UNITED REPUBLIC OF TANZANIA

National Action Plan for Artisanal and Small-Scale Gold Mining

2020 - 2025



Vice President's Office

February, 2020



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in accordance with the Minamata Convention on Mercury

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PREFACE

Mercury is a global pollutant with adverse effects to human health and the environment. Mercury is being used in Artisanal and Small Scale Gold Mining (ASGM) to recover gold. Consequently, the Minamata Convention on Mercury (2013) requires Parties to develop and implement National Action Plan on ASGM with the goal to reduce, *and where feasible eliminate*, mercury use and associated emissions and releases to the environment from ASGM.

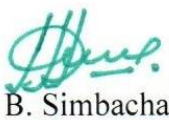
A total of about 1.2 million people are engaged in ASGM activities in Tanzania with an estimate of 7.2 million people (equivalent to 13% of the total national population) depending indirectly on ASGM. Baseline situational analysis revealed that national mercury consumption by ASGM is about 13.2 - 24.4 tonnes per year. Inadequate capacity to control, unsafe use and poor management of mercury pose significant health, environmental and socio-economic risks to miners and neighbouring communities.

This National Action Plan (NAP) on ASGM (2020 - 2025) has been developed to meet the requirements of the Minamata Convention and serves as a national framework for fostering sound management of mercury in ASGM and where feasible eliminate its use and associated emissions and releases. It also addresses environmental, health and socio-economic challenges faced by ASGM.

The overarching strategy of this NAP is to promote reduction, *and where feasible eliminate*, Mercury use in ASGM through elimination of mercury intensive and unsafe practices of mercury use, the adoption of mercury control and capture technologies, and/or the adoption of mercury free technologies.

The NAP offers a platform to take further actions towards improving the welfare of the artisanal and small-scale gold miners and the contribution of the ASGM sub-sector to the economy. The implementation of the NAP is linked with attainment of Sustainable Development Goals particularly those related to poverty alleviation, environment and health and gender.

The implementation of the NAP would require commitment and support of a wider spectrum of stakeholders in view of the multifaceted nature of the challenges associated with development and growth of the ASGM subs-sector in the country. I therefore urge relevant Ministries and government institutions, private sector, civil society organizations, ASGM communities and the media to contribute towards the ambition of a mercury free world. **It can be done, play your part.**



Hon. George B. Simbachawene (MP)
Minister of State, Vice President Office - Union and Environment

ACKNOWLEDGEMENT

The successful preparation of this National Action Plan (NAP) for Artisanal and Small Scale Gold Mining (ASGM) in the United Republic of Tanzania is a result of commitment and combined efforts of various stakeholders who deserve a vote of appreciation.

I wish to express our sincere gratitude to Prof. Simon Msanjila, Permanent Secretary, Ministry of Minerals and Dr. Zainab Chaula, Permanent Secretary (Health), Ministry of Health, Community Development, Gender, Elderly and Children for their cooperation and inputs provided during the development of this NAP.

I extend our appreciation to the members of the Project Steering Committee (PSC) for their policy and technical guidance provided during the process of developing this NAP. Members of the PSC were drawn from the President's Office - Regional Administration and Local Government; Vice President's Office; Ministry of Minerals; Ministry of Health, Community Development, Gender, Elderly and Children; National Environment Management Council (NEMC); Government Chemist Laboratory Authority (GCLA) and Federation of Miners' Association of Tanzania (FEMATA).

I am grateful to *Ambassador* Joseph E. Sokoine, Deputy Permanent Secretary, Vice President's Office; Prof. William Mwegoha, Director of Environment; and Ms. Kemilembe Mutasa, Acting Assistant Director of Environment for overseeing and coordinating the process of developing the NAP.

I am also thankful to the members of the National Task Force (NTF) for their technical inputs and commitment in formulating this NAP. Members of the NTF were drawn from the Vice President's Office; Ministry of Minerals; Ministry of Health, Community Development, Gender, Elderly and Children; Geological Survey of Tanzania (GST); National Environment Management Council (NEMC); Government Chemist Laboratory Authority (GCLA); State Mining Corporation (STAMICO); University of Dar es Salaam; Mineral Resources Institute (MRI) - Dodoma; and AGENDA for Environment and Responsible Development.

We are also indebted to the United Nations Environment Programme (UNEP) and the Global Environment Facility (GEF) for the technical and financial support provided which facilitated the development of this NAP.

Finally, we wish to thank all stakeholders, who in one way or the other, contributed to this important process of developing this NAP.

Eng. Joseph K. Malongo
Permanent Secretary
Vice President's Office

EXECUTIVE SUMMARY

Introduction

Mercury is one of the top ten chemicals of global public health concern owing to its persistence in the environment, long-distance transport, bio-accumulation (concentrate along food chain) and high toxicity. Consequently, the Minamata Convention on Mercury was adopted on 10th October, 2013 to address the adverse effects and risks that mercury poses to human health and the environment.

Artisanal and Small-Scale Gold Mining (ASGM) use mercury to recover gold and is the major source of mercury-related environmental pollution globally and nationally. It is against this background that, Article 7 of the Minamata Convention requires Parties take steps to reduce, *and where feasible eliminate*, the use of mercury and associated emissions and releases to the environment from ASGM. It requires the development and implementation of National Action Plans (NAPs) for ASGM. Tanzania being a signatory to the Minamata Convention and having significant ASGM activities is thus obliged to develop and implement a NAP.

This document presents the NAP for ASGM in Tanzania which serves as a strategic framework for addressing environmental, health and socio-economic challenges posed by use of mercury and activities of ASGM in the country in line with the requirements of the Minamata Convention. The timeframe for implementation of the NAP is five years starting 2020 up to 2025.

Overview of the NAP Development Process

The NAP on ASGM in Tanzania was developed between August, 2016 and June, 2019 involving extensive stakeholder consultation process. Coordination mechanisms were established through Project Management Unit, Project Steering Committee and National Task Force. An inception meeting was organized in January, 2017 to introduce the project to stakeholders and tailor made training was conducted to national experts.

Baseline situation analysis on ASGM in Tanzania was undertaken between January, 2017 and February, 2019. A total of 40 ASGM sites located in 9 Regions in the country were visited. Methods used for data collection include interviews, focus group discussions (FGDs) and field observations. The amount of mercury was estimated by using MS Excel Sheet framework of the UN Environment Toolkit for Estimating Mercury Use in Artisanal and Small-scale Gold Mining (ASGM) - Version 1, with input data obtained from field survey. A National Stakeholders Workshop was then organized to review and validate Draft National Overview Report for the ASGM in Tanzania in January, 2019. The report was endorsed by the Project Steering Committee meeting held in March, 2019. In total, more than 1,048 stakeholders were consulted during development process of the baseline report.

The National Task Force prepared Draft NAP between April-May 2019 that was reviewed and validated by National Stakeholders Workshop held in Dodoma City in May, 2019. The Project Steering Committee considered the Final Draft NAP and endorsed it in its meeting held in May, 2019.

Baseline Situation of the ASGM in Tanzania

Artisanal and Small-scale Gold Mining (ASGM) directly employs more than 1.2 million people (about 3% of the total national population), constituting more than 90% of the mining labour force in the country, and supporting indirectly about 7.2 million people. The ASGM sub-sector is estimated to produce 5.3 and 9.8 tonnes of gold per year (about 12-22% of the national annual gold production). It is estimated that ASGM consumes about 13.2 - 24.4 tonnes of mercury per year. The lead regions in gold production and mercury consumption are Geita, Mbeya, Shinyanga and Mara.

Challenges facing ASGM sub-sector in the country include widespread and haphazard use of the toxic mercury in gold recovery; informal nature of ASGM operations; low level of production due to low mechanization and limited capital investment; environmental degradation; health and occupational risks; child labour; gender inequality; social problems related to income and employment insecurity; and land use conflicts. The opportunities available for improving ASGM subsector includes research on best mining and processing technology for ASGM, research on best technology to remove mercury from gold-mercury tailings before reprocessing using cyanidation and provision of credit services.

The goal and objectives of NAP

The goal of this NAP is to reduce, and where feasible eliminate, the use of mercury in, and associated emissions and releases to the environment from ASGM. The specific objectives are:

a) To reduce the use of mercury in the ASGM sub-sector by 30% and enhance public awareness by 2025;
b) To strengthen legal framework, institutional capacity and stakeholder engagement in ASGM sub-sector governance by 2025; and
c) To develop and implement public health strategy for preventing and mitigating mercury exposure to ASGM communities by 2025.

Implementation strategies for NAP

In order to achieve the set objectives of this NAP, the following strategies will be implemented:

i) Promote elimination of worst practices particularly open burning of amalgam and processing of mercury contaminated tailings with cyanide to recover gold;
ii) Conduct periodic baseline estimates of ASGM mercury use to monitor trend;
iii) Facilitate provision of information to ASGM and affected communities on mercury related issues;
iv) Facilitate formalization of ASGM to enhance the welfare of the miners and contribution of the sub-sector to the economy;
v) Facilitate management and control of mercury trade;
vi) Strengthen involvement and engagement of stakeholders in the implementation and continued development of NAP;
vii) Facilitate development of public health strategy for preventing and mitigating mercury exposure to ASGM communities;
viii) Promote the reduction of emissions, releases, and risks of exposure to mercury; and
ix) Facilitate prevention and control the exposure of vulnerable populations, particularly children and women of child-bearing age, to mercury use in ASGM.

Key Targets of the NAP

The key targets in implementation of this NAP include the following:

i) Mercury use in ASGM sub-sector reduced by 30% by 2025 through elimination of mercury intensive and unsafe practices of mercury use, the adoption of mercury control and capture technologies, and/or the adoption of mining techniques that do not require mercury use;
ii) Enforcement of the Mining Act, 2010 and its amendments of 2017 and 2019; and other relevant sectoral legislations and regulations strengthened and enforced by 2025;
iii) Institutional capacity of the Ministries responsible for Minerals, Environment and Health strengthened by 2025;
iv) Public health strategy for preventing and mitigating mercury exposure to ASGM communities developed and implemented by 2025;
v) At least 20% of women miners in ASGM sub-sector empowered by 2025 through provision and access of social services, credit and financial services, work opportunities, training, technological support and awareness;
vi) At least 70% of working children in ASGM detached by 2025;
vii) At least 40% of Environmental Protection Plans (EPPs) are complied by respective licensed ASGM operators by 2025;
viii) At least 30% of ASGM operators have accessed affordable credit and financial services by 2025;
ix) A total of 13 regional mineral centers are established and operated to promote access to gold markets by 2025; and
x) Capacity building to Miners associations strengthened by 2025.

Budget estimates

The estimated budget for implementation of this NAP for a period of five years is USD 14,400,000. The source of funding will include internal and external sources.

Implementation arrangement

The Vice President's Office (VPO), in close collaboration with the Ministry of Minerals and Ministry of Health, Community Development, Gender, Elderly and Children, will coordinate the implementation of the NAP. The VPO will also have a role in organizing technical and planning meetings, and project proposal development for implementing the interventions identified in this NAP.

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LIST OF ABBREVIATIONS AND ACRONYMS

ASGM	**Artisanal and Small-scale Gold Mining**
ASM	Artisanal and Small-scale Mining
CEO	Chief Executive Officer
CMMVI	Chronic metallic mercury vapor intoxication
COSTECH	Tanzania Commission for Science and Technology
EIA	Environmental Impact Assessment
EPP	Environmental Protection Plan
FEMATA	Federation of Miner's Associations of Tanzania
FGD	Focus Group Discussion
GCLA	Government Chemist Laboratory Authority
GEF	Global Environment Facility
GMP	Global Mercury Project
GST	Geological Survey of Tanzania
HBM	Human Bio-Monitoring
Hg	Mercury
LGF	Lupa Goldfields
LSM	Large-Scale Mining
LVGF	Lake Victoria Goldfields
MLHHSD	Ministry of Land, Housing and Human Settlements Development
MMF	Mpanda Mineral Field
MoFP	Ministry of Finance and Planning
MoHA	Ministry of Home Affairs
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MoM	Ministry of Minerals
MoW	Ministry of Water
MRI	Mineral Resources Institute
MSPI	Multi-Sector Partnership Initiative
NAP	National Action Plan
NEMC	National Environment Management Council
NGO	Non-Governmental Organizations
NTF	National Task Force

OSHA	Occupational Safety and Health Authority
PDO	Project Development Objective
PML	Primary Mining License
PMO-LYEPwD	Prime Minister's Office - Labour, Youth, Employment and Persons with Disability
PMU	Project Management Unit
PO-RALG	President's Office - Regional Administration and Local Government
PSC	Project Steering Committee
REMAs	Regional Miner's Associations
SACCOS	Savings and Credit Cooperative Societies
SDGs	Sustainable Development Goals
SMMRP	Sustainable Management of Mineral Resources Project
STAMICO	The State Mining Corporation
TAMIDA	Tanzania Mineral Dealers Association
TAWOMA	Tanzania Women Miners Association
TDU	Transportable Demonstration Unit
TIB	Tanzania Investment Bank
TRA	Tanzania Revenue Authority
TZS	Tanzanian Shillings
UN	United Nations
UNEP	United Nations Environmental Program
USD	United States Dollar
VAT	Value Added Tax
VPO	Vice President's Office
WHO	World Health Organization
WIMA	Women in Mining Association

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1.0 INTRODUCTION AND BACKGROUND

1.1 Rationale and Context

Artisanal and Small-scale Gold Mining (ASGM) has been practiced in Tanzania for more than 100 years. It continues to grow with significant contribution to income, employment, local and national economy. It directly employs more than 1.2 million people, constituting more than 90% of the mining labour force in the country, and supporting indirectly about 7.2 million people.

However, there are some challenges facing the ASGM sub-sector in the country including widespread and haphazard use of the toxic mercury in gold recovery; informal nature of ASGM operations; low productivity; environmental, health and occupational risks; child labour; social problems related to income and employment insecurity; and land use conflicts. In spite of social, environmental and economic challenges associated with the sub-sector, it continues to be an important non-agricultural livelihood activity for many in rural areas.

The widespread use of mercury in ASGM for gold recovery has received global attention owing to its adverse effects on health and the environment. ASGM is known to be the major source of mercury pollution in the country and globally. Consequently, the Minamata Convention on Mercury (2013) was adopted with the objective to protect human health and the environment from the risks posed by anthropogenic emissions and releases of mercury. Article 7 of the Minamata Convention requires each Party that has significant Artisanal and Small-scale Gold Mining (ASGM) activities to take steps to reduce and where feasible eliminate mercury use in ASGM; and develop and implement a National Action Plan (NAP) for ASGM.

Tanzania being a signatory to the Minamata Convention and having significant ASGM activities is obliged to develop and implement a NAP for ASGM. This NAP on ASGM (2020 - 2025) has been developed to meet the requirements of the Minamata Convention and serves as a national framework for fostering sound management of mercury in ASGM and where feasible eliminate its use and associated emissions and releases. It also addresses environmental, health and socio-economic challenges faced by ASGM.

The implementation of NAP will facilitate awareness raising, training, technological change and reduction in mercury use in ASGM sub-sector. As a result, productivity, income and welfare of miners will improve and thus increasing contribution of the sub-sector to the national economy. Also, NAP is expected to contribute towards achievement of various national and international development frameworks. The NAP is linked with attainment of Sustainable Development Goals particularly those related to poverty alleviation, environment and health and gender. Further, NAP is interrelated to the implementation of the Tanzania Development Vision 2025 and the Five Year Development Plan (FYDP-II) (2015/16-2020/21) in terms of contributing in improving quality of life from avoided health effects and socio-economic impacts associated with exposure to mercury.

1.2 An Overview of the NAP Development Process

The NAP on ASGM in Tanzania was developed between August, 2016 and June, 2019 involving extensive stakeholder consultation process. The key steps in developing the NAP include the following:

i) Establishment of coordination mechanisms

The Project Management Unit (PMU) comprised of National Project Coordinator, two (2) Project Assistants, Accountant and Procurement Officer. The PMU provides administrative and technical support in day to day implementation of the project activities.

The Project Steering Committee (PSC) of the NAP Project, chaired by the Permanent Secretary, Vice President's Office, consist of 16 Senior Officials from relevant government departments, agencies, NGOs and private sector. The main function of the PSC is to advise and guide the formulation and implementation of the NAP on ASGM in Tanzania.

The National Task Force (NTF) was established by the Permanent Secretary, Vice President's Office, comprising of 14 members drawn from relevant Government Ministries and Agencies, Academia and Non-Government Organization to undertake the baseline study and formulate the NAP. The task force members received tailor made training to facilitate their task. The Terms of Reference for the National Task Force are presented in **Annex 1**.

ii) Inception and training workshop

An inception meeting was organized in January, 2017 to introduce the project to stakeholders and tailor made training was conducted to the National Task Force members.

iii) Developing national overview on ASGM in Tanzania

The national overview on ASGM in Tanzania was prepared between January 2017 and February 2019. A total of 40 ASGM sites located in 9 Regions in the country were visited, which constitute about 15% of the total ASGM sites in the country. The regions include Geita; Shinyanga; Mbeya; Katavi; Mara; Tabora; Dodoma; Singida; and Tanga. These sites were purposively selected based on intensity of ASGM activities and the historical profiles of the sites. A total of 15,691 km of travel was covered for a period of 21 days. Methods used for data collection include interviews, focus group discussions (FGDs) and field observations. At each site, individual interviews and focus group discussions **(Plate 1-1)** were undertaken using an open-ended checklist. The targeted groups included ASGM leaders, miners and women totalling to 372 people.

Physical measurements to establish mercury-to-gold ratio were done at six (6) selected sites, two sites for each major gold fields (Lake Victoria, Lupa goldfields and Mpanda Mineral Field). The sites were located in Geita, Singida and Katavi regions.

Site specific information collected during field survey were used to estimate the amount of mercury used on a site, regional and national levels based on MS Excel Sheet framework of the UN Environment Toolkit for Estimating Mercury Use in Artisanal and Small-scale Gold Mining (ASGM) - Version 1. Some of the key site specific information collected include ore grade; gold recovery; gold purity; unit price of gold and mercury; number of active pits per site; average number of miners per pit per site; amount of ore/shaft/miner/day; number of working days per year; and contact information.



Plate 1-1: A focus group discussion at Bingwa gold rush site in Geita Region

In total, more than 1,048 stakeholders were involved and consulted during the process of developing the national overview (baseline report) on ASGM including Government Officials; Miners Associations; Primary Mining License (PML) owners; Miners; Academia; Private sector; NGOs; and Media.

