



## **DEVELOPMENT OF NATIONAL ACTION PLAN FOR ARTISANAL AND SMALL-SCALE GOLD MINING IN BRAZIL**

### **Part I: Project Information**

#### **GEF ID**

#### **Project Type**

EA

#### **Type of Trust Fund**

GET

#### **CBIT**

CBIT No

#### **Project Title**

Development of National Action Plan for Artisanal and Small-Scale Gold Mining in Brazil

#### **Countries**

Brazil

#### **Agency(ies)**

UNEP

#### **Other Executing Partner(s)**

Funda??o para o Desenvolvimento Tecnol?gico da Engenharia ? FDTE

#### **Executing Partner Type**

Others

#### **GEF Focal Area**

Chemicals and Waste

#### **Taxonomy**

Chemicals and Waste, Focal Areas, Mercury, Artisanal and Scale Gold Mining, Influencing models, Strengthen institutional capacity and decision-making, Demonstrate innovative approach, Convene multi-stakeholder alliances, Transform policy and regulatory environments, Stakeholders, Beneficiaries,

Communications, Strategic Communications, Public Campaigns, Awareness Raising, Behavior change, Education, Type of Engagement, Partnership, Consultation, Participation, Information Dissemination, Civil Society, Community Based Organization, Non-Governmental Organization, Academia, Indigenous Peoples, Private Sector, Individuals/Entrepreneurs, Local Communities, Gender Equality, Gender results areas, Capacity Development, Access and control over natural resources, Knowledge Generation and Exchange, Participation and leadership, Access to benefits and services, Gender Mainstreaming, Gender-sensitive indicators, Women groups, Sex-disaggregated indicators, Capacity, Knowledge and Research, Knowledge Generation, Training, Workshop, Enabling Activities, Learning, Indicators to measure change, Adaptive management, Theory of change, Knowledge Exchange, Field Visit, North-South, Peer-to-Peer, Twinning, South-South

**Rio Markers**

**Climate Change Mitigation**

Climate Change Mitigation 0

**Climate Change Adaptation**

Climate Change Adaptation 0

<b>Type of Reports</b>	<b>Submission Date</b>	<b>Expected Implementation Start</b>	<b>Expected Completion Date</b>	<b>Expected Report Submission to Convention</b>
ASGM National Action Plan (ASGM NAP)	9/13/2021	1/1/2022	12/31/2024	12/1/2024

**Duration**

36In Months

**Agency Fee(\$)**

95,000.00

**A. FOCAL/NON-FOCAL AREA ELEMENTS**

<b>Objectives/Programs</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CW-EA	GET	1,000,000.00	
		<b>Total Project Cost(\$)</b>	<b>1,000,000.00</b>
			<b>0.00</b>

## B. Project description summary

### Project Objective

To assist Brazil in the development of its National Action Plan for the Artisanal and Small-Scale Gold Mining (ASGM) sector, raise national awareness on the Minamata Convention and build initial national capacity for the early implementation of the National Action Plan and the Minamata Convention

<b>Project Component</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>GEF Project Financing(\$)</b>	<b>Confirmed Co-Financing(\$)</b>
1. Global Technical Support for National Action Plan development	Brazil is enabled to develop and implement its NAP and contribute to the protection of the human health and the environment from the emissions and releases of mercury from the artisanal and small-scale gold mining sector	1.1 Training and guidance provided to relevant national stakeholders in Brazil to develop and implement a NAP as per Annex C of the Minamata Convention	50,000.00	

<b>Project Component</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>GEF Project Financing(\$)</b>	<b>Confirmed Co-Financing(\$)</b>
2. National Action Plan development	Brazil is enabled to develop and implement its NAP and contribute to the protection of the human health and the environment from the emissions and releases of mercury from the artisanal and small-scale gold mining sector	2.1 National Action Plan developed as per Annex C of the Minamata Convention	809,100.00	
3. Monitoring and Evaluation	Brazil is enabled to develop and implement its NAP and contribute to the protection of the human health and the environment from the emissions and releases of mercury from the artisanal and small-scale gold mining sector	3.1 Status of project implementation and probity of use of funds accessed on a regular basis and communicated to the Global Environment Facility 3.2 Independent terminal review developed and made publicly available	50,000.00	

<b>Project Component</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>GEF Project Financing(\$)</b>	<b>Confirmed Co-Financing(\$)</b>
		<b>Sub Total (\$)</b>	<b>909,100.00</b>	<b>0.00</b>
<b>Project Management Cost (PMC)</b>				
			90,900.00	
		<b>Sub Total(\$)</b>	<b>90,900.00</b>	<b>0.00</b>
		<b>Total Project Cost(\$)</b>	<b>1,000,000.00</b>	<b>0.00</b>

**C. Source of Co-Financing for the Project by Name and by Type**

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$ )</b>
			<b>Total Co-Financing(\$)</b>	

**Describe how any "Investment Mobilized" was identified**

n/a

**D. GEF Financing Resources Requested by Agency, Country and Programming of Funds**

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>
UNEP	GET	Brazil	Chemicals and Waste	Mercury	1,000,000	95,000
<b>Total Gef Resources(\$)</b>					<b>1,000,000.00</b>	<b>95,000.00</b>

## **Part II. Enabling Activity Justification**

### **A. ENABLING ACTIVITY BACKGROUND AND CONTEXT**

Provide brief information about projects implemented since a country became party to the convention and results achieved

#### **1. General background**

The Minamata Convention on Mercury was adopted and signed by 92 countries at the Plenipotentiary Conference held on October 10 and 11, 2013, in Kumamoto, Japan, coming into force on 16 August 2017, 90 days after the deposit of the 50th instrument of ratification. As of 21 January 2021, it has 128 signatories and 127 Parties, including Brazil. Brazil deposited its ratification on 8 August 2017.

The artisanal and small-scale gold mining (ASGM) sector is considered as one of the most relevant sources of mercury emissions and releases into the environment, receiving special attention in the Minamata Convention.

Article 7, paragraph 3, of the Minamata Convention, establishes that each party of the Convention, which determines that artisanal and small-scale gold mining and processing in its territory is more than insignificant, shall:

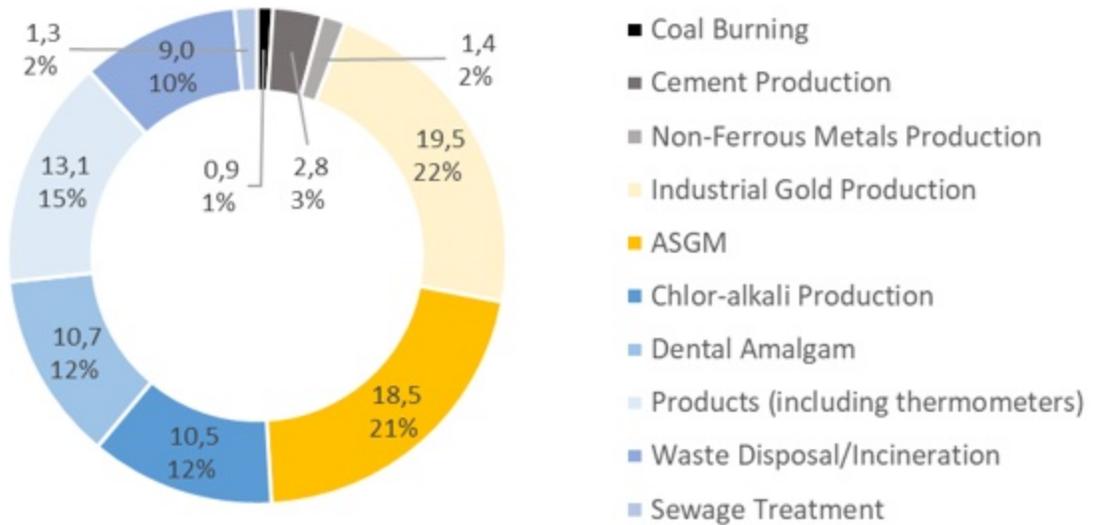
- (a) develop and implement a national action plan in accordance with Annex C;
- (b) submit its national action plan to the Secretariat no later than three years after entry into force of the Convention for it or three years after the notification to the Secretariat, whichever is later; and
- (c) thereafter, 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.

Recognizing that ASGM in its territory is more than insignificant Brazil submitted its notification to the Secretariat of the Minamata Convention on 20 November 2019<sup>[1]</sup>. The deadline for the presentation of the National Action Plan (NAP) is December 2022.

In 2015, artisanal and small-scale gold mining (ASM) globally accounted for approximately 38% of the combined mercury emissions and releases arisen from anthropogenic sources ? about 1,220 tons - an increase of 2.22% compared to the 2010 estimates<sup>[2]</sup>.

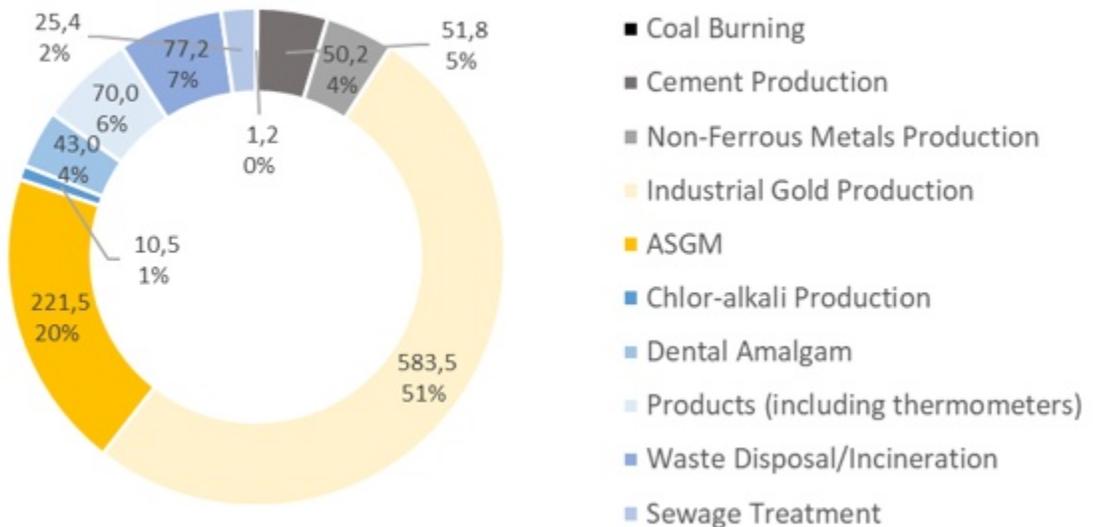
According to the National Inventory of Emissions and Releases of Mercury from the Artisanal and Small-Scale Gold Mining sector in Brazil ? carried out in 2018 as a result of the project GEF ID 5861 Development of Minamata Initial Assessment (MIA) in Brazil<sup>[3]</sup> ? the emission and release of mercury into the environment in Brazil range from 18.5 t/year to 221 t/year. The emissions and releases of mercury from the ASGM sector would represent at least 20% of the annual amount, as shown below in figures 1.a and 1.b:

**Brazil - Combined Emissions and Releases of Mercury  
Best Scenario (Ton./Year)**



1.a

**Brazil - Combined Emissions and Releases of Mercury  
Worst Scenario (Ton./Year)**



1.b

Figure 1. Estimates of Combined Mercury Emissions and Releases in Brazil in 2016, undertaken according to the UNEP Level II Toolkit. 1.a. Best scenario. 1.b. Worst scenario. Source: USP, 2019; CASTILHOS and DOMINGOS, 2018 (adapted).

Notably, in a cross-scenario analysis that considers the worst-case scenario for mercury emissions and releases from the ASGM sector; and the best-case scenario for other sources of emissions and releases, ASGM would represent a total of 76.2% of the total mercury released into the environment<sup>[4]</sup>.

The development of the NAP represents the fulfillment of an obligation under the Minamata Convention and is a crucial step to protect the human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.

## 2. Project's Adequacy to the UNEP and the GEF Guidelines and national priorities

### 2.1. Project's Relevance to the fulfillment of the UNEP Programme of Work 2020-2021

Besides contributing to the implementation of the Minamata Convention, the project also contributes to the achievement of the UNEP Biennial Programme of Work (PoW) 2020-2021, expected accomplishment A "Policies and legal, institutional and fiscal strategies and mechanisms for sound chemicals management developed or implemented in countries within the framework of relevant multilateral environmental agreements and SAICM". As a result of the project Brazil will have developed an action plan that promotes the implementation of the Minamata Convention with UNEP's support.

### 2.2. Project's Adequacy to the Programming Directions and Resource Allocation for the Seventh Replenishment of the GEF Trust Fund (GEF-7)

The Minamata Convention on Mercury, under Article 13, identifies and describes two entities that will function as the Financial Mechanism to support capacity building and technical assistance:

- i. the Global Environment Facility (GEF) Trust Fund; and
- ii. a Specific International Programme to support capacity-building and technical assistance.

The GEF financial support to mercury related activities is included in the GEF VII Chemicals and Waste Focal Area Strategy, which addresses mercury issues under the Program 4: Support enabling activities under the Minamata Convention, including MIAs and NAPs.

