.gy/population-data/#:~:text=Based%20on%20the%202012%20Census,371%2C805%20males%20and%20375%2C150%20females. (Accessed: 21 July 2021).

Bureau of Statistics (2020) *Guyana Labour Force Survey*. Guyana: Bureau of Statistics. Available at: https://statisticsguyana.gov.gy/wp-content/uploads/2020/07/GLFS_Bulletin_2019.pdf.

Bynoe, P. (2016) *Final Report on Short Term Consultancy for Socio-Economic Analyst for the Mercury Initial Assessment*.

Commonwealth Health Online (2020) 'Health systems in Guyana', *Commonwealth of Nations*. Available at: https://www.commonwealthofnations.org/cho/americas/guyana/health_systems_in_guyana/ (Accessed: 21 July 2021).

Couture R, Lafleur C, Lambert J. (2005) 'Path of mercury in the environment of alluvial gold mining in pristine areas in Guyana. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7269323/

Eftimie, A. *et al.* (2012) *Gender Dimensions of Artisanal and Small-Scale Mining : A Rapid Assessment Toolkit*. World Bank. Available at: https://openknowledge.worldbank.org/handle/10986/2731.

GEF (2020) *A GEF GOLD/ Supply Chain Approach to Eliminating Mercury in Guyana's ASGM Sector: El Dorado Gold Jewelry Made in Guyana*, *Global Environment Facility*. Available at: https://www.thegef.org/project/gef-gold-supply-chain-approach-eliminating-mercury-guyana-s-asgm-sector-el-dorado-gold (Accessed: 20 July 2021).

GEF and UNEP (2020) *Improving Access to Formal Finance in Artisanal and Small-scale Gold Mining*. Global Environment Facility and United Nations Environment Programme. Available at: https://www.planetgold.org/sites/default/files/2020-08/Improving_Access_to_Formal_Finance_in_ASGM-planetGOLD_Issue_Brief.pdf.

GGB (2021) *Gold Price Calculator | Guyana Gold Board*. Available at: https://calculator.ggb.gov.gy/#/ (Accessed: 19 July 2021).

GGDMA (2021) *Membership*, *Guyana Gold & Diamond Miners Association*. Available at: https://ggdma.com/about-us/membership/ (Accessed: 21 July 2021).

GGMC (2010) *Draft Environmental Management Code of Practice*. Georgetown, Guyana: Guyana Geology and Mines Commission. Available at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwig4eWpyPPxAhWSLs0KHZxFAJMQFjAAegQIAxAD&url=https%3A%2F%2Fwww.ggmc.gov.gy%2Ffile-download%2Fdownload%2Fpublic%2F440&usg=AOvVaw1aollAlBBml9j7yXF_5pcT.

GGMC (2021) 'ASGM Dredge Locations'.

GGMC Environmental Division (2020) *Mining Related Accidents in Guyana (2000-2019)*, *Mining Week 2020*. Available at: https://miningweek.ggmc.gy/environment2/.

GGMC Mines Division (2019) '2019 State of the Artisanal and Small-Scale Mining Sector'.

GLSC (2006) 'rative Map of Guyana'. Available at: https://glsc.gov.gy/services/maps/ (Accessed: 20 July 2021).

GLSC (2013) *Guyana National Land Use Plan*. Available at: https://glsc.gov.gy/wp-content/uploads/2017/05/National-Land-Use-Plan-Final-Oct-2013.pdf.

GNBS (no date) *Draft Guyana Standards Requirements for Mercury Emissions into the Environment; Draft Guyana Standards Requirements for Mercury Releases into the Environment*.

Government of Guyana (2005) *Mining (Amendment) Regulations*.

GRA (1929) *Income Tax Act - Consolidated Tax Act of Guyana*. Available at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi2ztPWr_PxAhWKZ80KHQ1tAHgQFjAAegQIBRAD&url=https%3A%2F%2Fwww.gra.gov.gy%2Fwp-content%2Fuploads%2F2019%2F07%2FIncomeTaxActrevDec18Jan19final.pdf&usg=AOvVaw1UpmL8T5e1KRookUfVdgwZ.

Gregory, G. (2009) *Paradoxes and practices of modernity in a Guyanese mining town*. Masters Thesis. McGill University. Available at: https://escholarship.mcgill.ca/concern/theses/5425kb698.