A National Stakeholders Workshop was organized to review and validate Draft National Overview Report for the ASGM in Tanzania in January, 2019. In addition, the Project Steering Committee endorsed the National Overview on ASGM in Tanzania in its meeting held in March, 2019.

iv) Formulation of NAP

Two zonal consultative workshops in Geita (April, 2019) and Mbeya (April, 2019) were organized to gather views and inputs from ASGM stakeholders including Government Officials; Miners Associations; PML owners; Miners; Academia; Private sector; NGOs; and Media.

The National Task Force prepared the Draft NAP in April-May 2019. It was reviewed and validated by a National Stakeholders Workshop held in Dodoma City in May, 2019.

The Project Steering Committee considered the Final Draft NAP and endorsed it in its meeting held in May, 2019.

2.0 NATIONAL OVERVIEW

2.1 Previous experiences in addressing ASGM

The 1929 Mining Ordinance was the first legislation for regulating the mineral sector in the country. However, its focus was on large scale mining operations. The 1929 legislation was later repealed by the Mining Act of 1979 which allowed small scale mining and encouraged formalization through provision of claim titles. This Act was replaced by the Mining Act of 1998, which most importantly introduced specific licenses for Tanzanian small-scale miners, namely Primary Mining Licenses (PMLs). In 2007, a Presidential Mining Review Committee was established and identified key policy and legal gaps and formulated concrete proposals to leverage the economic potential of the extractive sector. Some of these proposals were integrated in the 2010 Mining Act which, among others, strengthened the allocation of areas exclusive for PMLs.

Following the adoption of the Mineral Policy of 2009, the Small-scale Mining Development Section (Mineral Division) in the Ministry of Minerals was established in 2009, to oversee and coordinate activities of small scale mining in the country including provision of training and financial services; promoting the availability of appropriate and affordable mining equipment; and promote partnership between large scale and small-scale miners.

The State Mining Corporation (STAMICO), which is a state owned enterprise that was established in 1972 and restructured in 2015, has been newly assigned, among others, the function of promoting, facilitating and supporting transformation of artisanal and small scale mining into well organised mining. STAMICO, in collaboration with other government agencies and institutions, provides technical services to artisanal and small scale miners and thus serves as the 'institutional patron' for Artisanal Small-Scale Mining (ASM) in the country.

Between 2016 and 2017, the Geological Survey of Tanzania (GST) in collaboration with STAMICO through the Sustainable Management of Mineral Resources Project (SMMRP) Phase II (2015-2018), conducted geo-scientific studies in selected PMLs owned by mining cooperative societies and helped in establishing the available gold resource. These areas include Katente (Geita Region); Itumbi (Mbeya Region); Buhemba (Mara Region); and Kapanda and D-Reef (Katavi Region). A list of key projects addressing ASGM is provided in **Annex 2**.

As it can be seen, various initiatives have been undertaken over the years to address institutional, policy, legal and technical challenges for supporting the ASGM sub-sector. Notable achievements have been made in terms of increased number of PMLs issued; establishment of miners associations (Regional Miners Associations (REMAs), Federation of Miners Associations of Tanzania (FEMATA), Tanzania Women Miners Association (TAWOMA), Women in Mining Association (WIMA) and Tanzania Mineral Dealers Association (TAMIDA)); establishment of regional mineral centres for facilitating mineral market access; demarcating mineralized land for ASGM; and provision of economic incentives such as tax exemption (VAT and withholding tax) for ASM. However, there are still several challenges facing this sub-sector including insufficient institutional capacity to enforce existing laws and regulations; limited access to credit and financial services; limited availability of geo-scientific data; inadequate health, safety and environmental practices; and poor artisanal gold mining and processing technology.

2.2 Geographical distribution of ASGM

The ASGM activities in Tanzania are concentrated around the Lake Victoria goldfields (in the regions of Mara, Mwanza, Geita, Shinyanga, Tabora, Simiyu and Singida), Mpanda Mineral Field (particularly Katavi Region) and Lupa Goldfields (in the regions of Mbeya and Songwe). However, there are smaller operations taking place in most of the country's regions including Tanga, Dodoma, Iringa, Lindi, Ruvuma and Morogoro. The main producing goldfields in Tanzania is Lake Victoria Basin accounting for about 70% of national gold production, while the remaining portion comes predominantly from Lupa Goldfields and the Mpanda Mineral Field.

ASGM activities can be found in at least 13 administrative regions, out of the 26 regions of Tanzania Mainland. There are more than 300 ASGM sites in the country including both licensed and informal ones **(Figure 2-1).** During the field survey, 40 ASGM sites were visited, accounting for about 15% of the total sites. It can be noted that more than half of the ASGM sites are concentrated in four regions namely Geita, Shinyanga, Mara and Mbeya. These sites have been operational for varying period of time ranging from 2 months to over 50 years. Some of the sites that have long mining histories in the country include Nyarugusu, Mgusu and Rwamgasa (Geita Region) and Matundasi (Mbeya Region).



Figure 2-1: Geographical distribution of ASGM sites in Tanzania

2.3 Mining and processing information

Gold ore type

Gold mineralization in the country occurs in three major goldfields namely, Lake Victoria, Lupa and Mpanda Mineral Field. *The Lake Victoria Goldfields (LVGF)* underlain by a metamorphic greenstone belt which is mineralized with three distinct types: auriferous quartz reefs and stringers; auriferous Sulphide impregnations; and alluvial/elluvial deposits. On the other hand, *the Lupa Goldfields* underlain by Ubendian Belt comprises a network of auriferous quartz veins of the orogenic gold deposit type. The ore minerals in the gold-quartz veins comprise principally sulphides. In addition, *the Mpanda Mineral Field (MMF)* lies in the metamorphic Ubendian belt and hosts three types of metal associations in the mineralised veins: Gold-rich deposits; Gold and base metal rich deposits; and base metal rich deposits.

Mining methods

There are few sites where alluvial gold mining is practiced by artisanal and small scale miners. In most cases, underground mining is carried out to explore the gold ore. This involves clearing the site, sinking of the shaft up to or across the gold vein and then mining proceed by following the vein as tunnel mining. In soft rocks, mining is done by using chisel and hammer but for hard rock sites, miners apply drilling and blasting to fragment the rock in order to obtain ore from the stope. Shaft and the tunnel may be fully or partially supported or unsupported depending on the strength of the ore body and the surrounding materials.

Processing methods

The ASGM miners usually use a dry grinding process to liberate gold from its ore. The grinding process is done using locally-made ball mills *(''karasha'')* with steel balls as grinding media powered by diesel engines. The ground ore from the ball mill, in powdery form, is transferred by 25-50 kg bags to a sluicing box to obtain the gold concentrate. The gold concentrate is then panned with water and mercury for amalgamation process. Gold recovery from amalgam is mostly achieved through open burning using firewood or charcoal, within the ASGM sites or in residential areas to obtain sponge gold (impure gold). However, extremely few miners use retorts for burning amalgam to recover mercury instead of emitting it into the environment as is the case with the open burning. Further, mercury-contaminated tailings from ASGM is commonly re-processed using cyanidation technology to further recover the remaining gold. The tailings from ASGM are estimated to have 60-70% of the initial total gold content.

Miners population

The estimated number of people engaging in ASGM activities is about 1.2 million people (about 3% of the total national population), constituting more than 90% of the mining labour force in the country, and supporting indirectly about 7.2 million people. Majority of miners were found at the age ranging between 18 and 40 years and these were more involved in all mining activities such as digging, ore hauling, sluicing and amalgamation. On the other hand, miners aged above 45 years were found to be engaged more as PML owners, pit owners, site management supervisors and manual crushing of rock ore. This indicates that both men and women engage in ASGM activities in their youthful ages. The fluidity of entry by immigrants into artisanal and small-scale mining activities has made these communities highly heterogeneous in terms of its residents' areas of origin and ethnic diversity.

Women in ASGM are estimated to represent between 20-30% of the total ASGM population. Nevertheless, it is estimated that up to 10,000 children are specifically involved in ASGM in the country. The age of working children in the visited ASGM sites was found to range between 10-17 years. It was also noted that there were fewer girls (15-20%) than boys (80-85%) involved in child labour in the visited ASGM sites.

2.4 Baseline estimates of the amount of mercury used in ASGM

ASGM activities constitutes about 80% of the total mercury consumption in Tanzania while the remaining 20% is from dental amalgam and imported mercury- added products.

In Tanzania, gold ore concentrate amalgamation is the only process used to recover gold by ASGM which utilize less mercury compared to whole ore amalgamation. Based on the field

survey undertaken, it is estimated that ASGM consumes about 13.2 - 24.4 tonnes of mercury per year **(Table 2-1)**. The lead regions in mercury consumption are Geita, Mbeya, Shinyanga and Mara. Site level estimates and details on the calculations and estimations used in establishing the baseline are provided in **Annex 3**.

Table 2-1: Regional and national estimates of the amount of mercury used by ASGM in Tanzania

Region	Scenario 2	
	Gold Production (kg/year)	Mercury Use (kg/year)
Tabora	695	1,112
Singida	655	1,048
Mara	554	886
Geita	2,800	4,480
Mbeya	1,159	1,854
Katavi	771	1,234
Shinyanga	910	1,456
Dodoma	414	662
Tanga	55	88
Simiyu	240	384
Songwe	472	755
Morogoro	267	427
Iringa	544	870
Rukwa	557	891
Kigoma	562	899
Njombe	670	1,072
Ruvuma	481	770
Mwanza	1,060	1,696
Kagera	1,150	1,840
Lindi	400	640
Mtwara	420	672
Manyara	425	680
TOTAL	**15,261**	**24,416**

2.5 Legal and regulatory status

There are several national policies and legislation that govern and regulate the ASGM sub-sector in the country.

Policy framework

The Mineral Policy of Tanzania (2009) aims to, among others, recognize, support and promote formalization of ASM to ensure sustainable practices so as to increase its contribution to the economy. On the other hand, *the National Environmental Policy (1997)* acknowledges the environmental and health risks posed by mercury use in mining activities and therefore advocates for its control and promote use of retorts. Likewise, *the National Health Policy*

(2007) aims to improve the health and wellbeing of all Tanzanians, with a focus on those most at risk, and encourage the health system to be more responsive to the needs of the people and thus increase the life expectancy.

Legal framework

Generally, the legal framework governing the mineral sector recognizes and regulates the ASM sub-sector. *The Mining Act of 2010 and its amendments of 2017 and 2019* provides small-scale miners with the opportunity to acquire PMLs with access to not more than ten (10) hectares granted for seven years and can be mortgaged, renewed or transferred to another holder. On the other hand, *The Industrial and Consumer Chemicals (Management and Control) Act of 2003*, among others, provides for control and management of industrial and consumer chemicals including mercury, whereby all dealers and users are required to register and ensure their proper management. Further, *the Environmental Management Act No. 20 of 2004*, among others, requires developers including ASGM operators to conduct Environmental Impact Assessment (EIA) as well as to monitor any identified environmental issues associated with their activities. In addition, *the Public Health Act (2009)* provides for the promotion, conservation and maintenance of public health with a view of ensuring comprehensive functional and sustainable public health services.

Current status of regulation of the ASGM sector

The ASGM sub-sector is well recognized legally with substantial institutional and political support in view of its significant contribution to the economy. Licensing of ASM has been decentralized to the Regional Mines Offices and the use of online license application system have contributed in fast tracking licensing procedures. Consequently, compliance in terms of number of licenses issued to small-scale miners has increased tremendously over the past ten years. However, some challenges exist including inadequate institutional capacity for enforcement of relevant laws; informal pattern of ASGM operations; informal mercury and gold trade; and inadequate capacity to conduct geo-scientific studies to establish gold resources.

2.6 Leadership and organization of ASGM at national and local levels

Several miners associations within the mining sector have emerged over the last three decades and are actively involved in various ways to provide support to miners and influence change for better policy and practice. These associations exist at different levels from site, regional and national levels.

Regional and national level (REMAs and FEMATA)

In 1987, the Government initiated the formation of Regional Miners' Associations (REMAs) with the objectives to provide a platform for the development of organized operations of small scale miners and a communication channel with government and other interested parties. As key ASM anchor in each region, they represent small-scale miners in various fora and workshops and have contributed to diverse sensitization and training campaigns on issues such as child labour, women rights and mercury use. Most REMAs operate based on their members' contributions (fees), which makes most of them unable to sustain administrative costs. Further, REMAs only represent the formal side of ASM, which constitute a minority.

REMAs work within an umbrella organization known as the Federation of Miners Associations (FEMATA), which was established in 1984. FEMATA was formed to provide a platform for the REMAs to have a common voice. The federation is run through a board composed of representatives from the REMAs and has a full-time Chief Executive Officer (CEO) who runs the day-to-day operations. Further, the CEO serves as one of the commissioners of the Mining Commission in accordance with the Mining Act of 2010 and its amendments.

Miners Cooperatives

Some of the small-scale miners at different sites have organized themselves into Cooperatives and Savings and Credit Cooperative Societies (SACCOS) to pool resources for purchasing equipment, obtain licenses, attract investment and share organizational burdens. Further, the Cooperatives play a role in income distribution, mediating tensions and conflicts, and representation and advocacy towards authorities, investors and traders. Such cooperatives exist in Mgusu and Katente (Geita Region) and Nyangalata (Shinyanga), just to mention a few. Many of them face considerable financial and organizational challenges.

Tanzania Mineral Dealers Association (TAMIDA)

TAMIDA was formed in 1989 in Arusha and began functioning in 1990. Key roles of the Association include: cooperating with all relevant government agencies to ensure favourable taxes and levy rates; conducting research to understand mineral markets, advertise local minerals in international markets, organise trips for miners and dealers to exhibitions; creating systems to control production, preparation and selling of minerals and gemstones; and advising ASM and dealers on the value of minerals.

Tanzania Women Miners Association (TAWOMA)

In 1997, women artisanal and small-scale miners came together to form their own organization, TAWOMA, headquartered in Dar es Salaam. The Association was formed with the aim of facilitating women miners to organize and access the required financial, technical and marketing services to enable them to carry out mining activities that are both economically viable and environmentally sustainable; and thereby raise the standard of living of women miners and their families.

2.7 Mercury trade

Mercury used by ASGM in the country is solely imported. Dealers and users of mercury are required to register and ensure its proper management. The Industrial and Consumer Chemicals (Management and Control) Act of 2003 designates the Chief Government Chemist as the Registrar of industrial and consumer chemicals in the country.

Mercury importation into the country is informal. This is due to the fact there are no government official records of imported mercury based on the information provided by the Government Chemist Laboratory Authority (GCLA), in spite of Tanzania being one of the countries in Africa with significant ASGM activities which consumes substantive amount of mercury.

Based on few studies and the National Overview on ASGM (2017), it is believed that the main entry routes of mercury into the country are through Sirari, Namanga, Dar es Salaam City, and

Tunduma. Proportion of mercury used in ASGM sites around the dominating Lake Victoria Goldfields (LVGF) enters through Sirari and Namanga border posts, and that it is supplied by local gold brokers to operators, often on credit, with the dues settled upon the subsequent sale of gold by the loan recipients. This entry route is estimated to meet about 55% of the total national mercury consumption. It was further revealed that the mercury trade is also dominated by Dar es Salaam-based goldsmiths who import mercury from Algeria, who supply mercury to ASGM operators as part of their purchase arrangements with the gold sellers countrywide, accounting about 25% of the national mercury consumption. It is also suggested that the ASGM in the southern gold mining regions obtain mercury informally through Tunduma border post which is estimated to meet about 20% of national mercury consumption.

Mercury trade in ASGM sites is generally covertly conducted mostly through goldsmith shops. Field survey findings revealed that mercury distribution reach end users (miners) through either PML owners, gold buyers, goldsmiths, jewellers or processing centre owners.

Gold in the ASGM subsector is mainly produced by using the mercury amalgamation process. The gold market chain involves miners who sell sponge gold to middlemen, the sponge gold is then sold to brokers who either buy on behalf of gold dealer or sell direct to the local market. The major gold buying centres in Tanzania are Mwanza, which is the major city in the Lake Victoria Goldfields followed by Dar-es-Salaam, which is a major exit for most exporters and has a large number of jewellers. Other small gold trading centres include Mbeya, Musoma, Songea and Arusha. The gold sold to the dealer undergoes value addition through purification and is then exported. Gold dealers finally sell the purified gold to international markets particularly in the United Arab Emirates, South Africa, India and China

2.8 Economic aspects

Income levels and distribution

The ASGM sub-sector, being largely labour intensive, has played a significant role in the provision of employment opportunities in the country more than large scale gold mining. It is worth noting that ASGM accounts for over 90 percent of the employment in the mining sector in Tanzania.

In most of the ASGM sites, the average monthly income generated by the PML Owners ranges from TZS 0.8- 2 million (USD 364 - 909) as compared to Pit Owners which ranges from TZS 0.5 - 1.5 million (USD 227- 682). Further, Casual Workers earn about TZS 80,000 - 150,000 (USD 36 - 68) per month per person depending on availability of work. However, it was learnt that monthly income gained from ASGM activities can rise to as much as USD 1,000-2,500 per individual. Comparatively, on average, men earn two or three times more than women.

The income levels by the various ASGM occupations are generally higher than the current Government minimum wage which range from TZS 100,000 (USD 45) for agricultural labourers to TZS 400,000 (USD 180) for the mining sector.

Access to credit services

Many artisanal and small scale gold miners face difficulties in accessing credit services to acquire equipment and hire the labour needed to improve their production. This situation is

attributed to lack of geological information of respective concessions to establish potential lifespan and economic viability of the mine; inadequate physical loan collateral; and insufficient experience in formulating bankable projects, which form part of basic requirements by the financial institutions. However, they mainly depend on informal loans from gold buyers and other middlemen with unfavourable terms that can lead to further indebtedness.

Contribution of ASGM to social welfare

There are notable positive impacts of ASGM activities to the livelihoods of the surrounding communities. Some of these impacts include: emerging of townships with most of the basic social services, which reduces rural-urban migration and increased Government revenue and hence contributes to the capacity of the LGAs to provide social services. Most of the visited ASGM sites (both formal and informal) have been supporting community activities and projects. Some of these include construction of classrooms and health facilities; providing school desks; construction of village council offices and police posts; support funeral activities; drilling boreholes; and road maintenance.

