REPUBLIC OF SURINAME

SURINAME
MINAMATA INITIAL ASSESSMENT

REPORT 2020

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Suriname Minamata Initial Assessment Report 2020.

Foreword

Suriname acceded to the Minamata Convention on 02 August 2018. In its process towards accession, the Government of Suriname started in 2013 with the legal and institutional analysis of the then current situation towards the use of mercury and the role of the various actors.

This analysis resulted in the publication of an Advice Document and a Roadmap in 2015 which stated the activities that had to be implemented to phase out the use of mercury in Suriname. Since the outcome of the Advice Document, the government started the process to ratify the Minamata Convention and also started to implement the roadmap.

For Suriname one of the important obligations under this Convention is to formulate a National Action Plan (NAP) for the Artisanal and Small Scale Gold Mining (ASGM). Traditionally Artisanal and Small Scale Gold Mining has always been a source of income for parts of the community. The negative impact of mercury on health and environment in Suriname cannot be overlooked and needs to be addressed.

Suriname applied for funding from the Global Environment Facility for assisting the country in preparing the national processes of meeting the obligations of the Minamata Convention on Mercury. Through the enabling activities of the GEF, Suriname has been able to implement the project: GEF 00095987 “Minamata Initial Assessment Report” (MIA report).
Through this project, which started in October 2017, Suriname has been able to further its national agenda on the phasing out of the use of mercury.

The MIA report describes the current situation of mercury releases in Suriname, the current awareness programs that exists in the country, a roadmap and actions which need to be undertaken to meet all the obligations of the Convention.
One of the activities of this project was the Inventory of Mercury Releases in Suriname which will be addressed in Chapter 2 of this report.

The government of Suriname would like to express its sincere gratitude to GEF, UNDP Suriname and all stakeholders, for their support in implementing the project in the country. Special word of appreciation to all whom have contributed to the finalization of this document.

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Glossary

ADEKUvS	Anton de Kom University of Suriname
BIS	Bauxite Institute of Suriname
CARICOM	Caribbean Community
GDP	Gross domestic product
GMD	Geological Mining Department
GoS	Government of Suriname
HI&T	Ministry of Trade Industry and Tourism
HS	Harmonized Commodity Description and Coding System
IDB	Inter-American Development Bank
ILO	International Labour Organization
IPCS	International Programme on Chemical Safety
ISO	International Organization for Standardization
JusPol	Ministry of Justice and Police
NIMOS	National Institute for Environment and Development in Suriname
OWT&C	Ministry of Public Works Transportation and Communication
MNP	Mercury National Profile
SAICM	Strategic Approach for International Chemical Management
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme (UN Environment)
VG	Ministry of Public Health

Executive Summary

This Mercury Initial Assessment (MIA) Report , gives an initial overview of the country's situation related to mercury within the context of the Minamata Convention on Mercury. This MIA report is based on the results of the updated version (2018) of the National Inventory of Mercury Releases and the National Mercury Profile respectively.

The MIA provides the overall information and requirements to establish baseline knowledge, in order to facilitate the implementation of the Minamata Convention on Mercury in Suriname.

This implementation represents an important opportunity to address mercury pollution problems in the country, by putting in place emission and release control measures of mercury, mercury containing waste, and reduce and where feasible, phase out the use of mercury and mercury compounds in, with particular focus on the Artisanal and Small-Scale Gold Mining (ASGM) sector.

The results of the National Inventory of Mercury Releases [1] provided basic knowledge data on the quantities of mercury being released to the environment due to anthropogenic activities. The estimated total amount of anthropogenic emissions and releases of mercury correspond to 88,864 kg Hg/year (see Table 1).

Table 1 Emissions and releases of mercury from anthropogenic sources in Suriname, 2018 (UNEP Toolkit, Level 2).

Source category	**Calculated Hg output Kg/year**							
	Air	Water	Land	By-products and impurities	General waste	Sector specific treatment / disposal	Total releases by source category	Percent of total releases *3 *4
5.1: Extraction and use of fuels/energy sources	22.3	0.7	-	0.3	-	0.4	24	0.0%
5.2: Primary (virgin) metal production	16.869.3	23.829.7	44.563.4	962.6	-	-	86.225	97.0%
5.3: Production of other minerals and materials with mercury impurities *1	-	-	-	-	-	-	-	0.0%
5.4: Intentional use of mercury in industrial processes	-	-	-	-	-	-	-	0.0%
5.5: Consumer products with intentional use of mercury (whole life cycle)	274.9	291.3	284.5	-	430.9	-	1.282	1.4%
5.6: Other intentional product/process use *2	0.5	16.4	2.6	1.6	10.9	10.4	42	0.0%
5.7: Production of recycled metals	-	-	-	-	-	-	-	0.0%
5.8: Waste incineration and burning	867.1	-	-	-	-	-	867	1.0%
5.9: Waste deposition/landfilling and waste water treatment *3 *4	207.7	350.7	1661.4	-	-	-	1.220	0.5%
5.10: Crematoria and cemeteries 2.1	-	7.1	-	-	-	9	0.0%	
SUM OF QUANTIFIED RELEASES *3 *4	18.244	24.346	44.858	965	442	11	88.864	100%

[1] *National Inventory of Mercury Releases in the Republic of Suriname, 2018. UNEP Toolkit, for Identification and Quantification of Mercury Releases. Refined version, Inventory Level 2, Version 1.4 April 2017.*

From the total estimated emissions and releases of mercury from anthropogenic sources, 97% was estimated to originate from gold mining activities (see Figure 1), corresponding to 86,225 kg Hg/year.

The remainder of mercury emissions and releases (3%) corresponds to mercury emissions and releases from waste incineration (informal waste burning); waste dumping/landfilling (informal dumping of general waste) and consumer products containing mercury (thermometers and batteries containing mercury).

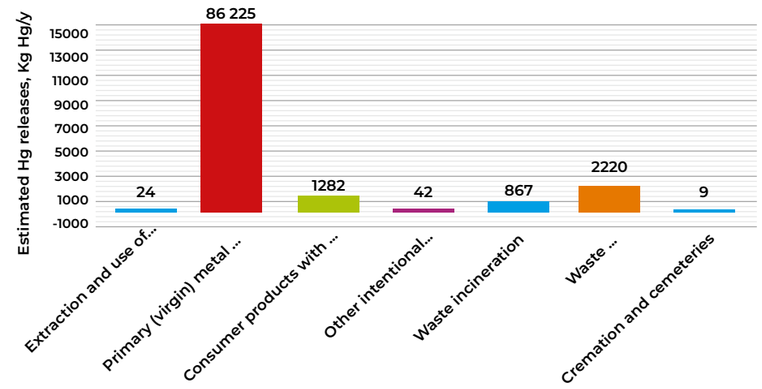


Figure 1 Total estimated emissions and releases of mercury from Suriname's anthropogenic sources. (Source categories 5.1 to 5.10).

In 2016 a Level 1 Inventory was conducted [2] , which indicated very similar results as compared to those resulting from the Level 2 Inventory completed in 2018. Both inventories indicated that the majority of emissions and releases in Suriname result from gold mining activities (99% and 97% respectively).
Nevertheless, important differences were observed between the Mercury Inventory Level 1 and Level 2 outcomes, in categories such as gold extraction, consumer products with mercury content, waste incineration and waste deposition.

The main observed difference between the Level 1 and 2 inventories was a fifty percent (50%) reduction in the estimated mercury input to society in the category Metal Production. This reduction was the result of using an adjusted input factor for "mercury content in gold ore" in the subcategory "Extraction without the use of mercury" (Toolkit Level 2) for large-scale gold mining (LSGM). The proposed default input factor of 15 gram of mercury per ton of gold ore (used in the UNEP Toolkit) was replaced by 1 gram (0,001 Kg) of mercury per ton of gold ore, in agreement with one large-scale gold mining company, based in Suriname, using their own internal information. It should be noted no additional data was obtained to corroborate this information. Therefore, a review of the mercury content in gold ore in Suriname would be an important additional step, to be confirmed during the Minamata Convention's implementation phase.

In the case of gold mining with mercury amalgamation (ASGM), the results of the Level 2 inventory are quite different due to a number of reasons. Firstly because Level 2 allows for more extraction category options, representing a more realistic picture of emissions and releases of mercury from gold mining (Figure 2).

[2] *Mercury Release Inventory, Waste, Storage and Disposal in the Republic of Suriname, December 2016. UNEP Toolkit, for Identification and Quantification of Mercury Releases. Guideline for Inventory Level 1, Version 1.3 April 2015*

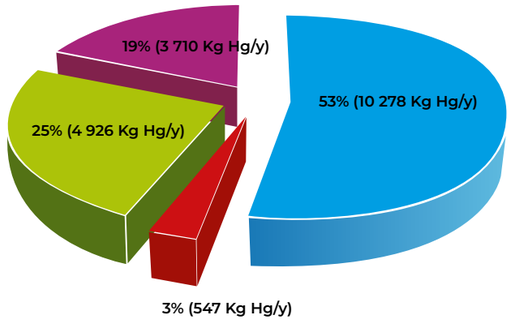


Figure 2 Total estimated emissions of mercury from gold mining (ASGM) activities.

As indicated earlier, Level 1 inventory was conducted as a desktop study over a period of 3 months, using fixed default values,as input factors. During Level 2 inventory, and for gold mining category with mercury amalgamation, the estimate amount of gold produced per year (kg produced per year) used as the activity rate was quite similar for both inventories; 18.246 [3] kg gold/year and 19.461 [4] kg gold/year. However, the estimated total mercury inputs into society was significantly lower for Level 1 (39,247 kg Hg/year) Hg/year) as compared to Level 2 (62,159 kg).

Indeed, Inventory Level 1 used fixed default values for input factors, while Mercury Inventory Level 2, in case of gold mining category with mercury amalgamation, have different options. That is the reason, the estimated total mercury inputs into society was much higher in the updated Inventory Level 2 version (62.159 kg Hg/year).

The difference is given by a variation of gold extraction techniques used in the releases Inventory level 2.

Inventory Level 2 gives alternative options, namely: a highest input factor of 5 kg mercury per 1 kg gold produced is used in so called "**whole ore amalgamation** technique, without use of retort". Input factor which is modified by a factor of (- 0,75 kg) when using the retort (4,25 kg mercury per 1 kg gold produced).
Although, when "**concentrate amalgamation** technique without using retort" is used, the input factor is only 1,3 kg Hg per 1 kg gold produced. When using retort (applying the same factor of – 0,75 kg) input factor is reduced to 0,55 kg mercury per 1 kg gold produced.

In case of mercury emissions to air, by far gold mining is responsible for the largest emissions, with 16 869 kg Hg/year (Figure 3), equivalent to 92.5% of total emission sources.

3 Amount of gold (activity rate used in Inventory Level 1) corresponding to exported by Suriname from the period 2011 (Legg, et al. 2015).

4 The average amount of gold exported (activity rate used in Inventory Level 2) registered by the Central Bank over the period (2010-2017) (Tjon Kie Sim, 2018).

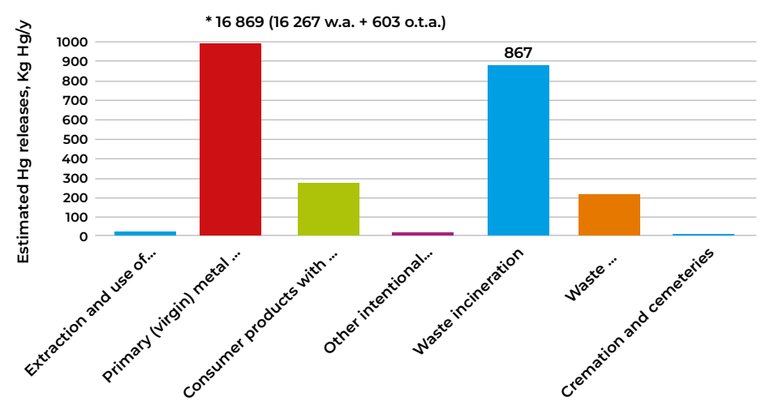


Figure 3 Total estimated mercury emissions to Air from anthropogenic sources.
**Total emission from primary metal (Gold) production. w.a. = with amalgamation / o.t.a.= other than amalgamation*

Total emissions to air from gold mining (16.869 Kg Hg/year) are made up by 16.267 Kg Hg/year (96.4%) of emission from gold mining with amalgamation process and 603 Kg Hg/year (3.6%) from gold mining by methods other than mercury amalgamation.

In the case of mercury releases to water, gold mining remains responsible for the largest releases, with 23.829 kg Hg/year (Figure 4), corresponding with 97.8% of total releases.

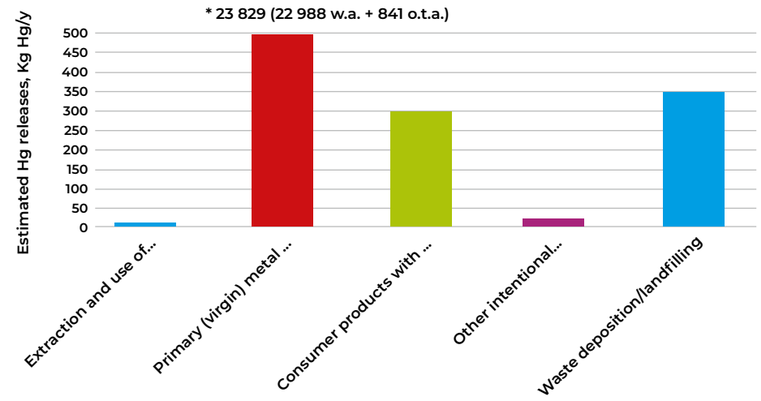


Figure 4 Total estimated mercury releases to Water from anthropogenic sources.
** Total releases from primary metal (Gold) production.*

In case of mercury releases to land, gold mining still remains the largest source of mercury, with 44.563 kg Hg/year (Figure 5), corresponding to 95.8% of total releases.

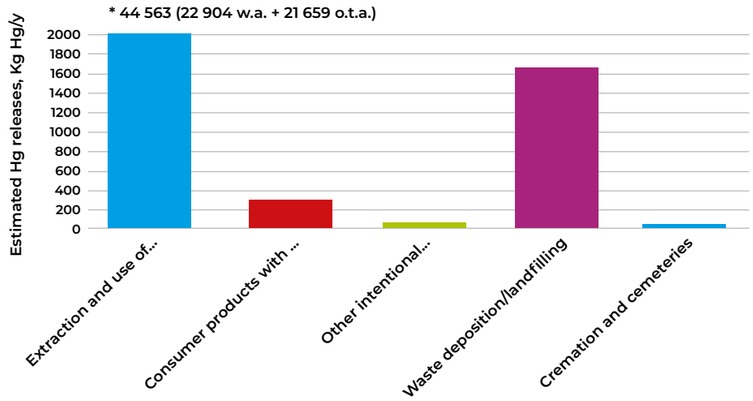


Figure 5 Total estimated mercury releases to Land from anthropogenic sources.

Related to releases to land, gold mining with mercury amalgamation (i.e. ASGM) and gold mining with extraction with other than mercury amalgamation techniques (i.e. LSGM), gives a quite similar amount of releases (see Figure 6).

This ratio is composed by by 51.4% and 48.6% (ASGM / LSGM) while in the previous cases (emissions to air and releases to water), this ratio was made up by 96.4% / 3.6% ASGM/LSGM . This fact stresses the need to focus on ASGM emissions while LSGM can be seeing as a re-mobilising of mercury.

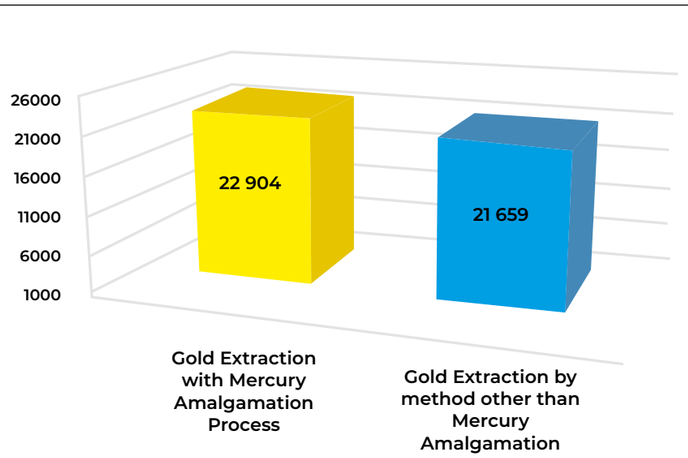


Figure 6 Estimated released of mercury to land, from gold mining, with and without mercury amalgamation.