## 3. Contribution to the Sustainable Development Goals

The development of the NAP contributes to the achievement of the Sustainable Development Goal (SDG) 12<sup>[5]</sup>:

<i>Goal</i>	<i>Target/Indicator</i>	<i>Contribution Form</i>
<b>12. Ensure sustainable consumption and production pattern</b>	12.4. By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.	
	12.4.1. Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement.	

<i>Goal</i>	<i>Target/Indicator</i>	<i>Contribution Form</i>
		Brazil meet its commitments and obligation in transmitting information as required by the Minamata Convention.

It is expected that the future NAP implementation will contribute to the following SDGs and indicators:

<i>Goal</i>	<i>Target/Indicator</i>	<i>Contribution Form</i>
<b>3. Good Health and Well-Being</b>		
	3.9. By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.	
	3.9.3. Mortality rate attributed to unintentional poisoning.	Mercury and its compounds derived directly and indirectly from artisanal gold mining are a severe cause of poisoning, especially chronic poisoning, in large regions. Reducing the emission of mercury into the air, water and soil will contribute to reducing the severe levels of mercury poisoning in the Brazilian Amazon Region <sup>[6]</sup> .

<b>5. Gender Equality</b>		
	5.2. Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation.	
	5.2.2 Proportion of women and girls aged 15 years and older subjected to sexual violence by persons other than an intimate partner in the previous 12 months, by age and place of occurrence	Violence against women within the scope of the ASGM is known and requires urgent measures for its real dimensioning and confrontation. The NAP implementation will address this issue and an expected effect is to restore compliance with the law in the ASGM sector, which includes respecting Brazilian laws that ensure human rights and protect women and girls from sexual exploitation and against domestic violence.

<b>6. Clean Water and Sanitation</b>		
	6.3. By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.	
	6.3.2. Proportion of bodies of water with good ambient water quality.	As part of the NAP implementation, guidelines will be developed to prevent the contamination of rivers by mercury, especially in the Amazon Region. It is important to highlight that the same rivers polluted by mercury supply water not only to nearby communities but also to more distant settlements including large cities with hundreds of thousands and even millions of inhabitants. Water treatments available cannot remove mercury and its compounds.

<b>8. Decent Work and Economic Growth</b>		
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<i>Goal</i>	<i>Target/Indicator</i>	<i>Contribution Form</i>
	8.8. Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.	
	8.8.1. Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status.	By banning the use of mercury or adopting methods and equipment capable of reducing the emission of mercury in the artisanal or small-scale gold mining process, Brazil will reduce the exposure of workers to mercury and its compounds and the corresponding rates of acute and chronic diseases caused by this exposure.
	8.8.2. Increase in national compliance of labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status	The increased formalization of the ASGM activity will contribute to improve the working conditions of artisanal miners in accordance with the labor rights inscribed in the national laws and ILO standards.

#### **4. Consistency with National Policies, Programs and Priorities**

The availability of data is a major challenge to design appropriate strategies for the reduction of mercury in Brazil. Nonetheless, studies of fundamental importance on the use of mercury in ASGM have already been carried out, among which:

- i) Removal of Barriers to the Introduction of Cleaner Artisanal Gold Mining and Extraction Technologies (GEF 1223), in 2002 (Global Mercury Project);
- ii) Development of Minamata Convention on Mercury Initial Assessment in Brazil (GEF 5861), started in 2015, currently in its final phase;
- iii) Socioeconomic and Environmental Diagnosis of Small-Scale Mining in Brazil, published in 2018 as a product of the Technical Assistance Project of the Energy and Mineral Sectors - META Project, funded by the International Bank for Reconstruction and Development (IBRD).

As a result of the Global Mercury Project relevant data on ASGM has been compiled and assessed at two sites in Brazil (S<sup>o</sup> Chico and Creporizinho) in the Tapaj<sup>s</sup> Region. The assessment describes some of the characteristics of the activity in Brazil such as: burning of mercury and the abandon of contaminated tailings in rivers forming a large number of 'hotspots'; the cyanidation of tailings; and other inefficient and polluting amalgamation techniques. Also, according to this assessment, the estimated gold production in the Tapaj<sup>s</sup> region was, at that time, 650 tons.

To assist in the implementation of the Minamata Convention in Brazil, the Ministry of the Environment, with the support from the United Nations Environment Programme and the Global Environment Facility, carried out the project 'Development of Minamata Convention on Mercury Initial Assessment in Brazil' (Project MIA), with the objective, among others, of developing an inventory of mercury sources and its emissions and releases and gathering initial data to facilitate the early implementation of the Minamata Convention.

Some of the reports from the MIA Project, published in 2017, are directly related to ASGM, such as the report on the analysis of the regulatory framework for mercury and the national inventory of mercury emissions and releases in the scope of artisanal and small-scale mining in Brazil. They are a useful starting point for the in-depth studies needed to reach the objectives of this project.

In addition, the 'Socioeconomic and Environmental Diagnosis of Mining on a Small Scale in Brazil' coordinated by the Secretariat of Geology, Mining and Mineral Transformation, of the Ministry of Mines and Energy and published in 2018, is one of the reference studies for the construction of the NAP.

The diagnosis, financed by the World Bank (IBRD) through the META Project has an overview of the small-scale mining sector with inventories for metallic, non-metallic substances, gems and diamonds, and detailed case-studies for five regions with relevant mineral extraction activity. The diagnosis addresses technical issues related to the washing and processing of substances, in addition to social and environmental issues and recommendations for public policies. Although the scope was more general, this work highlights the challenges that must be overcome by this project.

It is foreseen that the NAP will be an essential guide to future phases of the META project. In addition, it will also be an important tool for the implementation of public policies and the formalization of the ASGM sector in Brazil as detailed in the National Mining Plan - PNM 2030.

## 5. Scope of the Project

### 5.1 Territorial and Populational Basis

Artisanal miners, or 'garimpeiros', who dedicate their lives to prospect and extract gold, are located in many places throughout Brazil. However, the major social and environmental impacts of gold extracted with mercury amalgamation can be seen in the 'Legal Amazon' region, a territorial space legally and formerly defined by Law 1.806/1953, and currently defined by Law 5.173/1966, covering an area of approximately 5.217.423 km<sup>2</sup> (61% of the Brazilian territory). It includes nine federal states (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, Mato Grosso, Tocantins, and part of Maranhão) and has a population of 25 million inhabitants (estimate, IBGE, 2019) (Figure 2).

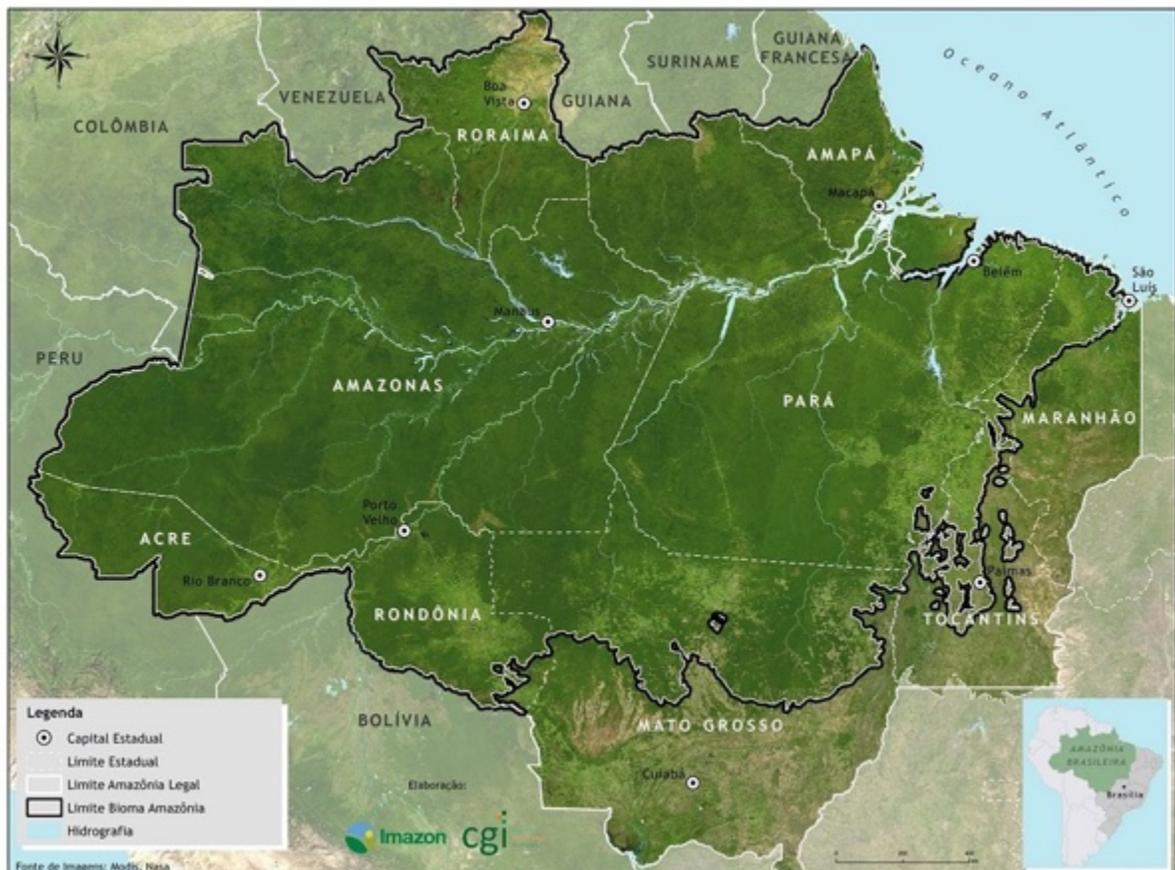


Figure 2. Demarcation of the Legal Amazon and the Amazon biome in Brazil.

At the beginning of the 21st century, approximately 236.000 km<sup>2</sup> or 4.34% of the total area of the Brazilian Amazon region was affected by ASGM activities.<sup>[7]</sup> Most of this activity is concentrated in the state of Pará, with 150.000 km<sup>2</sup> of the total area, including the Tapajós River region, which is still the largest artisanal mining area and the biggest gold supplier in the country (100.000 km<sup>2</sup>).

## 5.2. Population directly benefiting from the project- Age and Gender Considerations

It is difficult to state the number of gold *garimpeiros* in the country due to the lack of specific census. The estimates range from 80,000 to 800,000 people.<sup>[8]</sup>

The Ministry of Mines and Energy estimates that around 500,000 people are directly dedicated to artisanal and small-scale mining (ASM), of which 80-90% work directly with gold mining. On average, for each *garimpeiro*, there are about 4-5 other workers who are directly linked to the activity, carrying out supporting tasks inside and outside the extraction sites. Considering the families and the population whose livelihood is economically linked to ASM several locations depend exclusively on the economic resources generated by this activity, the proportion would be of 10-14 economically dependent people for each artisanal mining worker. Therefore, the population directly benefiting from the project may reach up to 7 million people.

In general, the women's work at ASM is commonly associated with prostitution, often forced by social conditions or even by the direct use of violence. However, several studies (for example, BONFIM, 2011 and FI?ZA, 2009)<sup>[9]</sup> and the press report that women, in addition to carrying out several artisanal mining tasks, are crucial in the establishment and sustainability of human settlements (such as villages). In some cases, women in ASM areas even reach command positions and play the role of oppressive power.

The *Socioeconomic and Environmental Diagnosis of Small-Scale Mining (SSM) in Brazil*<sup>[10]</sup>, covering not only gold extraction but also all small-scale mining activities in the country, identified that in the visited mines, approximately 94% of the workers are men and 6% are women, highlighting that:

*According to the anthropological team, the lower participation of women in the SSM sector can be explained by the gender relations observed in the workforce as a whole and by the fact that small-scale mining, and especially artisanal mining, which uses less technology comparing to others, is a job that, in general, requires physical strength. Thus, women are less involved in extraction and processing and more involved in supporting services.*

*In general, according to the results obtained in the five case studies, the female workforce operates mainly in clothing trade, markets, transportation agencies, bars and restaurants, and administrative posts. In the *garimpo* areas covered in the case studies (the Tapajós and the Peixoto Azevedo Artisanal-Small Scale Mining Reserve regions), women get involved in different roles, imposed by economic reasons and emotional relationships, working in the trade industry, as cooks, and with prostitution. Many are entrepreneurial and run their own businesses, guaranteeing their livelihood and generating jobs.*<sup>[11]</sup>

The lack of statistical data on the population linked to ASM results in the impossibility of delivering a reliable age and gender categorization. Despite of this information gap and considering the expansion of the effects of the project to the communities themselves, which are either directly or indirectly linked to the *garimpo*, it can be temporarily considered that the age and gender distribution is a reflection of the population in general.

According to IBGE's estimates (2019), the Amazon's age pyramid categorized by gender is shown in figure 3, indicating that approximately 49.7% of the covered population is formed by women and 30.5% by children from 0 to 14 years old (of which 15% are girls and 15.5% are boys).