Contribution of ASGM to the welfare of individual miners

According to the interviews during the field survey in three of the visited ASGM sites namely, Ilindi-Mwime (Shinyanga Region), Masagalu (Tanga Region) and Itumbi (Mbeya Region), about 50% of the miners indicated that their living standards have improved substantially since engaging in ASGM, whereas 25% pointed out that not much has changed. Most of the livelihood improvements were observed to be associated with PML owners, pit owners and entrepreneurs who provide goods and services in the ASGM sites. However, about 25% of the miners revealed that life has generally gotten worse principally due to less income gained since they got involved in ASGM.

2.9 Demographic and social information

Social hierarchy

ASGM activities are attributed with gendered division of labour where in most cases men engage in underground work and women in ore processing work particularly in transporting ore from pit area to processing areas, manual rock crushing, ore milling, sluicing and panning (amalgamation). The number of women engaged in ASGM is about 240,000 - 360,000 constituting about 20-30% of the total population of miners. The main driver for the majority of women engagement in ASGM activities is poverty and inadequate alternative employment opportunities. On average, women earn about 25-40% of the income earned by men.

Furthermore, there are about 8,000-10,000 children working in ASGM (equivalent to about 1% of the total ASGM population) with boys being slightly the majority. Children mostly work in the mines for specific activities such as manual crushing of ore; hauling gold ore bags; sluicing and panning; fetching water for ore processing; working in shops and local restaurants; and chopping wood. They are reported to start working at the age of 7-10 years. Many studies have indicated that poverty (household poverty) and lack of parental support are major drivers of child labour.

Educational status

With regard to education status, it has been revealed that most of miners (80-90%) had primary school education having the ability to read and write. In addition, most of the miners have not attended any special training on mining activities but rather have acquired necessary skills through experience. This low level of education may impact negatively on their mining operations especially in handling mercury and in complying with occupational health and safety requirements. It could also constitute a challenge in the endeavours to facilitate formalization and compliance with existing relevant legislation.

Access to social services

The majority of the ASGM sites are accessible using earth roads due to their predominantly remote locations. Inadequate health facilities in ASGM sites is a major concern taking into consideration the many health and occupational risks associated with often poor gold mining and processing practices at these sites. Many of the visited ASGM sites have education facilities (primary and secondary schools) though they are located between 3 and 10 km away.

The majority of the visited sites depend on bore holes and surface water sources which are rather unprotected sources, a feature of particular concern in parts of ASGM sites where there is an increased threat of mercury pollution. In all ASGM sites, miners use pit latrines most of which are of poor standard and do not match with the actual needs of existing populations. In most of the visited ASGM sites and available literatures, majority of the miners are accommodated in temporary tents made out of plastic and wooden materials due to the fact that the miners do not expect to stay permanently. However, in more mature settlements such as Nyarugusu (Geita Region) and Itumbi (Mbeya Region), miners do invest in more permanent housing.

Level of knowledge on the environmental and health risks

Several studies have demonstrated low level of awareness among miners on the health and environmental problems caused by mercury. Correspondingly, during the field survey, one interviewed miner at Nyamikondo (Mara region) explained that he has been using mercury for more than 20 years and has not experienced any health effects. This indicates limited knowledge on adverse health effects of mercury at ASGM and surrounding communities.

The survey also revealed that the majority of miners do not use protective gears to avoid mercury exposure. Furthermore, findings suggests that the public, including many health professionals, have limited knowledge and awareness on health risks associated with mercury, diagnosis and treatment.

Occurrence of criminal activities

Occurrence of criminal activities is minimal in most of the ASGM sites due to presence of community policing, availability of private security companies and temporary police posts, or having policemen on site. Some of the crimes include sexual abuse and harassment, theft, robberies and drug abuse.

2.10 Environmental Information

Soil Contamination

Mercury contamination in soil is considered to be contributed by ASGM activities. Several studies targeting ASGM sites have revealed mercury concentrations in soil to range from 0.005 - 1,759 µg/kg (National Overview of ASGM in Tanzania, 2019). Generally, there is decreasing trend in mercury concentration with distance from the ASGM sites.

Sediment Contamination

Several studies assessed mercury contamination in bottom sediments collected from different water bodies (rivers, streams, lakes, water ponds, swamps and wetlands) and used as an indicator to determine water quality. Mercury concentrations in freshwater sediments collected from these water sources ranged from 0.01 - 36.3 µg/kg (National Overview of ASGM in Tanzania, 2019). Mercury concentrations in sediment were generally higher in ASGM sites as compared to non-mining areas.

Surface Water Contamination

Based on several studies, surface water samples in selected ASGM sites showed a range of mercury values from 0.0004 to 6.78 µg/L (National Overview of ASGM in Tanzania, 2019). However, findings from other studies were below the WHO drinking water standard for inorganic mercury in surface and ground waters at concentrations usually of less than 0.5 µg/L. The presence of Mercury in water sources used for human consumption could be due to dispersion from unprotected tailings and amalgamation ponds.

Mine Tailings Contamination

Mine tailings emanating from sluicing and amalgamation stages in ASGM are of both economic and environmental interest as they still contain significant quantities of gold (60-70% of the original quantity), mercury and other toxicants with potential environmental adverse effects. Mercury concentration in mine tailings investigated by several studies were found to range between 0.2 and 232 mg/kg in selected ASGM sites (National Overview of ASGM in Tanzania, 2019).

Land Degradation and Deforestation

ASGM often involves the clearing of vegetation cover for mining, settlements and establishing access roads. Consequently, the landscape of most ASGM sites is characterized by bare land patches, shallow dugouts, deep pits, piles of waste tailings, poorly and randomly constructed temporary tents, and small farms, all of which contribute in increasing the possibility of soil erosion. Further, the drainage system of many ASGM sites has also been affected by the mining activities, while some streams are diverted and tampered in order to mine gold ore. ASGM activities are estimated to contribute in land degradation and deforestation at a rate of about 7,440 - 18,600 hectares per annum (National Overview of ASGM in Tanzania, 2019). It is also worth noting that back-filling of ASGM pits is rarely undertaken, thus contributing to land degradation.

Tailings Management

Tailings from ASGM are commonly generated during sluicing and amalgamation. It is estimated that annual generation of tailings from ASGM in the country is in the range of 1-1.9 million tonnes (National Overview of ASGM in Tanzania, 2019). Tailings generated during ASGM operations is often stockpiled nearby and for re-processing and/or sale to cyanide leaching process plants. However, in view of the tailings being potentially mercury contaminated, haphazard stockpiling poses threat to widespread environmental contamination.

2.11 Health information

Health impacts from mercury exposure

Various studies suggest that occupational exposure to mercury in ASGM contributes substantially to increased mercury body burden. Miners in various ASGM localities in the country have been found to have elevated levels of mercury in urine, hair and breast milk. It is worth noting that miners engaged with burning amalgam are the most at risk with extreme mercury body burden.

Human exposure to mercury can cause neurological and neuropsychological deterioration, however, only few studies have been undertaken in the country. In a study undertaken at Saza and Makongolosi ASGM sites (Mbeya Region) in 2017 involving 150 participants, symptoms such as cough, chest tightness, tremor of hands, tremor of tongue, tremor of eyelid and trouble of walking were significantly more prevalent in exposed than non-exposed subjects (National Overview of ASGM in Tanzania, 2019). Further, using a combination of both human bio-monitoring (HBM) and health data in a diagnostic algorithm, it was estimated that between 25-33% of the miners in Tanzania (based on a total miners population of 800,000) suffer from moderate chronic metallic mercury vapor intoxication (CMMVI). The data suggests that mercury intoxication in ASGM is a substantial, largely neglected national and global health problem.

Access to health services for mercury related illness

ASGM sites have inadequate access to health facilities, which increases risk taking into consideration the many health and occupational risks in the sites, including poor gold mining and processing practices. During the field survey, it was learnt that, in many cases, the available health facilities do not have capacity for diagnosis and treatment of mercury related illness.

Sanitation and hygiene

The sanitation and hygiene in the ASGM are poorly practiced. The field survey noted that in all ASGM sites, miners use pit latrines most of which are of poor standard and do not match with the actual needs of existing populations. The pits in some mining areas usually shallow and can easily contaminate other water sources. Hand washing and other related hygiene are inadequately done because of lack of water supply to many sites. This situation suggests for the prevalence of water borne diseases in many ASGM sites in the country possibly due to open defecation and haphazard disposal of excreta and other wastes.

2.12 Towards a decision making process

The development process of NAP was consultative, and efforts were made to influence and ensure mainstreaming of NAP into plans and strategies of lead institutions. This was achieved through periodic briefings to the Permanent Secretaries of Ministries responsible for Environment, Minerals and Health; Project Steering Committee; and the Cabinet Committee on Environment.

The National Task Force made visits for briefing the Permanent Secretaries of the Vice President's Office; Ministry of Minerals; and the Ministry of Health, Community Development, Gender, Elderly and Children. The purpose of the visits were to sensitize, influence support and create institutional partnership for the NAP. During the visits, briefings were made to introduce the NAP project; findings of the National Overview on ASGM; and the National Action Plan.

Further, the Project Steering Committee, which constituted Senior Officials from key institutions was regularly involved in the NAP development process through its meetings. The PSC was a useful platform in providing strategic direction in the development and eventual implementation of the NAP.

In addition, a Cabinet Paper on Implementation of NAP was prepared and tabled to the Cabinet Committee on Environment, which is chaired by the Vice President of the United Republic of Tanzania, to obtain high level support and influence integrating NAP in plans and strategies of lead institutions.

3.0 NATIONAL OBJECTIVES AND REDUCTION TARGETS

3.1 Problem Statement

Artisanal and small-scale gold mining (ASGM) has been practiced in Tanzania for more than 100 years. Gold recovery using mercury is widely being practiced in the country with serious long-term environmental and health risks. Baseline situational analysis revealed that national mercury consumption is about 13.2-24.4 tonnes per year. A total of about 1.2 million people are engaged in ASGM activities with an estimate of 7.2 million people (equivalent to 13% of the total national population) depending indirectly on ASGM. Inadequate capacity to control, unsafe use and poor management of mercury pose significant health, environmental and socio-economic risks to miners and neighbouring communities. There is a need to promote more sustainable activities in this sub-sector, and to reduce and where feasible eliminate mercury use in the sector, to protect human health and the environment.

3.2 The Goal of NAP

The goal of the NAP is to reduce, *and where feasible*, eliminate the use of mercury in, and associated emissions and releases to the environment from ASGM.

3.3 Specific Objectives

The specific objectives of the NAP are:

a) To reduce the use of mercury in the ASGM sub-sector by 30% and enhance public awareness by 2025;

b) To strengthen the legal framework, institutional capacity and stakeholder engagement in ASGM sub-sector governance by 2025; and

c) To develop and implement a public health strategy for preventing and mitigating mercury exposure to ASGM communities by 2025.

3.4 Key Targets of the NAP

i) Mercury use in the ASGM sub-sector reduced by 30% by 2025 through elimination of mercury intensive and unsafe practices of mercury use, the adoption of mercury control and capture technologies, and/or the adoption of mining techniques that do not require mercury use;

ii) Enforcement of the Mining Act, 2010 and its amendments of 2017 and 2019 and other relevant sectoral legislations strengthened; and regulations on the control and management of mercury prepared and enforced by 2025;

iii) Institutional capacity of the Ministries responsible for Minerals, Environment and Health; Mining Commission, GCLA, NEMC and TRA strengthened by 2025;

iv) A public health strategy for preventing and mitigating mercury exposure to ASGM communities developed and implemented by 2025;

v) At least 20% of women miners in ASGM sub-sector empowered (training, technology and credit services) by 2025;

vi) At least 70% of working children in ASGM detached by 2025.

vii) At least 40% of approved Environmental Protection Plans (EPPs) are complied by respective licensed ASGM operators by 2025;

viii) At least 30% of ASGM operators have accessed affordable credit and financial services by 2025;

ix) Regional mineral centers are established and operated in each region to promote access to gold markets by 2025; and

x) Capacity building to Miners associations, particularly FEMATA, REMAs, TAWOMA, TAMIDA and WIMA, strengthened by 2025.

4.0 IMPLEMENTATION STRATEGY

4.1 Strategies

The Strategy provides framework for stakeholders' participation in the implementation of NAP. In addition, it provides strategic interventions to reduce, *and where feasible eliminate*, use of mercury in ASGM. Specific strategies have been highlighted in the sub section below.

4.1.1 Actions to Eliminate Worst Practices

Baseline Situation

ASGM activities in the country constitute a number of worst gold processing practices that are targeted by the Minamata Convention for elimination. These include open burning of amalgam on site or in residential areas and cyanidation of potentially mercury-contaminated tailings which are widely practiced in the country.

A large majority of artisanal miners separate mercury from gold in amalgam by heating in an open pan. They do not use methods to condense mercury such as ''retorts'' because they do not believe that mercury vapours are harmful. Also, most of them argue that by using retort they cannot observe the burning process of amalgam and believe they can lose their gold through the process. Another perception that creates resistance to retorts is that it takes too much time to eliminate mercury from the amalgam. Any method to replace mercury should first address the needs and beliefs of the miners.

Reprocessing of tailing materials from ASGM for recovering the remaining gold through cyanidation process is considered to be worst practice since the tailings from the amalgamation process can potentially contain some amount of residual mercury which is undesirable. This is due to the fact that when cyanide is mixed with mercury, the resulting complex makes the mercury more bio-available with increased potential to contaminate food chain.

The persistence of these worst practices are mainly attributed by low awareness of risks associated with mercury exposure; and resistance to use mercury capture technologies such as retorts.

Requirements of the Minamata Convention

Annex C 1(b) of the Minamata Convention aims to eliminate worst practices in ASGM which contribute significantly to mercury emissions and releases particularly whole ore amalgamation; open burning of amalgam or processed amalgam; burning of amalgam in residential areas; and cyanide leaching in sediment, ore or tailings to which mercury has been added without first removing the mercury.

Priority Interventions

Priority interventions to promote elimination of worst practices in ASGM operations with the aim of achieving the set objectives related to reduction in mercury use and awareness raising include:

i) Develop and implement awareness raising and training plan on best practices on mercury capture techniques such as mercury retorts and mercury-free gold processing including gravity separation and cyanidation;

ii) Develop and implement a financial and technical assistance plan to facilitate miners with the transition from worst practices to reduced- and zero-mercury mining practices through facilitation to access financial institutions and adoption of mercury free gold processing technologies;

iii) Promote research and dissemination of mercury free alternative technologies for gold processing to higher learning and research Institutions; and

iv) Promote research on effective and affordable technologies for mercury recovery from existing tailings generated by the ASGM sub-sector.

4.1.2 Actions to Conduct Baseline Estimates of ASGM Mercury Use

Baseline Situation

Tanzania has significant ASGM activities with implication on substantial mercury use. However, there is scanty information on the amount and trend on mercury use in ASGM in the country. There have been efforts by different stakeholders through various initiatives to establish inventory on mercury use in the country. In most cases, these efforts are *ad hoc*, uncoordinated and of limited geographical scope.

Requirements of the Minamata Convention

Annex C 1(d) of the Minamata Convention requires Parties to develop strategies for conducting Baseline estimates of the quantities of mercury used and the practices employed in artisanal and small-scale gold mining and processing within its territory;

Priority Interventions

Priority interventions to establish periodic baseline estimates of ASGM Mercury use, with the aim of achieving the set objectives related to reduction in mercury use include:
:

i) Establish multi-stakeholder inventory team and provide tailor made training, and
ii) Update baseline estimates of ASGM mercury use every three years in line with the requirements of Article 7 of the Minamata Convention.

4.1.3 Steps to Facilitate Formalization or Regulation

Baseline Situation

Formalization is a process that seeks to integrate the ASGM sub-sector into the formal economy, society and regulatory system. Formalization is seen by many as an important step for the ASGM sector to harness its potential as a tool for poverty alleviation and improvement of working conditions while helping to overcome social and environmental challenges, since a more formal ASGM sector will enable outreach not only on mercury management but also on

the full range of social, environmental, and economic development issues related to ASGM. Formalization encompasses several aspects particularly legal, institutional, financial, socioeconomic and geo-environmental dimensions.

Initiatives have been taken by the Government to formalize the ASGM subsector These include elaboration of the importance of formalization in the Mineral Policy and other relevant policies, enactment of relevant legislations, developing of projects to address challenges in the ASGM sub-sector including formalization challenge.

Some of the achievements attained include:- establishment of the Mining Commission and upgrading of laboratory facilities at the Geological Survey of Tanzania (GST) and Mineral Resources Institute (MRI); put in place policy and legal framework including enactment of the Mining Act, 2010 and its amendments of 2017; establishment of three (3) mining and processing demonstration centres at Katente and Rwamgasa (Geita Region) and Itumbi (Mbeya Region) to offer centralized processing services and seven (7) centres of excellence at Bukoba, Bariadi, Musoma, Buhemba, Mpanda, Songea and Handeni; and training on best mining and processing practices; provision of Tanzania Shillings 7 billion to licensed small scale miners through a government grant scheme to 111 miners; training of more than 10,000 miners on best mining and processing practices over the past 5 years (2013-2017); and more than 10,000 working children have been removed from mining activities over the past 5 years (2013-2017).

Despite these achievements, formalization of ASGM has continued to face several challenges including limited availability and access by miners to geological information; limited access to credit and financial services; difficulty in obtaining market information and market access; limited institutional capacity to enforce existing laws; insufficient demographic and related information onASGM; dysfunctional Regional Mining Associations (REMAs); and low level of awareness.

Requirements of the Minamata Convention

Annex C of the Minamata Convention requires Parties to take steps to formalize or regulate the ASGM sector.

Priority Interventions

Priority interventions to facilitate formalization of ASGM with the aim of achieving the set objectives related to legal framework, institutional capacity, and awareness raising include:

i) Review, prepare, and enforce relevant legislation and regulations as necessary to encourage formalization of informal ASGM through demarcation of informal mining sites, capacity building and promote group forming;

ii) Strengthen the capacity of key institutions mandated with licensing and governance of the ASGM sub-sector to facilitate formalization;

iii) Operationalize regional mineral centres to promote access to gold market and improve contribution of the ASGM sub-sector to the economy;

iv) Conduct land use mapping and geo-prospecting and dermacate land for ASGM;

v) Create enabling environment and arrangements to facilitate access to affordable credit and financial services by miners; and

vi) Strengthen capacity of miners' associations to enhance formalization.