As it was mentioned above, this MIA Report assesses the central requirements for a sound management of mercury and products with mercury content, where several of legal, technical/analytical, institutional and related needs were identified.

From the review of existing legal and regulatory tools identified in the Mercury Profile and focusing on management of mercury as toxic chemical, the current structure requires to be updated. A number of gaps and needs were identified. These are related to both operational and regulatory requirements in order to ensure a mercury sound management accordingly.

It is worth noting that besides the government regulation Decree Negative List there is no other legal instruments that specifically mentions mercury.
However, within the already existing legal tools, a number of modifications could be introduced in order to mainstreaming mercury and products with mercury content (as the Negative List, the Occupational Health and Safety regulation; Food Safety regulation; Disaster Management rules and law on fire brigade among others).

In line with the aforementioned, non-regulatory instruments developed by the National Institute for Environment and Development in Suriname – NIMOS (such as guidelines in case of the Environmental and Social Impact Assessments EIA), it is suggested to develop other instruments (rules and norms), particularly in case of the ASGM, in order to speed up enacting procedure and facilitate the overall mercury management (during a transition period).

In addition, in the mining sector, there is no existing framework and institutional strength in order to support such an important sector to reduce/phase out the use of Mercury.

Based on the results of the refined mercury releases inventory and following the Minamata Convention's guidelines, these gaps and needs must be associated to the ASGM and its National Action Plan, where a number of Priority Actions should be addressed. These actions are relevant and critical issues and are needed to undertake the implementation of the Convention properly.

These priority topics might be the following

Mercury management

- More restricted measures to control the use of mercury (during a transition period) and restricted measures to improve safety handling and storage of mercury.
- At Custom level, review the Tariff Heading of mercury (the specific technical descriptors of each one sub-heading), in order to improve control over the import of mercury and products with mercury content.

To ASGM sector

- Updating of a National Register of artisanal miners.
- Systematic risk assessment of population located within mercury priority areas.
- Occupational exposure monitoring within mercury priority areas.

Regulatory evaluation

- Review the current capacity for control and enforcement, within the governmental bodies, in order to incorporate new standards that can strengthen the present state and to main stream mercury as a target compound under this legislation.

Review the current Institutional framework

- To improve and reinforce the institutional framework.
- Special effort must be concentrated on human resources in order improve their professional skills through capacity building) programmes and economic incentives.
- Development of national capacities, with a synergic and integrated approach with the MEAs signed by Suriname.

Contaminated sites

- Systematic evaluation of communities within ASGM areas (risk assessment).
- Using passive sampler devices to conduct mercury field sampling and measurement campaign in order to identify zones of mercury major impact.
- Strengthen and support Anton de Kom University in its research to improve the understanding of mercury contamination over time in Suriname.
- To include such a systematic approach within the National Action Plan, that can be used to monitor the level of progress of taken actions and activities.

National Reference Laboratory

- To establish a National Reference Laboratory to characterize mercury compounds, within the framework of the Minamata Convention.
- To provide necessary support to develop capacity to conduct mercury characterization in different environmental matrix (soils, air, particulate matters, water, etc.).
- To accreditate the Laboratory (ISO/EIC 17025).
- To facilitate regular training and capacity building.

Emission standards

- To undertake measures as emissions standards and requirements of systematic monitoring or reporting based on the mercury emission inventory results, in line with article N° 8 of the Minamata Convention.

There is therefore a need to establish emission standards, regulations, and rules to improve overall mercury management, especially associated to human protection of communities located in the vicinity of gold mining areas.

Adhering to the Minamata Convention on Mercury ratifies the commitment of the Government of Suriname's government towards the improvement of the legal and regulatory framework related to toxic chemicals, considering the already adopted Stockholm and Basel Conventions.

Despite the existing constraints, the Minamata implementation phase brings an opportunity to face these issues, focusing on priority topics of concern related to mercury pollution and human health in Suriname.

In this regard, is important to note that mercury management as well as other environmental priority matters will be allocated from the limited available national budget. Therefore, it is essential to clearly define these needs under a Priority Program.

This report is part of the expected outcomes of the UNDP-GEF MIA-project: "Minamata Initial Assessment for Suriname", where the National Institute for Environment and Development in Suriname (NIMOS) is acting as the National Focal Point for the Minamata Convention to the Government of Suriname.

Introduction

Mercury is released to the environment from both natural sources and processes and as a result of human activities. Once it has entered the environment, mercury cycles between air, land, and water until it is eventually removed from the system through burial in deep ocean sediments or lake sediments and through entrapment in stable mineral compounds (UNEP[5]).

The Minamata Convention on Mercury is an Internationally global agreement to protect human health and the environment from the adverse effects of mercury. The text of the Convention was agreed in January 2013, and the Convention was opened for signature in October 2013 and entered into force on 16 August 2017 after it was ratified by more than 50 nations. The 50-ratification milestone was reached on 18 May 2017.

The main focusses of the Convention include a ban on new mercury mines, the phase-out of existing ones, control measures on air emissions, and the international regulation of the informal sector for Artisanal and Small-scale Gold Mining (ref[6]).

The government of Suriname supports the objective of the Convention to protect human health and the environment from anthropogenic emissions and release of Mercury. Therefore, in March 2018 the decision taken by the government to become party to the Minamata Convention was approved in the Surinamese Parliament (De Nationale Assemble van Suriname).

The Mercury Initial Assessment (MIA) provides the baseline knowledge of the mercury issue as a whole, (including the technical, legal, regulatory, social and gender mainstreaming aspects) towards the ratification and implementation of the Convention.

The MIA project is assisting Suriname to develop a National Action Plan in ASGM in accordance with Article 7; and to prepare a national plan to reduce emissions of mercury in accordance with Article 8.

This MIA report outlines the main findings from the Suriname's inventory of mercury releases (UNEP Toolkit Mercury Inventory Level 2). Notice that this inventory is a refined version of the 2016 First National Mercury Inventory (ref[7]), using the UNEP Toolkit level 2 version 1.4.

This MIA report describes the current institutions, legislation existing in Suriname to implement the Minamata Convention. Likewise it identifies the gaps and eventual barriers that might put the implementation process at risk. The report also provides some proposal for actions, recommendations and regulatory revisions, including financial needs (including resources from the GEF, national sources, bilateral sources, the private sector and others).

Methodology

The MIA project was initiated during the second quarter of 2018 with data gathering to update the mercury inventory Level 1 conducted in 2016, using the UNEP Toolkit level 2 version 1.4. This stage was finalized with a number of interviews with stakeholders related to mercury issues in Suriname.

5 UNEP Global Mercury Assessment 2013, Sources, Emissions, Releases and Environmental Transport. UNEP Chemicals Branch, Geneva, Switzerland.

6 Minamata Initial Assessment for Suriname. UNDP-GEF Project, UNDP-GEF PIMS ID: 5809.

7 Ibid 2.

During the 2nd and 3rd week of June, an intensive agenda of consultation meetings was conducted between NIMOS – UNDP Team and the main participant stakeholders of the MIA project (Ministry of Natural Resources, Cabinet of the President of Suriname – Coordination Environment, Ministry of Public Works, Ministry of Justice and Police, MEKI TAMARA Research Initiative in Suriname. Research Center of the Academic Hospital Paramaribo, Foundation of Holders of Mining Rights, the Public Prosecution Office, Ministry of Trade, Industry & Tourism, Ministry of Health, Central Laboratory, Bureau for Public Health(BOG); Anton de Kom University of Suriname and the Custom Authority).

Field visit to mining districts

During the same period, field visits, were organized by a NIMOS-UNDP team in the central Suriname's gold mining areas. Two mining areas were visited (Brokopondo and Sabajo area) in order to verify in-situ gold mining activities and worker's interview. The information exchange helped elaborate further proposals and technical recommendations, which are described in this report

UNEP Toolkit Mercury Inventory Training and Validation Workshop

During the last week of July (30th July to 2nd August 2018) a UNEP Toolkit Mercury Inventory Training and a Validation Workshop were organized under the NIMOS MIA Project's coordination.

Firstly, a one-day validation workshop was organized, in order to present and discuss the results and methodology used to update the National Mercury Inventory. At this event many public and private stakeholders took part, including Ministries, NGOs, universities and representatives of private companies, among others (see list in Annexes).

Thereafter, a Toolkit Mercury Inventory Training was conducted along three days for about 35 people, staff and representatives from a number of public and private institutions, including Ministries, Custom Authority, NGOs, university and representatives of private gold mining associations, among others (see list of participants and main content of the training in Annexes).

The mercury path in Suriname

Mercury has been associated to gold mining. Although gold mining in the Guianas (Figure 7) has a history that stretches back more than 150 years (ref[8]).

In Latin America evidence of gold exploitation by indigenous peoples exists from 1200 BC and historical documents suggest mercury was employed in precolonial times to recover both gold and silver from ore (ref[9]).

Estimations of the amounts of mercury circulating in the Guianas area during the last decade are of critical concern. The amounts are ranging from an estimated minimum of 80 tons of mercury used each year by miners across the Guianas, and that most of that is lost to the environment (ref8) up to 150 ton/year legally imported (ref[10]).

8 Ibid 3.

9 Cremers L and de Theije M (2013). Small-Scale Gold Mining in the Amazon. Chapter 1. Small-Scale Gold Mining in the Amazon the Cases of Bolivia, Brazil, Colombia, Peru and Suriname. CEDLA.

10 Guyana Custom Department. Official Statistic, 2016.

Figure 7 The mineral belt of the Guiana Shield (ref [13]).

The first gold mining rush started in Suriname between 1870 and 1910 (ref [11]) and despite the relatively small amount of gold produced it promoted the construction of the only railroad in the country, connecting the capital Paramaribo to the mining areas in the south (ref [12]).

The second gold rush started in 1980 with the finding of a large gold deposit in Serra Pelada in Brazil (ref[13]) and spread to all neighbouring countries and this rush continues.

Similar to the Guianas' region area, gold production in Suriname has initiated a new stage of growth driven by the rising gold price beginning in the 1970s was disrupted by the Interior War (1986–1992) (ref [14]).

In the beginning of 1970s, gold production in Suriname had a new stage of growth driven by the rising gold price (ref[15]).

At present it is estimated that 40.000 people are directly and indirectly involved with ASGM in Suriname. A number slightly higher than estimations (35.000) done around 7 years ago (ref [16]). Since the end of the Domestic war, income incentives have become more impotant as safer gold fields attract immigrants, foreign prospecting companies, and urban Surinamese to the interior of the country (ref [17]).

In relation to gold mining without mercury amalgamation, currently three gold companies are functioning in Suriname, : IAMGOLD concession area at Gross Rosebel; Newmont Suriname with exploitation concession at Merian and exploration concession at Sabajo Hill and Grassalco (Grasshopper Aluminium Company) with exploitation at Maripa ston and several exploration concessions.

IAMGOLD concession at Rosebel began activities in 2004 and the current gold production reported for 2017 was 300,000 troy ounces. The second large scale gold company Newmont Suriname started relatively late (October 2016) and last year reported 511,000 troy ounces gold production.

11 De Vletter D.R.& A.L.Hakstege 1998. The search for gold in Suriname. In: Th. H. Wong, D.R. De Vletter, L Krook, J.I.S., Zonnelveld & A.J. Van Loon (eds), The history of earth science in Suriname, pp 311-349. Netherlands Institute of Applied Geoscience TNO/Royal Netherlands Academy of Arts and Sciences, Amsterdam.

12 Paul E. Outboter (2015). Review of mercury pollution in Suriname. Academic Journal of Suriname, 2015, 6, pp 531-543.

13 Veiga, MM., 1997 Introducing new technologies for abatement of global mercury pollution in Latin America. UNIDO/University of British Columbia/ Center for Mineral Technology, Rio de Janeiro.

14 Heemskerk Consultants in Social Sciences (2011). Small-Scale Gold Mining in the Transboundary Areas of Brazil, Suriname and French Guiana. Social and Environmental Issues. UNDP GSF.

15 Heemskerk Consultants in Social Sciences (2011). Small-Scale Gold Mining in the Transboundary Areas of Brazil, Suriname and French Guiana. Social and Environmental Issues. UNDP GSF.

16 Ibid.

17 Ibid.

The last one Grassalco, is a government owned enterprise, operating in the District of Para. The company is currently operating partially (old tailings only), reporting 48 Kg/year gold production, (2017 data ref [1]).

Since ASGM made up approximately 60% of the exported gold production in Suriname (ref [18]) using extraction methods with mercury amalgamation, undoubtedly should be the main focus and concern . What's more, considering the global emission perspective, where near to half of the emission pattern (37%) corresponds to emission to air from ASGM activities (see Figure 8).

The uncertainties regarding the global mercury trade are a reality. Particularly, within the Guia-nas data is particularly sparse: 1) French Guiana, where the use of mercury in gold mining is illegal 2) In Suriname no official import of mercury has been recorded (no license to Ministry of Trade and Industry have been required).

The main emission sources from human activities at global scale, estimated in 2010 are (Figure 8):

37% Artisanal and small-scale gold mining
24% Fossil fuel combustion
18% Metal production (ferrous, non-)
9% Cement production
5% Waste incineration, waste, other
1% Chlor-alkali industry
6% Others

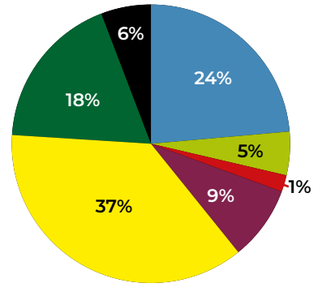


Figure 8 Global anthropogenic mercury emissions (UNEP Time to Act 2013).

For Suriname, this pattern of mercury emissions (Figure 8) represents a serious concern with particular significance, since ASGM is a key driver of the country's economy.

The majority of ASGM in the Suriname's Greenstone Belt is done by Brazilian miners (Garimpeiros) and in lesser extend by Surinamese Maroons. Unfortunately, due to its largely unregulated and uncontrolled nature, mining, and in particular ASGM, is causing significant negative environmental impacts on forests, freshwater, fish and other groups of species.

In line with the Minamata Convention and together with this Mercury Initial Assessment, Suriname is developing a National Action Plan (NAP) focused on ASGM sector, in order to define a strategy to systematically reduce mercury emissions. To this purpose a review of the institutional capacities available to achieve the reduction of emissions and releases of, and exposure to mercury in ASGM is included. In addition, considering the importance of ASGM within the context of the MIA project, the focus on mercury sources (e.g. trade, import, export) associated to gold mining, should be established as main priorities to face the implementation of the Convention.

This Mercury Initial Assessment Report provides an overall assessment of the existing legislation and policies relevant to implement the Minamata Convention in Suriname. The report identifies gaps and eventual barriers to the implementation process as well as some proposals for actions and recommendations to address the implementation process, including financial needs. This report outlines the main findings from the National Mercury Inventory and the National Profile, which describes the current institutional structure existing in Suriname to implement the Minamata Convention.

Background information and a brief description of project context are also included, considering the project development and objectives. Detailed Annexes and documents (mercury inventory and national mercury profile) support all this information.

18 Surimep (2015). Mining, Oil and Gas and Energy Information. Available from: http://surimep.com/the-event-3/mining/. Accessed 2018.

1 National Background Information

1.1 Country profile

1.1.1 Geography and population

The Republic of Suriname with 541,638 inhabitants (ref[19]) Algemeen Bureau voor de Statistiek, NBS 2015) is situated between 2-6° N and 54-58° W on the northern part of South America.

Suriname borders the Atlantic Ocean in the north, Brazil in the south, Guyana in the west and the French Department of La Guyane (also named French Guiana) in the east.
(Figure 9).

The total area of Suriname is 163,820 km2, and consists of a swampy coastal plain, a central plateau region containing broad savannahs and swamp forest, and to the south a highland region densely forested with tropical vegetation.

The country has a typical tropical climate, a mean daily temperature of about 27 rainfall varying from 1900 mm along the coast to 2700 mm in the centre of the country. There are two wet seasons from April to August and from November to February, as well as two dry seasons from August to November and February to April (National Chemical Profile. Suriname 2011).