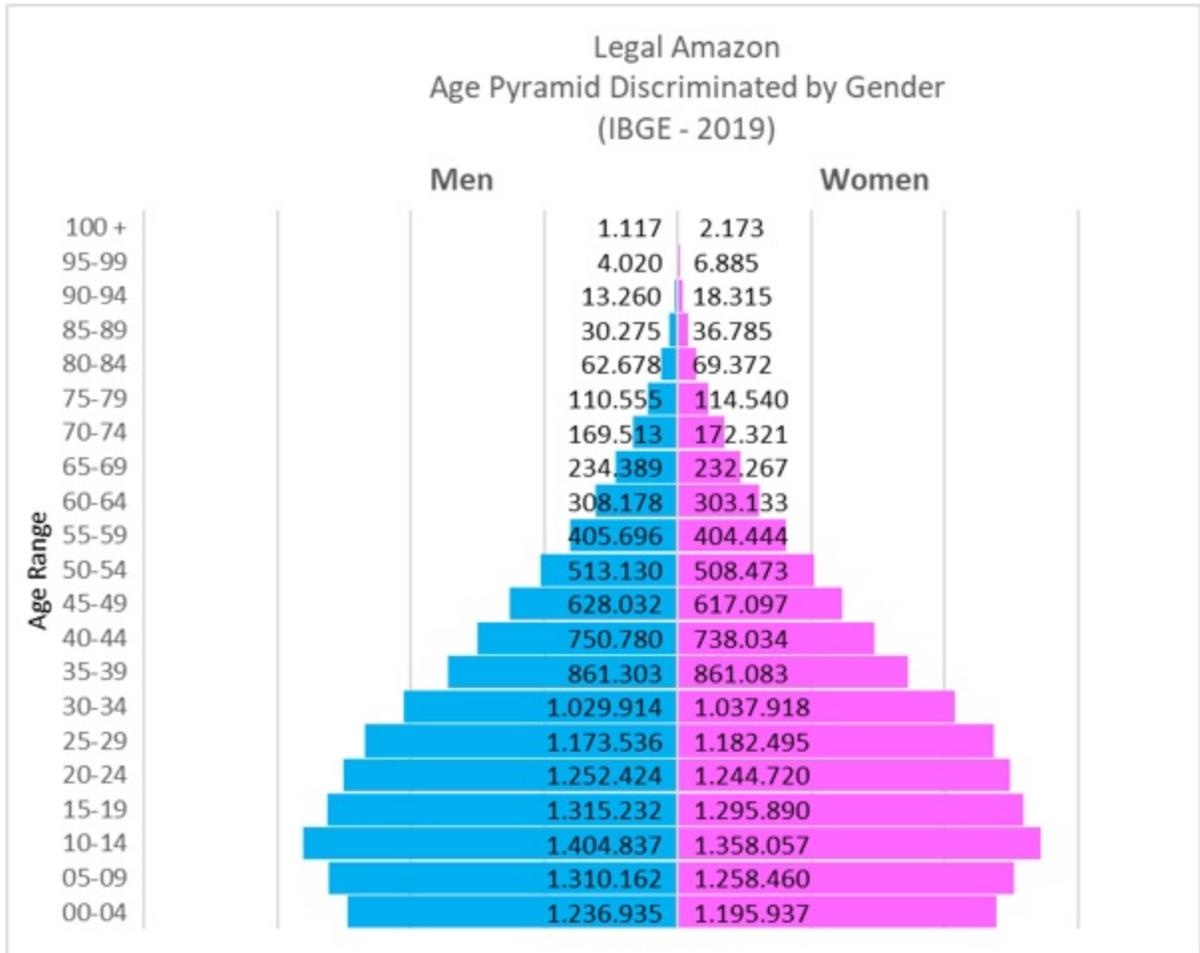


Figure. 3. Legal Amazon's age pyramid detailed by gender.

Therefore, it is estimated that the proposed project will have an impact on the social extract exposed in Table 1:

	<i>Gold miners and families</i>		<i>Population directly benefiting from ASGM</i>		<i>Estimated Total Scope</i>	
	?	?	?	?	?	?
Adults	500.000	493.853	2.125.000	2.098.874	2.625.000	2.592.727
Children	154.180	148.738	655.265	632.138	809.446	780.877
<b>Total</b>	<b>1.296.771</b>		<b>5.511.278</b>		<b>6.808.049</b>	

Table 1. Estimated Population Benefiting from the future NAP implementation.

## 6. Context of artisanal and small-scale gold mining in Brazil

### 6.1. General Historical and Social Context

According to the "Socioeconomic and Environmental Diagnosis of Small-Scale Mining in Brazil (SSM)"<sup>[12]</sup>, (artisanal and small-scale mining in Brazil is a mineral activity with low capital and technology inputs, and labor intensive. SSM is the classification given to micro and small operations (up to 100,000 ton/year) of Run of Mine (ROM), according to the criteria of the National Mining Agency (ANM).

Artisanal mining is in general practiced in independent units, often informal, without titles or licenses, following a family and subsistence business model. It's generally of micro or small-scale production, but there are exceptions. These ventures are popularly known as "garimpos", and have been an economic activity present in the country since the beginning of its colonization. The "garimpeiro" (artisanal miner), in his search for precious gems and minerals, mainly gold, was one of the main players for the expansion and settlement of the territory that became Brazil.

Historically, 4 major gold cycles can be identified in the country: the first, from 1500 to 1700; the second, from 1700 and 1800; the third, from 1800 to 1980, and the fourth, from 1980 to the present, mostly in the Amazon<sup>[13]</sup>. The latest gold cycle was motivated both by the unprecedented increase in gold prices and the discovery of Serra Pelada. Serra Pelada was the largest open pit gold mine with more than 100,000 miners working simultaneously for years. In 1988, Brazil reached the peak of its gold production, with 112.6 tons per year, of which 90 came from ASGM.

Despite of their economic and historic relevance, the general public still considers the artisanal miner in Brazil as a marginal and adventurous individual, devoid of culture or moral values and, for many, intrinsically illegal<sup>[14]</sup>. Even today, "they remain invisible in Brazil's mineral economy or are often criminalized for their informality and social and environmental damage"<sup>[15]</sup>.

There are, indeed, several and repeated complaints of artisanal and small-scale illegal mining cases in Brazil. This activity, informally performed, does not follow the proper authorization process of the competent Public Administration and still occurs in places where there is a legal prohibition for its exercise. For example, GIATOC (2016) states that 75.000 artisanal miners would operate illegally in Brazil, producing from 10-15% of the amount of gold that is legally mined, and warns that part of this production is "laundered" by legal miners who "give up" their mining prospecting permits in exchange for commissions; the Amazon Network of Georeferenced Social and Environmental Information (RAISG) states that there might be 453 illegal ASM areas in the Brazilian Amazon<sup>[16]</sup>.

On the other hand, there are also several sources citing human rights violations of artisanal miners and associated populations, including slave labor and forced prostitution<sup>[17]</sup>.

One of the projects expected results is that the general public has a better understanding of the sector and have a more accurate image of the artisanal miner. This would contribute to the effective compliance with national legislation, notably in the scope of safety and dignity at work and environmental safety.

### 6.2. Sources of Information on Artisanal and Small-Scale Gold Mining in Brazil

As previously mentioned, there is no specific census for small-scale artisanal mining in Brazil, nor one focusing on gold extraction and processing.

The available data derives mostly from estimates extracted from a range of non-systematized sources, notably academic studies on specific aspects of the selected extraction sites perceived especially for the convenience of the research, rather than the production of nationally comprehensive data.

According to HACON et al. (2009) "mercury contamination in the Amazon Region was first discussed in the late 1980s, when studies highlighted the significance of the 'gold rush' as a mercury source for

this ecosystem"<sup>[18]</sup>, counting with 429 identified publications from the 1990s to 2005, "including 41 theses and dissertations, 25 reports, 15 books, 307 articles published in scientific magazines and 41 expanded abstracts presented at scientific meetings about mercury contamination in the Brazilian Amazon Basin".

The National Inventory of Emissions and Releases of Mercury by Artisanal and Small-Scale Mining in Brazil<sup>[19]</sup> highlights this difficulty in obtaining systematic data on ASM, stressing, for example, factors that might explain this situation, such as the activities' high degree of informality, its seasonality in several extractive regions and the distinctive mobility of the small-scale miner. It recognizes that despite using the estimation methodology recommended by UNEP and seeking as much scientific accuracy as possible "it's an initial effort to inventory ASGM's mercury emissions within the scope of the MIA Project (GEF 5861) and that "with the progress of the implementation of the Minamata Convention in the country it must be improved".

The relatively recent Socioeconomic and Environmental Diagnosis of Small-Scale Mining (SSM) in Brazil<sup>[20]</sup> sought to comprehensively understand the context of artisanal and small-scale mining in the country. However, besides missing a deeper understanding of the issue of gold extraction and the practices that require mercury use in this activity, it focused on the formalized portion of the activity only:

*"This diagnosis of ASM, according to its ToR, does not involve informal mining. However, it was found that the informality, and even the illegality, of some segments of the mining activity, is substantial, and that actions are needed to solve the problems caused by this scenario. The analysis based only on official data is not sufficient for a realistic characterization of the MPE in Brazil, since the official statistics available are incomplete, partially outdated and dispersed in different institutions of the Brazilian administrative scenario, as well as restricted only to the formalized portion of this sector, in which, as said, informality is significantly present".*

*(CONS?RCIO, 2018, p. 18)*

Although with acknowledged gaps, the Diagnosis was compiled in the following reports: existing information baseline (Report 1), legal-institutional structures and socioeconomic and environmental aspects (Reports 2 and 3), inventory of the small-scale mining by macro area of activity (Reports 4, 5 and 6) and was used to establish an information database (Product 7). It constitutes a relevant baseline for further assessments in the NAP project.

### **6.3. Mercury Use in ASGM in Brazil**

ASGM in Brazil is characteristically an activity that lacks operational and administrative technical support. The artisanal miner assumes all physical and economic risks and receives a monetary return that covers only his mere subsistence.

This situation is evidenced, for example, in the National Inventory of Emissions and Releases of Mercury by Artisanal and Small-Scale Mining in Brazil:

*"Artisanal or manual mining is an economic activity typically related to the subsistence and carried out by small groups; often counting with the participation of whole families and in an itinerant way. "Garimpeiros", or artisanal miners, use rudimentary tools such as "bateia", a type of conical pan used to cluster gold. For the separation of gold, they use elemental mercury. The extraction sites are determined by the acquired knowledge at work. The guidance is often provided by older "garimpeiros", who are recognized holders of this knowledge. Usually, with the permission of the owners of semi-mechanized "garimpos", these groups are located around their pits (COSTA, 2007).*

*Semi-mechanized "garimpo" started in the 1980s as a result of the development of rudimentary mining techniques and processes. This allowed work on (i) primary ore, deposits that in the past were not available to miners; (ii) alluvium in the active riverbeds, and (iii) deeper alluvium. This style of mining also has an itinerant character, although less strong than the manual way, counting on groups with 5-10 workers, where the owners are usually family members who hire other workers. "Garimpeiros" as a*

rule plow lands belonging to third parties, called superficiaries. As a result, agreements are established between them or between ?garimpeiros? and financiers of the enterprise, which occasionally generate conflicts (COSTA, 2007). Labor relations are established in a mutual trust system - sometimes as cooperative - and there is compensation on the percentage of the ore mined. These are vertical relations, but not rigid, that is to say, with coordination mechanisms in which the machine owners determine the tasks to be performed and the workers perform them together with the most experienced miners. Kolen et al., 2013 explain that the more mechanized the ?garimpo?, the greater is the percentage that stays with the machine owner, and, in general, the ratio is of 70% for the machine owner and 30% for the group of miners, who share it equally among themselves, no matter how many they are. This proportion may be greater for garimpeiros if they assume the costs of their nourishment and the payment of the cook.<sup>[21]</sup>

The same Inventory found that amalgamation with mercury remains a universal practice in ASGM in Brazil, probably because it is a simple, efficient and relatively inexpensive methodology, consecrated by the practice that has been disseminated from generation to generation since the discovery of gold in the country (16th century). According to CASTILHOS and DOMINGOS (2018)<sup>[22]</sup>, in 1833 ESCHWEGE criticized the indiscriminate use of mercury in the gold ore purification process.