4.1.4 Strategies for promoting the reduction of emissions, releases, and risks of exposure to mercury

Baseline Situation

Mercury losses occur mainly in tailings (amalgamation process losses), air (burning to recover gold) and during cyanidation of potentially mercury contaminated tailings from ASGM. The losses accounts for 36% in air and 64% in tailings from total mercury losses. From the baseline study done, it is estimated that the ASGM sub-sector consumes between 13.2 and 24.4 tonnes of mercury per year. The mass balance studies in Tanzania showed that most of the losses occur during Au/Hg amalgam burning to remove excess Hg. The mass balance flow analysis illustrates that 70-80%of the Hg released to the environment is lost to the atmosphere through active amalgam roasting at the mine site and in goldsmiths' shops in towns. Between 20 and 30% are lost to tailings, soils and water.

Some of the Hg emitted during amalgam burning in houses or in goldsmith's shops is deposited on surfaces close to the site of emission, usually at the mudwall next to the fire place or on soot in the roof of the hut. A sample from the mudwall of a hut at Katente (Tanzania) in which amalgam was burned contained 324 mg Hg/kg whereas the soot in a goldsmith shop in Shinyanga(Tanzania) analyzed 62 mg Hg/kg.

ASGM does dispose their empty mercury bottles mainly through open dumping at the site or roadside; throwing the bottles in pit latrines; and some taking back to the trading stores for reuse. This trend attributed to lack of awareness on appropriate management practices of used/empty mercury bottles and mercury waste in general has led miners to resort to unscrupulous methods that pose a great risk to peoples' health and the environment.

The diagnosed health impacts associated with mercury in Tanzania include increased mercury body burden evidenced in terms of high mercury levels in urine, hair and breast milk with estimated 25-33% of the miners in Tanzania considered suffering from moderate mercury intoxication. Further, neurological and neuropsychological deterioration have been documented across ASGM sites whose signs and symptoms include tremor, ataxia, excessive salivation, coordination problems, metallic taste, sleep disturbances, gray to bluish discoloration of the oral cavity and proteinuria.

Studies have shown that mercury may pass from mother to fetus in blood and may be found in amniotic fluid and milk and therefore breast-feeding can be a source of mercury exposure for infants. In a study conducted in Geita Region, four (4) of the participating breast-feeding women (aged between 30-35 years) working in ASGM sites were found to have mercury breast milk ranging from 3.4 to 146.60 µg/L (ppm). Similarly, in a global study involving 1,044 women of child-bearing age from 25 countries, it was found that 71% of diagnosed women in Kenya had mercury levels greater than the threshold limit of 0.58 ppm mercury, related to their engagement in ASGM activities. These studies suggest that there is a substantial threat to women and children's health from mercury exposure particularly those involved in ASGM. There is generally limited awareness among miners and the general public on the threats to

health associated with exposure to mercury. In addition, there are very few occupational medicine specialists in the country. This situation poses a challenge for diagnosing and treatment of mercury related diseases.

The release of mercury contributes to the environmental contamination, as ASGM heavily use (inorganic) mercury to extract the gold from the ore. Open burning of gold mercury amalgam is generally preferred by ASGM miners rather than using retorts in capturing of mercury. Further, the excavation and processing of ore along with the disposal of tailings may facilitate the release of non-mercury heavy metals into the environment that were otherwise sequestered. Mercury contamination in soil is considered to be contributed by ASGM activities and partly geological nature of a site (background concentration). Mercury concentrations in soil were reviewed in 8 studies involving a total of 528 samples, most of which focused on Lake Victoria Goldfields (LVG) and to a less extent in the Lupa Goldfields (LGF) and Mpanda Mineral Field (MMF). Mercury concentrations ranged from 0.005 - 1,759 µg/kg.

Requirements of the Minamata Convention

Annex C 1(e) of the Minamata Convention requires Parties to develop 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.

Priority Interventions

Priority interventions to promote the reduction of emissions, releases and risks of exposure to mercury with the aim of achieving the set objectives related to legal framework and awareness raising include:

i) Strengthen enforcement of laws related with land use planning and environmental management that restrict the use of mercury in environmentally/ecologically sensitive areas; and

ii) Develop and implement communication strategy on education and awareness on the risks associated with the use of mercury in ASGM.

4.1.5 Strategies for managing trade and preventing diversion of mercury and mercury compounds

Baseline Situation

Mercury supply for ASGM is met through importation into the country. During the field survey, it was learnt that a larger proportion of mercury used in ASGM sites around the dominating Lake Victoria Goldfields (LVGF) enters through Sirari and Namanga border posts. This entry route is estimated to meet about 55% of the total national mercury consumption. It was further revealed that the mercury trade is also dominated by Dar es Salaam-based goldsmiths who import mercury from Algeria, who supply mercury to ASGM operators as part of their purchase arrangements with the gold sellers countrywide. This source is estimated to contribute about 25% of the total national mercury consumption. Further, it is believed that the ASGM in the southern gold mining regions sources mercury informally through Tunduma border post. This route is estimated to meet about 20% of national mercury consumption.

Mercury trade in ASGM sites is generally covert and is practiced under-the-counter in goldsmith shops. Field survey findings revealed that, mercury distribution reach end users (miners) through either PML owners, gold buyers, goldsmiths, jewellers or gold processing centre owners.

The fluctuation of mercury prices partially depends on the price of gold in the global market as well as availability. It is noted that ASGM activity increases as the prices of gold increases which can also affect the mercury price and consumption. The market price of mercury in Tanzania ranges from TZS 200,000 (USD 92) to 300,000 (USD 137.4) per kg. Along the domestic supply chain, mercury is imported in either 1 or 2 kg bottles or 34.5 kg canisters and refilled into smaller bottles depending on the market. Below this level of supply, bottled portions are measured into soda bottle caps (using 5 mm^3 syringes), which are priced at TZS 30,000 (USD 14).

The amount of gold produced by ASGM using mercury is estimated to range from 13.2 and 24.4 tonnes per year.

Main actors in the gold value chain are:

i) *Gold dealers* – these are located in major towns and cities and buy gold from miners and brokers and sell it to international market. They are also considered to play some role in mercury trade as local suppliers.

ii) *Gold buyers/brokers* – who provide mercury to ASGM miners under different arrangements such as provision of credit, in exchange for gold, subsidized or free of charge and in turn miners sell the gold to these buyers. Most of the gold buyers operate in District or regional towns or major ASGM centres.

iii) *Licensed Onsite gold buyers* – these are located in ASGM sites who buy gold from individual miners and may also be involved in distributing mercury to miners on agreed arrangements.

Requirements of the Minamata Convention

Annex C, Paragraph 1(f) of the Minamata Convention requires the NAP to include 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.

Priority Interventions

Priority interventions to facilitate management and control of mercury trade with the aim of achieving the set objectives related to institutional capacity, legal framework and reduction in mercury use include:

i) Strengthen institutional capacity to facilitate control and monitoring of mercury supply chain in ASGM;

ii) Prepare and enforce Regulations on the control and management of mercury and mercury compounds; and

iii) Engage in regional and international cooperation in controlling transboundary mercury trade.

4.1.6 Strategies for involving stakeholders in the implementation and continuing development of the plan

Baseline Situation

There are several actors engaged in the ASGM sub-sector. These include Government Ministries and Agencies; Local Government Authorities; private sector; and civil society. These stakeholders will guide the NAP development and its implementation through all its phases.

Level	Institution	Role and responsibility
Ministry level	President's Office - Local Government and Regional Administration (PO-RALG)	The main function of PO-RALG is to coordinate and supervise regional development, management and administration; coordinate activities of Regional Secretariats and LGAs and build their capacity in institutional development strategies for integrated socio-economic development and financial development of LGAs; and strengthen the channel of information and communication between national and sub-national levels. The role of PO-RALG is to coordinate ASGM activities at regional and local level.
	Vice President's Office	It has the mandate of overall coordination and policy articulation on environmental management in the country. With regard to ASGM, it supports awareness raising and technical guidance on mitigating environmental impacts related to mining activities.
	Prime Minister's Office - Labour, Youth, Employment and Persons with Disability (PMO-LYEPwD)	Facilitate, ensure and enforce legal requirements related to effective and fair labour and employment relations and conditions of work.
	Ministry of Minerals	Promote formalization of artisanal miners; demarcate mineralized land for ASGM; facilitate technology transfer to enhance productivity, safety and environmental protection; and provision of extension services to miners.
	Ministry of Health, Community Development, Gender, Elderly and Children	Facilitate provision of curative and preventive health services; promote environmental sanitation; training; and monitoring of health risks in ASGM activities.
	Ministry of Home Affairs	Ensure public safety and security in ASGM sites.
Agency level	Mining Commission	Issuing licenses; revenue collection; and conducting mining inspection on ASGM sites to oversee issues related to safety, health and environment.

Level	Institution	Role and responsibility
	State Mining Corporation (STAMICO)	Identification of suitable areas with mineral potential; technological support; training; facilitate access to credit and financial services; and facilitate access to market and information related to activities of ASGM.
	Geological Survey of Tanzania (GST)	Conducting extension services to ASGM in understanding geology of the area; mining techniques and improving recovery by providing technical training; and conducting exploration activities of demarcate areas for ASGM.
	National Environment Management Council (NEMC)	Ensuring compliance with environmental management laws and regulations; awareness raising; and training on sustainable mining practices.
	Government Chemist Laboratory Authority (GCLA)	Registration of users, importers, exporters, distributors, sellers of mercury, cyanide and other related chemicals; conduct inspection and monitoring of compliance; training; bio-monitoring and Laboratory analysis of environmental samples.
	Occupational Safety and Health Authority (OSHA)	Registration of ASGM sites for occupational health and safety compliance; inspection of ASGM sites; training; occupational health surveillance; and enforcing compliance on safety and occupational health.
	Tanzania Commission for Science and Technology (COSTECH)	Promote, coordinate, monitor and evaluate scientific research and technology development and technology transfer in mining activities in the country.
	Fire and Rescue Force	Registration, inspection and training and provision of rescue services in case of mining accidents and disaster.
Regional level	Regional Commissioner's Office	Overseeing development issues, peace and security and coordination of local government institutions in the region.
District/ Municipality/ Township/ Town level	District Commissioner's Office Executive Director's Office (District/ Municipality/ Township/ Town)	Overseeing development issues, peace and security and coordination of local government institutions in the district.
Village level	Village Chairperson's Office	These are responsible for land ownership under Village Land Act, 1999; peace and security at village level; and overseeing development activities and provision of social services
Private sector	Large-scale gold mining companies	To organise and implement programmes that aim to transform and formalise the ASM sector whilst ensuring health, safety and environmental standards are upheld.
	Financial institutions	Develop ASM-specific tailored products to encourage participants to seek and access financing from the institutions.
	Media	Develop and implement programmes aimed at increasing public awareness of ASM; disseminate

Level	Institution	Role and responsibility
		information and data aimed at promoting ASM an improving its public image.
Academia	Universities, Research and training institutions	Conduct targeted research and develop solutions to improve ASM productivity; and Develop and implement training programmes aimed at improving performance of the ASM
Civil Society level	Federation of Miners' Associations of Tanzania (FEMATA)	The mission of FEMATA is to facilitate, lobby and support interest and recognition of artisanal and small scale miners' in Tanzania.
	Regional miners' associations (REMAs)	To bring together miners working with different mineral commodities and provide a platform for the development of organised operations.
	Tanzania Mineral Dealers Association (TAMIDA)	To foster a more conducive environment for members to buy and export gemstones in line with government directives.
	Tanzania Women Miners Association (TAWOMA)	The association provides a range of services to its members such as advocacy research and lobbying; training and education about environmental conservation and disease prevention; access to information; access to technical, financial and marketing services and knowledge exchange through networking events.

A number of challenges exist in engaging stakeholders in ASGM governance including inadequate coordination and collaboration among government actors; inadequate capacity particularly of miners associations in mobilizing miners and networking with other stakeholders; and lack of a formal platform for consultation and dialogue between ASGM players and the Government.

Requirements of the Minamata Convention

Annex C Paragraph 1 (g) of the Minamata Convention requires that the NAP include strategies for involving stakeholders in the implementation and continuing development of the national action plan.

Priority Interventions

Priority strategies to strengthen involvement and engagement of stakeholders in the implementation and continuing development of the NAP with the aim of achieving the set objectives related to stakeholder engagement include:

i) Strengthen coordination and collaboration of government actors in matters related to the ASGM sub-sector; and

ii) Establish and operationalize Stakeholders Annual Forum on ASGM.

4.1.7 A public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury

Baseline Situation

Individuals in or near ASGM communities can be exposed directly to mercury vapor produced during the open burning of amalgam and during mixing of ore concentrate and mercury. Indirect exposure to mercury may occur through consumption of mercury contaminated foodstuffs such as fish, meat, agricultural crops and drinking water. The main health concerns of mercury include neurological, kidney, cardiovascular and immune system effects. Other systems that may be affected include the respiratory, gastrointestinal, hematologic and reproductive systems.

The different studies suggest that occupational exposure to mercury in ASGM contributes substantially to increased mercury body burden. Exposure to mercury can be determined by measuring mercury levels in various body tissues and fluids such as hair, blood, urine, human milk and nails which provides an indicative measure of the likelihood of adverse health effects. Several studies have indicated miners in various ASGM localities in the country to have elevated levels of mercury in urine, hair and breast milk. It is worth noting that miners engaged with burning amalgam are the most at risk with extreme mercury body burden.

It is widely known that human exposure to mercury vapour can cause neurological and neuropsychological deterioration. However, only few studies have been undertaken to assess neurological and neuropsychological deterioration associated with mercury intoxication in the country.In a study undertaken at Saza and Makongolosi ASGM sites (Mbeya Region) in 2017 involving 150 participants, symptoms such as cough, chest tightness, tremor of hands, tremor of tongue, tremor of eyelid and trouble of walking were significantly more prevalent in exposed than non-exposed subjects (National Overview of ASGM in Tanzania, 2019). Further, using a combination of both human bio-monitoring (HBM) and health data in a diagnostic algorithm, it was estimated that between 25-33% of the miners in Tanzania (based on a total miners population of 800,000) suffer from moderate chronic metallic mercury vapor intoxication (CMMVI). The data suggests that mercury intoxication in ASGM is a substantial and largely neglected national and global health problem.

Further, several studies have demonstrated low level of awareness among miners on the health and environmental problems caused by mercury. Correspondingly, during the field survey, interviewed miners explained that they have been using mercury for more than 20 years without experiencing any health effects. This might indicate the existing limited knowledge on adverse health effects of mercury by ASGM population and surrounding communities in most ASGM areas in Tanzania. The field survey also revealed that the majority of miners do not use protective gears to avoid and/or minimize mercury exposure. Based on the field survey findings and available studies, the situation suggests that the public including many health professionals have limited knowledge and awareness on health risks associated with mercury, its diagnosis and treatment.

The number of health workers available in the country is equivalent to 56.4 percent of the required human resources. The shortage is most severe in remote rural areas where health services are often provided by faith-based organizations and other private entities.

Availability of health facilities in ASGM sites in the country is a major concern taking into

consideration the many health and occupational risks associated with often poor gold mining and processing practices at these sites. This is generally due to the supposedly transient characteristics of these communities. Although it was observed that 72.5% (29 out of 40 sites) of the visited ASGM sites have some access to health facilities, about half (14 out of 29 sites) of the sites have health facilities located between 3-15 km away.

Requirements of the Minamata Convention

Annex C Paragraph 1(h) of the Minamata Convention requires that the NAP includes 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.

Priority interventions

Priority interventions to facilitate development and implementation of public health strategy for preventing and mitigation mercury exposure to ASGM communities, with the aim of achieving the set objectives related to public health and awareness raising include:
:

i) Develop and implement an integrated public health approach in data collection including health data related to mercury and public health status of the ASGM communities;
ii) Develop and implement a training programme for healthcare professionals to enhance their capacity to recognize, diagnose and treat mercury intoxication;
iii) Develop and disseminate diagnosis and treatment protocols for mercury-related health effects including exposure to mercury in ASGM;
iv) Establish and/or strengthen health facilities particularly those located in ASGM areas to cater for mercury related illnesses; and
v) Develop and implement awareness campaign programmes to ASGM communities on health risks associated with ASGM.

4.1.8 Strategies to prevent the exposure of vulnerable populations, particularly children and women of child-bearing age, to mercury used in ASGM

Baseline Situation

ASGM has been singled out to be contributing to the worst form of child labour due to involvement of a score of children along its value chain. The main concerns include the exposure of children to dangerous working conditions including working with mercury and crawling into tiny and unreinforced shafts/pits. It is estimated that up to 10,000 children are specifically involved in ASGM in Tanzania. The age of working children in the visited ASGM sites was found to range between 10-17 years. However, the age of the majority of the children was found to concentrate between 13-15 years which corresponds to the age group of children who should have completed their primary education. The average age at which the children started gold mining activities is 12, with 10 being the youngest. It was also noted that there were fewer girls (15-20%) than boys (80-85%) involved in child labour in the visited ASGM sites. Among the working children in the visited ASGM sites, 55 percent (aged 10-13 years) were still attending primary school, 15 percent (aged 12-15 years) had dropped out of school and 30 percent (aged 14-17 years) had completed their primary school education. For the school

drop-outs, about 60 percent left school when they were in the third grade and the remaining did so in the fifth or higher grades.

Many studies have indicated that poverty is a major driver of child labour while other contributing factors include lack of parental support (unstable family situations and divorce); need for supporting household income particularly those from larger families and single-parent families; less priority placed on education by parents; drop out from school for lack of interest or long distance to school; cultural factors, (e.g. in some cultures children have to work as part of their upbringing); early pregnancies and early marriages; the impact of HIV/AIDS and the high level of orphan-hood since orphans are more vulnerable to child labour. In this context, it can be said that socio-economic problems (at macro and micro levels) are an important force driving participation in child labour.

It was noted during the field survey that children mostly work in the mines for specific activities such as manual crushing of ore; hauling gold ore bags; sluicing and panning; fetching water for ore processing; working in shops and local restaurants; chopping wood; and chopping down trees. Majority of the interviewed children indicated that the most preferred in the ASGM sites was panning followed by working in a restaurant.

In the field survey, it was observed that about 1 in every 5 children (20%) working in ASGM had experienced at least one accident at work. Such accidents involved, falling into an open pit, and working tool related accidents. These accidents resulted into broken legs and arms, head and backbone injuries, skin rashes and sores, body aches and pains, eye problems and chest/respiratory infections, cuts and lacerations, and few fatalities. It was further learnt that more than half of the working children when injured, did not attend hospitals instead sought medications from local drug shops.

In the field survey, it was observed that about 1 in every 6 working children (about 17 percent) contact mercury particularly in the amalgamation process. Unfortunately, none of these children take any protective measure and, worse still, are unaware of the trailing adverse health effects of working with mercury particularly at their tender age. Clearly, the working children do not pay enough attention to their safety and health at work.