Figure 9 The map of Suriname and its ten districts (National Chemical Profile. Suriname 2011).

During the last decade, literacy has been improved from 89.6%5 to 95.6% (2004 to 2015 respectively) (ref [20]).

Table 2 Suriname Official Statistic (Suriname National Bureau of Statistic)

Population	541,638 (July 2017)
Total Area	163,820 km2
Land	156,000 km2
Water	7,820 km2
Currency	Surinamese Dollar (SRG)
Per capita GDP 2017	US$14,600

In terms of geographical characteristics and land use, Suriname is made up by 94.6% of forest land with the greatest diversity of flora and fauna. The main natural resources are timber, hydropower, fish, kaolin, shrimp, bauxite, gold, and small amounts of nickel, copper, platinum, iron ore.

[19] Algemeen Bureau voor de Statistiek, NBS Suriname, National Bureau of Statistic, http://www.statistics-suriname.org, Accesed 2018.
[20] Updated www.indexmundi.com/, Updated 2015.)

1.2 Demographic context

The great diversity of the population of Suriname is composed by indigenous tribes (Native Amerindians) and tribes (descendants of African slaves) Marroon diaspora, the European diaspora (Dutch descendants), Javanese diaspora (descendants or Indonesia),Hindostani diaspora (descendants or India) and the greatest contribution of all these ethnic groups is the preservation of cultural values, norms and traditions (ref [21]). In terms of percentage, it is made up of Hindustani, 27.4%; Creoles, 17.7%; Maroons, 14.7%; Javanese, 14.6%; Mixed, 12.5%; Others (Chinese, Indigenous peoples, Lebanese, European, etc.) 6.5%; Not reported, 6.6%, (ref [22]).

Dutch is the official language; however more than 16 other languages are spoken. Sranang Tongo (Surinamese, is the native language and is lingua franca among others), Caribbean Hindustani (a dialect of Hindi), Javanese.

The religious profile is made up by: Protestant 23.6% (includes Evangelical 11.2%, Moravian 11.2%, Reformed .7%, Lutheran .5%), Hindu 22.3%, Roman Catholic 21.6%, Muslim 13.8%, other Christian 3.2%, Winti 1.8%, Jehovah's Witness 1.2%, other 1.7%, none 7.5%, unspecified 3.2% (2012 est.)

Table 3 Religues profile of Suriname

Religion Profile in Suriname	Percentage (%)	Obs.
Protestant*	23.6	Evangelical 11.2% Moravian 11.2% Reformed 7% Lutheran 5 %
Hindu	22.3	
Roman Catholic	21.6	
Muslim	13.8	
Other Christian	3.2	
Winti	1.8	
Jehovah's Witness	1.2	
Other	1.7	
None	7.5	
Unspecified	3.2	
Total	99.9	

Age structure (2017)(ref [23])
The present Suriname's age structure is:
0 -14 years: 24.62% (male 74,247 / female 71,456)
15-24 years: 17.44% (male 52,599 / female 50,618)
25-54 years: 44.4% (male 133,835 / female 128,980)
55-64 years: 7.54% (male 21,940 / female 22,697)
65 years and over 6.04% (male 15,394 / female 20,153)

Population growth rate:
1.02% (2017)

Birth rate:
15.8 births/1,000 population (2017)

Death rate:
6.1 deaths/1,000 population (2017)

Life expectancy at birth:
Total population: 72.5 years
Male: 70.1 years
Female: 75.1 years (2017)

1.3 Profiles of economic sectors

The main driver of Suriname's economy is the mining & oil industry, with exports of oil and gold accounting for approximately 85% of exports and 27% of government revenues. This makes the country's economy highly vulnerable to variation in mineral prices.

The worldwide drop in international commodity prices and the cessation of alumina mining in Suriname significantly reduced government revenue and national income during the past few years. In November 2015, a major US aluminum company discontinued its mining activities in Suriname after 99 years of operation. Public sector revenues fell, together with exports, international reserves, employment, and private sector investment (ref [22]).

The economy of Suriname has traditionally rested on three main industries: mining, oil, lumber, food processing and fishing.

Industrial products

Suriname is well known as gold producer with an estimated export of over 100 tonnes during the last five years. In addition to gold mining, other industrial products are oil, lumber, food processing, fishing.

Agriculture products

These sectors play an important role in the country's economy. The main products are rice, bananas, sea bob shrimp, yellow-fin tuna, vegetables.

21 United Nations Group of Experts on Geographical Names, Working Paper, report of Suriname No. 15/18, Bangkok, April 2016.
22 Updated National Chemical Profile. The Republic of Suriname. Ministerie Van Arbeid Technologische Ontwikkeling en Milieu (ATM), July 2011.
23 Suriname government. Source : CIA https://www.cia.gov/library/publications/the-world-factbook/geos/ns.html .

2 Mercury Inventory and Identification of Emissions and Releases

The results of the refined version of the National Inventory of Mercury Releases provided the basic understanding about the mercury circulating in the country and the estimated amount of mercury emission and releases, as the results of Suriname human society's activities.

2.1. Overall outcomes of the refined version of National Mercury Inventory

The estimated total amount of anthropogenic emissions and releases of mercury correspond to 88,864 kg Hg/year (see Table 3).

Table 4 Emissions and releases of mercury from anthropogenic sources in Suriname (UNEP Toolkit, refined version Level 2).

Source category	**Calculated Hg output Kg/year**							
	Air	Water	Land	By-products and impurities	General waste	Sector specific treatment / disposal	Total releases by source category	Percent of total releases *3 *4
5.1: Extraction and use of fuels/energy sources	22.3	0.7	-	0.3	-	0.4	24	0.0%
5.2: Primary (virgin) metal production	16.869.3	23.829.7	44.563.4	962.6	-	-	86.225	97.0%
5.3: Production of other minerals and materials with mercury impurities *1	-	-	-	-	-	-	-	0.0%
5.4: Intentional use of mercury in industrial processes	-	-	-	-	-	-	-	0.0%
5.5: Consumer products with intentional use of mercury (whole life cycle)	274.9	291.3	284.5	-	430.9	-	1.282	1.4%
5.6: Other intentional product/process use *2	0.5	16.4	2.6	1.6	10.9	10.4	42	0.0%
5.7: Production of recycled metals	-	-	-	-	-	-	-	0.0%
5.8: Waste incineration and burning	867.1	-	-	-	-	-	867	1.0%
5.9: Waste deposition/landfilling and waste water treatment *3 *4	207.7	350.7	1661.4	-	-	-	1.220	0.5%
5.10: Crematoria and cemeteries 2.1	2.1	-	7.1	-	-	-	9	0.0%
SUM OF QUANTIFIED RELEASES *3 *4	18.244	24.346	44.858	965	442	11	88.864	100%

A highly predominant amount of 86,225 kg Hg/year was estimated as emissions and releases from gold mining activity (see Figure 10).

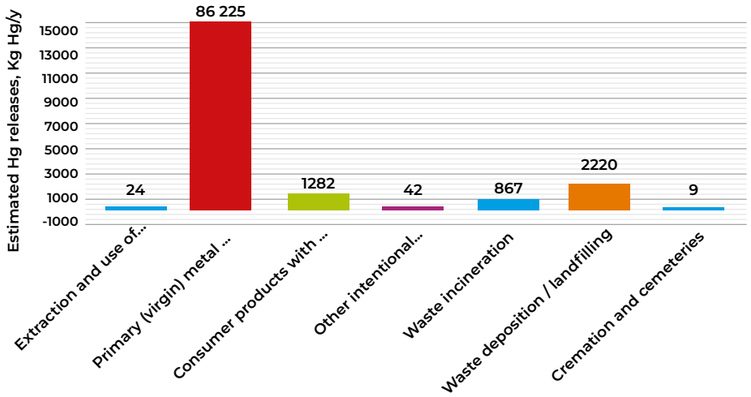


Figure 10 Total estimated emissions and releases of mercury from Guyana's anthropogenic sources.

A highly predominant amount of 86,225 kg Hg/year was estimated as emissions and releases from gold mining activity (see a The outcomes of the refined version of the mercury releases inventory, ratify some expected results and provide important and useful information. Figure 10).

2.2. Releases of concern by major economic sector

Suriname's gold mining with mercury amalgamation is the main and almost exclusively source of anthropogenic emissions/releases of mercury into the society.

2.2.1. Gold mining LSGM & ASGM sectors

These emissions correspond to 97.3% of the total mercury emissions resulting from Suriname' anthropogenic activities (86,225 Kg Hg), where the higher input corresponds to ASGM with 62,159 Kg Hg/year and LSGM with 24,066 Kg Hg/year (72% - 28% respectively).

From a global perspective (emissions to air), ASGM contributes with 16,267 Kg Hg/year while the LSGM contribution is only 603 Kg Hg/year of the total emissions to air (96.4% - 3.6% respectively).

The contribution of LSGM in the global frame can be seen as:

- input of LSGM to air is 0.67% of the total emission amount (88,864 Kg Hg/year).
- input of LSGM to air is 3.31% of the total air emission amount (18,244 Kg Hg/year).

Consumer products with intentional use of mercury (thermometer and batteries with mercury content) and Waste disposal and informal dumping of wastes are additional sources of mercury emissions and releases. However, amounts of these emissions are significantly lower than gold mining ones (Figure 11).

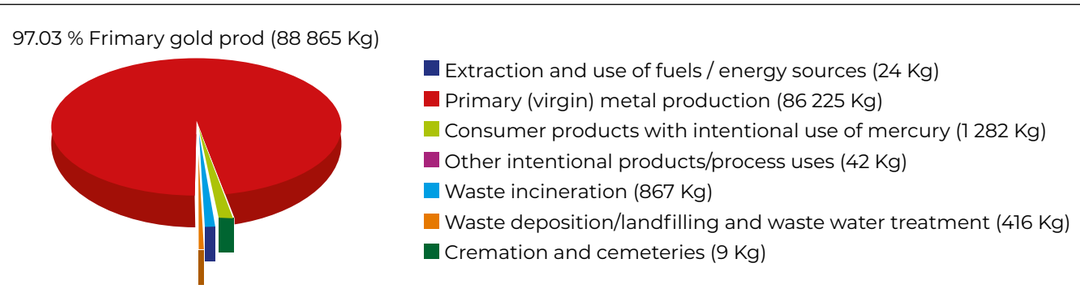


Figure 11 Total estimated emissions and releases of mercury from Suriname's anthropogenic sources

2.2.2 Comparison of mercury inventory results of 2016 Level 1 and refined 2018 Level 2 versions

Following a similar chart, the results of the mercury emissions and releases estimated in 2016 (Inventory Level 1), and the results of the refined version of the National Mercury Inventory Level 2 (July 2018) ratify to overwhelming mercury emissions and releases from gold mining activities (99% and 97% respectively), as the main and almost exclusive emission source of mercury. However, important differences between the Mercury Inventory Level 1 and Level 2 outcomes were found in categories (subcategories) as Gold extraction, Consumer products with mercury content, Waste incineration and Waste deposition.

The main observed difference in the outcomes was a fifty percent (50%) reduction of estimated mercury input to society in the category Metal production. This reduction was obtained by using an adjusted input factor for mercury content in gold ore used in the subcategory "Extraction without the use of mercury" (Toolkit Level 2), corresponding to large-scale gold mining (LSGM).

The UNEP Toolkit proposed a default input factor of 15 gram of mercury per ton of gold ore which was replaced by 1 gram (0.001 Kg) of mercury per ton of gold ore. This modification was done in agreement with one large-scale gold mining company in Suriname, based on their own internal information. In this regard it should be noted that no Surinamese data was found at that moment, to corroborate this information. Therefore, review of mercury content in gold ore in Suriname it would be an interesting and necessary element, to be included during the Minamata Convention's implementation phase, in order to verify whether such value fits with country's reality. mining ones (Figure 11).

2.2.3. ASGM Sector

As it was pointed out the emission from ASGM reaches 62,159 Kg Hg/year which corresponds to the 69.95% of total emission (88,864 Kg Hg/year) and to the 72% of the total emission (ASGM + LSGM) from gold mining activity only (86,225 Kg Hg/year).

From a global perspective ASGM contributes with 16.267 Kg Hg/year of the total Suriname's emissions to air. This contribution can be seen as:

- input of ASGM to air is 18,30% of the total emission amount (88.864 Kg Hg/year)
- input of ASGM to air is 89,16% of the total air emission amount (18.244 Kg Hg/year).

In case of Gold mining with mercury amalgamation (ASGM), the results of the refined version of Mercury Inventory Level 2 are quite different due to a number of reasons, firstly due to more options to choose extraction categories, representing a more realistic picture of the emission and releases of mercury from gold mining (Figure 12).

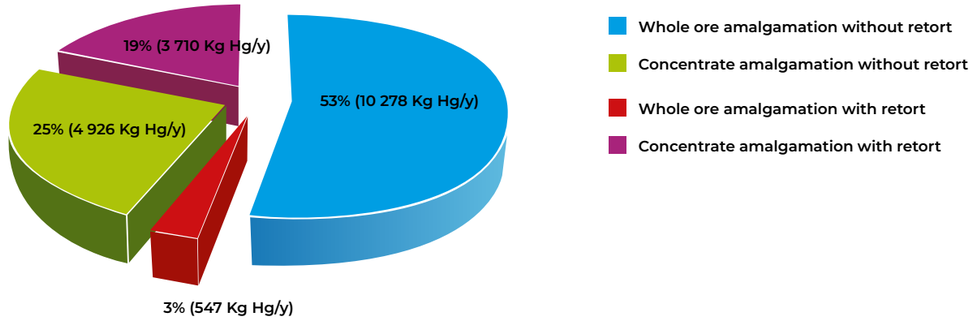


Figure 12 Total estimated emissions of mercury from gold mining (ASGM) activities

Level 1 inventory was conducted as a desktop study over a period of 3 months, using fixed default values, as input factors. During Level 2 inventory and for gold mining category with mercury amalgamation, the estimate amount of gold produced per year (kg produced per year) used as the activity rate was quite similar for both inventories; 18.246[24]kg gold/year and 19.461[25]kg gold/year, however, the estimated total mercury inputs into society was significantly lower for level 1 (39,247 kg Hg/year) as compared to level 2 (62,159 kg Hg/year).

The difference is given by a variation of gold extraction techniques used in the releases inventory level 2 toolkit.

The highest input factor of 5 kg mercury per 1 kg gold produced is used in so called “whole ore amalgamation practice without use of retort”. Input factor which is modified by a factor of (- 0.75 kg) when using the retort (4,25 kg mercury per 1 kg gold produced).

Although, when concentrate amalgamation technique is used and without using retort, the input factor is only 1.3 kg Hg per 1 kg gold produced. When using retort (applying the same factor of – 0.75 kg) input factor is reduced to 0.55 kg mercury per 1 kg gold produced.

Regarding mercury emissions to air, gold mining is responsible for the largest emissions, with 16,869 kg Hg/year (Figure 13), equivalent to 92.5% of total emission sources.

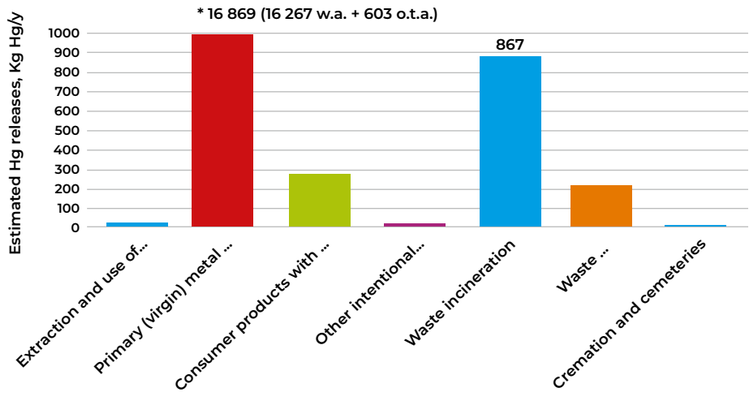


Figure 13 Total estimated mercury emissions to Air from anthropogenic sources.
** Total emission from primary metal (gold) production.*

Total emissions of mercury to air from gold mining (16,869 Kg Hg/year) are composed of 96.4% (16,267 Kg Hg/year) from gold mining with amalgamation process (w.a. = with amalgamation) and 3.6% (603 Kg Hg/year) from gold mining by methods other than mercury amalgamation (o.t.a. = other than amalgamation).