Hilson, G. and Maconachie, R. (2017) 'Formalising artisanal and small-scale mining: Insights, contestations and clarifications', *Area*, 49. doi:10.1111/area.12328.

Hong, Y.-S., Kim, Y.-M. and Lee, K.-E. (2012) 'Methylmercury exposure and health effects', *Journal of preventive medicine and public health = Yebang Uihakhoe chi*. 2012/11/29 edn, 45(6), pp. 353–363. doi:10.3961/jpmph.2012.45.6.353.

Hook, A. (2019) 'Over-spilling institutions: The political ecology of "greening" the small-scale gold mining sector in Guyana', *Land Use Policy*, 85, pp. 438–453. doi:10.1016/j.landusepol.2019.03.049.

Hook, A.N. (2018) *The Political Ecology of Small-Scale Gold Mining Reform in Guyana: Resource Competition, Formal Institutions and Green Development Patways*. Sussex, England: University of Sussex.

IDB (2015) *Analysis of the Small and Medium-scale Mining Industry in Guyana: Challenges and Needs*. Washington, D.C.: Inter-American Development Bank.

IDB (2017) 'Caribbean Region Quarterly Bulletin: Commodities in the Caribbean', 6(2). Available at: https://publications.iadb.org/publications/english/document/Caribbean-Region-Quarterly-Bulletin-Commodities-in-the-Caribbean-Volume-6-Issue-2-June-2017.pdf (Accessed: 21 July 2021).

IGF (2014) *IGF Mining Policy Framework Assessment: Suriname*, p. 45.

ISAGS (2012) 'Health System in Guyana', in *Health Systems in South America: Challenges to the Universality, Integrality and Equity*. Rio de Janeiro, Brazil: South American Institute of Government in Health, p. 508. Available at: https://issuu.com/isagsunasur/docs/chapter_8_guyana.

Legg, E.D., Ouboter, P. and Wright, M.A.P. (2015) *Small-Scale Gold Mining Related Mercury Contamination in the Guianas: A Review*. doi:10.13140/RG.2.1.1399.9204.

Lember, V., Kattel, R. and Tõnurist, P. (2018) 'Technological capacity in the public sector: the case of Estonia', *International Review of Administrative Sciences*, 84(2), pp. 214–230. doi:10.1177/0020852317735164.

Lowe, S. (2006) *Situation Analysis of the Small-Scale Gold Mining Sector in Guyana*.

Mars, P. (1998) 'Socio - Political Impact of Large Scale Gold Mining in Guyana: Resolving Tensions Between Capital and Labou r', in *Guyana's Gold Industry*. Georgetown, Guyana: Institute of Development Studies University of Guyana.

McRae, E. (2014) *Source of Mercury Entering Guyana for Gold Mining: Sources and Distribution of Mercury in Guyana*. Consultancy Report.

MIA (2016) *Minamata Initial Assessment Report (MIA)*, p. 143.

MNR (2017) *Guyana National Action Plan Reduction of Mercury Use*. Guyana: Ministry of Natural Resources.

O'Neill, J.D. and Telmer, K. (2017) *Estimating Mercury Use and Documenting Practices in Artisanal and Small-scale Gold Mining (ASGM)*. Geneva, Switzerland: UN Environment.

Osborne, A. and Ramlagan, K. (2020) *Humanizing Gender Dynamics within Guyana's ASGM Sub-Sector, Examining the Experience of Women in Artisanal & Small-Scale Gold Mining*, *planetGOLD*. Available at: https://www.planetgold.org/humanizing-gender-dynamics-within-guyanas-asgm-sub-sector (Accessed: 21 July 2021).

Pasha, S., Wenner, M.D. and Clarke, D. (2017) *Toward the Greening of the Gold Mining Sector of Guyana: Transition Issues and Challenges | Publications*. Available at: https://publications.iadb.org/publications/english/document/Toward-the-Greening-of-the-Gold-Mining-Sector-of-Guyana-Transition-Issues-and-Challenges.pdf (Accessed: 19 July 2021).