Requirements of the Minamata Convention

Annex C1(i) of the Minamata Convention requires the development and implementation of 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.

Priority Interventions

Priority interventions to facilitate prevention and control the exposure of vulnerable population particularly children and women of child-bearing age to mercury used in ASGM, with the aim of achieving the set objectives related to legal framework, stakeholder engagement and awareness raising include:

i) Strengthen enforcement of environmental, labour and mining legislation and regulations prohibiting working children in ASGM;

ii) Develop and implement gender-sensitive initiatives in ASGM sub-sector through provision and access of social services, credit and financial services, work opportunities, training, technological support and awareness;
iii) Develop and implement public awareness raising strategy on the risks of childrens and women of child bearing age exposure to mercury in ASGM communities; and

iv) Integrate child labor issues into ASGM programmes and events and information sharing on child labor with relevant government actors.

4.1.9 Strategies for providing information to artisanal and small-scale miners and affected communities

Baseline Situation

Several studies have demonstrated generally low level of awareness among miners on the health and environmental problems caused by mercury. Further, at present there are no specific public information programmes targeting artisanal and small-scale gold miners. However, direct communications with miners and affected communities may require a more nuanced approach that is designed to inform people but also change behaviors.

One of the major challenges to effective communicating with miners and affected communities is inadequate mechanisms to inform and engage stakeholders effectively. In this context, there is need to sensitize and communicate regularly and systematically with different stakeholders using numerous platforms. There exist information pathways that may be used to provide information to artisanal and small-scale gold miners. However, the success of these pathways will very much depend on the target audience **(Table 4-1)**. Multimedia pathways might be more effective as it would enhance coverage and outreach.

Table 4-1: Analysis of information pathways

Information Pathway	Target Audience	Coverage	Relative Effectiveness
1) Radio programme	All (Rural and Urbanites)	Entire country	Very effective
2) Television Programmes	Mainly Urbanites	Mainly Urban areas and small towns	Very effective
3) Social media	All	Entire country	Very effective
4) Newspapers	Literates	Entire country	Effective
5) Publication of brochures / Newsletters / Booklets / Stickers	Literates	Mainly in Urban centres, rural and ASGM sites	Effective
6) Seminars / Workshops / Meetings	All	Specific groups	Very effective
7) Village/District environmental committees	Villages and Districts	Mainly rural	Effective

Information Pathway	Target Audience	Coverage	Relative Effectiveness
8) Commemoration of World Environment Day/ National Tree Planting Day/ Presidential Award	All	Whole nation	Fairly Effective
9) Essay Competitions (especially for school children)	Schools	Entire country	Fairly Effective
10) School curricula	Primary and Secondary schools	Entire country	Effective
11) NGOs and CBOs	All	Entire country	Very Effective
12) Drama/ Songs/ Traditional dances	All	Entire country	Effective

Initial outreach efforts may need to focus on providing information to communities to raise general awareness of mercury issues and the requirements of the Minamata Convention, whereas subsequent outreach may address specific aspects related to public health, appropriate mining techniques, changes related to legislation and regulation, or other aspects of formalization, alternative livelihoods, and/or natural resource management issues.

Requirements of the Minamata Convention

Annex C1(j) of the Minamata Convention requires the development of strategies for providing information to artisanal and small-scale miners and affected communities.

Priority Strategies/Actions

Priority interventions to facilitate provision of information to ASGM and affected communities on mercury related issues, with the aim of achieving the set objectives related to awareness raising include:

a) Develop and implement an outreach plan specific for affected communities;
b) Establish and operationalize sector-specific depository facilities of information on mercury particularly health, environment, minerals and labour sectors;
c) Develop and implement ASGM training programmes for reduced- and–zero-mercury mining practices; and
d) Develop and implement sensitization plan on mercury risks to the media.

4.2 Work plan

4.2.1 Work plan and budget

Table 4-2 presents the NAP on ASGM which describes concrete actions necessary to implement the identified strategies (Section 4.1) and indicate how the activities will be implemented including information priority, activity lead, timeframe, funding source, estimated budget, expected results and indicators. Detailed budget for each of the proposed interventions is presented in **Annex 4**.

Table 4-2: National Action Plan for the period 2020-2025

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
Specific Objective 1: To reduce the use of mercury in the ASGM sub-sector by 30% and enhance public awareness by 2025												
1.1 Promote elimination of worst practices in ASGM	1.1.1 Develop and implement awareness raising and training plan on best practices on mercury capture techniques	High	**MoM,** NEMC, MRI, STAMICO, Mining Commission, FEMATA, TAWOMA, CSOs						Internal and external sources	700,000	• Awareness and training plan and materials in place • Awareness increased and knowledge gained	• Number of miners sensitized and trained • Number of miners adopted best practices
	1.1.2 Develop and implement a financial and technical assistance plan to facilitate miners with the transition from worst practices to reduced- and zero-mercury mining practices.	High	**MoM, MoFP,** BoT, NEMC, MRI, STAMICO, Mining Commission, FEMATA, TAWOMA, CSOs						Internal and external sources	750,000	• Financial and technical assistance plan in place • Availability of technical and financial resources ready to support ASGM	• Amount of funds mobilized and utilized • Number of miners accessed funds • Number of financial institutions providing

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
												financial services to miners
	1.1.3 Promote research and dissemination of mercury free alternative technologies for gold processing	High	**MoM,** COSTECH, Research Institutions, STAMICO, Mining Commission, MRI, TIRDO, CSOs						Internal and external sources	800,000	• Mercury free alternative technologies in place • Reduction in mercury use	• Number of alternative technologies developed and disseminated • Number of miners adopted alternative technology such as gravity separation and cyanidation.
	1.1.4 Support operationalization of the seven Centres of Excellence for training and gold processing (Simiyu, Mara, Kagera, Katavi, Mbeya, Ruvuma and Tanga) and the demonstration centre (model mine) at Rwamgasa (Geita Region)	High	**MoM**, STAMICO, Mining Commission, GST,Academic and Research Institutions, CSOs						Internal and external sources	700,000	• Centers of excellence operationalized • Number of miners adopted mercury free gold processing increased	• Numbers of operational centres of excellence for training • Number of miners trained by centres of excellence • Number of miners adopted mercury free gold processing at the demonstration centres

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
	1.1.5 Promote research and adoption of effective and affordable technologies for mercury recovery from tailings generated by ASGM sub-sector.	High	**MoM**, NEMC, MRI, STAMICO, Mining Commission, FEMATA, TAWOMA, Academic and research institutions, CSOs						Internal and external sources	500,000	• Number of technologies revealed and adopted • Reduction in environmental pollution from mercury	• Number of technologies adopted • Amount of mercury-contaminated tailings treated
1.2 Conduct baseline estimates of ASGM Mercury use	1.2.1 Establish multi-stakeholder inventory team and provide periodic tailor made training	High	**MoM**, MoHCDGEC, VPO, GCLA, NEMC, Mining Commission, MRI, STAMICO, FEMATA, TAWOMA, CSOs						Internal and external sources	60,000	• Mercury inventory team in place and trained • National capacity in undertaking inventory strengthened	• Number of trained experts
	1.2.2 Update baseline estimates of ASGM mercury use every three years	High	**MoM,** VPO, MoHCDGEC GCLA, NEMC, Mining Commission, MRI, STAMICO,						Internal and external sources	150,000	• Adoption of mercury free alternative technologies; • Adoption of best practices	• Amount of mercury imported and used in ASGM • Number of national inventories

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
			FEMATA, TAWOMA, CSOs									
1.3 Facilitate provision of information to ASGM and affected communities on mercury related issues	1.3.1 Develop and implement an outreach plan specific for affected communities in Regions hosting ASGM activities	High	**MoM,** MoHCDGEC, VPO, NEMC, GCLA, OSHA, MRI, STAMICO, Mining Commission, PO-RALG, CSOs						Internal and external sources	600,000	• Outreach plan in place • Number of miners reached • Awareness on mercury issues increased	• Outreach plan developed and implemented • Number of miners and communities reached
	1.3.2 Establish and operationalize sector-specific depository facilities of information on mercury particularly health, environment, mineral and labour sectors	High	**PMO-YELPwD**, MoM, MoHCDGEC, VPO, NEMC, GCLA, OSHA, MRI, STAMICO, Mining Commission, CSOs						Internal and external sources	800,000	• Depository facilities in place and operationalized • Availability and accessibility of information on mercury improved	• Number of depository facilities • Number of people accessed depository facilities
	1.3.3 Develop and implement sensitization plan on mercury risks to the Media	High	**VPO**, MoM, MoHCDGEC, , TISD, Mining Commission, GCLA, STAMICO, NEMC, CSOs,						Internal and external sources	100,000	• Sensitization plan in place and implemented • Awareness increased among media personnel	• Sensitization plan • Number of media houses and personnel sensitized

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
			Academic institutions, FEMATA, TAWOMA, MCT, JET,TAMWA									
Specific Objective 2: To strengthen legal framework, institutional capacity and stakeholder engagement in ASGM sub-sector governance by 2025												
2.1 Facilitate formalization of ASGM	2.1.1 (a) Prepare, review and enforce relevant legislations including formulating regulations on the control and management of mercury and mercury compounds	High	**PMO-YELPwD**, MoM, MoHCDGEC, MoJCA, AGC, VPO, NEMC, GCLA, Mining Commission, PO-RALG						Internal and external sources	800,000	• Updated legislations in place and enforced • Regulations on mercury formulated and enforced • Formalization of ASGM increased	• Number of legislations • Number of formal miners • Regulations on mercury
	2.1.1 (b) Strengthen enforcement of environmental, labour and mining legislations prohibiting employment of children in ASGM	High	**PMO-YELPwD**, MoM, MoHCDGEC, PO-RALG, NEMC, , Mining Commission, FEMATA, TAWOMA, CSOs						Internal sources	100,000	• Legislations related to child labour enforced • Child labour reduced	• Number of legislations • Number of children

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
	2.1.2 Strengthen capacity of key institutions mandated with licensing and governance of ASGM sub-sector to facilitate formalization	High	**MoM,** MoHCDGEC, PMO-YELPwD, VPO, NEMC, STAMICO, OSHA, GCLA, Mining Commission						Internal and external sources	1,520,000	• Capacity building plan developed and implemented • Capacity of key institutions strengthened	• Number of institutions • Number of formal miners • Contribution of ASGM to national economy
	2.1.3 Strengthen regional mineral centers to promote access to gold market and improve contribution of the ASGM sub-sector to the economy	High	**MoM**, MoFP, Mining Commission, STAMICO, PO-RALG, MoHA, FEMATA, TAWOMA						Internal and external sources	650,000	• Regional mineral centers strengthened • Improved access to gold market	• Number of regional mineral centers • Amount of revenue collected • Number of miners and traders accessed regional mineral centers
	2.1.4 Conduct land use mapping and geo-prospecting and demarcate land for ASGM	High	**MoM**, GST, STAMICO, Mining Commission, MLHHSD, LGAs						Internal and external sources	800,000	• Land use plans in place • Gold reserve established • Availability and accessibility of mineralized land for ASGM improved	• Size of land demarcated for ASGM • Number of land use plans • Amount of gold reserve • Number of issued licenses

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
	2.1.5 Strengthen capacity of miners' associations to enhance formalization	Medium	**MoM**, PO-RALG, NEMC, STAMICO, Mining Commission, FEMATA, TAWOMA, TAMIDA, CSOs						Internal and external sources	340,000	• Capacity building plan in place and implemented • Miners associations strengthened	• Number of miners associations • Capacity building plan
2.2 Facilitate management and control of mercury trade	2.2.1 Strengthen institutional capacity to facilitate control and monitoring of the mercury supply chain in ASGM	High	**GCLA,** MoM, MoHA, TRA, STAMICO, Mining Commission, FEMATA, TAWOMA,						Internal and external sources	800,000	• Capacity building plan developed and implemented • Monitoring plan of mercury supply in place • Data and information on mercury trade improved	• Number of institutions • Capacity building plan • Monitoring plan • Amount of mercury traded and used
	2.2.2 Engage in regional and international cooperation for controlling transboundary mercury trade	High	**VPO,** MoFEC, MoHA, MoM, GCLA, Mining Commission						Internal and external sources	450,000	• MoU on joint control of mercury trade • Compliance to legal requirements improved	• Number of meetings • Number of MoUs • Number of traders • Amount of mercury
2.3 Strengthen involvement	2.3.1 Establish and operationalize	Medium	**MoM,**						Internal and	250,000	• Stakeholders Forum	• Number of meetings

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
and engagement of stakeholders in the implementation and continuing development of the NAP	Stakeholders Annual Forum on ASGM		VPO, FEMATA, TAWOMA						external sources		established and operationalized • Collaboration and sharing of information among stakeholders improved	• Number of stakeholders participated • Number of initiatives raised
Specific Objective 3: To ensure prevention and mitigation of mercury exposure to ASGM communities through a public health strategy by 2025												
3.1 Facilitate development and implementation of public health strategy for preventing and mitigating mercury exposure to ASGM communities	3.1.1 Develop and implement integrated public health approach in data collection related to mercury and public health status of the ASGM communities	High	**MoHCDGEC,** MoM, PO-RALG, OSHA, NBS, GCLA, NIMR, LGAs, Research institutions, FEMATA, TAWOMA, CSOs						Internal and external sources	360,000	• Database developed and maintained • Availability of health data on ASGM improved	• Database • Number of affected communities
	3.1.2 Develop and implement training programme for healthcare professionals to enhance their capacity to recognize, diagnose	High	**MoHCDGEC,** NIMR, OSHA, Academic institutions, PO-RALG						Internal and external sources	500,000	• Training plan developed and implemented • Expertise of healthcare professionals enhanced	• Training plan • Number of trained healthcare professionals

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
	and treat mercury intoxication											
	3.1.3 Develop and disseminate diagnosis and treatment protocols for mercury-related health effects	High	**MoHCDGEC,** PO-RALG						Internal sources	240,000	• Diagnosis and treatment protocols developed and disseminated • Improved healthcare services	• Number of diagnosis and treatment protocols
	3.1.4 Establish and/or strengthen health facilities particularly those located in ASGM areas to cater for mercury related illnesses	High	**MoHCDGEC,** PO-RALG						Internal and external sources	500,000	• Healthcare equipment and health facilities in place • Improved availability and accessibility of health services	• Number of health facilities • Number of healthcare equipment
	3.1.5 Develop and implement awareness programme on health risks associated with ASGM	High	**MoHCDGEC,** OSHA, GCLA, MoM, Mining Commission, VPO, MRI, NEMC, NIMR, PO-RALG, Academic institutions, FEMATA, TAWOMA, CSOs, Media						Internal and external sources	220,000	• Awareness programme developed and implemented • Public awareness increased	• Awareness programme • Number of communities

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
3.2 Promote the reduction of emissions, releases and risks of exposure to mercury	3.2.1 Conduct monitoring of mercury contamination in the environment (soil, sediment, surface and ground water and foodstuff) in ASGM areas	High	**GCLA,** NEMC, MoW, TBS, Research Institutions, NBS						Internal and external sources	500,000	• Monitoring plan developed and implemented • Trend in mercury contamination established	• Monitoring plan • number of samples • Monitoring reports • Database
	3.2.2 Develop and implement communication strategy on the health risks associated with the use of mercury in the ASGM.	High	**MoHCDGEC**, MoM, VPO, PO-RALG, GCLA, NIMR, NEMC, STAMICO, OSHA, Mining Commission, Research institutions, FEMATA, TAWOMA, CSOs, Media						Internal sources	440,000	• Communication strategy developed and implemented • Public awareness improved	• Communication strategy • Number of people sensitized
3.3 Facilitate prevention and control the exposure of vulnerable populations, particularly children and women of	3.3.1 Develop and implement gender sensitive initiatives (financial, technological and training) in ASGM	High	**MoM,** MoHCDGEC, PO-RALG, Mining Commission, STAMICO, LGAs, FEMATA,						Internal and external sources	560,000	• Gender mainstreaming programme developed and implemented • Participation of women in ASGM activities increased	• Gender mainstreaming programme • Number of women miners, dealers and brokers • Number of initiatives

Strategy	Actions	Priority	Responsible Institution	Timeline					Funding source	Activity cost (USD)	Expected results	Indicator
				Y1	Y2	Y3	Y4	Y5				
child-bearing age, to mercury used in ASGM			TAWOMA, WIMA, CSOs									
	3.3.2 Develop and implement awareness strategy on the risks of children's and women of child bearing age exposure to mercury in ASGM communities	High	**PMO-YELPwD**, MoM, MoHCDGEC, VPO, PO-RALG, LGAs, Mining Commission, MEWATA, TAWOMA, WIMA, TAMWA, CSOs, Media						Internal and external sources	160,000	• Awareness strategy developed and implemented • Awareness on mercury health risks to children and women improved	• Awareness strategy • number of children and women sensitized
	3.3.3 Integrate child labor issues into ASGM related programmes and events	Medium	**PMO-YELPwD**, MoM, MoHCDGEC, VPO, PO-RALG, LGAs, Mining Commission, FEMATA, TAWOMA, WIMA, CSOs						Internal sources	50,000	• Child labour mainstreaming plan developed and implemented • Awareness on child labour issues improved	• Child labour mainstreaming plan • Number of events • Number of miners sensitized
								GRAND TOTAL		**14,400,000**		

4.2.2 Implementation Cost and Sources of Funding

The total cost for implementation of NAP is USD 14,400,000 over a period of 5 years (2020-2025). The sources of funding for its implementation will include internal and external sources. Internal sources will include government budgetary allocation and contribution from private sector. External sources will include bilateral arrangements and international financial mechanisms particularly the Global Environment Facility.

4.2.3 Implementation Arrangement

The implementation of NAP needs effective coordination and cooperation among relevant Government and Non-government actors. It is imperative to recognize existing institutional mechanism and consider ways and means of which coordination and cooperation among stakeholders is aligned.