In the case of mercury releases to water, gold mining remains responsible for the largest releases, with 23,829 kg Hg/year (Figure 14), corresponding with 97.8% of total releases to water.

24 Amount of gold (activity rate used in Inventory Level 1) corresponding to exported by Suriname from the period 2011 (Legg, et al. 2015).
25 The average amount of gold exported (activity rate used in Inventory Level 2) registered by the Central Bank over the period (2010-2017) (Tjon Kie Sim, 2018).

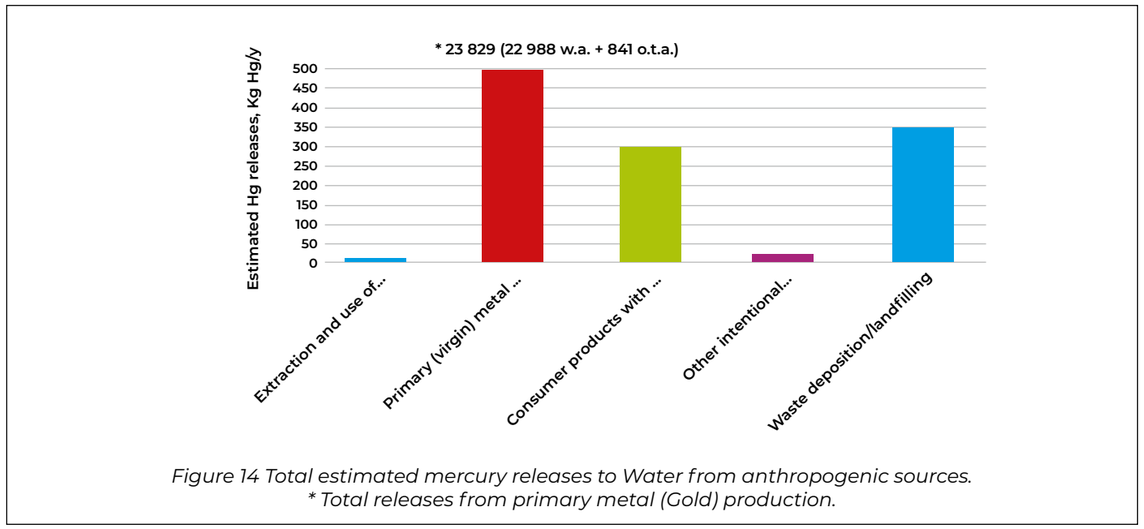


Figure 14 Total estimated mercury releases to Water from anthropogenic sources.
** Total releases from primary metal (Gold) production.*

Similar to the previous case (emissions to air) the total mercury releases to water from gold mining are made up by 96.4% (22,988 Kg Hg/year) of releases from gold mining with amalgamation process (w.a. = with amalgamation) and 3.6% (841 Kg Hg/year) from gold mining by methods other than mercury amalgamation (o.t.a. = other than amalgamation).

The second source of mercury releases to water – “Waste deposition/landfilling and waste water treatment” and the third – “Consumer products with intentional use of mercury” are significantly lower (68 & 82 times) that gold mining releases (350.7 and 291.3 Kg Hg/year respectively, Figure 14).

In terms of mercury releases to land, gold mining remains the larger source of mercury in the country, with 44,563 kg Hg/year (Figure 15), corresponding with 95.8% of total releases to land. Nevertheless, subtracting the release to land from the informal dumping of general waste and the waste treatment to avoid double counting (1661.4 and 143 Kg Hg/year respectively), the releases to land from gold mining shifts from 95.8% to 99.3%.

Contributions from gold extraction with mercury amalgamation and gold extraction without mercury amalgamation, performed by large-scale gold mining are almost equal. Total mercury releases to land (44,563 kg Hg/year) are made up by 51.4% (22,904 Kg Hg/year) of releases from gold mining with amalgamation process and 48.6% (21,659 Kg Hg/year) from gold mining by methods other than mercury amalgamation.

As can be seen on Figure 15, the second source of mercury releases to land “Consumer products with intentional use of mercury”, excluding “Waste deposition/landfilling and waste water treatment” (corresponding to informal dumping of general waste) is also significantly low 284.5 Kg Hg/year. i.e. 157 times than the primary source (gold mining).

As can be seen in Figure 15, mercury release to land, from Primary metal production is significantly high 44,563 Kg Hg/year. The second and third sources of mercury releases to land, “Waste deposition/landfilling and wastewater treatment” (corresponding to informal dumping of general waste) and “Consumer products with intentional use of mercury” are significantly lower (27 and 157 times respectively) than the Primary metal production (gold mining).

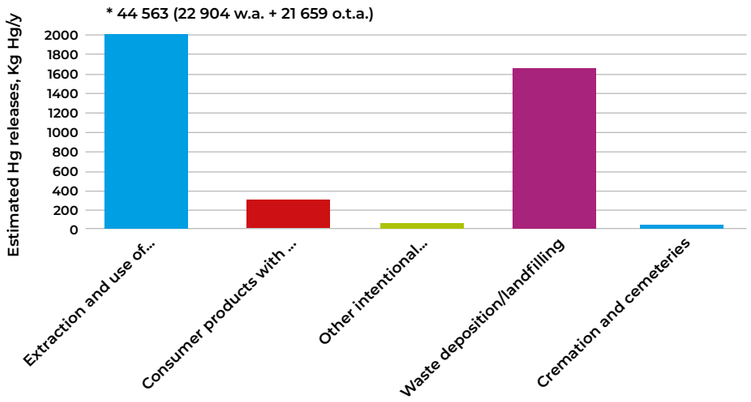


Figure 15 Total estimated mercury releases to Land from anthropogenic sources.

In case of mercury releases to land, to gold mining with mercury amalgamation (i.e. ASGM) and gold mining with extraction with other than mercury amalgamation techniques (i.e. LSGM), the refined version of the mercury inventory gives quite similar amounts of releases in both cases (see Figure 16). This ratio is made up by 51.4% and 48.6% (ASGM / LSGM) while in the previous cases (emissions to air and releases to water), this ratio was respectively made up by 96.4% / 3.6%. This fact stresses the need to focus on ASGM emissions while LSGM can be seeing as a re-mobilising of mercury.

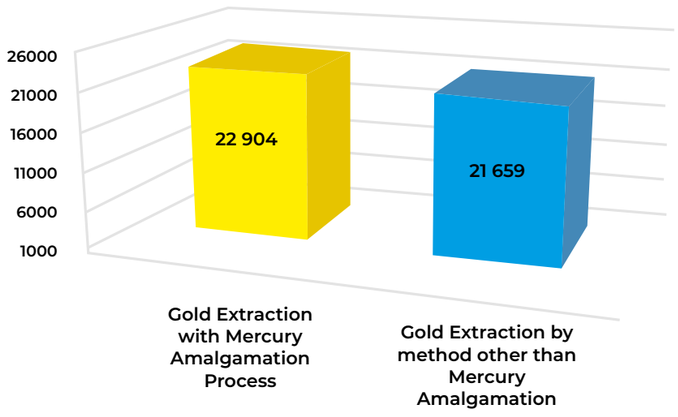


Figure 16 Estimated released of mercury lo land, from gold mining, with and without mercury amalgamation.

2.2.4. Other sources of mercury emission and releases in Suriname

"Consumer products with intentional use of mercury" (thermometer and batteries with mercury content) and "Waste incineration" and "Waste disposal" are additional sources of mercury emissions and releases. However, amounts of these emissions are significantly lower than gold mining ones(see Figure 11).

These sources are:

- "Consumer products with intentional use of mercury" with 1,282 Kg Hg/year.
- "Waste incineration and burning" with 867 Kg Hg/year and
- "Waste deposition/landfilling and waste water treatment" with 416 Kg Hg/year (2077 – 1661).

Considering the joint contribution of all these sources to the total anthropogenic emissions of the country, this input does not reach even 3% of the total Suriname's anthropogenic emissions.

3 Institutional, Policy and Regulatory Framework Assessment

3.1 Legal and Institutional Framework

3.1.1 Legal Framework[26]

This chapter provides information of the laws and regulations in respect of the import, the use and management of mercury in Suriname. In addition, Annex III provides an overview of relevant legal regulations, including the scope of the articles.

The Environmental Framework Bill which has been drawn up since 2002 contains provisions for the protection and conservation of the environment and contains the basic international environmental principles, including the principle of transparency, participation and legal protection, the precautionary principle, the principle of the polluter pays, and the principle of the environmental impact assessment.

The adoption of this Bill is necessary for a better management and the regulation of economic activities that harm the environment. The act can contribute to the management of mercury and the gradual phasing out of mercury use.

The analysis of the legal regulations shows that the current legislation applies per sector, and that an integral act to regulate the use, the import, export and treatment of mercury is absent.

Discussions with representatives of regulatory agencies show the following:

1. No environmental monitoring requirements in permits for new and established gold buyers and exporters;
2. No legal mandate for environmental protection at the local (district) level. The current Hin derwet (Nuisance Act) does not provide enough mandate for protection of the environment;
3. Little or no collaboration among institutions responsible for regulating mercury use, transport or handling; A coordinating body is not present;
4. Limited capacity for measuring mercury (in several chemical structural bonds). Validation of data is not present.
5. Limited human resource capacity which reflects on multiple roles of stakeholders (scientists and regulators).

3.1.2 Institutional Framework

Different government institutions play a role in the mercury issue because of their task description. The Ministry of Trade and Industry plays a crucial role in regulating the import of mercury. This Ministry is responsible for granting permits for the import of mercury. However, data from the Inspection of Import Duties and Excises showed that in the past years no official (registered) import of mercury occurred.

The Foreign Exchange Commission subsides under the President and grants licenses to private sector companies to buy and sell gold. The Foreign Exchange Commission has currently no environmental conditions in its permit.

Another important institution which is directly linked to the President of Suriname is the Commission on Regulation of the Gold Sector in Suriname (OGS – Ordening Goudsector Suriname).

26 Institutional and Legal Assessment (Policy document and Roadmap), NIMOS 2013.

OGS is directly responsible for structuring the activities of small-scale gold miners and maintaining peace and security in this sector. Both Commissions are powerful regulatory institutions because of their legal mandate and direct link with the highest authority in Suriname.

Other primary stakeholders are involved in the mercury issue. Every one of these parties has another field of expertise, for example, regulating mercury in plant/animals (LVV), monitoring of pollution of water, soil and air (NIMOS, Meteorological service) and human health (BOG, ATM).

Institutions sometimes collaborate with organisations closely related to the activities they execute, for instance, the Ministry of Trade and Industry collaborates with the Customs Department, because of imports. However, there is little to no cooperation between the actors having different interests. Some institutions have an intensive scientific interaction with organisations abroad (BOG, Meteorological Service). Others depend on organisations abroad for validation of data (L VV) or operate in institutional isolation (Foreign Exchange Commission, Central Bank of Suriname). Below follows an overview of the regulatory agencies playing a direct role in the mercury issue.

Table 5 Overview of relevant Institutions and mercury-related tasks.

Ministry	Mercury-related tasks	Some remarks
Agriculture, Animal Husbandry and Fisheries	Establish quality standards for quality control on sectoral products;	Samples are sent to the Netherlands to inspect fish that is being exported to the EU. It is not clear whether locally consumed fish is also inspected.
Trade, Industry and Tourism	Domestic and foreign trade (import and export policy) Grant import, export and foreign exchange permits and company permits.	Grant permits for establishing goldsmiths and silversmiths, cement factories and chlorine factories If necessary, NIMOS is asked for technical environmental advice.
Ministry of Regional Development	Entrusted with the care of regional administration	The Districts Commissioners grant permits in accordance with the Nuisance Act. No knowledge and instruments to measure mercury vapours.
Natural Resources	The inventory, exploration, optimal exploitation and management of minerals	Grants exploration and exploitation permits for minerals. No environmental conditions are included in the permits.
Labour	Labour Conditions	Medical Unit measures mercury vapors (labour aspects)
Public Health	Guarantee the quality, availability and accessibility of public health in the whole country	The Bureau for Public Health advises in the field of mercury poisoning and conducts research.
Central Bank of Suriname	Export of gold.	Mercury content in gold is not measured.
Foreign Exchange Commission	Grants permits to gold buying and exporting companies.	NIMOS will be asked for a technical environmental advice when new permits are applied for.
Commission on Regulation Gold Sector Suriname (OGS).	The preparation and execution of plans on the policy level to arrive at the desired regulation.	OGS is directly responsible for structuring the activities of small-scale gold miners and maintaining peace and security in this sector.
Cabinet of the President – Coordination Environment	Responsible for formulation of national environmental policy and the coordination of the implementation thereof.	Coordination Environment is the National Focal Point for the Minamata Convention and responsible for the implementation of the treaty into policy and regulation.
National Institute for Environment and Development in Suriname (NIMOS)	NIMOS is an executive arm of the Cabinet of the President and gives environmental advice.	NIMOS is asked for technical environmental advice especially by the Ministry of Trade and Industry and the District Commissioners. Within this framework NIMOS has developed minimal
		conditions for establishing cement and concrete plants, goldsmiths and silversmiths and gold buying companies. NIMOS is the focal point for information exchange under art. 17.4

3.1.3 Tasks and Responsibilities of Regulatory Agencies

The current tasks and responsibilities of the regulatory agencies are taking care of the environment, human well-being and public health. The skills of these agencies need to be strengthened and also technical tools have to be made available to act on violations of the law. Regulatory agencies are quite often linked to regional and international organisations and networks with specific knowledge and experience that can be accessed.

Staffing of regulatory agencies is also important.

The capacity for enforcing violations in mercury use is lacking, especially with the rapid expansion of the “mercury chain”. Mercury is currently illegally “imported” and distributed throughout the country. This situation is highly undesirable from a public health and safety perspective. Collective action of several regulatory agencies is required to:

- monitor compliance to mercury import and distribution
- register the quantities of mercury imported
- monitor waste handling and reuse
- enforce compliance to rules and regulations on occupational health and safety in all areas and sectors where mercury is used.

3.1.4 Analysis of Regulatory Agencies

The SWOT analysis provides an insight in the current capacity of the regulatory agencies. It is necessary for developing a realistic roadmap for Suriname to phase out mercury and ratify the Minamata Convention. The SWOT analysis is based on information from the stakeholders. The SWOT analysis presents an overview of the strengths, weaknesses, opportunities and threats for regulatory agencies. In practice, there are other governmental agencies involved in executing tasks aimed at safeguarding public health, safety and the environment. The general conclusion from the stakeholder analysis is that regulatory agencies are either understaffed or they lack the technical equipment and know-how to fully contribute to mercury monitoring and enforcement.

WEAKNESS	**OPPORTUNITIES**
- Regulatory agencies do not have indepth knowledge and experience in prioritized, treating and removing mercury No legal framework for management and monitoring - Little/ no scientific data on the baseline of mercury import, emissions and influence on health enforcement of the current regulations is weak	- Current scientific research on air pollution provides indications for effective planning Pressure from the international community to regulate mercury use - Innovation and technological development of alternatives will be expedited as a result of the Minamata Convention Receiving technical assistance
THREATS	**STRENGTHS**
- Economic and social interest of phasing out mercury from the artisanal and small-scale gold mining sector depends on the availability of alternatives - Increase of illegal activities from neighbouring countries who will ratify the convention	- Willingness and commitment to regulate and monitor mercury use expertise of government institutions in the field of activity - Government institutions are affiliated to regional and international networks

Figure 17 SWOT analysis of regulatory agencies in Suriname

3.2 Policy Areas for Minamata Implementation in Suriname

Prior to it accession to the Minamata Convention the Government of Suriname – through its Environmental Institute NIMOS- started with a legal and institutional assessment of the Minamata Convention and the implications of accessions on Suriname. This study was concluded in 2013 and published in January of 2014[27]. Aside from the assessment of regulatory and institutional aspects of the Minamata Convention and Suriname on of the main results of this assessment was the formulation of a Roadmap for Minamata implementation in Suriname. This Roadmap was formulated based on the wide stakeholders consultation session that were held during the assessment period and was validated by stakeholders. This Roadmap has served as a guidance for all government Departments and Agencies working in the field of mercury to guide their interventions, in order to create a cohesive government approach to the issues with mercury that the country faces.