PTCCB, GGMC, EPA and MNR (2019) 'Memorandum of Understanding for the Management of the Importation of Mercury into the Cooperative Republic of Guyana'. Available at: https://nre.gov.gy/wp-content/uploads/2019/08/MOU-MNR-GGMC-PTCCB-EPA-1.pdf.

Rahm, M. *et al.* (2017) *Monitoring the impact of gold mining on the forest cover and freshwater in the Guiana Shield*. ONF International and Worlf Wide Fund for Nature France.

Richard, M. (2014) *A Simple Public Health Strategy for ASGM*, *Artisanal Gold Council*. Available at: https://www.artisanalgold.org/publications/articles/a-simple-public-health-strategy-for-asgm/ (Accessed: 21 July 2021).

Richard, M. *et al.* (2014) 'Using Retorts to Reduce Mercury Use, Emissions, and Exposures in Artisanal and Small-Scale Gold Mining - A Practical Guide'. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/31365/Guide.pdf?sequence=1&isAllowed=y.

Roopnaraine, T. (1996) *reighted fortunes : gold and diamond mining in the Pakaraima Mountains, Guyana*. Doctoral. University of Cambridge. Available at: https://www.repository.cam.ac.uk/handle/1810/251603.

Roopnarine, L. (2006) 'Small-Scale Gold Mining and Environmental Policy Challenges in Guyana: Protection or Pollution', *Canadian Journal of Latin American and Caribbean Studies / Revue canadienne des études latino-américaines et caraïbes*, 31(61), pp. 115–143.

Singh D, Watson C, Mangal S. (2001). 'Identification of the sources and assessment of the levels of mercury contamination in the Mazaruni Basin in Guyana, in order to recommend mitigation measures. Available at: https://wwflac.awsassets.panda.org/downloads/2005_mercury_contamination__a_legacy_to_handicap_a_generation_haysvieira.pdf

Thom, S. (2018) 'An Overview of Mercury-Free Mining in Guyana'.

Thomas, C. (2009) *A Scoping Study of The Small and Medium Scale Gold and ...*

UN Comtrade (2021) *UN Comtrade: International Trade Statistics*, *UN Comtrade Database*. Available at: https://comtrade.un.org/data/ (Accessed: 3 August 2021).

UNEP (2012) *A Practical Guide: Reducing Mercury Use in Artisanal and Small-Scale Gold Mining*. United Nations Environment Programme. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/11524/reducing_mercury_artisanal_gold_mining.pdf?sequence=1&isAllowed=y.

UNEP (2017) *Global mercury supply, trade and demand*. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/21725/global_mercury.pdf?sequence=1&isAllowed=y.

UNEP (2019) 'Guidance for Conducting a Rapid Environmental Mercury Assessment of Artisanal and Small-Scale Gold Mining Sites in the Context of National Action Plans'. United Nations Environment Programme. Available at: https://wedocs.unep.org/handle/20.500.11822/31113.

UNEP and Global Mercury Partnership (2017) 'Guidance Document - Developing a National Action Plan to Reduce and, Where Feasible, Eliminate Mercury Use in Artisanal and Small-Scale Gold Mining'. Available at: https://web.unep.org/globalmercurypartnership/nap-guidance-document.

UNEP and Minamata Convention on Mercury (2019) 'Guidance on the Management of Contaminated Sites'. Secretariat of the Minamata Convention on Mercury. Available at: http://www.mercuryconvention.org/Portals/11/documents/forms-guidance/English/Guidance_Contaminated_Sites_EN.pdf.

UNEP (2021) 'Draft Incorporating Gender Dimensions into National Strategy Setting in Chemicals Management'. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/36587/GenderNAP.pdf?sequence=3&isAllowed=y

UNICEF (2017) 'Study on Indigenous Women and Children in Guyana'. UNICEF Guyana & Suriname. Available at: unicef.org/lac/media/4691/file/PDF%20Study%20on%20indigenous%20women%20and%20children%20in%20Guyana.pdf

UNICEF (2019) *Humanitarian action - UNICEF response to migrant issue*, *UNICEF Guyana & Suriname*. Available at: https://www.unicef.org/guyanasuriname/humanitarian-action (Accessed: 21 July 2021).

UNITAR (2018) *Socio-economic ASGM Research Methodology*. Geneva, Switzerland: UNITAR. Available at: https://www.unitar.org/sites/default/files/uploads/cwm/final_socio-economic_methodology.pdf.