The Vice President's Office (VPO), in close collaboration with the Ministry of Minerals and Ministry of Health, Community Development, Gender, Elderly and Children, will coordinate the implementation of the NAP. The various key stakeholders having roles in implementation of the NAP are indicated in **Table 4.**

Table 3: Roles of key stakeholders in implementation of NAP

Stakeholder	Responsibilities
1. President's Office - Regional Administration and Local Government	• Coordinate and ensure provision of basic social services in ASGM communities • Support formalization of ASGM • Promote awareness on mercury related issues • Support capacity building of miners associations and other related organizations in ASGM • Support elimination of child labour in ASGM activities • Collaborate with other stakeholders in addressing environmental management issues in ASGM
2. Vice President's Office	• Serve as the National focal point for the Minamata Convention on Mercury and other related MEAs. • Coordinate implementation of the NAP • Promote public awareness and capacity building on mercury related issues • Oversee the enforcement of Environment Management Act, 2004 • Prepare and review regulations for the control and management of mercury • Support periodic baseline inventories of mercury in ASGM • Coordinate country participation in regional and international meetings in relation to control of mercury use in ASGM • Coordinate Stakeholders Annual Forum on ASGM • Support resource mobilization for implementation of NAP
3. Prime Minister's Office - Youth, Employment, Labour and Persons with Disability	• Coordinate enforcement of the Labour Act and other relevant legislations on elimination of child labour in ASGM • Promote public awareness on mercury related issues • Support gender mainstreaming and elimination of child labour in ASGM • Establish and operationalize depository facility of information on labour, employment and mercury issues in ASGM

Stakeholder	Responsibilities
4. Ministry of Minerals	• Support coordination in implementation of NAP • Ensure reduction, and where feasible eliminate, use of mercury in ASGM • Promote public awareness and capacity building on mercury related issues • Facilitate financial and technical assistance for adopting best practices and appropriate technologies for gold recovery by miners • Coordinate and facilitate research on alternative technologies to mercury • Oversee operationalization of centres of excellence for training and gold processing and the demonstration centre (model mine) • Promote appropriate technologies for mercury recovery from mercury-contaminated tailings • Coordinate demarcation of land for ASGM activities • Coordinate periodic baseline inventories of mercury use in ASGM • Oversee operationalization of regional mineral markets • Facilitate and coordinate capacity building of miners associations • Oversee enforcement of the Mining Act, 2010 and other related legislation. • Oversee formalization of ASGM • Support implementation of public health strategy on prevention and mitigation of exposure to mercury • Support gender mainstreaming and elimination of child labour in ASGM • Support resource mobilization for implementation of NAP
5. Ministry of Health, Community Development, Gender, Elderly and Children.	• Support coordination in implementation of NAP • Coordinate preparation and implementation of a dedicated public health strategy for prevention and mitigation of exposure to mercury • Support periodic baseline inventories of mercury in ASGM • Promote public awareness and capacity building on mercury related issues • Coordinate and facilitate monitoring of mercury contamination in the environment and epidemiological surveillance • Support gender mainstreaming and elimination of child labour in ASGM • Oversee enforcement of the Public Health Act; Industrial and Consumer Chemicals Act and other related legislation. • Support resource mobilization for implementation of NAP
6. Ministry of Justice and Constitutional Affairs	• Facilitate amendment of legislation and regulations for effective implementation of relevant legislations on control of mercury use in ASGM • Provide legal advice in implementation of the Minamata Convention on Mercury and other related MEAs • Capacity building on negotiation skills and all matter related to chemicals and waste related MEAs. • Promote public awareness on mercury related issues
7. Ministry of Foreign Affairs and East African Cooperation	• Facilitate deposit of the instrument of ratification of relevant MEAs • Support coordination of country participation in regional and international meetings related to control of mercury use in ASGM • Facilitate negotiations with international financial mechanisms and bilateral arrangements to mobilize funds for implementation of NAP
8. Ministry of Finance and Planning	• Coordinate resource mobilization for implementation of NAP

Stakeholder	Responsibilities
	• Allocate budget to implement NAP and related obligations under the Minamata Convention on Mercury and other MEAs. • Facilitate fiscal incentives for programmes and technologies for reducing mercury use in ASGM. • Facilitate payment of fees and other contributions to MEAs to which Tanzania is a Party
9. Ministry of Land, Housing and Human Settlements Development	• Undertake land use planning/mapping for ASGM • Promote public awareness on areas demarcated for ASGM • Enforcement of compliance of Land Act and other related legislation
10. Ministry of Home Affairs	• Facilitate control and monitoring of mercury supply chain in ASGM • Support control of trans boundary mercury trade • Support public awareness creation in ASGM
11. Mining Commission	• Coordinate enforcement of the Mining Act, 2010 and its amendments and other related legislation to control mercury use in ASGM. • Promote public awareness on mercury related issues • Support operationalization of centres of excellence for training and gold processing and the demonstration centre (model mine) • Promote appropriate technologies for mercury recovery from mercury-contaminated tailings • Coordinate operationalization of regional mineral markets • Coordinate and facilitate formalization of ASGM
12. Government Chemist Laboratory Authority (GCLA)	• Serve as the Registrar of industrial and consumer chemicals • Enforcement and compliance of industrial and consumer chemicals Act including registration, inspection and monitoring of import, export and use of chemicals including mercury. • Support periodic baseline inventories on mercury use in ASGM • Promote public awareness on mercury related issues • Support implementation of a public health strategy for prevention and mitigation of exposure to mercury • Establish and maintain depository facility of information on health effects associated with mercury • Facilitate control and monitoring of mercury supply chain in ASGM • Support monitoring of mercury contamination in the environment and epidemiological surveillance
13. National Environment Management Council (NEMC)	• Enforce compliance of EMA, 2004 and relevant legislations • Promote public awareness on mercury related issues • Promote appropriate technologies for mercury recovery from mercury-contaminated tailings • Support periodic baseline national inventories on mercury • Establish depository facility of information on environmental management in ASGM • Support capacity building to miners associations • Support monitoring of mercury contamination in the environment and epidemiological surveillance • Support Annual Stakeholders Forum on ASGM
14. Occupational Health and Safety Authority (OSHA)	• Enforce compliance of the Occupational Safety and Health Act and relevant legislations • Promote public awareness on occupational safety and health risks related to mercury exposure • Establish depository facility of information on occupational safety and health issues in ASGM • Support training of health professionals on mercury related issues
15. Tanzania Bureau of Standards (TBS)	• Enforce Standards Act and other relevant legislations

Stakeholder	Responsibilities
	• Support monitoring of mercury contamination in the environment and epidemiological surveillance • Promote public awareness on mercury related issues • Support control and monitoring of mercury supply chain in ASGM
16. Tanzania Revenue Authority (TRA)	• Enforcement and Compliance of legislations related to mercury trading. • Support periodic baseline inventories on mercury • Support control of illegal importation of mercury • Promote public awareness on mercury related issues
17. State Mining Corporation (STAMICO)	• Serve as patron of small scale miners • Promote best practices and mercury-free appropriate technologies • Promote public awareness on mercury related issues • Support research and adoption of mercury free alternative technologies • Establish depository facility of information on ASGM • Support formalization of ASGM • Support demarcation of and for ASGM activities • Oversee operationalization of centres of excellence for training and gold processing • Support periodic baseline national inventories on mercury • Support mainstreaming of gender and elimination of child labour in ASGM
18. Mineral Resources Institute (MRI)	• Support research and adoption of mercury free alternative technologies • Promote best practices and mercury-free appropriate technologies • Promote public awareness on mercury related issues • Provide training on gold mining and processing • Support periodic baseline national inventories on mercury
19. Tanzania Commission for Science and Technology (COSTECH)	• Promote research and disseminate mercury free alternative technologies • Support periodic baseline national inventories on mercury
20. National Bureau of Statistics (NBS)	• Data collection related to mercury and public health status of ASGM communities • Support sector-specific depository facilities of information on mercury related issues • Support monitoring of mercury contamination in the environment in ASGM areas
21. Geological Survey of Tanzania (GST)	• Conduct geo-prospecting and demarcate land for ASGM • Support operationalization of ASGM centres of excellence • Promote public awareness on mercury related issues
22. National Institute for Medical Research (NIMR)	• Conduct training programmes for health care professionals on recognition, diagnosis and treatment of mercury intoxication • Support data collection on related to mercury and public health status of the ASGM communities • Support public awareness on health risks associated with use of mercury in the ASGM
23. Tanzania Industrial Research and Development Organization (TIRDO)	• Promote research and disseminate mercury free alternative technologies • Support periodic baseline national inventories on mercury
24. Tanzania Information Services Department (TISD) (MAELEZO)	• Promote public awareness on mercury related issues • Support development and implementation of Communication Strategy on health risks associated with the use of mercury
25. Local Government Authorities (LGAs)	• Support formalization of ASGM • Promote awareness on mercury related issues • Support capacity building of miners associations and other related organizations in ASGM

Stakeholder	Responsibilities
	• Support elimination of child labour in ASGM activities • Collaborate with other stakeholders in addressing environmental management issues in ASGM • Enforce compliance of EMA, 2004 and relevant legislations within their areas of jurisdiction
26. Medical Women Association of Tanzania (MEWATA)	• Support awareness to children and women of child bearing age exposure to mercury in the ASGM • Support training programmes for health care professionals on recognition, diagnosis and treatment of mercury intoxication • Support data collection on related to mercury and public health status of the ASGM communities
27. FEMATA, TAWOMA and WIMA	• Support public awareness and capacity building on mercury related issues • Support facilitation of financial and technical assistance for adopting best practices and appropriate technologies for gold recovery by miners • Support promotion of appropriate technologies for mercury recovery from mercury-contaminated tailings • Support periodic baseline inventories of mercury use in ASGM • Support formalization of ASGM • Support implementation of public health strategy on prevention and mitigation of exposure to mercury • Support gender mainstreaming and elimination of child labour in ASGM
28. Civil Society Organizations (CSOs)	• Support public awareness and capacity building on mercury related issues • Support facilitation of financial and technical assistance for adopting best practices and appropriate technologies for gold recovery by miners • Support promotion of appropriate technologies for mercury recovery from mercury-contaminated tailings • Support periodic baseline inventories of mercury use in ASGM • Support formalization of ASGM • Support implementation of public health strategy on prevention and mitigation of exposure to mercury • Support gender mainstreaming and elimination of child labour in ASGM • Support promotion of research and dissemination of mercury free alternative technologies
29. Academic and research institutions	• Conduct research, publish and disseminate on mercury free alternative technologies • Support periodic baseline national inventories on mercury • Support public awareness and capacity building on mercury related issues • Support operationalization of centre of excellence for training and gold processing
30. Tanzania Media Women's Association (TAMWA)	• Promote public awareness on mercury related issues • Support development and implementation of Communication Strategy on health risks associated with the use of mercury • Support gender mainstreaming and elimination of child labour in ASGM
31. Tanzania Mineral Dealers Association (TAMIDA)	• Strengthen capacity of miners associations • Support public awareness and capacity building on mercury related issues • Support promotion of appropriate technologies for mercury recovery from mercury-contaminated tailings

Stakeholder	Responsibilities
	• Support implementation of public health strategy on prevention and mitigation of exposure to mercury
32. Private Sector	• Credit and financial services to promote mercury free alternative technologies • Investment in provision of services for supporting control and management of mercury use in ASGM • Support gender mainstreaming and elimination of child labour in ASGM
33. Media	• Development and implementation of Communication Strategy on health risks associated with the use of mercury • Conduct awareness raising and outreach on mercury related issues.

5.0 EVALUATION MECHANISM

Evaluation of the achievements made in implementation of this NAP would be undertaken through field surveys in selected ASGM sites and stakeholder consultations to establish overall achievements as well as other positive impacts of this NAP. Further, stakeholders meeting with participation from key stakeholders will be organized to review evaluation report. **Table 5-1** provides indicators that would be utilized in evaluating progress in the implementation of this NAP.

In order to review the effectiveness and efficiency of the NAP implementation, the VPO in collaboration with key stakeholders, shall adopt two main evaluation mechanisms as follows:

i) Mid-term evaluation that will be undertaken after 2.5 years of implementation of this NAP, with active participation from all relevant stakeholders to evaluate the outputs, identify the challenges, and set a direction for further implementation.

ii) Terminal evaluation of the achievements of the NAP implementation that will be organized at the end of its implementation phase. Key indicators for evaluating achievements that have been made will include: the trend of mercury use and release from ASGM; adoption of mercury free alternative technologies; and adoption of best practices such as use of mercury retorts and amalgamation of gold ore concentrate.

Table 5-1: A summary of set objectives, strategies and selected indicators for evaluating the implementation of NAP

Objective/target	Strategies	Indicators
Specific Objective 1: To reduce the use of mercury in the ASGM sub-sector by 30% and enhance public awareness by 2025	1.1 Promote elimination of worst practices in ASGM	• Number of miners reached and trained • Number of miners adopted best practices such as gravity separation and cyanidation • Amount of funds mobilized and utilized to facilitate miners adopt best practices • Number of miners accessed funds to facilitate adoption of best practices • Number of financial institutions providing financial services to miners • Number of mercury-free alternative technologies developed and disseminated • Number of miners adopted mercury-free alternative technology • Numbers of operational centres of excellence for training miners • Number of miners trained by centres of excellence

Objective/target	Strategies	Indicators
		• Number of miners adopted mercury free gold processing at the centres of excellence • Amount of mercury-contaminated tailings treated
	1.2 Facilitate provision of information to ASGM and affected communities on mercury related issues	• Number of trained mercury inventory experts • Amount of mercury imported and used in ASGM • Number of national mercury inventories in ASGM undertaken
Specific Objective 2: To strengthen legal framework, institutional capacity and stakeholder engagement in ASGM sub-sector governance by 2025	2.1 Facilitate formalization of ASGM	• Number legislations related to formalization of miners reviewed, prepared or enforced • Number of formal miners • Number of miners having accessed financial services • Regulations on control and management of mercury prepared and enforced • Number of legislations related to child labour enforced • Number of children detached from mining activities • Number of institutions strengthened to facilitate formalization of ASGM • Contribution of ASGM to national economy • Number of operational regional mineral centers • Amount of revenue collected from mineral centres • Number of miners and traders accessed regional mineral centers • Size of land demarcated for ASGM • Number of land use plans indicating demarcated land for ASGM • Amount of gold reserve in demarcated ASGM sites • Number of miners associations strengthened • Capacity building plan for miners associations
	2.2 Facilitate management and	• Number of institutions strengthened to facilitate control and monitoring of mercury supply chain

Objective/target	Strategies	Indicators
	control of mercury trade	• Capacity building plan to facilitate control and monitoring of mercury supply chain • Monitoring plan of mercury supply chain • Amount of mercury traded and use in ASGM • Number of attended regional and international meetings on controlling transboundary mercury trade • Number of signed MoUs on cooperation in controlling transboundary mercury trade • Number of mercury traders • Amount of mercury imported and traded
	2.3 Strengthen involvement and engagement of stakeholders in the implementation and continuing development of the NAP	• Number of meetings of the National Forum on ASGM • Number of stakeholders participated in the National Forum on ASGM Number of initiatives conceived from the National Forum on ASGM
Specific Objective 3: To ensure prevention and mitigation of mercury exposure to ASGM communities through a public health strategy by 2025	3.1 Facilitate development and implementation of a public health strategy for preventing and mitigating mercury exposure to ASGM communities	• Database of health status of ASGM communities developed • Number of affected communities from mercury exposure • Training plan of healthcare professionals • Number of trained healthcare professionals • Number of diagnosis and treatment protocols developed • Number of health facilities strengthened and/or established in ASGM sites • Number of healthcare equipment procured for health facilities in ASGM sites • Awareness programme on health risks associated with mercury in ASGM • Number of communities sensitized on health risks associated with mercury in ASGM

Objective/target	Strategies	Indicators
		•
	3.2 Promote the reduction of emissions, releases and risks of exposure to mercury	• Monitoring plan to assess mercury contamination in the environment • Number of environmental samples collected • Monitoring reports on mercury contamination in the environment • Database on mercury contamination in the environment • Communication strategy on health risks associated with use of mercury in place • Number of people sensitized on health risks associated with use of mercury
	3.3 Facilitate prevention and control the exposure of vulnerable populations, particularly children and women of child-bearing age, to mercury used in ASGM	• Gender mainstreaming programme in ASGM • Number of women miners, dealers and brokers engaged in ASGM • Number of initiatives to empower women participation in ASGM • Awareness strategy on health risks of mercury to children and women • Number of children and women sensitized on health risks of mercury • Plan for child labour mainstreaming into ASGM activities and events • Number of events involving child labour issues • Number of miners sensitized on child labour issues

ANNEXES

ANNEX 1: TERMS OF REFERENCE FOR THE NATIONAL TASK FORCE

A. Introduction

Mercury is a toxic pollutant that can circulate globally for years or even decades and is listed by the World Health Organization as one of the top ten chemicals of major public health concern. Mercury is known to cause an array of adverse health effects, notably impairment of nervous and respiratory systems, cardiovascular disorders, kidney malfunctions, immune system changes and digestion impairment.

Consequently, the Minamata Convention on Mercury was negotiated and adopted with the objective of protecting human health and the environment from the adverse effects of anthropogenic mercury emissions and releases. The United Republic of Tanzania signed the Minamata Convention on 10 October 2013 and is in the final stages of ratification. To reduce potential impacts of mercury, the Convention regulates anthropogenic emissions and releases of mercury in a number of ways including a ban on new mercury mines; phase out of existing mercury mines; control measures on emissions and releases, and the international regulation of the informal sector for artisanal and small-scale gold mining (ASGM).

Article 7 of the Convention requires each Party that has significant artisanal and small-scale gold mining activities to take steps to reduce, and where feasible, eliminate use of mercury and associated emissions and releases to the environment from ASGM. Further, each Party is obliged to develop and implement a National Action Plan on ASGM, which is the subject of this assignment.