It was also found in the Inventory that the practice of filtering is a routine with the declared intention of recovering mercury to allow its reuse. The use of retorts or chapels is adopted in some cases, while in other ASGM sites there is no control to reduce mercury emissions - or they use plant leaves in an attempt to recover the metal. CASTILHOS and DOMINGOS (2018)<sup>[23]</sup> warn that such control equipment does not have absolute effectiveness:

*?The high levels of mercury in the atmosphere, observed during the amalgam decomposition, even with the use of retorts or chapels, indicate that there is still an important emission of mercury into the atmosphere. Despite the retorts and chapels are present and, in general, are used, printing significant reduction of emission of mercury, the metal level reach values that exceed the maximum quantification limit of the used equipment (Atomic absorption spectrophotometer, Lumex brand), of 220 ?g m<sup>3</sup>?. Thus, the preliminary monitoring of mercury in the atmosphere showed that the levels reach values above the recommended as the maximum allowed for 8h of exposure by the Brazilian labor legislation, requiring the use of individual protection equipment. From the perspective of occupational exposure, it should be taken into account that such levels are intermittent, which means that there are peaks and valleys of mercury levels in the atmosphere. For this reason, it is suggested that monitoring is carried out more frequently over time. Also, in some areas, managers or people who perform amalgam thermal decomposition used unappropriated masks for the protection of mercury in the atmosphere. It is imperative to know the exposure pattern of these ?garimpeiros? and their families and provide protective guidelines which are likely to be adopted?<sup>[24]</sup>*

#### **6.4. Origin of Mercury used in Amalgamation in Brazil**

The mercury used in ASGM in Brazil is, as a rule, of irregular origin, as evidenced in the National Inventory of Emissions and Releases of Mercury by Artisanal and Small-Scale Mining in Brazil:

*?Regarding the origin of the Hg used in ASGM, only one cooperative reported buying the product with a credit memo from a legal supplier in the State of S?o Paulo. All other reported the purchase without an invoice. According to them, the acquisition of legalized Hg is very difficult, since there is no formal market for the product and the Hg of illegal origin can be easily purchased in pharmacies and stores for gold mining. Besides, it was found that it can also be easily purchased on websites. According to the received information, the price of Hg varies from R \$ 600.00 / kg to R \$ 1,200.00 / kg in Brazilian states?<sup>[25]</sup>*

Under the Brazilian law, every importer, recycler, trader and user of metallic mercury must provide information on the activities they've used the metal, whether they are classified as potentially pollutant

or not, and are responsible for the safe handling, use, and for the environmental adequate disposal of any residues.

The import of mercury is controlled by the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), the federal environmental agency, and can only be carried out in compliance with all legal requirements, including the placement in one of the hypotheses admitted by the Minamata Convention.

The aforementioned Inventory, however, demonstrated the easy acquisition of illegal mercury in pharmacies, mining shops, and websites, highlighting that it identified 43 metallic mercury offers suitable for artisanal mining on the web, which was the object of 737 sales, resulting in 93.1 kg, or 77% of the mercury destined for mining in 2015, or 3% of all metallic mercury sold in a year.

It was reported that the average price of mercury in mining areas is around R\$ 700,00 / kg (seven hundred reais per kilogram), varying from R\$ 600,00 to R\$ 1,200,00 / kg. However, the internet offers listed in the Inventory (Preliminary Report 1) indicate that, on that route, the average selling price was R\$ 360,00 / Kg. In comparison, the average price in the domestic market of 1 g of gold through official channels that year was over R\$ 1,200.00.

## **6.5. Negative Impacts from Mercury Amalgamation in ASGM**

### **6.5.1. Environment Impact from Mercury Amalgamation in ASGM**

Mining with gold recovery by mercury amalgamation has been the most common artisanal mining method in the Americas since the first decades after its "discovery".

It is estimated that around 156.000 and 250.000 tons of mercury have been released into the atmosphere, soils, and aquatic environments over the past 430 years across the continent. Tailings from this anthropogenic activity continue to pose an environmental risk due to the endurance of mercury in the soil.

In Brazil, it is estimated that in the last "gold rush" of the last three decades of the 20th century about 4.000 tons of mercury were released into the environment.

CASTILHOS and DOMINGOS (2018)<sup>[26]</sup> applied the UNEP toolkit criteria for the ASGM mercury releases and emissions inventory, and considered the multiple degrees of informality in the sector. They've concluded that the emission factor considering the amount of gold formally produced by ASGM range from 0.30 and 0.44 (scenario with 100% formal production) and 2.40 and 6.46 (scenario with 13% formal production).

When these factors are applied to the formal ASM gold production, it can be concluded that the sum between the mercury emissions and releases in 2008-2017 was 88.95 tons. (scenario with 100% formal production) and 1,034.97 tons. (scenario with 13% of formality, or an 8 times greater informality rate).

It is important to consider that the best scenario with 100% formal production is absolutely hypothetical, since considerable portion of gold production from ASGM takes place informally. It's more realistic to consider a ratio of 33% of formality, which would represent a total of 367.81 tons of mercury releases and emissions in these 10 years (average of 36.8 ton. /year), with an estimated peak of 72.6 ton. in 2016.

Graphically, these scenarios are shown in figure 4:

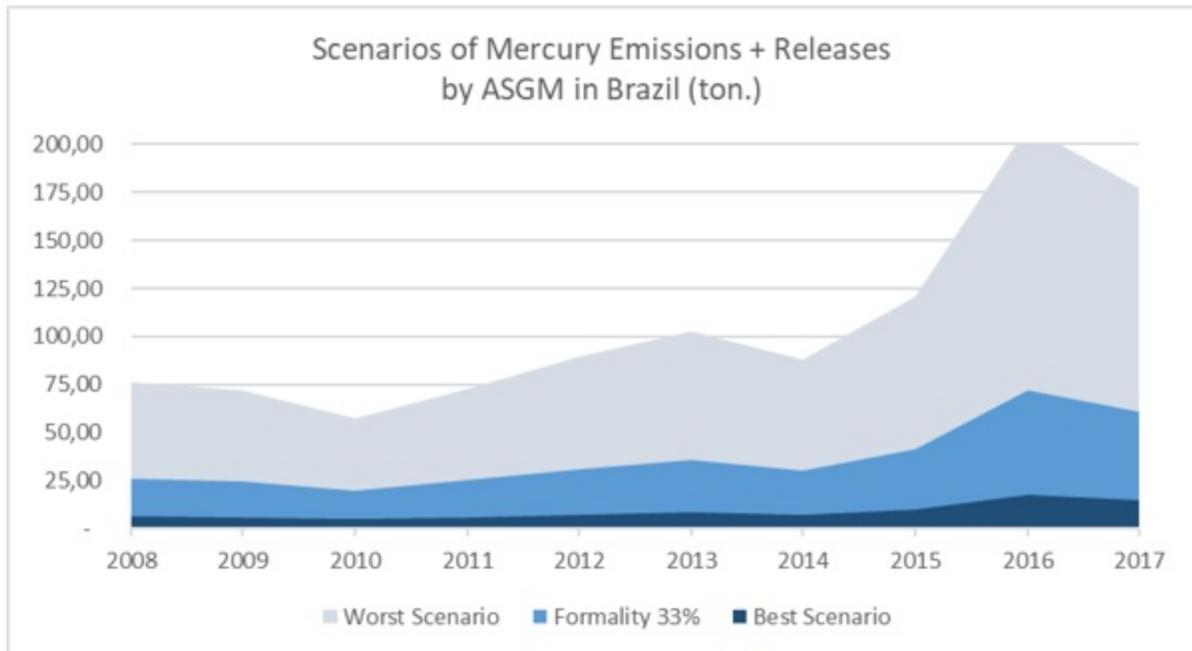


Figure. 4. Scenarios for Estimated Combined Emissions and Releases of Mercury by ASGM in the Period 2008-2017.

There are no known mercury deposits in the Brazilian Amazon (or anywhere else in the country), although in the Andes the metal occurs as a by-product of copper ore. Yet, there is a mercury content in the Brazilian Amazon soil and sediment that is considered higher than normal. HACON et al. (2009)<sup>[27]</sup> mention that initially these high levels of mercury were attributed specifically to gold mining, but recently ? from the 1990s on ? studies have suggested a natural origin for the concentration and atmospheric transportation of anthropogenic mercury, besides various possible mechanisms for remobilization and reissuing of the metal, highlighting that:

*?Despite the available documentation on the biota?s, sediments? and soils? contamination and the health studies about some Amazonian population, especially the riverside population, the mercury sources and sinks in the Brazilian Amazon are not yet well established and there is still no complete understanding of its biogeochemical cycle. Some Amazonian riverside populations have high levels of mercury in their hair?.*

*(HACON et al., 2009, p. 31)*

Regardless of the low reactivity of metallic mercury in gold mining amalgamated tailings, its transportation to adjacent aquatic environments can result in significant remobilization and greater bioavailability.

The study by VEIGA, SILVA and HINTON (2002)<sup>[28]</sup> describes that the gold mines? mercury released into the environment can be oxidized or methylated ? "transformation of mercury compounds into methylmercury (CH<sub>3</sub>Hg<sup>+</sup>), the most toxic form of mercury" ? in a not completely known mechanism with possible bacterial action and favored by aerated, rich in organic matter environments, as often occurs in the Amazon Basin. As the authors warn, "methylmercury is hardly detected in water as it has a great affinity to combine with protein groups and get retained in the organisms? tissues".

This great bioavailability of methylmercury result in a rapid bioaccumulation. Combined with its slow elimination it leads to its biomagnification within the trophic chain and perpetuates the contaminant in the biota in detriment of the environment and human health.

In this context, although it's still unclear the exact contribution of mercury amalgamation in ASGM to environmental pollution, especially in the Brazilian Amazon, it is clear that this contribution is significant. It has been measurable cause of harmful effects to the biota and the regional human population's health. It is also clear that the natural environmental condition of mercury in soils and sediments in the legal Amazon aggravates its effects.

Furthermore, the expanding production of gold from ASGM linked to the growing international demand leads to a scenario of increased or maintained levels of mercury emissions and releases to the environment. Therefore, mercury emissions and releases from the ASGM sector will remain an issue of concern to the country in the long run.

### **6.5.2. Impact on the Population's Health Due to Mercury Amalgamation in the ASGM**

The lives of the Legal Amazon populations are intensely linked to water bodies due to the unparalleled networks of the largest river basin in the world and the common seasonal floods throughout the whole region, whether in large cities or isolated settlements.

Regarding the 'garimpo' situation, the link to water bodies is even broader, since the river is not only the single access route to the region but also a source of food which is shared with other human groups cohabitating in the same physical and social space (traditional coastal populations and indigenous people).

As highlighted by VEIGA, SILVA and HINTON (2002)<sup>[29]</sup> citing Malm et al, 'the coastal population in the Amazon depends on fish as their main source of protein. They have shown levels of methylmercury in the blood 300 times higher than what's considered normal'. This condition that is aggravated inside the 'garimpo' area and in its immediate surroundings due to the exposure to the released mercury from the amalgam burning.

The effects on population's health are not limited to those isolated communities or the closest ASGM surroundings. The commercialization of gold is made in urban centers and the commercial establishments that receive this production, along with its surroundings, are sites known to be contaminated with mercury due to amalgam burning or reprocessing of the precious metal that was not sufficiently purified at its source. This situation is described by C?MARA et. al. (1996):

*'(...) gold, when sold in buying houses, presents from 3-5% of mercury residues (CETEM / CNPq, 1994). During purification for weighing, this residual content is volatilized, contaminating not only the stores environment, but also the entire neighborhood. The lack of adequate mercury retention systems in these stores, which have, at most, simple exhaust fans, results in atmospheric contamination by metallic mercury on the environment for about 400 meters from the burning point, depending on the wind's flow and intensity (Silva et al., 1991); CETEM / CNPq (1994). Marins et al. (1991) demonstrated that the burning operations in urban centers must be controlled, since in the surroundings of the buying houses in Pocon?, Mato Grosso, the detected mercury level in the air is above 1.65 ?g / m<sup>3</sup>, which exceeds the maximum limit of 1.0 ?g / m<sup>3</sup> (WHO, 1976) ?<sup>[30]</sup>*

This source of environmental and human contamination was a source of concern in the National Inventory of Emissions and Releases of Mercury by Artisanal and Small-Scale Mining in Brazil:

*'At last, the levels of mercury in the atmosphere observed in gold purchase stores varied in orders of magnitude, indicating the diversity of this mercury potential emission source. Gold purchase stores must be considered as significant in the overall computation of ASGM emissions and in the potential human environmental and occupational exposure. One of the main reasons is that, even when it comes to melting 'dore' gold, with about 1 to 5% of Hg remaining, the store performs from tens to hundreds of mergers per day. Also, there are cases in which 'garimpeiros' directly fuse the amalgam in the*

*purchase house, which can result in a considerable emitted Hg final load?.*  
(CASTILHOS e DOMINGOS, 2018, Final Report, p. 7)<sup>[31]</sup>

The effects of mercury contamination on the human population in the Legal Amazon are synthetically exemplified by VEIGA, SILVA and HINTON (2002):

*?Symptoms of the Minamata disease have never been confirmed in the Amazon, but it has been reported evidences of neurological effects in people who frequently eat fish meat affected by medium or high levels of methylmercury in their flesh (Lebel et al., 1996; Lebel et al., 1998; Dolbec et al., 2000). Methylmercury can be slowly excreted in the faeces (from 1 to 4% per day) and a small part can be excreted through the hair. Usually, the level of methylmercury in the hair is 300 times higher than the concentration in the blood. A person who frequently eats contaminated fish can expect mercury concentration in their hair (C in ppm) that can be provided by the following equation:  $C = 0.285 \times P \times C_p$ , in which P is the amount of fish consumed per day and  $C_p$  is the Hg concentration in ppm in the fish muscle (Veiga, 1994). Thus, a person who eats 200 g of fish every day, as it is common in the Amazon, holding a concentration of 0.5 ppm of Hg (maximum concentration recommended by the World Health Organization), for example, should expect an approximate content of 30 ppm of Hg in their hair.*

*This is an approximation, since the mentioned equation depends on many variables related to the excretion and metabolism systems of each individual. Hg levels in Amazonian coastal population's hair are usually high (Malm et al., 1997). Hg hair levels below 5 and 10 ppm are acceptable to safeguard, respectively, the fetus (in case of pregnant woman) and the adult (Boischio and Henshel, 2000). Unfortunately, up to 84 ppm of Hg were analyzed in pregnant women's hair in the ?garimpo? region of Rio Madeira (Boischio and Cernichiar, 1998)?.*  
(VEIGA, SILVA and HINTON, 2002, p. 18)<sup>[32]</sup>

It is important to note that the toxic effects of mercury exposure are not systematically monitored by local health services, since health professionals are not trained to distinguish the toxicity of mercury in the context of endemic diseases in the region. This might be an explanation why the toxic effects caused by mercury exposure are not well documented in the Amazon.