The Roadmap speaks to 7 Policy Areas which were identified, based on the current policy of Suriname, the current situation with regard to the legal and institutional framework, and the other hand on the goal and obligations under the Minamata Convention.

The policy areas were based on an integral approach in which all aspects of mercury use in Suriname are included. The seven policy areas are:

1. **Legal and Institutional Framework:** The import of mercury is included in the Order Negative List (SB 2003 no.58) as a good subject to prioritized. Other legislation does not specifically focus on mercury use, release and handling. There is legislation that emphasizes environmental management in general, but this legislation lacks a framework because the environmental framework law has not been adopted. Furthermore, as a result of lacking legislation a gap has arisen insofar as the powers and tasks of the different regulatory agencies are concerned. Because of a lacking adequate legal framework, the agencies are not able to execute their regulatory and supervisory tasks appropriately. Within the framework of the above the goal for this policy area is formulated as: having an integral national policy and adequate legislation available to prevent mercury pollution in the country.

2. **Data and research:** A database and research system for the sustainable management of mercury, mercury added products and mercury compounds is of the utmost importance. Policy should be based in reliable data and research. In this manner concrete objectives can be formulated. Especially research and data collection in small-scale gold mining, but also in other less visible sectors needs to be done. Currently research is being done, however this research is often ad hoc and not part of a bigger research plan. The consequence of this is that the data from these studies are not always suitable for drawing conclusions on the basis of which long-term policies can be formulated. The goal formulated for this policy area is: to have a database and research system for sustainable management of mercury, mercury added products and mercury compounds.

3. **Phasing out mercury:** Within the framework of the obligations of the Minamata Convention a plan for phasing out mercury use and mercury added products will also have to be elaborated. The goal for this policy area is for that reason: to establish an agenda for phasing out mercury and mercury compounds and emissions goals for same. This policy area is to a large extent dependent on the policy area data and research, since research needs to be done first on which sectors and what quantities are used of mercury or mercury added products. Only after this, can an adequate plan for phasing out be drawn up.

27 NIMOS 2014, Minamata Advies Document.

4. **Waste Management and Contaminated Areas:** To promote the safe handling of mercury, Suriname should take a serious steps towards toxic/hazardous waste collection. This means establishing an incinerator with adequate personnel to collect mercury (and other toxic compounds) waste all over the country. In addition, standards for storage, handling and disposal of waste should be developed with the stakeholders. The goal formulated for this policy area is: to have a sustainable system for the management of mercury waste and contaminated areas.

5. **Artisanal and Small-scale Gold Mining (ASGM):** Although there are strong suspicions that small-scale gold mining is the largest emitter of mercury, this has to be thoroughly investigated before this can and may be convincingly stated. Concrete steps have already been taken by the government to regulate small- scale illegal gold mining through the OGS. These steps, however, will have to be prioritizedized. They thus become a part of national policies in respect of small-scale gold mining in Suriname. The goal for this policy area is: to develop policies to reduce, and where feasible eliminate, the use of mercury and mercury compounds, and the emissions and releases to the environment upon the extraction and processing of gold.

6. **Public information, education and awareness about health and environmental impacts:** A strategy for sharing research results, increase general knowledge about mercury poisoning, and the effects thereof on the environment and health will also further contribute to the successful execution of the policies in the area of mercury use. The goal for this policy area is for that reason: to develop a strategy and implementation plan for public information, education and awareness about health and environmental consequences of mercury and mercury compounds.

7. **Establish a Financial Mechanism:** For the implementation of the policies and roadmap financial resources will be required. In view of the existing commitment of the government to regulate small-scale gold mining this will fit in the current policies of the government to continue on this road by including an item on the budget to implement this policy document and roadmap. In addition, funding from abroad will have to be actively sought to implement the national policies. The Minamata Convention will also make funds available. The goal for this policy area is: to establish a fund for allocating financial means for the successful implementation of the policy document and roadmap.

The table below gives an overview of the above-mentioned policy areas and their goals.

Table 6 Overview of the Roadmap Policy Areas and their goals

General Objective: *Taking national measures to protect human health and the environment against the exposure to mercury with the prospects of a mercury free environment in Suriname.*	
Policy Area	**Objective**
Legal and Institutional Framework	*To have an integral national policy and adequate legislation available to prevent mercury pollution in the country.*
Data and Research	*Have a database and research system for sustainable management of mercury, mercury added products and mercury compounds*
Mercury Phase-out	*Establish a phasing out agenda and emissions targets for mercury and mercury compounds*
Waste Management and Contaminated Areas	*To have a sustainable system for better management of mercury waste and contaminated areas.*
Artisanal Small-scale Gold Mining (ASGM)	*Develop policies to reduce, and where feasible eliminate, the use of mercury and mercury compounds, and the emissions and releases to the environment upon the extraction and processing of gold.*
Education, awareness and public information about health and environmental impacts	*Develop a strategy and implementation plan for public information, education and awareness about health and environmental consequences of mercury and mercury compounds*
Establish a Financial Mechanism	*Establish a fund to allocate financial means for the successful implementation of the policy document and roadmap*

3.3 Assessment of Legislation and Policies relevant to implement the Minamata Convention in Suriname

Following GEF guidelines to undertake an assessment of legislation and policies in regard to the implementation of Convention provisions related to the following articles (3, 7, 8, 9 and 10)[28], details can be found in the table below:

3.3.1 Mercury supply sources and trade[29]

Article 3 of the Convention deals with mercury supply sources and the trade in mercury. The provisions of this article do not apply to quantities of mercury[30] or mercury compounds[31] to be used for laboratory-scale, research or as a reference standard; neither to naturally occurring trace quantities of mercury or mercury compounds present in such products as non-mercury metals, ores, or mineral products, including coal, or products derived from these materials, and unintentional trace quantities in chemical products and Mercury-added products.

Based on the relevant provisions the following assessment was done.

Table 7 Minamata Convention's provisions (Article 3) applied to Suriname.

Provisions (Paragraphs)	Current Status in Suriname	Identification of gaps and needs
3. no new primary mercury mining	*Not /Applicable (N/A) – Suriname has no primary mercury mining industry.*	*N/A*
4. only allow primary mercury mining that was already being conducted within its territory for up to 15 years after entry into force.	*N/A*	*N/A*
5. identify individual stocks of mercury or mercury compounds exceeding 50 metric tons, as well as sources of mercury supply generating stocks exceeding 10 metric tons per year,that are located within its territory.	*Suriname has no official registry of mercury stocks that it is currently keeping.* *Not apply (No Alkali plants in Suriname).*	*No information is available. However, a lack of capacity to track it was recognized by the National Authority.*
6. Each party shall not allow the export of mercury except: *(a) To a Party that has provided written consent, and only for the purpose of:* *(i) A use allowed to the importing Party under this Convention; or* *(ii)Environmentally sound interim storage as set out in Article 10; or* *(b) To a non-Party that has provided written consent, including certification demonstrating that:* *(i) The non-Party has measures in place to ensure the protection of human health and the environment and to ensure its compliance with the provisions of Articles 10 and 11; and* *(ii) Such mercury will be used only for a use allowed to a Party under this Convention or for environmentally sound interim storage as set out in Article 10.*	*Imports of mercury is regulated in Suriname. Exports are also regulated. A permit is needed.* *In this regard, the experiences of Rotterdam Convention's PIC procedures and/or Montreal Protocol licensing system are useful to be taken into consideration by Suriname Government.* *For (b) (ii):* *This registry also allows the country to inform mercury uses.*	*Identified gap – currently in Suriname import and export of mercury requires licence. However, Custom Authority should further develop the tariff heading harmonized codes to facilitate identification of products with mercury content.* *This could be done under Customs authority procedures and/or under PRTR platform (Pollutants Releases and Transferences Registry).* *The PRTR platform is one of several information platforms possible to be include within priority actions/tasks.*
7. An exporting Party may rely on a general notification to the Secretariat by the importing Party or non-Party as the written consent required by paragraph 6. Such general notification shall set out any terms and conditions under which the importing Party or non-Party provides its consent. The notification may be revoked at any time by that Party or non-Party. The Secretariat shall keep a public register of all such notifications.	*Suriname has opted out of this option.* *A similar approach as point 6 (b) could be used (Rotterdam Convention and/or Montreal Protocol licensing system).*	*N/A*
8. Forbid import of mercury from a non-Party to whom it will provide its written consent unless the non-Party has provided certification that the mercury is not from sources identified as not allowed under paragraph 3 or paragraph 5 (b).	*Currently there are no import licenses extended or import of mercury. There is no list of mercury importing countries. The Suriname authorities should update the official list of "mercury importing countries".*	
9. A Party that submits a general notification of consent under paragraph 7 may decide not to apply paragraph 8, provided that it maintains comprehensive restrictions on the export of mercury and has domestic measures in place to ensure that imported mercury is managed in an environmentally sound manner.	*Procedural and coordination mechanisms should be implemented for decision-making at the NIMOS Mercury Coordination Mechanism (NMCM) level.*	*Actions have to be taken and to be included within the Priority List.*
10. Each Party shall include in its reports submitted pursuant to Article 21 information showing that the requirements of this Article have been met.	*NIMOS as National Focal Point of the Convention should report the Conference of Parties, through the Secretariat the measures taken and their effectiveness to ensure the imported mercury (if applicable) is managed in an environmentally sound manner.*	*Actions have to be taken at the Custom Authority level and to be included within the List of Priorities.*

3.3.2 Mercury-added products[32]

The measures in this Article shall apply to the manufacture, import or export of mercury-added products listed in Part I of Annex A, after the phase-out date specified for those products.

Table 8 Minamata Convention's provisions (Article 4) applied to Suriname.

Provisions (Paragraphs)	Current Status in Suriname	Identification of gaps and needs
Each Party shall not allow, by taking appropriate measures, the manufacture, import or export of mercury-added products listed in Part I of Annex A after the phase-out date specified for those products, except where an exclusion is specified in Annex A or the Party has a registered exemption pursuant to Article 6.	*Products listed in Part I of Annex A, Phase-out date 2020.*	*Proposal to address the provisions associated with products listed in Part I of Annex A:* *Batteries can be addressed by the Customs Authority or Ministry of Trade.* *Switches and relays can be addressed by the Custom Authority or Ministry of Trade.* *Lamps can be addressed by the Ministry of Natural Resources.* *Cosmetics can be addressed by the Food & Drug Regulation (Bureau for Public Health).* *Pesticides, Biocides can be addressed by the Ministry of Agriculture, Animal Husbandry and Fisheries.* *Non-electronic measuring devices can be addressed by the National Bureau Standards.* *Dental amalgam can be addressed by the Ministry of Public Health. In cooperation with the Dentist Association and The Foundation for Youth Dentistry (Stg. Jeugd Tandverzorging)*

28 GEF/C/45/Inf.05. Rev 0.1, Jan 23, 2014. GEF Council Meeting, November 5-7, 2013, Washington D.C., USA.
29 Minamata Convention on mercury, UNEP, Text and Annexes, United Nations, www.mercuryconvention.org. October 2013.
30 References to "mercury" include mixtures of mercury with other substances, including alloys of mercury, with a mercury concentration of at least 95 per cent by weight.
31 "Mercury compounds" means mercury (I) chloride (known also as calomel), mercury (II) oxide, mercury (II) sulphate, mercury (II) nitrate, cinnabar and mercury sulphide.
32 Ibid 26.

3.3.3 Artisanal and small-scale gold mining[33]

The measures in this Article and in Annex C shall apply to artisanal and small-scale gold mining and processing in which mercury amalgamation is used to extract gold from ore.

This article has the following provisions:

Table 9 Minamata Convention's provisions (Article 7) applied to Suriname.

Provisions (Paragraphs)	Current Status in Suriname	Identification of gaps and needs
2. Each Party that has artisanal and small-scale gold mining and processing subject to this Article within its territory shall take steps to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing.	*Applies to the Government of Suriname.* *The National Mercury Profile Report addresses these matters, which should be included in the Action Plan*	*Actions have to be taken and to be included within the Priority list accordingly.*
3. Each Party shall notify the Secretariat if at any time the Party determines that artisanal and small-scale gold mining and processing in its territory is more than insignificant. If it so determines the Party shall: *(a) Develop and implement a national action plan in accordance with Annex C;* *(b) Submit its national action plan to the Secretariat no later than three years after entry into force of the Convention for it or three years after the notification to the Secretariat, whichever is later; anI(c) Thereafter, provide a review every three years of the progress made in meeting its obligations under this Article and include such reviews in its reports submitted pursuant to Article 21.*	*Applies to the Government of Suriname.* *Suriname's Notification was deposited with instruments of accession.* *National Action Plan Draft version is under elaboration.* *To be done by the Focal Point.*	*Actions have already been taken and some additional has to be included within the List of Priorities.*
4. Parties may cooperate with each other and with relevant intergovernmental organizations and other entities, as appropriate, to achieve the objectives of this Article. Such cooperation may include: *(a) Development of strategies to prevent the diversion of mercury or mercury compounds for use in artisanal and small-scale gold mining and processing;* *(b) Education, outreach and capacity-building initiativl* *(c) Promotion of research into sustainable non-mercury alternative practices;* *(d) Provision of technical and financial assistanlce;* *(e) Partnerships to assist in the implementation of their commitments under this Article; and* *(f) Use of existing information exchange mechanisms to promote knowledge, best environmental practices and alternative technologies that are environmentally, technically, socially and economically viable.*	*Applies to Government of Suriname.* *At CAR level.* *(11) (a) The National Mercury Profile Report addresses these matters, which should be included in the Action Plan* *GEF funding.* *Anton de Kom University.* *GEF or others funding mechanism, at CARICOM level.* *(f) The National Mercury Profile Report addresses these matters, which should be included in the Action Plan.*	*A need to harmonise the mercury transit at the regional level. mercury imports from Guyana are being constrained since August 1 , 2019. Suriname and French Guyana has restrictive norms. However, intensive ASGM with mercury use is conducted at these countries.* *Therefore, a regional approach at CARICOM level becomes urgent*

33 Ibid 26.

3.3.4 Mercury Emissions[34]

This Article concerns controlling and, where feasible, reducing emissions of mercury and mercury compounds, often expressed as "total mercury", to the atmosphere through measures to control emissions from the point sources falling within the source categories listed in Annex D.

This article has the following provisions:

Table 10 Minamata Convention's provisions (Article 8) applied to Suriname.