Vieira, R. (2014) 'Optimization of Sluice Box Performance'. Guyana, 11 September. Available at: https://ggmc.gov.gy/sites/default/files/news/attachments/sluice_box_performance_rickford_vieira_11092014_0.pdf.

Watson, L.C. *et al.* (2020) 'Survey of Methylmercury Exposures and Risk Factors Among Indigenous Communities in Guyana, South America', *Journal of Health & Pollution*, 10(26), p. 200604. doi:10.5696/2156-9614-10.26.200604.

WHO (2017) 'Mercury and Health Factsheet'. World Health Organisation. Available at: https://www.who.int/news-room/fact-sheets/detail/mercury-and-health (Accessed: 21 July 2021).

World Bank (2015) *International Development Association Project Paper On A Proposed Additional Credit In The Amount of SDR 32.7 Million (Us$45 Million Equivalent) To The United Republic Of Tanzania for the Sustainable Management Of Mineral Resources Project*, p. 42.

WWF-Guianas, EPA, GGMC and MNR (2014) Konawaruk River. Biodiversity Assessment Team (BAT). Preliminary Report.

Annex 1 – Literature Reviews

Annex 1 provides the following Literature Review Reports developed by the National Consultants which contain the information gathered during the desktop study that contributed to the development of the national overview and informed the development of the recommended strategic objectives, intervention areas and activities.

- Public Health and Outreach Literature Review, November 2020;
- Baseline Inventory Estimating Mercury Use and Documenting Practices in Guyana, December 2020;
- Literature Review for the Assessment on the current legal and regulatory status of the ASGM sector in Guyana, April 2021; and
- Literature Review for the Socio-Economic and Gender Analysis of the Artisanal and Small-Scale Gold Mining Sector, January 2021.

Annex 2 – Assessment Reports

Annex 2 provides the following Assessment Reports developed by the National Consultants which contain the information gathered during the field research and observations that contributed to the development of the national overview and informed the development of the recommended strategic objectives, intervention areas and activities.

- Technical and Environmental Assessment Report, June 2021
- Legal and Institutional Capacity Assessment Report, June 2021
- Public Health Assessment Report, June 2021
- Socio-Economic Assessment Report, June 2021

Annex 3 – Strategy Documents

Annex 3 provides the following Strategy Documents developed by the National Consultants which contain the details for the proposed intervention areas and recommended activities under each thematic area.

- ASGM Inventory Technical and Environmental Baseline Strategies and Implementation Plan, June 2021
- Legal and Institutional Capacity Strategies and Implementation Plan, June 2021
- Public Health and Outreach Strategies and Implementation Plan, June 2021
- Socio-Economic Strategies and Implementation Plan, June 2021

Annex 4 – Conformity with Annex C of the Minamata Convention

The following table describes the requirements for compliance of the National Action Plan with the Minamata Convention, and explains how this compliance is reached:

National Action Plan requirement based on Annex C of the Minamata Convention	Corresponding sections of the National Action Plan
1. National objectives and reduction targets	4.1 National Strategic Objectives
2. Actions to eliminate:	
2a. Whole ore amalgamation	4.2 Strategic Objective 1
2b. Open burning of amalgam or processed amalgam	4.2 Strategic Objective 1
2c. Burning of amalgam in residential areas	4.2 Strategic Objective 1
2d. Cyanide leaching in sediment, ore or tailings to which mercury has been added without first removing the mercury	N/A
3. Steps to facilitate the formalisation or regulation of the artisanal and small-scale gold mining sector	4.2 Strategic Objectives 2 and 3
4. Baseline estimates of the quantities of mercury used and the practices employed in artisanal and small-scale gold mining and processing within its territory	4.2 Strategic Objective 1
5. 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	4.2 Strategic Objective 1
6. 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	4.2 Strategic Objective 6
7. Strategies for involving stakeholders in the implementation and continuing development of the national action plan	4.2 Strategic Objective 10
8. 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	4.2 Strategic Objectives 7 and 8
9. 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	4.2 Strategic Objective 9
10. Strategies for providing information to artisanal and small-scale gold miners and affected communities	4.2 Strategic Objective 10
11. A schedule for the implementation of the national action plan	Chapter 5


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