## **6.6. ASGM's Formalization and Citizenship's Rescue**

Although required by Brazilian law as a precondition for the exercise of artisanal and small-scale mining, formalization is the major challenge for ASGM.

There are several reasons for the ASGM's non-formalization ? and sometimes this is a conscious option ?, which covers the lack of technical training, the limited access to information, the lack of technical capacity to meet the work's environmental and safety requirements, the intention to mine in prohibited places and to cheat the official gold trading routes to escape taxation and to keep access to the clandestine market that ravages Latin American gold production.

The National Inventory of Emissions and Releases of Mercury by Artisanal and Small-Scale Mining in Brazil explains:

*?GIATOC (2016) informs that illegally produced gold enters the international market after its true origin is hidden ("laundered"). After processed in the production region, the gold is transported to refiners who purify it to the qualities required by the end users. Latin American gold is usually shipped to refineries in the USA, Switzerland or Canada. GIATOC (2016) also indicates that the amount of exported gold reached 74 tons in 2013, of which 24% were exported to Switzerland and 44% to ?other countries?. It does not inform if this amount of gold comes only from ASGM or from large mining too. If it is only from ASGM, the 74 tons represent 6 (six) times more than what was declared in 2014, corroborating with the scenario of significant increase in the declared amount, as indicated by Seccatore et al. (2014)?.*

(CASTILHOS e DOMINGOS, 2018, Final Report, p. 15)<sup>[33]</sup>

Although potentially linked to prohibited practices, informality should not be immediately confused with criminality.

Informality in this context is most often mild illegality, a disagreement with the legal condition of registration that authorizes the exercise of this economic activity. This is very different from a so-called 'illegality' (in the lay sense of the word), which is the contrary action to the legal prohibition, that in many cases constitutes a crime – mining in full-protection areas, for example.

It is a fact that formalization is an essential measure to allow the Government to ensure the necessary legal conditions for artisanal and small-scale miners, guaranteeing their right to work and promoting technical assistance programs aiming at better economic management and work and environmental security. This would contribute to the enforcement of these miners' and the surrounding communities' human rights.

### **6.7. Legal Framework and Institutional Structure**

Artisanal and small-scale mining, especially 'garimpo', is the object of special consideration in the Brazilian Federal Constitution of 1988.

The Constitution, in its art. 20, Item IX, establishes that mineral resources are assets of the Union, including those of the subsoil, and as such the Union is responsible for legislating on the subject. One of the competences and obligations of the Union is 'to establish areas and conditions for the exercise of the mining activity, in associative form' (art. 21, XXV), as well as one of the general principles of the economic activity is that 'the State will favor the organization of gold mining activities in cooperatives, considering the protection of the environment and the economic and social promotion of the 'garimpeiros' (art. 174, § 3).

The Constitution also establishes that the 'garimpeiro' cooperatives will have priority in the authorization or concession for research and mining of resources and deposits of 'garimpeiros' minerals (subject to artisanal and small-scale mining), both in the areas delimited by the Public Power, and in those they are already working.

Law 11.685/2008 instituted the 'Garimpeiro Statute', which gave better grounds to the Constitution, stating that 'the mining activity will be the object of public policies elaborated by the Ministry of Mines and Energy, which aim to promote its sustainable development' (art. 10.), define incentive mechanisms for associative artisanal mining and establish the duties attached to the activity:

*Art. 12. The 'garimpeiro', their cooperatives and the person who has entered into a Partnership Contract with 'garimpeiros', in any type of work, are obliged to:*

*I - recover degraded areas caused by their activities;*

*II - meet the provisions of the Mining Code; and*

*III - comply with the current legislation in relation to safety and health at work?.*

*(Law 11.685/2008, art. 12)*

The mining regulation is generally based in the Mining Code (Decree-Law 227/1967), which gather the general norms of the mining activity, and mainly by Law 7,805/1989 establishes the 'Panning' Mining Permission regime (PLG).

Law 7,805/1989 redefined the concept of gold mining, moving away from legal concepts related to the rudimentary and individual form of work, and conditioning the activity to several requirements, the main ones being:

i. it will be granted to a Brazilian or a 'garimpeiros' cooperative with authorization to work as a mining company;

- ii. the permissioned area may not exceed 50 (fifty) hectares, except when granted to a ?garimpeiros? cooperative;
- iii. it will be required prior environmental licensing, granted by the competent environmental agency;
- iv. it will be required the Municipality?s consent for the activities undertaken in urban areas;
- v. the permission will be valid for 5 (five) years, and might be renewable for equal periods (if the legal requirements are being followed);
- vi. the execution of mining works must comply with technical and regulatory standards, issued by the National Mining Agency (ANM) and the competent environmental agency;
- vii. the execution of mining works must adopt measures to protect the environment, for example to avoid embezzlement and to treat fresh water.

Decree 97,507/1989 conditions the use of metallic mercury and cyanide in the ASGM to previous specific environmental licensing (art. 2, ? 1 and 2) and Decree 9,406/2018, among others issues, regulates the Mining Code and sanctions for violations of mining legislation.

As established in the legislation (Decree 9,675/2019, art. 15 of Law 7,805/1989 and art. 174, ? 3, of the Federal Constitution), the institutional structure responsible for mining activities, including artisanal and small-scale, has the Ministry of Mines and Energy, through the Secretariat of Geology, Mining and Mineral Transformation, as the highest agency for planning and guiding public policies, and the National Mining Agency - ANM (successor to the National Department of Mineral Production - DNPM), as an executive and inspection body.

### **6.8. Perspectives of Artisanal and Small-Scale Gold Mining in Brazil and the Use of Mercury in this Activity**

Although it was considered that mining in Brazil would be an extinguished activity in the middle of the first decade of the 21st century, recent economic data point to a strong resumption of the activity and a growth perspective for the coming years. This is due to a worldwide trend characterized by the constant and consistent increase in commercialization prices of precious metals (increased benefit).

In this sense, as expressed in Figure 5, the ASGM?s attractiveness has grown over the past few years.

International gold prices have increased ? the annual average peak price per ounce in the 2010-2019 decade was USD 1.668.66 in 2012, an increase of 660% if compared to the minimum price in the 2000-2009 decade, which was USD 271.04 in 2001. The average international price of gold per troy ounce in the 2000-2009 decade was USD 427.02 and in the 2010-2019 it was USD 1.267.66.

As a result, in 2011 one gram of gold in the domestic market was equivalent to about 290% of the monthly minimum wage, which was a highly attractive factor for the ?garimpo?. Thus, even if it is common to pay the expenses in gold in artisanal or small-scale gold extraction isolated sites, which results in the consumption of pretty much everything that is obtained, it is tempting for the ?garimpeiro? to exercise the activity with the purpose to obtain from 50g to 200g of metal per month, instead of other less promising activities.

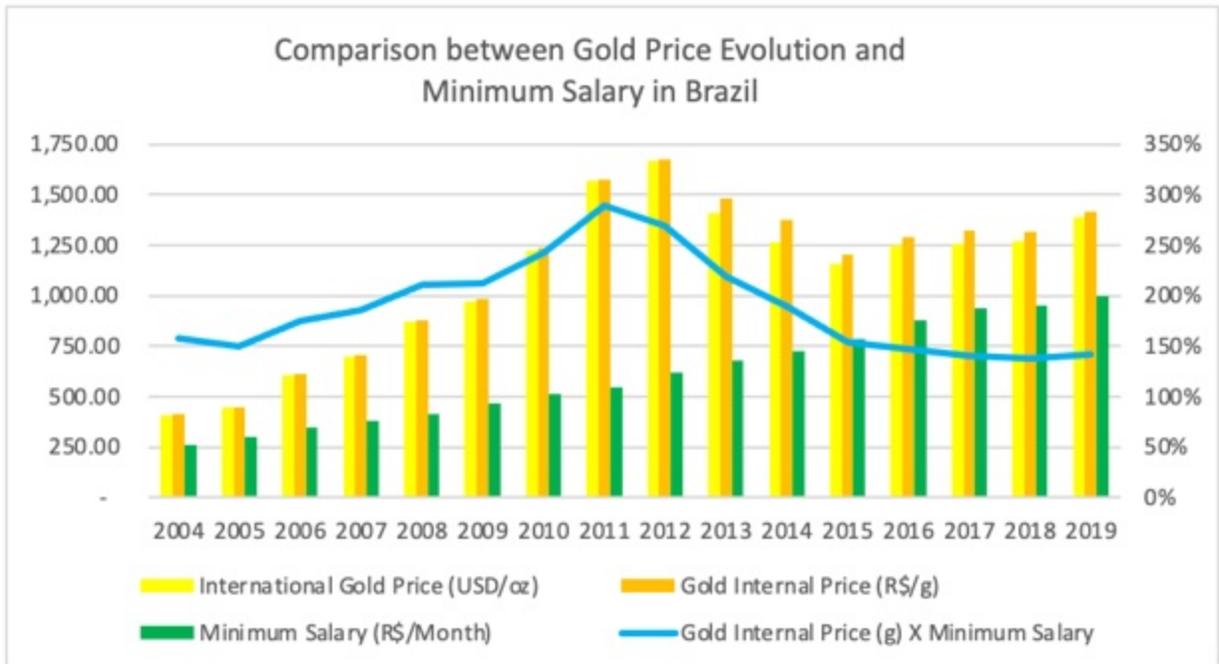


Figure. 5. Comparative framework between the gold price and the minimum wage in Brazil.

The prospect of increased demand for gold mining activity is confirmed at some extent by official statistics.

The official gold production from ASGM shows a consistent evolution regarding the precious metals? price evolution, noting, of course, a certain reaction delay of 1 or 2 years, as shown in figure 6. However, the actual production is even higher since the clandestine portion is probably much higher than the official one.

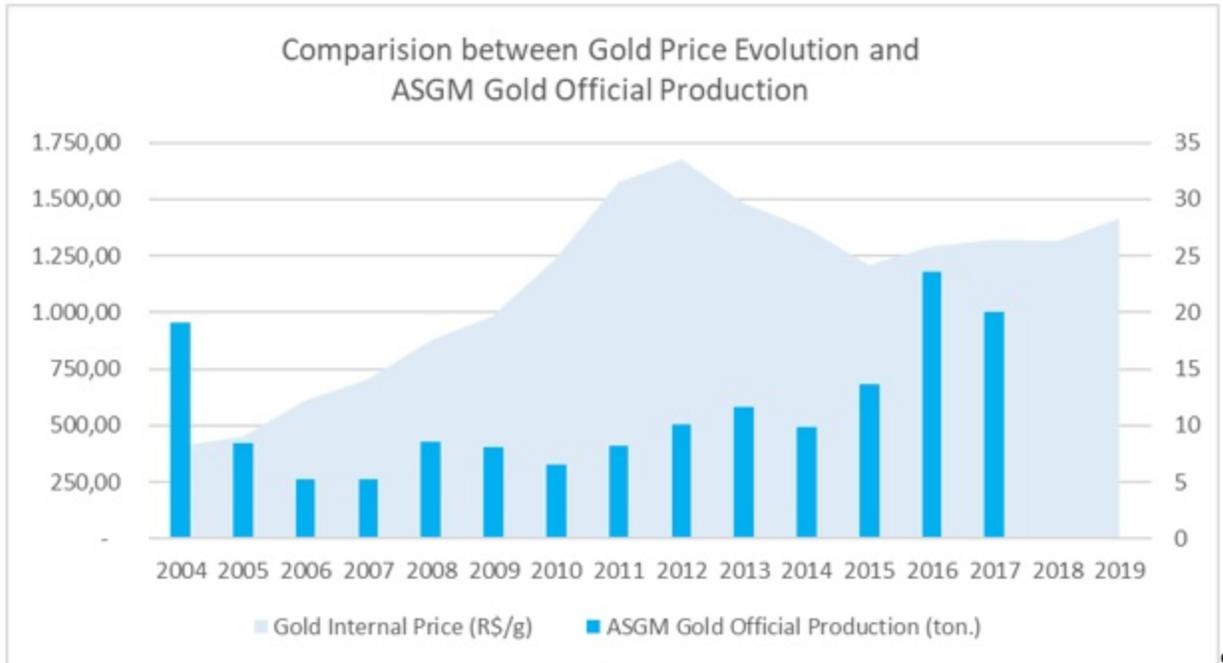


Figure. 6. Comparative framework between gold price and gold production in ASGM.