Provisions (Paragraphs)	Current Status in Suriname	Identification of gaps and needs
3. A Party with relevant sources shall take measures to control emissions and may prepare a national plan setting out the measures to be taken to control emissions and its expected targets, goals and outcomes. Any plan shall be submitted to the Conference of the Parties within four years of the date of entry into force of the Convention for that Party. If a Party develops an implementation plan in accordance with Article 20, the Party may include in it the plan prepared pursuant to this paragraph	*Applies to the Government of Suriname. Under the Inventory these sources are identified. The National Mercury Profile Report addresses these matters, which should be included in the Action Plan.*	*National Action Plan (NAP). Relevant sources from ASGM require best available techniques/ best environmental practices (BAT/BET).*
4. For its new sources, each Party shall require the use of best available techniques and best environmental practices to control and, where feasible, reduce emissions, as soon as practicable but no later than five years after the date of entry into force of the Convention for that Party. A Party may use emission limit values that are consistent with the application of best available techniques.	*Applies to Government of Suriname.* *The National Mercury Profile Report addresses these matters, which should be included in the Action Plan.*	*The National Action Plan should include this requirement for new large-scale gold mines.* *Require monitoring/reporting or establish a mercury emission inventory of these new sources.*
5. For its existing sources, each Party shall include in any national plan, and shall implement, one or more of the following measures, taking into account its national circumstances, and the economic and technical feasibility and affordability of the measures, as soon as practicable but no more than ten years after the date of entry into force of the Convention for it: *(a) A quantified goal for controlling and, where feasible, reducing emissions from relevant sources;* *(b) Emission limit values for controlling and, where feasible, reducing emissions from relevant sources;* *(c) The use of best available techniques and best environmental practices to control emissions from relevant sources;* *(d) A multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions;* *(e) Alternative measures to reduce emissions from relevant sources.*	*Applies to the Government of Suriname.* *Several of the mentioned measures are already under consideration to be implemented.* *(a) The National Mercury Profile Report addresses these matters, which should be included in the Action Plan.*	*The National Action Plan should include the already identified sources.* *A gradual phaseout plan will be established*
6. Parties may apply the same measures to all relevant existing sources or may adopt different measures in respect of different source categories. The objective shall be for those measures applied by a Party to achieve reasonable progress in reducing emissions over time.	*To be further discussed at the National Mercury Project Coordination Board.*	*Require monitoring/reporting or establishment of a mercury emission inventory.*

34 Ibid 26.

Provisions (Paragraphs)	Current Status in Suriname	Identification of gaps and needs
7. Each Party shall establish, as soon as practicable and no later than five years after the date of entry into force of the Convention for it, and maintain thereafter, an inventory of emissions from relevant sources.	*First version performed (UNEP Toolkit Levels 1 and 2).*	*The National Action Plan should consider the timeframe for the inventory's updating as part of the monitoring /reporting requirement for air emissions within Convention.*
8. The Conference of the Parties shall, at its first meeting, and guidance on: *(a) Best available techniques and on best environmental practices, taking into account any difference between new and existing sources and the need to minimize cross-media effects; and* *(b) Support for Parties in implementing the measures set out in paragraph 5, in particular in determining goals and in setting emission limit values.*	*(a) These matters have to be included in the national position of Suriname´s representatives to the Conference of Parties and be prepared by the Focal Point.* *(b) The support of international and local experts should be addressed by the financial mechanism of the Convention. This matter has also to be included in the national position of Suriname´s representatives to the Conference of Parties and be prepared by thocal Point.*	
9. The Conference of the Parties shall, as soon as practicable, adopt guidance on: *(a) Criteria that Parties may develop pursuant to paragraph 2 (b);* *(b) The methodology for preparing inventories of emissions.*	*This matter has to be included in the national position of Suriname´s representatives to the Conference of Parties and be prepared by the Focal Point.*	*Requires the monitoring/reporting or establishment of a mercury emission inventory.* *The NAP will establish the requirement to update "relevant sources"' of the inventory (based on Inventory results Level 2).*
10. The Conference of the Parties shall keep under review, and update as appropriate, the guidance developed pursuant to paragraphs 8 and 9. Parties shall take the guidance into account in implementing the relevant provisions of this Article.		
11. Each Party shall include information on its implementation of this Article in its reports submitted pursuant to Article 21, in particular information concerning the measures it has taken in accordance with paragraphs 4 to 7 and the effectiveness of the measures.	*Responsibility of National Focal Point.*	*The National Mercury Coordination Board should be established to measure the effectiveness of reporting mechanisms*

3.3.5 Mercury Releases[35]

This Article concerns controlling and, where feasible, reducing releases of mercury and mercury compounds, often expressed as "total mercury", to land and water from the relevant point sources not addressed in other provisions of this Convention.

This article has the following provisions:

35 Ibid 26.

Table 11 Minamata Convention's provisions (Article 9) applied to Suriname.

Provisions (Paragraphs)	Current Status in Suriname	Identification of gaps and needs
3. Each Party shall, no later than three years after the date of entry into force of the Convention for it and on a regular basis thereafter, identify the relevant point source categories.	*Applies to the Government of Suriname.* *The National Mercury Profile Report addresses these matters, which should be included in the Action Plan*	*National Action Plan in progress.*
4. A Party with relevant sources shall take measures to control releases and may prepare a national plan setting out the measures to be taken to control releases and its expected targets, goals and outcomes. Any plan shall be submitted to the Conference of the Parties within four years of the date of entry into force of the Convention for that Party. If a Party develops an implementation plan in accordance with Article 20, the Party may include in it the plan prepared pursuant to this paragraph.	*The National Mercury Profile Report addresses these matters, which should be included in the Action Plan.*	*National Action Plan should be reviewed at the National Mercury Project Coordination Board (Mercury National Committee) to summarize the needs and requirements.*
5. The measures shall include one or more of the following, as appropriate: *(a) Release limit values to control and, where feasible, reduce releases from relevant sources;* *(b) The use of best available techniques and best environmental practices to control releases from relevant sources;* *(c) A multi-pollutant control strategy that would deliver co-benefits for control of mercury releases;* *(d) Alternative measures to reduce releases from relevant sources.*	*The National Mercury Profile Report addresses some of these matters, which should be included in the National Action Plan.*	*National Action Plan in progress. Will include these requirements (one or more measures where feasible) for large power plants.* *Requires monitoring/reporting or the establishment of a mercury emission inventory.*
6. Each Party shall establish, as soon as practicable and no later than five years after the date of entry into force of the Convention for it, and maintain thereafter, an inventory of releases from relevant sources.	*The refined inventory Level 2 has been conducted within the framework of the MIA Project.*	*Require monitoring/reporting or establish a mercury emission inventory (included within the National Action Plan).*
7. The Conference of the Parties shall, as soon as practicable, adopt guidance on: *(a) Best available techniques and on best environmental practices, taking into account any difference between new and existing sources and the need to minimize cross-media effects;* *(b) The methodology for preparing inventories of releases.*	*This matter has to be included in the national position of Suriname´s representatives to the Conference of Parties and be prepared by the Focal Point.*	*This guidance should be considered under the Suriname's National Committee on Mercury (Mercury Coordination Mechanism)* *(working group on BAT/BET and emission inventories).*
8. Each Party shall include information on its implementation of this Article in its reports submitted pursuant to Article 21, in particular information concerning the measures it has taken in accordance with paragraphs 3 to 6 and the effectiveness of the measures.	*Task of National Focal Point.*	*The Mercury National Committee (National Mercury Project Coordination Board) should establish the mechanism for reporting the effectiveness of measures undertaken.*

3.3.6 Environmentally sound interim storage of mercury, other than waste mercury[36]

This Article shall apply to the interim storage of mercury and mercury compounds as defined in Article 3 that do not fall within the meaning of the definition of mercury wastes set out in Article 11.

This article has the following provisions:

Table 12 Minamata Convention's provisions (Article 10) applied to Suriname.

Provisions (Paragraphs)	Current Status in Suriname	Identification of gaps and needs
2. Each Party shall take measures to ensure that the interim storage of such mercury and mercury compounds intended for a use allowed to a Party under this Convention is undertaken in an environmentally sound manner, considering any guidelines, and in accordance with any requirements, adopted pursuant to paragraph 3.	*Applies to the Government of Suriname.* *The National Mercury Profile Report addresses some of these matters, which should be included in the Action Plan.*	*National Action Plan in progress. Efforts to identify stocks of mercury and to apply environmentally sound interim storage.*
3. The Conference of the Parties shall adopt guidelines on the environmentally sound interim storage of such mercury and mercury compounds, considering any relevant guidelines developed under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and other relevant guidance. The Conference of the Parties may adopt requirements for interim storage in an additional annex to this Convention in accordance with Article 27.	*This matter has to be included in the national position of Suriname´s representatives to the Conference of Parties and be prepared by the Focal Point.*	
4. Parties shall cooperate, as appropriate, with each other and with relevant intergovernmental organizations and other entities, to enhance capacity-building for the environmentally sound interim storage of such mercury and mercury compounds.	*This matter has to be included in the national position of Suriname´s representatives to the Conference of Parties and be prepared by the Focal Point.* *The National Mercury Profile Report addresses some of these matters, which should be included in the National Action Plan.*	

Based on the above assessment it can be said that, through the MIA exercise, the Suriname authority has been able to identify the main challenges and relevants aspects to implement the Minamata Convention accordingly, where the main efforts and resources should be allocated within the small scale mining sector.

36 Ibid 26.

4 Identification of Populations at Risks and Gender Dimensions

4.1 Preliminary Review of potential populations at risk and potential health risks

Globally, the negative human health and environmental impacts of mercury are well known and documented, and it is widely acknowledged that communities in the vicinity of gold mining areas are exposed to this chemical. Therefore, it is quite relevant to translate this fact into the local population, the potential impact on human health and exposure risk of both mining and non-mining communities, especially in the interior (inland of Suriname).

Contamination of freshwater is likely the main route to move mercury released away from mining sources (ref[37]) as well as the major site for methylation and biomagnification.

Local contamination close to ASGM sector (in the Gross Rosebel area) has been confirmed in a study investigating water released from a small-scale gold mine, which detected high concentrations of mercury up to 0.93 µg/L at the site of the mine and in river water 1 km downstream up to 0.2 µg/g compared with local uncontaminated stream baselines up to 0.05 µg/g (ref[38]).

P. Ouboter (ref 12) has developed a comprehensive work on mercury contamination in the region and he states "data from Suriname shows widespread, almost country wide, mercury contamination consistently above CCME guidelines (ref[39]) in all areas except the northwest of the country.

No-one knows exactly how many people are mining for gold in Suriname. Drs Marieke Heemskerk and Rachael van der Kooye estimate that between 20,000 and 25,000 small-gold miners active in Suriname at any given time. However, some believe that there may be twice as many (Quick et al. 2001).

The impact of mercury pollution on humans and wildlife is dependent on the form of mercury present. Methylmercury is more toxic than inorganic mercury and is absorbed by organisms from the environment at a much higher rate (ref[40]). The process of mercury methylation primarily occurs in aquatic environments, where it is readily accumulated in living organisms. However, due to the rapid absorption by organisms, the methylmercury concentrations in the environment may be misleadingly low (ref[41]).

To address this, ratios called bioaccumulation factors (BAF) are used to calculate the relationship between concentrations of mercury in fish and the water media. As noted, these concentrations increase with trophic level and they also vary depending on conditions (ref [8]).

Diet is the main route of exposure route to mercury of non-mining population, mainly through eating contaminated fish. The relationship between the extent of environmental mercury contamination and mercury concentration in fish is complex. Multiple factors including trophic level, river-current speed, extent of mercury methylation and fish age all play a part in determining levels of toxicity. (ref [8]).

37 Paktunc D, Smith D, Couture R (2004). Mineralogical and Geochemical Characterization of Sediments and Suspended Particulate Matter in Water from the Potaro River Area, Guyana: Implications for Mercury Sources. In Applied Mineralogy, Pecchio, M.; Andrade, F. R. D.; D'agostino, L. Z.; Kahn, H.; Sant'agostino, L. M.; Tassinari, M. M. M. L., Eds. ICAM-BR: Sao Paolo, 2004; pp 379-382.
38 Gray JE, Labson VF, Weaver JN, Krabbenhoft DP (2002). Mercury and methylmercury contamination related to artisanal gold mining, Suriname. Geophys Res Let. 29; 2014–5.
39 The Canadian Council of Ministers of the Environment (CCME) guidelines have a safe limit of 26 ng/L of mercury in water.
40 Stanford (1971). Methyl Mercury: Critical Groups and Sources of Intake. Report from an expert group. Available from: http://dge.stanford.edu/SCOPE/SCOPE_10/SCOPE_10_4.4_AppendixD_MetylHg_199-214.pdf. Accessed April, 2015.
41 Veiga MM (1997). Mercury in Artisanal Gold Mining in Latin America: Facts, Fantasies and Solutions. UNIDO, Vienna.

Table 13 Acceptable safety concentration levels of mercury in humans (ref [8]).

Sample type	Most useful for	Safe limit	Authority
Blood	*Short-term vapour exposure (also affected by diet)*	*< 10 ng/mL (normal) > 50 ng/mL (significant toxicity)*	*Dobbs, 2009*
Urine	*Long-term vapour Exposure (less affected by diet)*	*30 – 50 µg/g creatinine*	*WHO, 1990*
Hair	*Dietary mercury*	*10 – 14 µg/g*	*WHO, 1990*

A single survey on mercury releases from gold burning was conducted in Paramaribo. Mean mercury concentrations in gold buying shops were above the National Institute for Occupational Safety and Health (NIOSH) recommended exposure level of 50 µg/m3, posing a serious health risk to employees (ref[42]).

The data available in Suriname suggests that a similar picture exists to that in French Guiana with indigenous communities which are reliant on fish being at high risk of mercury toxicity. Data from the urban centre of Paramaribo on maternal exposure are worrying and should be closely followed and extended to urban centres in both Guyana and French Guiana (ref 8).

Despite the small amount of data available, particularly in Guyana and Suriname, it is clear that certain communities in all three Guianas are exposed to dangerous levels of mercury. Exposure is principally through diet, although both miners and the extended communities in the vicinities are also at risk. Examples of neurological dysfunction have been demonstrated in both French Guiana and Suriname (ref 8).

In case of human health, the main driver of toxicity appears to be a reliance on predatory fish as a major food source. The developmental delay seen in children affected by mercury in French Guiana is of concern, and a specific public program was launched in 2012 to mitigate and reduce population at risk. Communities with high levels of freshwater fish in their diet are at risk of mercury toxicity with some already showing symptoms including mental retardation of children. Emerging evidence also points towards urban population remote from mining being exposed to mercury pollution (ref 8).

Certainly, there is still specific research to be conducted to better understand the level of exposure, the level of contamination and the communities more affected by mercury pollution in Suriname. However, these gaps do not reduce the need for action to phase out mercury from the gold-mining sector as quickly as possible. Specially in case of artisanal miners known as Porcknockers and their families, which represent a subpopulation of poor people. It seems that this type of miners is found along the whole Guianas and they represent an unknown number of people.

4.2 Assessment of potential gender dimensions related to the management of mercury.

It is widely accepted that different aspects, including differences in occupational roles, biological susceptibility and household duties, impact gender differently in exposure to toxic chemicals and the resulting health impacts. It is expected that the level and kind of chemical exposures at the workplace often differs by gender because women and men generally perform different duties and responsibilities[43].

42 Wip D, Warneke T, Petersen AK, Notholt J, Temme C, Kock H, Cordy P (2013). Urban mercury pollution in the City of Paramaribo, Suriname. Air Quality, Atmosphere & Health 6; 205-213.

43 UNDP. Chemical Management. Gender Mainstreaming-4. A key driver of development in Environment & Energy, 2007. Gender Mainstreaming Guidelines Series, UNDP. http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/chemicals-management/chemicals-management-the-why-and-how-of-mainstreaming-gender/Chemicals%20Management%20and%20Gender%20Mainstreaming.pdf?download

This potential gender dimension, in the case of porcknockers and their families, apply, since the women and especially children are under higher risk during mercury exposure (higher vulnerability). In this case, there is a higher risk that amalgam burning might be performed at home, spreading the mercury risk exposure to the whole family, women, and children.

5 Awareness and Existing Training and Education Opportunities

5.1 Awareness and Understanding of Workers and the Public

Probably due to the large amount of research, spread of information (specially through different social media channels and digital platforms) and the active role of NGOs linked to mercury and ASGM sectors, the environmental and mercury concerns have increased.

Ministries, Agencies and related governmental bodies nowadays can better communicate their messages, conduct awareness-raising campaigns, using different web applications and/or providing training. Documentary videos on mercury are also at disposal, as well as conducting Validation, Dissemination and Training Workshops are also different type of modalities to reach audiences, workers and the Public.

During the consultation meetings, interviews were conducted with a wide range of stakeholders, including non-governmental organizations (Kampos; the Association of Indigenous Village Bureau VIDS and Foundation of Holders of Mining rights), all fully aware of mercury and the scope of Minamata Convention.

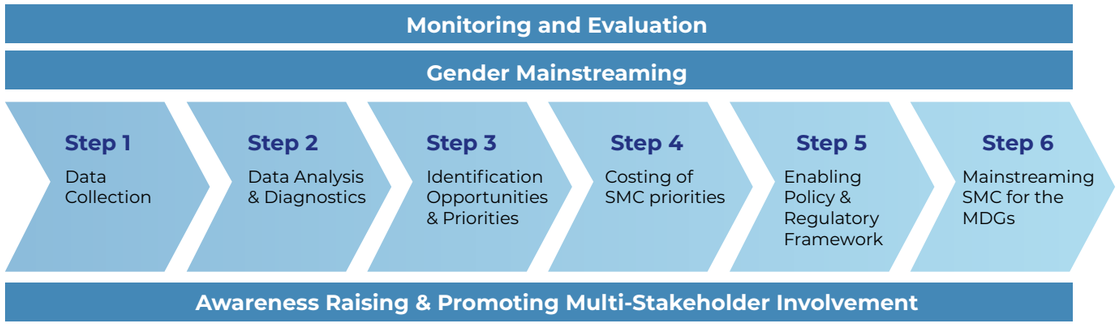
5.2 Existing Training and Education Opportunities of Target Groups and Professionals

The World Wildlife Fund (WWF) – Guianas, is probably the most relevant non-governmental organization involved in Suriname in mercury awareness raising campaigns and mercury in gold mining activities.