B. Main Tasks

In the course of undertaking the assignment, the main tasks shall involve the following:

B1. Baseline situation analysis of ASGM in Tanzania

a) Describe profile of ASGM sites, demographic and migration of miners
- Describe location, physical characteristics, land use classification and geographical distribution of ASGM sites countrywide (about 50+ ASGM sites);
- Provide details on organization structure, functional division of labour and sharing modality of proceeds in ASGM; and
- Explore the main drivers and migration patterns of miners.

b) Assessment of ASGM practices and use of mercury
- Provide details on gold mining and extraction processes and methods prevalent in ASGM;
- Estimate mercury quantities used in each step of gold processing and provide indicative annual national consumption, emissions and releases;
- Explore knowledge and perception of miners about the possible effects of mercury to the environment and human health;
- Assess willingness and attitude of miners in adopting environmentally friendly alternative technology;
- Indicate any environmentally friendly alternative methods currently being used in ASGM;
- Explore undesirable practices in ASGM such as use of cyanide; and
- Estimate amount of gold production by the ASGM sector against large scale gold mining.

c) Assessment of mercury market chain
- Determine mechanisms and entry routes of mercury into the country and investigate domestic mercury supply hotspots and transportation routes;

- Provide mercury supply chain diagram indicating identified stakeholders (such as traders and gold shop owners), their roles (such as supply and storage) and the possible mercury flows from these stakeholders to the ASGM miners;
- Describe mercury supply and distribution modalities at ASGM sites;
- Compare official statistics on mercury imports against indicative annual demand and use by the ASGM sector and identify limitations of mercury data availability and accessibility;
- Determine and assess trends and relationship in prices of mercury against that of gold over the past 10 years; and
- Assess adequacy of existing laws/regulations regulating the mercury trade in ASGM.

d) Review of policy, institutional and legal framework governing ASGM
   - Assess adequacy of the existing policy and legal framework governing ASGM sector;
   - Assess institutional capacity to enforce the existing laws and regulations related to ASGM; and
   - Explore effectiveness and possible influence of taxation regime (taxes, fees and royalties) in formalization of ASGM.

e) Undertake diagnostic analysis of socio-economic inter-linkages of the ASGM sector
   - Assess the contribution and linkages of the ASGM sector in meeting the goal of poverty alleviation and improving livelihoods at individual, community and national levels;
   - Assess availability and adequacy of social infrastructure in ASGM sites (health facilities, schools, water, housing, food security, sanitation facilities and infrastructure (power, transportation and telecommunication));
   - Explore monthly income and expenditure patterns as well as forms/types of savings by miners, disaggregated by gender;
   - Determine social impacts of ASGM to the livelihoods of miners and non-miners population;
   - Describe alternative income generating options in ASGM sites, seasonal change in livelihood activities and their contribution in improving standard of living;
   - Undertake comparative analysis of socio-economic status of miners prior to and after being involved in ASGM activities;
   - Determine level of productivity of ASGM miners including production quantity, value and cost;
   - Explore potential socio-economic risks (such as food shortage and illness) that ASGM communities experience and their capacity to overcome them;
   - Describe experience of ASGM related associations and networks in provision of community support projects;
   - Evaluate barriers and opportunities to access gold markets (local and international) by ASGM miners;
   - Assess experience with regard to relationship, interaction and conflicts between ASGM and large scale gold mining; and
   - Explore socio-economic challenges faced by miners and non-miners in ASGM.

f) Description of gender dimensions of ASGM
   - Determine indicative number and demographics of women miners and non-miners involved in ASGM sector;
   - Explore main drivers, existing and evolving roles and participation of women in ASGM;
   - Describe working conditions of women and socio-cultural challenges faced and opportunities for improvement;
   - Determine the impact of mining and non-mining occupation on women's income, health and families in comparison to men; and
   - Provide at least two (2) case stories of individual women experience in ASGM.

g) Assessment of child labor concerns
- Provide indicative number and explore demographics of children miners and non-miners involved in ASGM sector;
- Describe main drivers, roles and involvement of children in ASGM;
- Explore working conditions and socio-cultural challenges of children in ASGM;
- Determine impact of ASGM on children in the context of welfare, family, income, health and safety; and
- Provide at least two (2) case stories of individual children experience in ASGM.

h) Assessment of nature and extent of environmental impacts associated with ASGM activities (contaminated sites, mercury releases in soil, air and water)
- Evaluate relevant literature over the past 10 years on the extent and level of environmental pollution in different ecosystems associated with ASGM activities for both active and abandoned sites;
- Estimate indicators of mercury contamination in ASGM which may include average mercury releases per unit area occupied by ASGM, average mercury and cyanide consumption per miner and average mercury emissions per miner;
- Provide driving factors and indicative annual land degradation, deforestation and loss of arable farming land by ASGM;
- Estimate amount of annual siltation load into water bodies associated with ASGM activities; and
- Assess the nature, rate and extent of loss of biodiversity associated with ASGM activities.

i) Description of health impacts and occupational risks
- Evaluate occurrence and severity of adverse health effects related to mercury exposure in ASGM sites and surrounding areas;
- Review existing literature on human bio-monitoring in ASGM sites involving levels of mercury human body burden (blood, urine, hair, nail and human milk) among miners and non-miner population;
- Explore nature and extent of occupational health risks to miners and non-miner population in ASGM sites; and
- Assess prevalence and patterns of common diseases in ASGM sites in relation to existing socio-economic status of ASGM sites.

j) Population at risk of mercury exposure and national disease burden
- Identify common mercury exposure pathways in ASGM sites and their significance to cause harm;
- Estimate size of the different population subgroups at risk to mercury exposure;
- Review existing literature on estimates of average dietary human exposure to mercury in ASGM areas as compared to WHO Guidelines; and
- Provide preliminary quantification of mercury related national health burden (chronic metallic mercury vapour intoxication) associated with ASGM activities and compare with prevalent diseases in the country.

k) Evaluation of technical assistance, initiatives and support to ASGM sector
- Assess achievements in implementation of major projects and initiatives supporting ASGM over the past 10 years;
- Describe success factors and barriers towards achievements made or failure of these initiatives;
- Describe any innovations/creativity in practice, programme or implementing strategies or new initiative that have occurred over the past 10 years;

- Provide success case studies which describe positive change or successful interventions over the past 10 years such as elimination of child labour, adoption of mercury retorts and a woman owned and operated mining venture; and
- Explore lessons learned from these previous initiatives that would be useful for future endeavours.

l) Identification of information gaps
- Describe information gaps and limitations of the study on the basis of existing literature and information collected from field visits to ASGM sites

B2. Development of National Action Plan to Reduce and Eliminate Mercury Use in ASGM in Tanzania

The NAP should address the identified gaps and deficiencies in order for the country to meet requirements of the Minamata Convention on Mercury. The main elements of the NAP are as follows:

B2.1 Problem Statement, Goal and National Objectives and Target.

- Provide a brief description and contextual details of the environmental, socio-economic and institutional challenges associated with the ASGM sector and the need for action.

- Describe the goal of the NAP based on relevant obligations to the Minamata Convention and country situation. A goal refers to a specific statement detailing a desired impact of a project which should be ambitious and yet realistic.

- Provide the national objectives and target which should be achievable with the means available. Objective reflects on a specific statement detailing a desired accomplishment or outcome of the NAP whereas target refers to a specific point which we want to reach by a stated timeline.

B2.2 Strategies and Priority Actions

The NAP is meant to devise strategies and priority actions that would transform ASGM sector into a sustainable and economically effective sector. Key strategies to be incorporated in the NAP shall include, but not limited to the following:

a) Eliminate worst practices

- Define the actions to be taken so as to eliminate worst practices such as open burning of amalgam or processed amalgam, burning of amalgam in residential areas, inappropriate use of cyanide and others.
- Identify the financial and technical mechanisms that will assist miners with the transition.

b) Facilitate formalization/regulation of ASGM

- Recommend measures to facilitate integration of the ASGM sector into the formal economy, society and regulatory system. Some of the actions may include:
  - Develop and carry out a plan for stakeholder engagement and participation in the formalization process;
  - Develop a vision for the ASGM sector;
  - Promote decentralized small to medium enterprises, cooperatives, and other models; and
  - Perform policy and regulatory review and amend laws and regulations as necessary to encourage formalization.

c) Undertake periodic baseline estimates of ASGM mercury use

- Elaborate the main approaches that can be used to estimate mercury use in ASGM. These include: Direct measurements, Intensity based estimates, Interviews, Official trade and census data, and Information on other potential sources of mercury.

d) Reduce emissions, releases and risks of exposure to mercury

- Describe the actions to be taken in promotion of reduction of emissions, releases and exposure such as; developing a training programme to inform miners of techniques for reducing their reliance on mercury, including improved concentration and zero-mercury techniques.
- Provide immediate and long term strategies to be taken to reduce mercury releases into water bodies and onto land of which may include: management of tailings, mercury capture and recycling and partial amalgamation.

e) Manage trade of mercury and prevent diversion for use in ASGM

- Describe actions for managing trade and preventing diversion of mercury to ASGM. Some of the actions may include:-investigate how mercury enters into the country and is traded at ASGM sites; review adequacy of laws affecting mercury trade in ASGM; develop country import consent process; and develop module for training customs officials on mercury and others.

f) Engage stakeholders in the implementation and continuing development of the National Action Plan

- Propose various actions to be used in involving Stakeholders in the Implementation and continuing development of the National Action Plan. Some of them may include to:
  - Identify key government and non-government actors that are familiar with ASGM activities.
  - Provide incentives for stakeholders to participate in consultation sessions; Engage leaders at the community level.
  - Hold consultation meetings in or nearby communities affected by mining and processing.
  - Establish and maintain a communication schedule between all stakeholders.

g) Institute public health strategy

- Define actions to prevent the exposure of artisanal and small-scale gold miners and their communities to mercury focusing on, *inter alia*, gathering of health data, training for health-care workers, development of treatment protocols and awareness-raising through health facilities.

h) Prevent exposure of vulnerable populations to mercury used in ASGM

- Identify the vulnerable populations of which include children and women of child-bearing age, especially pregnant women, to mercury used in artisanal and small-scale gold mining.
- Propose useful strategies to prevent exposure of vulnerable populations. This may include targeted outreach and awareness-raising on the risks of children's work with mercury in ASGM communities - including with community leaders, parents and children.

i) Provide information to Artisanal and Small-scale Miners, Gold Processors and Affected Communities

- Provide mechanisms and techniques for providing information to Artisanal and Small-scale Miners, Gold Processors, and Affected Communities.

j) Schedule, budget and indicators for implementation and monitoring of the National Action Plan

- Indicate timeframe for implementation of each proposed activity to facilitate monitoring and evaluation exercise.
- Estimate cost for implementing each activity for the provided timeline.
- Provide indicators (quantifiable measure) to facilitate monitoring progress in achieving the objectives.

C. Sample Format of the Action Plan

The layout of the Action Plan shall be presented in a format indicated below.

Strategy	Actions	Priority	Activity lead	Timeline			Funding source	Activity cost	Expected results	Indicator
Objective 1:										

D. Names and Contact Details of the National Taskforce Members

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ANNEX 2: LIST OF KEY PROJECTS RELATED TO ASGM

A1. Sustainable Management of Mineral Resources Project (SMMRP)

Overview

The Ministry of Minerals (MoM) conceived the Sustainable Management of Mineral Resources Project (SMMRP) within the rational of Vision 2025 and the Sustainable Development Goals (SDGs). The Project Development Objective (PDO) was to strengthen the Government's capacity to manage the mineral sector, to improve the socioeconomic impact of large-scale and small-scale mining for Tanzania and Tanzanians and enhance private local and foreign investment. The SMMRP Phase I commenced its implementation in September, 2009 and ended in June, 2015.

Following the successful implementation of SMMRP-I, the SMMRP Phase II was launched on 1st September, 2015 and retained the Project Development Objective of the original project but putting greater emphasis on the part of it which aims to "improve the socio-economic impact of large-scale and small-scale mining for Tanzania and Tanzanians". The project ended in December, 2018.

The SMMRP Phase II covered aspects of artisanal and small-scale mining with the aim of improving their performance and the associated social, economic and environmental impacts; good governance, transparency and regulation of the mineral sector; strengthening of sector management and coordination including inter-agency linkages; strengthening promotion of the mineral sector through improved mining information systems and physical promotional activities

Achievements

i) Provision of grants to small scale miners who are PML owners, cooperatives, association, partnership and companies. The Small Grants funding focused on increasing performance of ASM activities directly or indirectly through improved mining practices, value addition, skills development and subsidiary business service development. The equivalent of USD 3 million was disbursed through government grant scheme in 2015/16 to a total of 111 ASM projects. The grant was limited to a maximum of USD 50,000 per operator. The Ministry engaged a Tanzania Investment Bank (TIB) to manage the programme.

ii) Establishment of seven Centres of Excellence to serve as minerals processing demonstration centers in mining hot spots throughout the country in order to provide practical training; upgrading of processing technology and carrying out of demonstration activities to model environmentally sound and safe processing techniques to ASGM. The seven (7) Centers of Excellence were established in Musoma (Mara Region), Handeni (Tanga Region), Bukoba (Kagera Region), Bariadi (Simiyu Region), Songea (Ruvuma Region), Chunya (Mbeya Region) and Mpanda (Katavi Region);

iii) The Project engaged Geological Survey of Tanzania (GST) and the State Mining Corporation (STAMICO) who conducted detailed geoscientific studies and estimated resources in selected areas. These areas include Buhemba (Mara), D-Reef and Kapanda (Katavi Region), Katente (Geita Region) and Itumbi (Mbeya Region);

iv) Procurement and training of a 3-D mining and geological software for STAMICO;

v) Procurement of technical equipment (*Multiple Purpose Air Rotary Rig*) for STAMICO to provide affordable drilling services to ASM operators;

vi) Upgrading an office building at the Minerals Resources Institute in Dodoma that will host Women Miners Association (TAWOMA) office for the aim of strengthening the capacity of the association;

vii) Development of Guidelines on Environmental Protection Plan for Artisanal and Small-scale Mining; and

viii) Development of guidelines for the storage and handling of explosives with respect to small-scale mining and related to health and safety protocols.

A2. Multi-Sector Partnership Initiative (MSPI) Project

Overview

The MSPI initiative was launched in July 2013 by the national MSPI Coalition that is composed of representatives from the Government of Tanzania, the Small-Scale Miners' Federation, the Women's Small-Scale Mining Federation (TAWOMA), the World Bank Group, AngloGold Ashanti, and African Barrick Gold.

MSPI aimed to improve conditions and livelihood for small-scale miners, decrease environmental degradation and facilitate peaceful co-existence between ASM and large-scale mining companies (LSM) in Rwamgasa in the Geita region. The project fostered the legal, regulated, safe, sustainable development of an ASM sector that operates within the rule of law and with respect for human rights with special measures of "no mercury" and "no child labour" policies.

Achievements

Construction of a demonstration centre (model mine) at Rwamgasa in Geita Region **(Figure A1-1)**.



Figure A1-1: Rwamgasa Model Processing Plant in Geita Region.

A3. Global Mercury Project (GMP) (2002-2007)

https://wwwglobalmercuryprojectorg%20(1).pdf

Overview

The Global Mercury Project (GMP) (2002-2007) had a vision to demonstrate ways of overcoming barriers to the adoption of best practices and pollution prevention measures that limit the mercury contamination of international waters from artisanal and small-scale gold mining (ASGM). The GMP aimed to introduce cleaner technologies, train miners, develop regulatory mechanisms and capacities within Government, conduct environmental and health assessments and build national capacity for continued monitoring of Mercury pollution after the project.

Achievements

Diagnostic Analyses

- Current processing practices of amalgamating gold ore concentrate leads to the use of significantly less mercury than similar operations in other locations around the world.
- Health assessments found that symptoms of mercury intoxication were prevalent in the exposed group (the control group did not show the same symptoms).
- Child labour and the exposure of expecting and nursing mothers to mercury were identified as significant problems.
- The Medical Officer of Nyarugusu Village initiated counselling sessions to outpatients to discuss and raise awareness on health, sanitation, and danger of mercury poisoning.

Training and Awareness Campaign

- 1,430 villagers in Rwamgasa attended class training and 2,700 attended field demonstrations.
- Training in Rwamgasa was extended to 522 pupils and 20 teachers from two primary schools in the village.
- 3,900 villagers in Nyarugusu attended class training and 4,800 attended field demonstrations.
- Training in Nyarugusu was extended to 1,885 primary school children and it is estimated that 5,000 miners were trained.
- About 98 retorts were provided to miners and gold buyers.
- Up to late October 2007, four local fabricators had made more than 230 retorts for use in the Geita district.
- Washing ponds are being constructed away from water bodies.

Promotion of Programme

- 100 copies of four educational booklets (Mercury and Health; How to use and re-use mercury; How to protect your water; and, How to get more gold) were prepared in English and Swahili and distributed to stakeholders.
- 1,000 copies of four posters displaying important messages about mercury and mining were printed and distributed to mining communities and public areas in the Geita District.

- 750 T-shirts and caps were printed, advertising “Less Mercury, More Gold”, and distributed to mining communities and nearby towns.
- Press releases were made through radio and television to announce the Transportable Demonstration Unit (TDU) launching days and progress of project activities. Star TV network of Mwanza also presented a one-hour special mercury awareness programme soon after the launching of the awareness campaign at Rwamgasa village.
- 16 newspapers articles on GMP objectives and Geita activities appeared periodically in The Guardian, Mwananchi, Habari Leo, and Msanii newspapers.
- Contacts were made with the Mining Association leaders and village leaders who attended courses.
- Coalition with other implementing partners like Geita Gold mine was made to plan the needs to conduct Miners Day (educational programmes) at other locations.
- Village government in Rwamgasa has included mining and environmental issues as permanent agenda items in its council meetings.

ANNEX 3: DETAILED NATIONAL BASELINE ANALYSIS

A. METHODOLOGY

The national overview on ASGM in Tanzania was developed between January, 2017 and February, 2019 involving extensive consultation process. The key steps undertaken include:

i) Establishing National Task Force with the main task of preparing the national overview on ASGM and NAP;
ii) Organizing inception meeting and conducting training of national experts;
iii) Data collection through field survey and literature review;
iv) Carrying out stakeholder consultations through formal and informal interviews and meetings; and
v) Validation of the national overview report through national stakeholder meeting and endorsement by the Project Steering Committee .

A1. National Task Force

The National Task Force (NTF) was established comprising of 13 members drawn from relevant Government Ministries and Agencies, Academia and Non-Government Organization. The NTF members received a two-day training in January, 2017 to provide overall guidance on field survey based on international practice (UNEP/AGC Guidelines) and NAP development.

A2. Field Survey

A field survey was conducted in selected ASGM sites across the country to gather baseline information regarding socio-economic, environmental, health, mining practices and mercury use on ASGM. The field survey was carried out during September - October, 2017. A total number of 40 ASGM sites scattered across 9 Regions in the country were visited which constitutes about 15% of the total ASGM sites in the country **(Table A3-1 and Figure A3-1)**. These sites were purposively selected based on intensity of ASGM activities and historical profile of the sites.