Data from the Brazilian Cooperatives Organization (OCB), a private body legally defined as representative of all cooperatives in Brazil has shown an increased number of mining cooperatives and cooperative members (figure 7.). Nonetheless, the numbers have also shown the high degree of informality of the sector when it considered the disparity between the number of registered members and the estimated number of artisanal and small-scale miners.

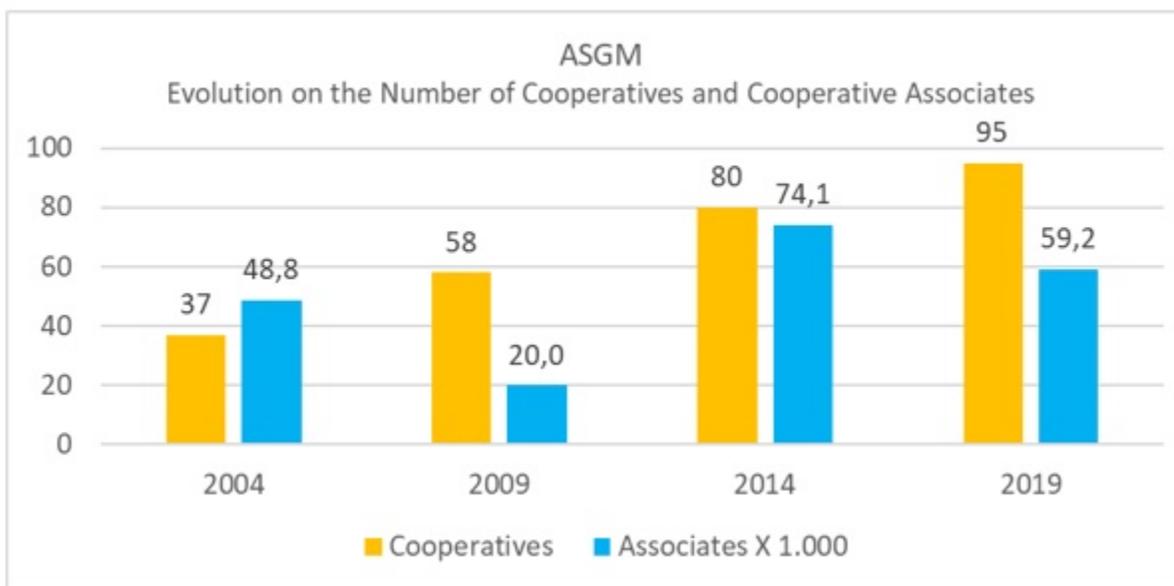


Figure. 7. Evolution on the number of mining cooperatives and their associated members.

Considering that this increase is significant even in the worst-case scenario of ASM's gold production, it is reasonable to conclude that ASM and the use of mercury for amalgamation in this activity will continue to be significant in Brazil in the next years.

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[4] CCCB/CRCE, Centro Coordinador Convenio Basilea-Centro Regional Convenio de Estocolmo para América Latina y el Caribe; PNUMA/ORLAC, Programa de las Naciones Unidas para el Medio Ambiente / Oficina Regional para América Latina y el Caribe. El Convenio de Minamata sobre el Mercurio y su implementación en la región de América Latina y el Caribe [the Minamata Convention on Mercury and its implementation in the Region of Latin America and the Caribbean]. Montevideo, Uruguay: UNEP/CCCB/CRCE, Apr. 2014.

[5] During the execution of this project, gender equality will be carefully observed, including in managerial positions and access to training. Thus, during its execution, this project will also contribute to SDG 5.5, indicator 5.5.2.

[6] It is important to note that due to the teratogenic and carcinogenic effects of mercury, the reduction of emissions of this metal may also positively influence the indicators 3.2.1, 3.2.2, and 3.4.1.

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## **B. ENABLING ACTIVITY GOALS, OBJECTIVES, AND ACTIVITIES**

The proposal should briefly justify and describe the project framework. Identify also key stakeholders involved in the project including the private sector, civil society organizations, local and indigenous communities, and their respective roles, as applicable. Describe also how the gender equality and women's empowerment are considered in project design and implementation

The goal of this project is that Brazil reduces, and where feasible eliminates, the use of mercury and mercury compounds, and the emissions and releases to the environment of mercury from ASGM gold mining and processing through the development of a NAP in accordance with Article 7 and Annex C of the Minamata Convention.

The project objective is to assist Brazil in the development of its NAP, raise national awareness on the Minamata Convention and build initial national capacity for the early implementation of the NAP and the Minamata Convention.

The project framework follows the guidance on the preparation of NAPs by parties addressing the issue of artisanal and small-scale gold mining that is more than insignificant, as agreed at the first meeting of the Conference of the Parties<sup>[1]</sup>. The guidance has been developed with the intention of addressing ASGM in a holistic manner and includes a review of legal, educational, economic, regulatory and enforcement frameworks, and provides guidance on developing budgets and workplans and identifying potential sources of funding and partners.

### **1. Project Components and Activities:**

The NAP development has three components, which consist of the outputs and activities indicated below.

#### ***Component 1: Global Technical Support for NAP Development***

The UNEP Global Mercury Partnership has successfully supported countries globally on the development of their NAPs. As a result of the previous NAP projects, a roster of international, regional and national experts on NAP development and implementation was developed. The roster lists over 70 experts in eight areas of ASGM expertise: (i) technical aspects of gold recovery, (ii) formalization, (iii) baseline estimates and inventories, (iv) mercury supply and trade, (v) public health, (vi) awareness raising and outreach in ASGM communities, (vii) market mechanisms for the mercury-free gold, and (viii) gender issues/ child labour. The roster contains experts with diverse regional experience, ranging from Latin America, to Africa, Central and East Asia and Southeast Asia, speaking over 20 languages (including English, French, Spanish, Swahili, Portuguese, Arabic).

A key set of tools and methodologies has also been developed in response to country needs as listed below:

- 1) **ASGM Inventory Toolkit** ? methodology to collect and analyse the ASGM baseline data;
- 2) **Mobile data collection tool** ? to store and manage the collected ASGM data;
- 3) **MapX platform for NAPs** ? to map and monitor the collected ASGM data and to facilitate knowledge management and information exchange;
- 4) **Handbook** for Developing National **ASGM Formalization Strategies** within National Action Plans;
- 5) **Quick Start Guide for managing mercury trade** in Artisanal and Small-Scale Gold Mining, to fulfil obligation under Minamata Convention National Action Plan?;
- 6) **Illustrated Guide to mercury free ASGM** ? an interactive, online guide that synthesizes and connects existing information on mercury-free practices in the ASGM sector;
- 7) Other outreach materials such as a guidance on the application of available gender toolkits will be developed.

Experts from different regions were trained on the use of the NAP guidance and were supported on its application. Finally, government representatives were invited to participate in information exchange groups on the national institutional and regulatory framework needed to support the implementation of the Minamata Convention in the ASGM sector.

Through this project Brazil will also benefit from the support of the UNEP Global Mercury Partnership.

#### Expected Outputs and activities:

1.1 Initial training and guidance provided to relevant stakeholders in Brazil to develop and implement a NAP as per Annex C of the Minamata Convention.

*1.1.1 Enhance the existing roster of experts; collection and development of tools and methodologies for NAP development;*

*1.1.2 Quality check of the NAP project products including e.g. national overview of the ASGM sector, draft of the NAP document and the final quality check by an independent consultant;*

*1.1.3 Technical support and capacity building on key elements of the NAP as needed, including e.g. baseline inventories of mercury use in ASGM;*

*1.1.4 Knowledge management and information exchange through the UNEP Global Mercury Partnership website and or Partners websites and tools;*

*1.1.5 Final regional workshop to identify lessons learned and opportunities for future cooperation in the NAP implementation.*

### **Component 2: NAP development**

#### **Step 1: Establishing a coordinating mechanism and organization of process**

The successful development of the NAP will rely on the establishment of a National Coordination Mechanism (NCM). The members of the NCM will be both technical and political, which is necessary to ensure stakeholder involvement throughout the project implementation. The National Coordination Mechanism should include members from relevant government ministries or departments. The NCM will be formalized at the project inception phase considering the available legal options.

The formalized NCM will increase the institutional capacity of the Brazilian Government by providing a common space for communication between government and society. It will also foster more cohesion between the NAP and the public policies of the various ministerial portfolios involved.

The National Coordination Mechanism will identify a Stakeholder Advisory Group (SAG) of stakeholders who possess relevant knowledge and information, and whose collaboration and cooperation will be needed for the successful formulation and implementation of the NAP. The Stakeholder Advisory Group will include relevant members of civil society with experience and knowledge in the ASGM sector. The National Coordination Mechanism will engage with the advisory group at regular intervals and during all phases of the NAP development and direct feedback on the NAP will be provided through a mechanism to be agreed upon by the National Coordination Mechanism in the inception meeting. A list of suggested members of the NAP National Coordination Mechanism and of the stakeholders' advisory group can be found at pages 21-22 to the guidance document. Key agencies involved in other related projects and activities will also be included to ensure a coordinated effort for ASGM management.

***Step 2: Communication strategy and awareness plan implemented throughout the duration of the project***

The NAP implementation is expected to have a significant social impact, bringing about a change in production practices that have been universally adopted for centuries in Brazil. The effectiveness of the NAP implementation requires a communication strategy and awareness raising to enable, nurture and sustain this change. A fundamental aspect of this plan will be the elimination of negative prejudices of the population related to artisanal miners, raise awareness on the distinction between legal, irregular and illegal ASGM, and requirements and legal mechanisms to achieve the full legality of the activity.

A campaign manager will be hired to develop a communication strategy and awareness raising plan and monitor its implementation.

The project inception phase will:

- (i) formalize the NCM and clearly define the relative roles and responsibilities of its members;
- (ii) agree on the budget allocation and work plan for the project;
- (iii) develop a communication strategy and awareness raising plan on mercury use in ASGM and its environmental and health impacts to be implemented throughout the whole project;
- (iv) develop a gender analysis during inception to develop a clearer understanding of the gender roles and underlying socio-economic conditions;
- (v) develop a gender strategy to be implemented throughout the project;
- (vi) develop a capacity building plan for more effective participation of key stakeholders in the development of the NAP;
- (vii) pre-assessment of the NAP acceptance.

***Step 3: Developing a national overview of the ASGM sector, including baselines estimates of mercury use and practices developed as part of the mercury inventory activity***

Brazil will develop a national overview of the ASGM sector with information on the following:

- ? Legal and regulatory status of ASGM;
- ? Policies surrounding ASGM at the local, national and levels;
- ? Baseline estimates of mercury emissions and releases from the ASGM sector;
- ? Structure of the ASGM sector disaggregated by sex and age (i.e., single family miners, community mines, etc.);

- ? Geographic distribution of ASGM, including potential future areas of exploitation;
- ? Economics, such as earning per capita, mercury supply, use and demand, information on gold trade and export, cost of living, access to finance for miners, social welfare options for miners and their communities;
- ? Size of the formal and informal ASGM economy including relevant information from other countries that share the Amazon Basin with Brazil;
- ? Information on mining practices, including information on ore bodies exploited, processes used, the amount of mercury used, the number of people directly involved in ASGM and indirectly exposed to mercury (disaggregated by sex and age);
- ? Information on the location and demographics of ASGM miners that operate without the use of mercury and the techniques that they use;
- ? Assessment of gold mining techniques adopted by ASGM miners;
- ? Information on gold processing practices/burn off of mercury in gold processing shops or community retorts;
- ? Known information on mercury level of the environmental media (as baseline data), overall environmental impacts, contaminated sites, mercury releases in soil, air and water, including distribution relative to population centres. The baseline data should distinguish between areas of geochemical anomaly with a naturally high concentration of mercury and cases of anthropic contamination;
- ? Assessment of techniques and opportunities for the remediation of contaminated areas available in Brazil;
- ? Studies and other information on mercury exposure, through various media, and studies on impacts in ASGM communities and downstream communities (disaggregated by sex and age). Information on how cases of acute or chronic mercury poisoning are notified and monitored and any eventual health education programmes;
- ? Information about access to technical assistance for miners;
- ? Leadership and organization of ASGM at national and local levels;
- ? Assess the economic mechanisms to encourage formalization in ASGM; reduce illegal mercury trade and the adoption of mercury free gold certification;
- ? Experiences in addressing worst practices in ASGM;
- ? Assess the feasibility of alternatives for replacing or at least reducing mercury use, emissions and releases in ASGM;
- ? Information gaps at the local and national scale that can be addressed;
- ? Mercury Distribution Networks, including relevant information from other countries that share the Amazon Basin with Brazil.