WWF Suriname is currently supporting studies related to mercury contamination and their effects, with special focus on artisanal and small-scale mining from regional perspective (Guianas).

A number of non-governmental stakeholders related to gold mining, (private or social and environmental perspective) were interviewed within the development of the Mercury Initial Assessment (MIA) Project. These stakeholders are an important support to the MIA Project and should be considered within the Mercury National Action Plan, to collaborate in mainstreaming key relevant topics as awareness raising on mercury (during the transition phase).

Under this framework, UNDP's stepwise approach for incorporating sound management of chemicals, to assess mercury management is a useful tool to assess the progress of the implementation Plan (see Figure 17).



The “Steps for mainstreaming Sound Management of Mercury in National Development Strategies” is based on two relevant components:

- Awareness raising and
- ensuring multi-stakeholder participation.

These two components should facilitate the achievement of goals, i.e. strengthening a national sound management approach on Mercury.

6 Priorities for Action (Mercury Priority Programme)

Based on the results of the Level 2 version of the mercury releases inventory and following the Minamata Convention‘s guidelines, a number of Priority Actions should be addressed. These Priority Actions are relevant and critical issues and are needed to undertake the implementation of the Convention in Suriname properly.

6.1 The Minamata Implementation Roadmap

The National Institute for Environment and Development in Suriname (NIMOS), as environmental technical advisory body of the Cabinet of the President, has developed a Roadmap containing the activities that have to be implemented to phase out the use of mercury in Suriname.

The roadmap was developed with input received from experts, public sector officials, mercury users and interest groups, and the intention of the Government of Suriname to ratify the Minamata Convention in the future.

The roadmap presents a set of realistic and manageable measures towards a mercury-free environment, given the current situation in the country. The following aspects were considered in developing the roadmap:

- The current situation of the uncontrolled use and disposal of mercury;
- Obtaining a thorough understanding of and a grip on quantities used in small-scale gold mining and other industries;
- Need for measuring and monitoring mercury emissions regardless of the origin (industrial processing, power generation, mining, etc.);
- Increasing the awareness level on the health and safety risks for all people who are in contact with mercury;
- Promoting ongoing research as part of mercury monitoring and for developing proactive measures to safeguard our environment.

The activities in the roadmap are divided in short, medium and long term activities. The short term activities are needed to set the basic conditions for gradually phasing out mercury. The short term period is defined as the first 12 months after ratification of the convention. Several actions are proposed, howev rioritizedeed to be prioritised according to the available human and financial resources.

The activities for the medium and long term are more focused on setting conscious steps towards gradually phasing out mercury and mercury compounds and controlling anthropogenic releases throughout its life. Medium term is defined as the period between the 2nd and 3rd year after the ratification of the convention. Long term is any period after the 3rd year of joining the convention.

Given the significant role of small scale gold mining in the mercury chain in Suriname, it is crucial that a National Action Plan should be developed. This plan should be in accordance with the obligations listed in Annex C of the Convention. Furthermore, each party may include in its national action plan additional strategies to achieve its objectives. For the Suriname context it is recommended to additionally include in the national plan the following aspects:

- Identification of all relevant sources of mercury and reducing releases of mercury and mercury compounds in accordance with article 9 of the convention;
- Specific legal instruments and powers for regulatory agencies for supervision and enforcement;

- Designating the national focal point to comply with the reporting obligations in accordance with article 21 of the convention;
- To strengthen the institutional framework and improve the skills of the institutions (Bureau of Public Health, local administration/ district commissioner's offices)
- Establishing interdisciplinary working groups and consultation platforms, and better coordination.

The strategies and activities for the long term will mostly depend on the outputs and outcomes of the short- and medium-term activities. Long term activities should be aimed at institutionalizing of ongoing monitoring procedures for mercury use and release.

6.2 Measures to be implemented in Suriname

During its national approval process for the accession to the Convention in the national Parliament an more detailed framework of measures was presented that is based on the developed Roadmap. Also, pursuant to article 30, paragraph 4, of the Convention Suriname provided these measures to the Secretariat.

Below an adjusted Framework of Measures is presented.

Table 14 Framework of Measures for implementation in Suriname

Art	Measures to be implemented
Art. 3 para. 6 & 7	**Primary Mercury Mining:** *Primary mercury mining does not occur in Suriname. According to the Mining Act of 1986 there are 5 groups of minerals that can be mined: hydrocarbons, bauxite, construction materials and other minerals (metal and non-metal). Mercury would fall under this last group but has never been mined.* **Mercury trade:** *There is import of mercury –added products. So mainly measures will be taken to stop the import of these products. Currently there is a national Level 2 inventory of imported mercury-added products in process. This inventory will be completed in June 2018.* *Suriname chooses not to make a general notification under art. 3 para. 7, but will require a separate notification of the exporting country for every import of mercury.* **Measures:** *1. By the end of 2020, a State order shall be issued which will forbid primary mercury mining in Suriname.* *2. The revision of the Mining Decree by end-2019, the aforementioned will be explicitly included;* *3. The import of metal mercury is already regulated through a permitting system.* *Two mobile scans have been purchased by Customs to increase import control.* .
Art 4 para. 2	**Plan for Phase-out Annex A:** *Based on existing data, it is already clear that for a number of products in Annex A Suriname will not be able to comply to the phase-out date of 2020. The plan to request an extension was not executed due to circumstance. This means that the phase-out date for Suriname will be 2020.* *One major dilemma Suriname, and with us many other countries, face is the structure of the current tarrif headings (HS code) that prove to be insufficiently broad, making the identification of imports falling under Annex A difficult. In order to be able to have a phase out agenda that is relevant this issue needs to be resolved first.* **Measures:** *1. In collaboration with the other parties to the Minamata Convention explore possibilities for measures to address the current gaps that exist in identifying the products in Annex A through the HS codes (COP3) in 2019;* *2. Placing on the Negative List of Annex A products and requiring a permit. This is included in the Asycuda system used by Customs, which gives the system a notification for extra control;* *3. Increase the import duties on the products listed in Annex A;* *4. Stimulate the import of non-mercury-containing alternatives through, among other things, public awareness;* *5. Link violations of the Negative List to the Economic Offenses Act.*

Art	Measures to be implemented
	Non electronic measuring devices: *As far as the meters containing mercury such as blood pressure meters and thermometers are concerned, extension of the phase-out date will also be required. Here, the PAHO and the Ministry of Public Health are investigating which actions have to be taken, especially in the conditions of the interior of the country. The use of these meters is still preferred because of their advantages such as accuracy and maintenance.* **Measures:** *1. Studying alternatives together with Ministry of Public Health and have alternatives available by 2022;* *2. Request technical assistance from international organizations such as the PAHO / WHO;* **Waste & seizure of illegal mercury and mercury -added products:** *Suriname does not yet have an adequate chemical and hazardous management system. Currently, modalities are being considered to go to a Public Private Partnership in which the private sector and the government will jointly contribute to a chemical management plan that not only covers mercury but all other chemical waste. It will therefore be a system from the moment of import (port), transport, storage, use (standards for emissions), and waste management.* **Measures:** *1. Conclude studies on a Public Private Partnership for chemical storage and waste* *2. Setting up an adequate storage area for waste and confiscated products under Annex A.* **Dental amalgam in the Dentistry:** *As far as the use of mercury amalgam in dentistry is concerned, discussions took place in 2013, amongst others, with the Dentists Association. Based on their information it has been established that mercury amalgam is practically no longer used in Surinamese dentistry. Nevertheless, together with the Dentists Association and the Foundation for Youth Dental Care (JTV) a program will be set up to completely halt the use of mercury amalgam in the dentistry.* **Measures:** *1. By the end of 2021 in collaboration with Dentists Association and Foundation for Youth Dental Care (JTV) to completely ban the use mercury amalgam.*
Art. 5 paras. 2, 3, 5, 6 & 7	**Manufacturing processes:** *Currently there are no production processes as listed in Annex B in Suriname. Even though this is the case legislation will be drafted to prevent start up. It will be policy of both the Ministry of Trade, Industry and Tourism and the Districts Commissioners under the Nuisance Act to reject the startup of companies using these processes.* **Measures**: *1. Prohibit these specific production processes by State Order by the end of 2020.*
Art 7 para. 3	**Artisanal and Small Scale mining and processing with mercury amalgamation:** *At the time of depositing its instruments of accession Suriname will also submit a notification as referred to in article 3 para. 3. "his notification of "mo"e than insignificant" will be made on the basis of the following criteria:* *The number of persons directly or indirectly earning income in this sector. (± 30,000);* *The contribution of this sector to the GDP of Suriname. (Suriname Development Plan 2017-2021, p. 83).* *From the moment of notification, Suriname has 3 years to present its National Action Plan in which it explains how the use and emission of mercury in small-scale mining will be reduced and where possible eliminated. The treaty (Article 7 and Annex C) does not give a phase-out date for mercury use in the ASGM. Suriname, through its own national consultation processes, will indicate which measures will be taken.* **Measures:** *1. Mapping of legal and illegal mining areas by means of GIS data and the monitoring thereof via satellite images;* *2. By 2021, Suriname will submit its National Action Plan for the use and emission of mercury in small-scale mining;* *3. Start consultation process mid-2019 for the formulation of Suriname's first NAP. It will be formulated in consultation with all relevant stakeho"ders;* *4. Start project "Environmental Management in the Mining Sector, with Emphasis on Artisanal and Sm"ll scale Gold mining", in collaboration with the UNDP/GEF mid-2018. This project aims to improve environmental management in the ASGM by introducing environmentally friendly gold mining methods. This will be done by setting up Mining centers where these methods will be demonstrated and the miners will be trained in this. The project document has been endorsed by the GEF CEO and for approval of the project document. The project has a duration of 7 years.*

Art	Measures to be implemented
	Illegal import of metal mercury: *According to Surinamese law the import of mercury is regulated. Together with the sector an investigation will start on which route can be followed and within which period the import of mercury can be completely banned, without having adverse effects on the sector and the income of the State. These measures will all be part of the NAP.* **Measures:** *1. Collaboration with neighboring countries through cooperation mechanisms such as the River Council with French Guiana and the Suriname-Guyana Cooperation Council, for the formulation and implementation of measures to contain illegal import of mercury.* *2. In consultation with the Ministry of Trade, Industry and Tourism, Justice and Police, minimize the illegal import and regulate the import of mercury via the legal route until the moment of phasing out linked to the NAP.* **Technical and financial assistance:** *The NAP will also pay attention to the areas where Suriname needs technical and financial assistance from the international community. On the basis of this List of Needs, international organization such as the GEF, Minamata Convention, Alliance of Responsible Mining (ARM), Artisanal Gold Council (AGC) and other bilateral partnerships will be negotiate and established, creating multiple opportunities for the sector to transition into mercury-free mining.* **Measures:** *1. To enter into international and bilateral collaborations to support the implementation of the obligations under Art. 7 in particular.* **Stimulus ASGM sector:** *Modalities will also be discussed within the government to further stimulate this sector. Some modalities to be considered are: tax reductions, soft loans, etc.* **Measures:** *1. Establish Mining Centers for Training and Awareness (UNDP / GEF project) in the 5 main mining districts by the end of 2021.* *2. Establish Mineral Institute by the beginning of 2020.*
Art. 8	**Point source emissions (Annex D):** *Given that most of these industries do not exist in Suriname, Government's policy will be to prevent the start of these industries through the adoption and implementation of necessary legislation.* **Measures**: *1. Further regulate the start of these activities by law;* *2. With regards to industrial gold the regulation will be in accordance with measures under art. 9.*
Art. 9	**Controlling "total mercury" to land and water:** *The Level 2 Mercury Inventory will determine whether there are other sources where mercury is released into the soil or water that has not been mentioned in other articles of the Convention.* **Measures:** *1. The control of limits for the release of mercury in soil and water will be further regulated by the adoption of standards under the Environmental Law (and Implementation regulations) which have been finalized and sent to the Parliament for approval.*
Art. 10	**Environmentally sound interim storage:** *As mentioned earlier, Suriname currently does not have an adequate chemical and hazardous waste management system. Currently, modalities are being considered to go to a Public Private Partnership in which the private sector and the government will jointly contribute to a chemical management plan that not only covers mercury but all other chemical waste. It will therefore be a system from the moment of import (port), transport, storage, use (standards for emissions), and waste management.* **Measures:** *1. On the short term the storage of seized illegal mercury will be temporarily stored in identified storage facilities awaiting further disposal;* *2. Within 5 years, using levies or through public-private partnership work is being done to set up an adequate storage space for waste and seized mercury and products under Annex A.*

Art	Measures to be implemented
Art. 11	**Mercury waste:** *Suriname is a party to the Basel Convention on the Transboundary Movement of Waste and Hazardous substances and their disposal. Under this treaty, the export and processing of hazardous substances is regulated on the basis of internationally established procedures.* **Measures:** *1. Export of mercury or mercury-added mercury waste for processing must be done according to the Basel procedure.* *2. Office of the President / Coordination Environment is the Designated National Authority where exports must be reported for permission and further guidance.*
Art 17 para. 4	**National Focal Point:** *Suriname will facilitate the exchange of information through setting up of a Coordination Mechanism and naming a special focal point for art. 17.* **Measures**: *1. A Coordination Mechanism for the monitoring of the implementation of the Convention will be set up in the framework of the MIA project in 2019.*

7 Conclusions and Recommendations

The present MIA report was prepared based on the results of the Mercury Releases Inventory and the National Mercury Profile.

7.1 Identification of technical and financial needs

The report identified a large number of gaps and missing tools, therefore a huge need to establish a priority frame to emission standards, norms, rules and other legal and regulatory and non-regulatory instruments, that can contribute to improve the overall mercury management in Suriname, having in mind the existing constraints.

These gaps and needs must be focused on ASGM and its National Action Plan, where Priority Actions should be addressed.

International financial support should also be identified and integrated into the National Action Plan in order to enable Suriname to face the implementation process properly. In this regard, it is worth noting that GEF has a unique mandate across multiple MEAs. In addition, GEF's mission is to safeguard the global environment by supporting developing countries in meeting their commitments to multiple environmental conventions.

The GEF-7 aims at further advancing the GEF2020 vision that pursues greater impact per unit of investment by tackling the drivers of environmental degradation and promoting greater sectoral and thematic integration. In this regard the GEF-7 replenishment period represents an interesting funding opportunity for Suriname, having an integrating approach, with focus on Minamata and Stockholm Convention on POPs and Mercury, chemicals & waste management.

7.2 Conclusions and recommendations

It can be concluded that in the process of developing the Mercury Initial Assessment, based on the Mercury National Profile and the National Mercury Inventory (updated version), many priority actions were identified. Undoubtedly these actions are linked to gold mining and therefore the very first focus of attention and consequently the very first priority actions must be associated to human life and the protection of communities located in the vicinity of gold mining areas where extraction with mercury amalgamation in currently used.

The Meki Tamara project as well as Professor P. Ouboter at Anton de kom University, have relevant research and data supporting these statements, and they can provide steady support to identify precisely those communities that need priority care.

In line with the aforementioned, by ratifying the Minamata Convention on Mercury, the Government of Suriname has shown commitment to improve the overall framework related to mercury as toxic chemical. Therefore, despite the existing constraints (technical, legal, analytical, human resources, etc.), it is very important to realize that the Minamata implementation process is bringing a valid possibility to address these issues, focusing on priority topics of huge concern related to mercury pollution and human health in Suriname.

In this regard, is important to note that mercury management will also share the limited available national budget with other environmental priority matters. Therefore, it is crucial to clearly define the needs under a Priority Program, to properly allocate funding and human resources.

Some important general remarks to consider:

- Consider lessons learned from similar experience in other countries. Suriname's economy as well as the rest of South America's community, has always to deal with restricted budget to fulfil needs and national requirements.
- Consider lesson learned from developed countries: the human resources are the key players to improve environment management and to move Suriname toward a sustainable long-term perspective.