Table A3-2: List of visited ASGM sites

Region	ASGM sites
1. Geita	Mgusu, Bingwa, Tembo Mine, Mpomvu, Nsangano
2. Shinyanga	Nyangalata, Mwazimba, Mwime-Ilindi, Kalole, and KakolaMwashina, Mwanubi, Itilima and Ishinablandi.
3. Mbeya	Mbigwa; Makongolosi; Mlimanjiwa; Itumbi; Chokaa and Mpigizamwendo
4. Katavi	Kapanda; Nsimbo; Isulamilomo; Ibindi; and Sitikiko
5. Mara	Nyasana, Kebaga, Msege, Naigoti, Nyamikondo and Sirorisimba
6. Tabora	Ikungu, Igulubi, Matinje, Busenge
7. Dodoma	Nholi
8. Singida	Sambaru, Londoni, Misigiri, and Mpipiti
9. Tanga	Masagalu

The baseline survey was conducted using both random and purposive sampling approach involving 372 people in the 40 visited ASGM sites, out of which women and girls constituted about 22.3% **(Table A3-2)**.Gender disaggregated data was collected and reported on.

Table A3-3: Sample size of the field survey

Stakeholder	Number	Percentage
1. Mining and Local Government Authorities Officials	36	9.7
2. Miners' Association Leaders	25	6.7
3. PML Owners	58	15.6
4. Miners and traders - Men (144); Women (71); Brokers (3)	218	58.6
5. Children Miners - boys (21) and girls (12)	33	8.9
6. Mining-related CSOs	2	0.5
TOTAL	**372**	**100**

Methods used for data collection were interviews, focus group discussions (FGDs) and observations. At each site, individual interviews and focus group discussions were undertaken using an open-ended checklist. Equipment used during field survey to support data collection include digital cameras, GPS devices, electronic and mechanical weighing scales, laptops and notebooks.

A3. Determination of Mercury-to-gold ratio and mercury emissions

Physical measurements to establish mercury-to-gold ratio were done at six (6) selected sites, two sites for each major gold fields (Lake Victoria and Lupa goldfields and Mpanda Mineral Field). The sites were located in Geita, Singida, Mbeya and Katavi regions. The measurements aimed to establish gold to mercury ratio and mercury emissions.

The amount of mercury added to the concentrate was weighed before mixing, as well as the amount of mercury recovered after amalgamation, and finally the weight of the amalgam after they squeeze the amalgam; weight of the amalgam before and after burning. Further, measurements were made at selected goldsmith shops where gold dore was weighed before and after being smelted **(Table A3-3)**.

Table A3-4: Procedure adopted for determining mercury emissions and releases

Evaluation	Procedure
1. Mercury entering the system	Mercury was weighed before being introduced into the amalgamation process.
2. Mercury recovered (excess Hg)	Mercury was weighed after squeezing the amalgam to eliminate excess Hg.
3. Mercury evaporated when amalgam was burned	Amalgam was weighed before burning to evaporate mercury, and the ore was weighed after burning.
4. Mercury evaporated when the gold ore was smelted	Gold ore was weighed before being melted. The mercury released during ore melting was obtained by weight difference before and after melting.
5. Mercury lost with tailings	This is estimated by the weight difference between mercury entering the process and mercury recovered and lost by burning

A4. Baseline estimate of national mercury use in ASGM

Site specific information collected during field survey, which covered 40 ASGM sites in the country, were used to estimate mercury use on a site, regional and national levels based on MS Excel Sheet framework of the UN Environment Toolkit for Estimating Mercury Use in Artisanal and Small-scale Gold Mining (ASGM) - Version 1. Some of the key site specific information collected include ore grade; gold recovery; gold purity; unit price of gold and mercury; number of active pits/site; average number of miners/pit/site; amount of ore/shaft/miner/day; number of working days per year; and contact information.

Three approaches were used to estimate gold production which are:

i) *Ore-extraction based approach:* It uses information collected on the amount of ore extracted to produce estimates of ASGM gold production and workforce.To carry out this approach, information gathered include number of pits and miners per pit/site; and the average ore production per pit and per miner. Mercury use was then determined by multiplying gold production by mercury-to-gold ratio.

ii) *Miner-income based approach:* It uses information collected on miner income to produce an estimate of ASGM gold production or workforce. To carry out this approach, information was collected include distribution of revenue between key players to produce an estimate of total income per pit/processing unit/site. Income was reported in terms of grams of gold, and therefore total gold production was established. Mercury use was then determined by multiplying gold production by average mercury-to-gold ratio.

iii) *Processing based approach*: It uses information collected on the amount of ore processed to produce estimates of ASGM gold production, mercury use, and workforce. To carry out this approach, information was collected about the number and type of processing units per site and average throughput of each processing unit. Throughput was reported in terms of grams of gold, and therefore total gold production was established. Mercury use was then determined by multiplying gold production by average mercury-to-gold ratio.

Once all of the required information was compiled, triangulation was then used to produce site-specific, regional and national estimates of mercury use in ASGM. Triangulation involves comparing baseline estimates from ore extraction based, income based and processing based approaches as a way of cross-checking the accuracy and validity of each of the data sources.

A5. Stakeholder Consultation and Participation

The baseline report capitalized on extensive stakeholder participation and consultation using various approaches at different stages. In conducting the baseline survey, key stakeholders were involved and consulted through multi-stakeholder supervisory and technical teams; field survey; stakeholder consultative meetings; relevant workshops and meetings organized by other stakeholders; and briefing sessions to Permanent Secretaries of key ministries responsible for Environment, Minerals and Health. As a result, a wide range of stakeholders were involved including Government Officials; Miner's Associations; PML owners; Miners; Academia;

Private sector; NGOs; and Media. More than 1,048 stakeholders were involved and consulted during the process of developing the baseline report.

A6. Validation and Endorsement of the Report

A National Stakeholders Workshop was organized to review and validate Draft Baseline Situation Report for the ASGM in Tanzania. In addition, the workshop served as a platform for sensitizing the stakeholders regarding mercury issues and the Minamata Convention on Mercury.

The National Steering Committee of the NAP Project, chaired by the Permanent Secretary, Vice President's Office, consisting of 16 Senior Officials from relevant government departments, agencies, NGOs and private sector considered and approved the National Overview Report in December, 2018.



Figure A3-2: Map of Tanzania showing visited ASGM sites

B. RESULTS

Estimates on Gold Production and Mercury Consumption

Region/Site	Gold Production (kg/Year)	Mercury Use (kg/Year)	Workforce
1. Tabora			
Igurubi	115	184	4500
Matinje	60	96	2500
Busenge	110	176	4500
Ikungu	260	416	6400
Others	150	240	16000
2. Singida			
Sambaru	120	192	5500
Sekenke	150	240	6200
Londoni	90	144	4200
Mpipiti	90	144	3900
Others	205	328	9300
3. Mara			
Kebaga	90	144	2200
Msege	80	128	6500
Naigoti	80	128	2350
Nyamikondo	20	32	3000
Nyasana	20	32	2200
Sirorisimba	40	64	6000
Others	224	358	25000
4. Geita			
Mgusu	180	288	51000
Bingwa	310	496	33000
Tembo	60	96	5600
Nsangano	210	336	9200
Mpomvu	50	80	1500
Others	1990	3184	71000
5. Mbeya			
Mbigwa	174	278	58000
Mlimanjiwa	202	323	15000
Itumbi	320	512	36000
Makongolosi	150	240	20000
Mpigizamwendo	110	176	10000
Others	203	325	15000
6. Katavi			
Sikitiko	40	64	1860
Ibindi	60	96	2480
Kapanda	40	64	1820
Nsimbo	190	304	8100
Isulamilomo	240	384	9500
Others	201	322	1850
7. Shinyanga			
Nyangalata	140	224	7000
Mwazimba	60	96	2300
Mwime-Ilindi	150	240	8000
Kalole	60	96	2000
Kakola	180	288	5000
Mwanubi	60	96	1500
Mwashina	10	16	1200
Ishinabulandi	10	16	1000
Others	213	341	110000

8. Dodoma			
Nholi	306	490	25230
Others	108	173	6200
9. Tanga			
Masagalu	23	37	1200
Others	32	51	3000
10. Simiyu			
Itilima	60	96	5000
Others	180	288	15000
11. Rukwa			
Kasitu	65	104	5580
Others	492	787	33750
12. Kigoma			
Nyakatungulu	70	112	6597
Others	492	787	35750
13. Njombe			
Makete	70	112	6597
Others	600	960	45750
14. Ruvuma			
Nyasa	71	114	6297
Others	410	656	25750
15. Mwanza			
Misungwi	150	240	7297
Others	910	1456	35750
16. Kagera			
Nyantimba	200	320	8297
Others	950	1520	37750
17. Lindi			
Ruangwa	50	80	4150
Others	350	560	1720
18. Mtwara			
Masasi	70	112	4512
Others	350	560	1720
19. Manyara			
Endabash	75	120	4700
Others	350	560	1720

C. KNOWLEDGE GAPS

In the course of developing the national overview on ASGM in Tanzania, a number of gaps have been observed including the following:

i) Extent of health impacts of mercury exposure to miners and affected communities.

ii) Data and information on mercury trade and market chain.

iii) Extent of mercury contamination in the environment particularly ambient air, soil, surface and underground water, sediments and foodstuff in ASGM sites and surrounding areas.

ANNEX 4: BUDGET FOR THE IMPLEMENTATION OF THE NAP

Strategy	Actions	Activity Cost (USD)	Cost Breakdown (USD)	
Specific Objective 1: To reduce the use of mercury in the ASGM sub-sector by 30% and enhance public awareness by 2025				
1.1 Promote elimination of worst practices in ASGM	1.1.1 Develop and implement awareness raising and training plan on best practices on mercury capture techniques	700,000	• Information gathering workshop to identify needs	15,000
			• Technical meeting for drafting the plan	20,000
			• Stakeholders validation workshop to review the draft Plan	15,000
			• Awareness and training workshops to 13 Regions hosting ASGM activities (USD 10,000 to each Region per year)	650,000
	1.1.2 Develop and implement a financial and technical assistance plan to facilitate miners with the transition from worst practices to reduced- and zero-mercury mining practices.	750,000	• Technical meeting for drafting the Plan	20,000
			• Stakeholders validation workshop to review the Draft Plan	20,000
			• Purchase of Mercury retorts	60,000
			• Demonstration workshops in 13 Regions hosting ASGM activities (USD 10,000@region for 5 years)	650,000
	1.1.3 Promote research and dissemination of mercury free alternative technologies for gold processing	800,000	• Conduct laboratory studies at MRI, STAMICO, UDSM and UDOM (USD 120,000 @institution for 5 years)	740,000
			• Dissemination meetings (@10,000)	60,000
	1.1.4 Support operationalization of the seven Centres of Excellence for training and gold processing (Simiyu, Mara, Kagera, Katavi, Mbeya, Ruvuma and Tanga) and the demonstration centre (model	700,000	• Training workshops (@12,500 per centre per year for 5 years)	500,000
			• Consumables (USD 5,000 @ centre for 5 years)	200,000

Strategy	Actions	Activity Cost (USD)	Cost Breakdown (USD)	
	mine) at Rwamgasa (Geita Region)			
	1.1.5 Promote adoption of effective and affordable technologies for mercury recovery from tailings generated by ASGM sub-sector.	500,000	• Develop demonstration manual	50,000
			• Dissemination meetings to Regions hosting ASGM activities (90,000 per year for 5 years)	450,000
1.2 Conduct baseline estimates of ASGM Mercury use	1.2.1 Establish multi-stakeholder inventory team and provide tailor made training	60,000	• Workshop and training (30,000 per session)	60,000
	1.2.2 Update baseline estimates of ASGM mercury use every three years	150,000	• Data collection and preparation of inventory report (75,000 @ inventory exercise)	150,000
1.3 Facilitate provision of information to ASGM and affected communities on mercury related issues	1.3.1 Develop and implement an outreach plan specific for affected communities in Regions hosting ASGM activities	600,000	• Information gathering workshop	20,000
			• Technical meeting for drafting the Plan	10,000
			• Sensitization workshops in Regions hosting ASGM activities (114,000 per year for 5 years)	570,000
	1.3.2 Establish and operationalize sector-specific depository facilities of information on mercury particularly health, environment, mineral and labour sectors	800,000	• Procurement of ICT and office equipment to 4 Ministries (150,000 @ Ministry)	600,000
			• To facilitate operationalization of depository facilities to 4 sector ministries (50,000 @ Ministry)	200,000
	1.3.3 Develop and implement sensitization plan on mercury risks to the media	100,000	• Information gathering workshops	10,000
			• Technical meeting for drafting the Plan	10,000

Strategy	Actions	Activity Cost (USD)	Cost Breakdown (USD)	
			• Sensitization workshops to the media (16,000 @ year)	80,000
Specific Objective 2: To strengthen legal framework, institutional capacity and stakeholder engagement in ASGM sub-sector governance by 2025				
2.1 Facilitate formalization of ASGM	2.1.1 (a) Prepare, review and enforce relevant legislations including formulating regulations on control and management of mercury and mercury compounds	800,000	• Stakeholders meetings and workshops to review relevant legislations (10,000 @ institution)	60,000
			• prepare and enforce regulations on control and management of mercury and mercury compounds	40,000
			• Conduct inspections (140,000 per year for 5 years)	700,000
	2.1.1 (b) Strengthen enforcement of environmental, labour and mining legislation prohibiting employment f children in ASGM	100,000	• Conduct inspections in ASGM areas by 8 institutions (20,000 per year)	100,000
	2.1.2 Strengthen capacity of key institutions mandated with licensing and governance of ASGM sub-sector to facilitate formalization	1,520,000	• Conduct training to staff for 8 Insitutions(40,000 @ institution)	320,000
			• Procurements vehicles and office equipment to 8 key institutions (150,000 @ institution)	1,200,000
	2.1.3 Strengthen regional mineral centres to promote access to gold market and improve contribution of the ASGM sub-sector to the economy	650,000	• Portable laboratory equipment for regional minerals centres (USD 130,000 per year)	650,000
	2.1.4 Conduct land use mapping and geo-prospecting and demarcate land for ASGM	800,000	• Conduct land use mapping and geo prospecting areas for ASGM in 5 years (USD 150,000 per year)	750,000

Strategy	Actions	Activity Cost (USD)	Cost Breakdown (USD)	
			• Procurement of 3-D mining and geological software	50,000
	2.1.5 Strengthen capacity of miners' associations	340,000	• Provision of office facilities to 17 associations (20,000 @ association)	340,000
2.2 Facilitate management and control of mercury trade	2.2.1 Strengthen institutional capacity to facilitate control and monitoring of mercury supply chain in ASGM	800,000	• Provision of office facilities to 6 key institutions (16,500 @ institution for 5 years)	500,000
			• Training workshops to staff of 6 key institutions (10,000 @ institution for 5 years)	300,000
	2.2.2 Engage in regional and international cooperation in controlling transboundary mercury trade	450,000	• Attend Regional and international meetings in 5 years (90,000 @ year)	450,000
2.3 Strengthen involvement and engagement of stakeholders in the implementation and continuing development of the NAP	2.3.1 Establish and operationalize stakeholder's Annual Forum on ASGM	250,000	• Conduct 5 Stakeholders meetings in 5 years (50,000@meeting)	250,000
Specific Objective 3: To ensure prevention and mitigation of mercury exposure to ASGM communities through a public health strategy by 2025				
3.1 Facilitate development and implementation	3.1.1 Develop and implement integrated public health approach in data collection related to mercury and health	360,000	• Information gathering workshop	10,000
			• Technical meeting for developing a database for data collection.	30,000

Strategy	Actions	Activity Cost (USD)	Cost Breakdown (USD)	
of public health strategy for preventing and mitigating mercury exposure to ASGM communities	status of the ASGM communities		• Collection of health data in ASGM communities (66,000 @ year)	330,000
	3.1.2 Develop and implement training programme for healthcare professionals to enhance their capacity to recognize, diagnose and treat mercury intoxication	500,000	• Technical meeting for developing training modules and printing	40,000
			• Conduct 20 training workshops to healthcare professionals in 5 years (USD 23,000 @ workshop)	460,000
	3.1.3 Develop and disseminate diagnosis and treatment protocols for mercury-related health effects	240,000	• Technical meeting for developing the protocols and printing	40,000
			• Conduct 10 training workshops to health officials around ASGM communities in 5 years (20,000 @ workshop)	200,000
	3.1.4 Establish and/or strengthen health facilities particularly those located in ASGM areas to cater for mercury related illnesses	500,000	• Establishment and/or strengthen of health facilities in ASGM areas (USD 78,000 @ year for 5 years)	390,000
			• Procurement of laboratory equipment to cater for mercury related diseases (22,000 @ year for 5 years)	110,000
	3.1.5 Develop and implement awareness campaign programmes to ASGM communities on health risks associated with ASGM	220,000	• Technical meeting for developing awareness campaign programme and materials	20,000
			• Conduct 10 awareness workshops in 5 years (20,000 @ workshop)	200,000
3.2 Promote the reduction of emissions, releases and risks of	3.2.1 Conduct monitoring of mercury contamination in the environment (soil, sediment, surface and ground water and foodstuff) in ASGM areas	500,000	• Sampling and laboratory analysis of environmental media in selected ASGM areas (100,000 @ year)	500,000

Strategy	Actions	Activity Cost (USD)	Cost Breakdown (USD)	
exposure to mercury	3.2.2 Develop and implement communication strategy on the health risks associated with the use of mercury in the ASGM.	440,000	• Technical meeting for drafting communication strategy	20,000
			• Stakeholders validation workshop	20,000
			• Conduct 20 awareness workshops in 5 years (20,000 @workshop)	400,000
3.3 Facilitate prevention and control the exposure of vulnerable populations, particularly children and women of child-bearing age, to mercury used in ASGM	3.3.1 Develop and implement gender sensitive initiatives (financial, technological and training) in ASGM	560,000	• Conduct 5 training sessions on business and financial management to women miners in 5 years (10,000 @ training session)	50,000
			• Conduct 5 awareness workshops to women miners on mercury related issues in 5 years (10,000 @ workshop)	50,000
			• Procurement of 100 retorts, 10 shaking tables and 10 compressors for women miners	410,000
			• Conduct 5 training workshops on best practices in mining and gold processing to women miners owning PMLs (10,000 @ workshop)	50,000
	3.3.2 Develop and implement awareness strategy on the risks of children and women of child bearing age exposure to mercury in ASGM communities	160,000	• Technical meeting for drafting public awareness raising strategy	20,000
			• Stakeholders validation workshop	20,000
			• Conduct 6 awareness raising workshops to ASGM communities in 5 years (20,000 @ workshop)	120,000

Strategy	Actions	Activity Cost (USD)	Cost Breakdown (USD)	
	3.3.3 Integrate child labor issues into ASGM related programmes and events	50,000	• Attend ASGM events and meetings (10,000@ year)	50,000
			GRAND TOTAL	**14,400,000**