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#### Step 4: **Setting goals and objectives**

Based on the results of the national overview of the ASGM sector, national workshops will be organized with the executing body and the stakeholders? advisory group to agree on:

- ? Final problem statement, goals, objectives and reduction targets;
- ? Implementation strategy with specific activities for each of the NAP elements described in Annex C of the Minamata Convention. The NAP will be linked as often as possible to high level national development goals and initiatives, such as poverty reduction strategies and Sustainable Development Goals-based National Development Plans. The NAP will identify potential negative social and cultural

impacts of their implementation as livelihoods impairment and will identify alternatives to avoid these negative impacts;

? Workplans, outreach plans, timelines and overall budgets for the implementation of the plans and their periodical review;

? Identification of roadmaps for NAP endorsement and submission.

The NAP should reflect the national reality and meet country needs for the implementation of the Minamata Convention.

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Expected Outputs and activities:

#### 2.1. NAP developed as per Annex C of the Minamata Convention

*2.1.1. National Inception workshop to be an initial milestone for publicizing the project and engaging members of the National Coordination Mechanism and key stakeholders. Among its objectives are included the exposition and the debate on topics such as (i) objectives and structure of the NAP; (ii) establishing a common vision regarding ASGM; (iii) establishing a general framework for coordinating actions, defining the mission of each partner; (iv) awareness raising strategy on mercury use in ASGM and its environmental and health impacts to be implemented throughout the whole project; (v) gender strategy to be implemented throughout the project; (vi) capacity building plan for a more effective participation of key stakeholders in the development of the NAP.*

*2.1.2. Organize four awareness raising workshops and consultations with key stakeholders and target groups ((i) ASGM's vision of its social and economic perspectives; (ii) ASGM's vision of alternatives to reduce or eliminate the use of mercury and better environmental control; (iii) public health and occupational safety at ASGM; (iv) formalization and advances in ASGM normative regulation);*

*2.1.3. Development of the national overview of the ASGM sector according to the NAP guidance;*

*2.1.4. Development of draft NAP;*

*2.1.5. Organize national consultations with the National Coordination Mechanism and the target population, to raise awareness, and agree on a roadmap for NAP endorsement and submission to the Minamata Secretariat;*

*2.1.6. Submit the endorsed NAP to the Minamata Secretariat.*

### **Component 3: Monitoring and Evaluation**

Day-to-day project management and monitoring will be the responsibility of the Executing Agency in close cooperation with the Ministry of Mines and Energy. The project monitoring will start with the national inception workshop and the development of a detailed workplan, budget and detailed monitoring and evaluation plan with key stakeholders. The Executing Agency will meet bi-annually with the National Coordination Mechanism to coordinate actions and evaluate the results of the project. The Executing Agency will develop and submit to UNEP technical and financial reports every quarter describing the progress according to the workplan and budget, identifying obstacles occurred during implementation and the remediation actions to be taken.

UNEP will monitor the project progress according to the workplan on a regular basis and provide guidance to the Executing Agency to progress according to the workplan. Yearly during the GEF PIR UNEP will provide information about the status of the project implementation and the disbursements made.

Monthly calls between the Executing Agency and the Implementing Agency will be agreed upon if the project is not progressing according to the work plan.

The terminal report and final statement of accounts developed by the Executing Agencies at the end of the project closes the Executing Agencies monitoring activities for this project. The final financial audit

will review the use of project funds against budget and assess probity of expenditure and transactions. The final audit is to be developed by an independent audit authority (a recognized firm of public accountants or, for governments, a government auditor). The final audit is to be sent to UNEP up to six months after the technical completion of the project.

Templates for the quarterly progress and financial report, terminal report and final statement of accounts will be provided by UNEP. There is no template for the final financial audit.

A preliminary assessment of the effectiveness of the NAP implementation will also be developed by the Executing Agency. The preliminary assessment will be translated to Portuguese, Spanish and English and shared widely to share experiences but also strengthen the collaboration with neighboring countries in dealing with the challenges of the use of mercury in ASGM.

An independent terminal review (TR) will take place at the end of project implementation, latest 6 months after completion of the project. An independent consultant will be responsible for the TR and liaise with the UNEP Task Manager at the Chemicals and Health Branch of the Economy Division throughout the process. The TR will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP and executing partners ? FDTE and MME in particular. The direct costs of the review will be charged against the project review budget. The TR report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the independent consultant in an open and transparent manner. Project performance will be assessed against standard review criteria using a six-point rating scheme. The final determination of project ratings will be made by the independent consultant when the review report is finalised. The review report will be publicly disclosed and will be followed by a recommendation compliance process.

#### Expected outputs and planned activities:

3.1 Status of project implementation and probity of use of funds accessed on a regular basis and communicated to the GEF.

3.1.1 *EA organizes bi-annual meetings with the National Coordination Mechanism;*

3.1.2 *EA develops and submit technical and financial reports quarterly to UNEP using UNEP's templates;*

3.1.3 *UNEP communicates project progress to the GEF yearly during the PIR using GEF's template;*

3.1.4 *Develop and submit terminal report and final statement of accounts to UNEP at project end;*

3.1.5 *Submit final financial audit to UNEP.*

3.2 Independent terminal review developed and made publicly available.

3.2.1 *Preliminary assessment on the NAP effectiveness developed and translated in English and Spanish;*

3.2.2 *Independent consultant carries out the terminal review upon the request of the UNEP Task Manager and make it publicly available in the UNEP website.*

## **2.Project Stakeholders:**

At the international level, the project will include:

**INTERNATIONAL STAKEHOLDERS**

**Institution**

**Main forms of Contribution**

Amazon Cooperation Treaty Organization (ACTO))

ACTO brings together diplomatic representatives from the eight countries that have territories that integrate the Amazon basin with the objective of promoting the integral development of the region and the well-being of its populations.

It executes numerous projects in areas such as the environment, indigenous affairs, water resources, science and technology, health, tourism and social inclusion, among them the project "Regional Action in the Area of Water Resources" (Projeto Amazonas), coordinated by the National Water Agency (ANA) since 2012. The project includes regional technical meetings and training courses in water resources management in the Amazon basin.

The issue of the use of mercury in the ASGM sector is among the themes emerging from its agenda. ACTO could greatly assist in the approximation and exchange of experiences between Amazonian nations on this topic.

UNEP Chemicals and Wastes ? GEF Unit- Economy Division (UNEP ? CHB ? GEF Unit)

UNEP is the only United Nations organization with a mandate derived from the General Assembly to coordinate the work of the United Nations in the area of environment and whose core business is the environment. UNEP Chemicals and Health is the UNEP Branch that works specifically to minimize the adverse effects of chemicals and waste on human health and the environment. The implementation of this project contributes directly to reach the main mandate of the Branch.

UNEP-CHB-GEF Unit will co-Implement the project with the UNEP-Brazil office. As such will be in charge of all the communications with the GEF and provide technical and administrative supervision to the UNEP-Brazil Office).

UNEP Regional Office for Latin America and the Caribbean (UNEP ROLAC)

UNEP has six regional offices supporting different groups of countries in their efforts towards sustainable development. The UNEP Regional Office for Latin America and Caribbean based in Panama will identify opportunities for regional synergies and areas of cooperation. Some examples may include: coordination of regional information exchange and provision of documents and inventories from other countries in the region, identification of regional experts, etc;

Global Mercury Partnership (GMP)	The overall goal of the Global Mercury Partnership is to protect human health and the global environment from the release of mercury and its compounds by minimizing and, where feasible, ultimately eliminating global, anthropogenic mercury releases to air, water and land. The Partnership works closely with stakeholders to assist in the effective implementation of the Minamata Convention on Mercury. Reducing mercury in Artisanal and Small-scale Gold Mining is one of the eight Partnership areas, and will support the implementation of the project by facilitating the access to resources and experts identified or developed by the Partnership.
Minamata Convention Secretariat	Based in Geneva, Switzerland, exert the Secretariat role of the Minamata Convention according to Article 24. The Minamata Convention Secretariat will be regularly informed on the progress in the implementation of the project to be able to identify opportunities to facilitate assistance to Parties in the implementation of the Convention.

The international partners will provide ongoing support to the project and their engagement will be discussed and agreed upon in the inception meetings.

National stakeholders involved in the NAP National Coordination Mechanism and Stakeholder Advisory Group:

*Table 2: Preliminary list of partners to be considered for the National Coordination Mechanism*

<b>National Coordination Mechanism</b>	
<b>Government/Ministries</b>	<b>Responsibility/areas of expertise</b>
Ministry of Mines and Energy (MME)	<p>Executing Agency</p> <p>Ministerial body responsible for public policies related to mining, among others.</p> <p>Proposition of regulatory standards for the mineral sector, including those related to the formalization of ASGM.</p> <p>Consolidation of statistical data on the mining sector, in particular ASGM.</p>
Ministry of the Environment	<p>Ministerial body responsible for public policies related to the environment, including the control of the use of chemical substances and production processes.</p> <p>Proposition of environmental regulatory standards, including those related to chemical safety and the use of mercury and any other substances.</p> <p>Consolidation of strategic environmental data.</p>

Ministry of Health	<p>Ministerial body responsible for public policies related to public health, including health surveillance, which includes monitoring human exposure to mercury.</p> <p>Proposition of regulatory standards for warning and response to human mercury contamination.</p> <p>Orientation of health education policies.</p>
Ministry of Economy	<p>Ministerial body responsible for public policies related to planning, economic development, industry, foreign trade and labor relations (including medicine and safety at work), among others.</p> <p>Proposition of regulatory standards in all its areas of operation, in particular market-based mechanisms for reducing the use of mercury, foreign trade and work safety.</p>
Ministry of Science, Technology, Innovations and Communications	<p>Ministerial body responsible for national policies for scientific and technological research and for encouraging innovation, among others.</p> <p>Proposition of regulatory standards in the areas of expertise, in particular, biosafety.</p>

*Table 3: Preliminary list of partners to be considered for the Stakeholder Advisory Group*

<b>Institution</b>	<b>Main forms of Contribution</b>
Relevant Ministries	Justice and Public Security; Education; Regional Development; Defense.
National Mining Agency (ANM)	<p>Institution linked to the Ministry of Mines and Energy with the function of regulating mining activity, including ASM.</p> <p>The body has a relevant role in the formalization of ASGM.</p>
Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA)	<p>Institution linked to the Ministry of Environment with the function of regulating the environmental licensing of productive activities at the federal level</p> <p>Agency responsible for controlling the import and sale of dangerous chemical substances such as mercury.</p>
Oswaldo Cruz Foundation (FIOCRUZ)	Institution of research and development in biological sciences linked to the Ministry of Health, considered one of the main world institutions of research in public health.
Jorge Duprat Figueiredo Foundation for Occupational Safety and Medicine (FUNDACENTRO)	Research and studies institution related to safety, hygiene and occupational medicine, linked to the Ministry of Economy.

<p>Mineral Technology Center (CETEM)</p>	<p>Research unit of the Ministry of Science, Technology and Innovations and Communications (MCTI) with expertise in the areas of mining technologies, environmental recovery of contaminated soils and mined areas, circular economy in the mineral industry and environmental and socioeconomic impacts of mining.</p>
<p>Police and customs inspection bodies (Federal Police of Brazil and Federal Revenue of Brazil)</p>	<p>Bodies specialized in the control and inspection of the entry of products and tradable substances, including mercury, in national ports and airports.</p>
<p>Governments of the Federated States</p>	<p>The participation of public organizations and agencies related to environmental inspection and licensing and mining activities of the federal states where the ASGM activity with the use of mercury occurs is essential for coordinated and harmonious actions, even in matters of exclusive federal competence.</p> <p>It is essential for the success of the NAP to deepen the understanding of the demands and weaknesses of the governments of the federated states, as well as to share their knowledge and experience.</p>

<p>Garimpeiro's organizations (Cooperatives and Associations)</p>	<p>COOGAVEPE (Cooperative of Garimpeiros in Vale do Rio Peixoto);  FECOGAT (Federation of Tapaj's Miner Cooperatives);  COOMIGASP (Mining Cooperative of Garimpeiros of Serra Pelada);  COMIDEC (Mixed Cooperative for the Development of Crepuriz'o);  COOGAMIBRA (Cooperative of Garimpeiros and Miners of Brazil);  COOMASPA (Cooperative Agro Mineral of Santa Luzia do Par?);  COOMIGAPA (Cooperative of Mining Garimpeiros of Par?);  COOMTAX (Tucum? and Alto Xingu Mining Cooperative);  COOPEROURI (Ouril?ndia and Region Garimpeiros Cooperative);  COOPERTRANS-ITAITUBA (Cooperative of Garimpeiros and Transgarimpeira of Moraes Almeida);  COOPOURO (Cooperative of Mining Garimpeiros and Gold Producers of Tapaj's);  COOPERSANTA (Santa Cruz Garimpeiros Cooperative);  CEMAL (Tin Mining Cooperative of the Legal Amazon);  COOGER (Cooperative of Garimpeiros of the State of Rond?nia);  COOGARIMA (Cooperative of Garimpeiros on the Madeira River); COOMIGA (Mining Cooperative of the Garimpeiros of Ariquemes);  COOGAM (Cooperative of Garimpeiros of Amazon);  COOEMFAM (Cooperatives of Family Mineral Extractors of Manicor?),  among others.</p>
<p>Organization of Cooperatives of Brazil (OCB)</p>	<p>Institution responsible for the promotion and defense of the Brazilian cooperative system.</p>
<p>Brazilian Mining Institute (IBRAM)</p>	<p>National private and non-profit organization that represents companies and institutions that operate in the mineral sector in search of the establishment of a favorable environment for business, competitiveness and sustainable development.</p> <p>It seeks to foster innovations in the sector and the dissemination of best practices and technologies available in the market, elaborates debates, events, studies, research and statistics related to the mineral economy, taxation, legislation, trends, protection of the environment, risks and opportunities and other topics associated with activities performed by the mining industry.</p>

### 3. Gender dimensions

In practice, gender mainstreaming means identifying gaps in gender equality using sex disaggregated data, developing strategies to close those gaps, putting resources and expertise into implementing strategies for gender equality, monitoring and implementation and holding individuals and institutions accountable for results. Gender mainstreaming is not an end in itself; is a process whose goal is to **achieve gender equality**<sup>[2]</sup> (Sustainable Development Goal 5).