In term of its importance and priority, the following topics were identified:

1. Mercury management

a. Restricted control measures for the use of mercury (during a transition period) and restricted measures to improve safety handling and storage of mercury.
b. At Customs level, review the Tariff Heading of mercury (the specific technical descriptors of each one sub-heading), in order to improve control over the import of mercury and mer cury-containing products.

2. ASGM sector

a. Update the National Register of artisanal miners.
b. Systematic risk assessment of population located within mercury priority areas.
c. Inclusion of occupational exposure monitoring in priority working areas.

3. Regulatory evaluation

a. Review the current capacity for control and enforcement, within the governmental bodies, in order to incorporate new standards that can strengthen the present state and to main stream mercury as a target compound under this legislation.

4. Review the current Institutional framework

a. Improve and reinforce the institutional framework.
b. Provide efforts for human resources in order to improve their professional skills (through capacity building) for programmes and economic incentives.
c. Develop national capacities, with a synergic and integrated approach with the MEAs signed by Suriname.

5. Contaminated sites

a. Systematic evaluation of communities within ASGM areas (risk assessment).
b. Using passive sampler devices conduct mercury field sampling and measurement campaigns in order to identify zones of mercury major impact.
c. Strengthen and support Anton de Kom University in its research to improve the understan- ding of mercury contamination over time in Suriname.
d. To include such a systematic approach within the National Action Plan, that can be used to monitor the level of progress of taken actions and activities.

6. National Reference Laboratory

a. To establish a National Reference Laboratory to characterize mercury compounds, within the framework of the Minamata Convention.
b. To provide necessary support to develop capacity to conduct mercury characterization in environmental matrix (soils, air, particulate matters, water, etc.).
c. To accreditate the Laboratory (ISO/EIC 17025).
d. To facilitate regular training and capacity building.

7. Emission standards

a. To undertake measures as emissions standards and requirements of systematic monitoring or reporting based on the mercury emission inventory results, in line with article N° 8 of the Minamata Convention.

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ANNEX I List of Consulted Stakeholders

GOVERNMENT		
Name	**Organization**	**Position**
Mr. Cedric Nelom	NIMOS	Acting General Director
Mr. Dave Abeleven	Ministry of Natural Resources	Permant Secretary
Mrs Ivette S.C. Patterzon, LLM	Office of the President Suriname/Coordination Environment	Senior Policy Officer
Ms. Tiffany van Ravenswaay	GEF # 5558 Regional POPs Project	National Regional Coordinator
Mr. Satish Mohan	Ministry of Public Works	Transpport Coordinator (Air, land, water)
Mr. Armand Amatali		Hydrology Department
Mrs. Kereshma Sheonarain		Hydrology Department
Mrs. Angela Tewarie		Department of Urban Planning
Mrs. Marianne Chin A Fat MLS	Ministry of Justice and Police	Director of Justice
Mrs. Lucretia Redan MSc. MPA		Director of Operational Services
Mr. Roy Bajnath-Panday	Public Prosecution Office	Public Prosecutor
Mrs. Reina Raveles	Ministerie van Handel, Industrie & Toerisme (Trade & Industry)	Permanent Secretary
Mr. Aroen Jadoenathmisier LLM		Manager Import and Export Division
Mr. Jan Quik	Ministry of Health, Central Laboratory, Bureau Openbare Gezondheidszorg (BOG)	Deputy Director Central Laboratory
Mrs. Ruth Renfurn-Coutinho	Custom Department	Managmement
Mrs. Vasilda Ahsa		Costums Officer
Alexis Armstrong	UNDP Suriname	Deputy Resident Representative
Bryan Drakenstein		Programme Specialist Energy and Environment

PRIVATE SECTOR		
Name	**Organization**	**Position**
Mrs. Kathleen Blom	Foundation of Holders of Mining Rights	
Mr. Micheal Naarendorp	NANA Resources	Director
Mr. Ryan Tjon Poen Gie	Kaloti Suriname Mint House	Managing Director
Roselyne Charles		Public Relations Manager

CIVIL SOCIETY		
Name	**Organization**	**Position**
Mrs. Marie-Josee Arstist	Association of Indigenous Village Bureau VIDS	
Mrs. Renata Simson	KAMPOS	

ACADEMIA		
Name	**Organization**	**Position**
Mrs. Sigrid Mac Donald-Ottevanger, MD	MEKI TAMARA Research Initiative in Suriname. Research Center of the Academic Hospital Paramaribo	Research Coordinator
Dr. Mr. Paul Outboter	Anton de Kom University Suriname/ Center for Environmental Research	Head

ANNEX II Overview of Laws and Regulations pertaining to Mercury in Suriname

IMPORT OF MERCURY		
Legal Regulation	**Relevant Articles**	**Comments / Findings**
Act on the Movement of Goods (S.B. 2003 no. 58, as amended last by S.B. 2004 no. 121)	**Article 3 Paragraph 3:** A negative list is established by government regulation for the import and export of goods for which the import and export is bound by a permit:	The Government Regulation Negative List was developed on the basis of the Act on the Movements of Goods.
State Order Negative List (S.B. 1999 no. 34, as amended last by S.B. 2006 no. 20)		On the basis of this regulation the import of mercury is bound by a permit. To obtain a permit, a request has to be submitted to the import export and foreign exchange control unit of the Ministry of Trade and Industry. When asked, it appeared that in the database of the Asycuda system , there is no official record of the import of mercury.

ESTABLISH FACILITY		
Legal Regulation	**Relevant Articles**	**Comments / Findings**
Nuisance Act (G.B. 1930 no. 64 as amended last by S.B. 2001 no. 63)	**Article 1:** It shall be prohibited to establish an institution that can form a hazard, may cause damage or nuisance without a permit from the District Commissioner. **Article 6:** Only objections originating in a fear of hazard, damage to property, companies on health, or nuisance of a serious nature (spreading a waste or of vile vapours or smells) can lead to a refusal of a permit.	According to the Nuisance Act o permit is required for establishing gold and silver smiths. NIMOS is asked for technical environmental advice in most cases. NIMOS has developed guidelines for gold and silver smiths that can be recommended in providing advice to the District Commissioner.
State order on Permits for Bussineses and Professions (S.B. 1981 no. 14, as amended last by S.B. 2006 no. 64)	**Article 2 paragraph 1:** It shall be prohibited to engage in bussiness or exercise professions to be designated by Government Regulation without prior written permit from the Minister of Economic Affairs. **Article 9:** The permit may be subject to conditions to be laid down by the Minister of trade and Industry	To establish a cement factory and gold and silver smith a permit is also required from the Minister of Trade and Industry. NIMOS advises in case of establishing cement factories of a certain size that the environmental impact assessment be done. Furthermore, there are guidelines for establishing cement factories
Foreign Exchange Act (G.B. 1947 no. 137, as amended last by S.B. 1984 no. 104)	**Article 1:** The Foreign Exchange Commission is charged with the execution of this Act. **Article 11:** It shall be prohibited, other than under a permit, to collect gold; **Article 17:** Other than under a permit it will be prohibited to import: A. Gold B. Precious Metals C. Object of gold or precious metals that are broken, as weel as objects or half-finished products made completely or partially from gold or precious metals, which in general are not manufactured from these metals.	As of May 2013 gold buyers and exports have to deposit a percentage (1%) into an environmental and rehabilitation fund. NIMOS is not asked for technical environmental advice when a foreign exchange permit is granted.

LABOUR CIRCUMSTANCES / SAFETY		
Legal Regulation	**Relevant Articles**	**Comments / Findings**
State Order on the Labour Inspection (S.B. 1983 no. 42)	**Article 12:** Activities That pose a threat to the safety or the health of the employees have to be abandoned.	The medical unit is charged with the monitoring of safe and healthy labour conditions. The unit does not have an instrument to measure mercury vapours.
Accident Regulation (S.B. 1983 no. 8);	**Article 4:** The employer shall be obligated to compensate an employee in case of an accident;	Accidents have to be reported toi the Head of Labour Inspection
	Article 24-27: An accident shall also include complaints from lead, mercury, skin conditions, etc.	
Safety Act (G.B. 1947 no, 142, as amended last by S.B. 1972 no. 95)	**Article 3 Paragraph 1:** The President can lay down instructions in respect of all companies, regarding amongst other things the prevention and reduction of accidents, fire, hygiene, harmful or unpleasant vapors or gasses, etc.	Pursuant to the safety Act, nine safety rules are laid down, Safety rule 9 deals with the prevention of harmful vapours or gasses.

EXPORT		
Legal Regulation	**Relevant Articles**	**Comments / Findings**
Fish Inspection Act: (S.B. 2000 no. 197)	**Article 3:** The production, trade, import or export of fisheries products can be subjected to regulation on account of sanitary aspects by Government Regulation. Article 6: The tasks of the Fish Inspection Institute will include, amongst other things, the inspection of fisheries products and the health control of aquaculture products.	Pursuant to this Act, all fisheries products landed or produced or at the latest prior to their first sale have to be submitted for inspection to the Fish Inspection Institute.
General Quality Regulation (S.B. 2002, no. 10).	**Article 5:** Live fisheries products originating from fish farms have to be accompanied in case of storage and transportation of a consignment document showing that it was subjected to a health inspection as referred to in Article 25: Further rules can be laid down by Ministerial Order in respect of the trade in live fisheries products	Upon the Inspection of fisheries products landed the specially the freshness is subjected to a thorough assessment. In case of inspections of live aquaculture products, the health condition of the fisheries products is assessed; in addition samples are regularly taken to monitor the contamination level with pathogenic bacteria and to determine the level of residues.
		sampling of mercury elements in fish destined for export (takes place abroad). No assessment of mercury in fish for local consumption. No skills for continuous in-country sampling and measurements

ANNEX III Roadmap for Implementation of the Minamata Convention in Suriname

The following Roadmap was taken from the Policy Document and Roadmap relating to the Minamata Convention published by NIMOS in August 2014.

Policy Area 1: Legal and Institutional Framework **Objective:** To have an integral national policy and adequate legislation available to prevent mercury pollution**.**		**Roadmap**		
Sub-goal	**Activities**	**Short term**	**Medium term**	**Long term**
1.1 Introduce environmental legislation	Adoption of Environmental Law	x		
	Develop legal standard for buying and processing gold	x		
	Legal mandate to be able to act in case of contamination	x		
	Review of current licence system (environmental conditions)	x		
	Reformulate national legislation and adapt to tasks and responsibilities		x	
1.2 Efficient and effective management structure and enforcement mechanism	Staff, upgrade and (better) equip regulatory agencies for effective monitoring		x	
	Train and update the skills of District Commissioner's offices in respect of enforcement of licence conditions	x		
	Improve the enforcement by agencies for mercury imports (illegal) and transborder movement of mercury	x		
	Give agencies a mandate to supervise and monitor the observance of the licence conditions in the whole chain (the design, the location and the exploitation of gold processing units).		x	
	Establish a permanent consultation structure between government institutions	x		

Policy Area 2: Data and Research **Objective:** Have a database and research system for sustainable management of mercury, mercury added products and mercury compounds.		**Roadmap**		
Sub-goal	**Activities**	**Short term**	**Medium term**	**Long term**
2.1 A reliable and accessible database will be available for national policy-making and international reporting	Collect, update and analyse (baseline) data about the use of mercury and emissions	x		
	Inventory sites / locations where possibly the environment, health and safety of humans are endangered		x	
	Procure equipment for measuring mercury	x		
2.2 Mercury-free methods have been investigated and are available	Establish an expert research group	x		
	Develop a validation system for scientific investigation		x	

Policy Area 3: Phasing out mercury **Objective:** Establish a phasing out agenda and emissions targets for mercury and mercury compounds.		**Roadmap**		
Sub-goal	**Activities**	**Short term**	**Medium term**	**Long term**
3.1 Fitting measures for phasing out mercury and emissions goals	Establish together with the policy-makers and experts the agenda and emissions goals for mercury	x		
3.2 An inventory is available of all production processes in which mercury or mercury added compounds occur	measuring and monitoring emissions regardless of the origin (industrial processing, power generation, mining, etc.);	x		
	Measures to mitigate emissions and releases of mercury in the environment		x	
	Promote research within the framework of better monitoring of mercury and for developing measures to protect the environment		x	
	Inventory and report emissions and releases in the environment			x

Policy Area 4: Waste management & Contaminated areas **Objective:** There is a sustainable system for the management of mercury and contaminated areas.		**Roadmap**		
Sub-goal	**Activities**	**Short term**	**Medium term**	**Long term**
4.1 There are standards for the treatment and management of waste	Develop guidelines for the management of waste materials		x	
	Establish a facility for hazardous waste			x
	Establish a team to coordinate hazardous waste management	x		
	Develop more efficient and safer system for recovery of mercury, in particular small-scale gold mining operations		x	
4.2 There are strategies and plans to identify and asses the areas	Develop guidelines for identifying and assessing the contaminated areas, assess the health and environmental risks and look at options for the management of these areas			x

Policy Area 5: Artisanal and small-scale gold mining (ASGM) **Objective:** Policies have been developed to reduce, and where feasible, eliminate the use of mercury and mercury compounds, and the emissions and releases upon the extraction and processing of gold.		**Roadmap**		
Sub-goal	**Activities**	**Short term**	**Medium term**	**Long term**
5.1 A national action plan for ASGM is developed	Formulate national goals and reduction goals		x	
	Establish a baseline of the quantity of mercury in the environment		x	
	Develop steps to regulate sector		x	
	Actions to eliminate the smelting of ore, open air burning and in residential areas		x	
5.2 the use of mercury and mercury compounds and the emission by ASGM is less and where possible prohibited	Develop strategies for: a. promoting the reduction of mercury emissions and promote mercury-free methods b. manage the trade in mercury and the prevention of the spread of mercury and mercury compounds c. develop a timeline for the execution of the national action plan		x	

Policy Area 5: Artisanal and small-scale gold mining (ASGM) **Objective:** Policies have been developed to reduce, and where feasible, eliminate the use of mercury and mercury compounds, and the emissions and releases upon the extraction and processing of gold.		**Roadmap**		
Sub-goal	**Activities**	**Short term**	**Medium term**	**Long term**
5.3 Mercury-free alternatives are being implemented	Promote the knowledge, best practices in environment and alternative technologies that are environmentally friendly, technically, socially and economically viable		x	
5.4 There is a strategy for public health relating to exposure of ASGM miners and communities	Gather health data		x	
	Training of public health workers		x	
	Awareness on mercury effects in ASGM		x	
	Involve stakeholders in the development and implementation of public health policies (prevent exposure of vulnerable population groups)		x	

Policy Area 6: Education, awareness and public information about health and environmental impacts **Objective:** Develop a strategy and implementation plan for public information, education and awareness about health and environmental consequences of mercury and mercury compounds.		**Roadmap**		
Sub-goal	**Activities**	**Short term**	**Medium term**	**Long term**
6.1 There is an awareness plan on the health and environmental consequences	Implement awareness campaigns by means of different types of media		x	
	Leaders and organisations are asked to fulfil a leadership role in the awareness process	x		
	Lobby with policy makers and leaders to support the roadmap to phase out mercury	x		
6.2 there is an exchange of scientific, technical, economic, legal, health and environmental information about mercury	Develop materials for different target groups		x	
	Exchange of information about alternatives for mercury mercury added products, production processes, health and environmental impacts		x	
6.3 there are strategies and programmes to protect the population, in particular vulnerable groups	Establish science-based guidelines with regard to the exposure to mercury and mercury compounds			x
	Objectives for reduction of exposure to mercury			x

Policy Area 7: Financial mechanism is established **Objective:** There is a fund to allocate adequate financial means for the successful implementation off the policy document and the roadmap.		**Roadmap**		
Sub-goal	**Activities**	**Short term**	**Medium term**	**Long term**
7.1 There is a government budget for implementation	Establish priorities of policy areas and roadmap	x		
	Establish a public private sector network for dialogue	x		
7.2 Overview of multilateral, regional and bilateral forms of financial financing	List of available funds (UNEP, GEF, etc.)	x		
	Identify project partners for implementation	x		
	Collect information about all projects in the field (baseline, needs)		x	
	Approach projects that are being implemented currently to see if there are opportunities for cooperation (co-financing)		x	
	Share information to create more support and to avoid duplication		x	

The Beginning of the Ending of Mercury