While male miners typically outnumber female miners, many women also perform tasks in the ASGM process that may increase their risk of exposure to mercury. These jobs include pouring the mercury into the ball-mills or mixing the mercury in panning, and burning the amalgam, often with their children or babies nearby. In some countries, women also carry the rocks from the mining sites to the processing plants.<sup>[3]</sup> Moreover, with an estimated 4.5 million women working in artisanal mining worldwide, many of childbearing age, low-level exposure to infants during gestation and breast-feeding is a risk.<sup>[4]</sup> As a potent neurological toxicant that interferes with brain functions and the nervous system, mercury has been shown to be particularly harmful to neurological development of babies and young children.<sup>[5]</sup>

The collection of sex-disaggregated data throughout the project will complement the national statistics by shedding light on the gender aspects of ASGM, including a potential gender related discrimination in its social institutions. The project will also be sensitive to the government's efforts in reaching gender equality in Brazil and will actively promote women's empowerment in the project implementation and in the ASGM NAP.

The following activities will be implemented in the project to address the current gender data gaps and promote gender equality:

1. Development of a gender strategy to be implemented throughout the project: at the project inception, a strategy with SMART indicators aimed at gender mainstreaming throughout the project implementation at the national level will be developed. Key project stakeholders will follow a training on section 1 of the World bank Toolkit? Gender Dimensions of Artisanal and Small-Scale Mining?<sup>[6]</sup> for an introduction to gender and ASGM before working on the strategy. The purpose is to ensure national ownership over this process. Additional guidance will be developed by the Global Component.
2. Development of a quick Assessment of the Gender Dimensions of ASGM in Brazil: a national focal point will be identified to follow up on the implementation of the strategy and to gather the requisite information to assess the Gender Dimensions of Artisanal and Small-Scale Mining. The World bank Toolkit? Gender Dimensions of Artisanal and Small-Scale Mining? will be applied. Most of the information will be collected by the national consultants developing the national profile (activity 2.1.2) and back to back with national consultations and trainings (activity 2.1.4). The national focal point will collect the missing information. This assessment will inform the final NAP to ensure its implementation is not worsening existing inequalities but contributing to reduce them.

Below some of the elements that could be considered in the gender strategy:

- (i) What could prevent woman's participation in project meetings and trainings? How will the project facilitate the equitable access of men and women to information and training?

- (iii) What could prevent women's participation in the project's national coordination mechanism? How will the project be encouraging the equitable participation of men and women?
- (iv) How to ensure equity between man and women in the recruitment of consultants?
- (v) How to prevent that the NAP strategies promote a widened gap between man and women in Brazil; e.g. will women be able to participate effectively in cooperatives or have access to newly introduced mining tools considering women has restricted access to productive and financial resources in Brazil<sup>[7]</sup>?

<sup>[1]</sup> Available at: [http://www.mercuryconvention.org/Portals/11/documents/forms%20and%20guidance/English/ASGM\\_guidance\\_e.pdf](http://www.mercuryconvention.org/Portals/11/documents/forms%20and%20guidance/English/ASGM_guidance_e.pdf)

<sup>[2]</sup> <http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ec-library/chemicals-management/chemicals-management-the-why-and-how-of-mainstreaming-gender/Chemicals%20Management%20and%20Gender%20Mainstreaming.pdf>

<sup>[3]</sup> <http://www.wecf.eu/english/articles/2013/10/minamata-sideevent.php>

<sup>[4]</sup> See Telmer and Veiga (2009)

<sup>[5]</sup> See United States EPA (1997); Bose-O'Reilly et al. (2010)

<sup>[6]</sup> <http://siteresources.worldbank.org/INTOGMC/Resources/toolkit-web.pdf>

<sup>[7]</sup> 62% inequality. Percentages range from 0 to 100 with higher values indicating higher inequality.

### C. DESCRIBE THE ENABLING ACTIVITY AND INSTITUTIONAL FRAMEWORK FOR PROJECT IMPLEMENTATION

Discuss the work intended to be undertaken and the output expected from each activity as outlined in Table A

**Implementing Agency (IA):** This project will be co-implemented by UNEP-Brazil Office and UNEP Chemicals and Waste-GEF Unit. As Implementing Agency, UNEP-Brazil will be responsible for the overall project supervision, overseeing the project progress through the monitoring and evaluation of project activities and progress reports, including on technical issues. UNEP Chemicals and Waste-GEF Unit will be responsible for the communication with the GEF on the project and will oversee the work of the UNEP-Brazil office.

**Executing Agencies (EA):** The Fundação para o Desenvolvimento Tecnológico da Engenharia - FDTE will be the Executing Agency for this project under the coordination of the Ministry of Mines and Energy of the Federative Republic of Brazil. FDTE will manage and be responsible for the project and its activities on a day-to-day basis. It will establish the necessary managerial and technical teams to execute the project after approval by the Ministry of Mines and Energy. It will search for and hire any consultants necessary for technical activities and supervise their work. It will acquire equipment and monitor the project; in addition, it will organize independent audits in order to guarantee the proper use of GEF funds. Financial transactions, audits and reports will be carried out in accordance with national regulations and UNEP procedures. FDTE will provide regular administrative, progress and financial reports to UNEP. A Project Manager will be recruited by FDTE.

The Ministry of Mines and Energy will be responsible for coordinating project activities, approving the TORs of the management and technical teams, and supervising the work carried out by the consultants and partner institutions that perform them. The Ministry of Mines and Energy will be responsible for

authorizing expenses and the purchase of products and services within the scope of the project, always in accordance with the nature of the activities that make up the work plan and the schedule that makes up this project.

The Ministry of Mines and Energy will nominate:

- (i) a National Project Director (NPD): responsible for directing the execution of the project, including communication with the Implementing Agency and other partners;
- (ii) a Project General Coordinator (PGC): responsible for coordinating and monitoring the actions and activities of the project, including knowledge management, and will replace the NPD when necessary.

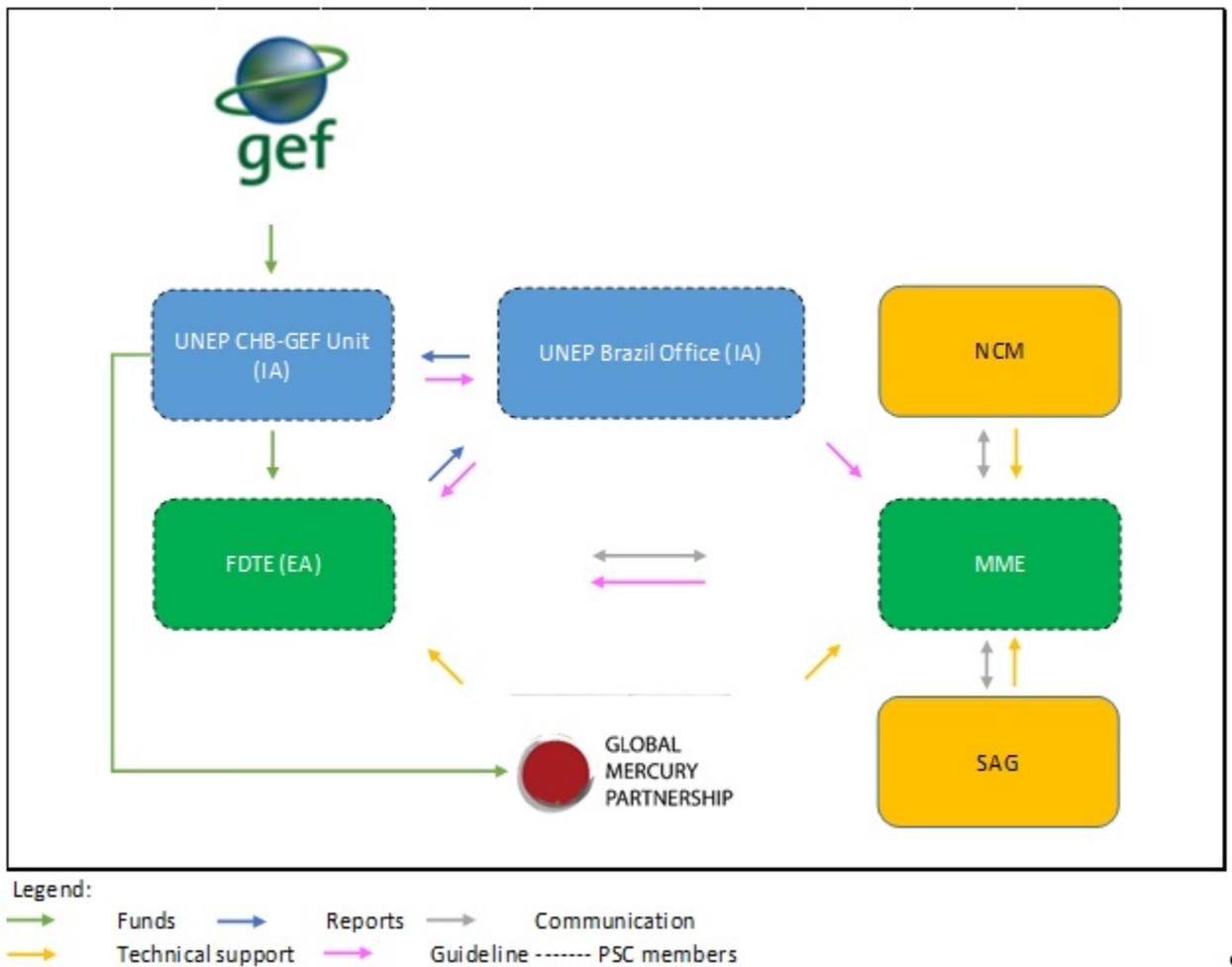
The Ministry of Mines and Energy be responsible for providing the necessary information for the preparation of progress reports and approving financial reports.

**Project Steering Committee (PSC):** will meet annually during the project implementation. The steering committee for this project will be made up of representatives from the Implementing Agency, and the Executing Agencies (FDTE and the Ministry of Mines and Energy). It will be the role of the project steering committee to decide on the proposal to the UNEP Economy Division and the GEF of any changes that may be necessary under the terms originally agreed, as well as to decide on the approval of the changes proposed by the GEF or the UNEP Economy Division.

**National Coordination Mechanism (NCM)** will meet regularly during project implementation. The Committee will include key national stakeholders and will evaluate the progress of the project and will take the necessary measures to guarantee the fulfillment of its goals and objectives. The NCM will take decisions on the project in line with the project objectives and these decisions will be implemented by Executing Agencies.

**Stakeholder Advisory Group (SAG):** This group will include relevant stakeholders who possess relevant knowledge and information, and whose collaboration and cooperation will be needed for the successful formulation and future implementation of the NAP. The NCM will engage with the advisory group at regular intervals and during all phases of the NAP development and direct feedback on these documents will be provided through a mechanism to be agreed upon by the NCM.

**Global Mercury Partnership (GMP):** The partnership works closely with stakeholders to assist in the timely ratification and effective implementation of the Minamata Convention. Reducing Mercury in ASGM is one of the partnership areas and it has supported countries in its efforts to reduce mercury uses and releases in the ASGM sector; eliminate the worst practices in ASGM and explore innovative market-based approaches to enable the transition away from mercury. The partnership will ensure Brazil has access to all the expertise and experience of its members to implement the project.



**Figure 8: Implementation arrangements**

**D. DESCRIBE, IF POSSIBLE, THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT**

The NAP implementation will be supported by the currently existing capacities and expertise in Brazil put in place during the MIA development with support from UNEP as the GEF Implementing Agency. Cost-effectiveness will be achieved through fully utilizing the infrastructures and human resources available in FDTE and MME.

The involvement of the International experts is limited to tasks that could not be accomplished by national consultants, e.g. review of technical documents, training in conduct of inventories. Suitably qualified research assistants will be identified locally through the local stakeholders. This will foster an increase in local and national capacity to manage mercury and contribute to the cost-effectiveness of the project through reduced consultancy fees and travel expenses.

FDTE, MME and UNEP’s project manager will ensure that only essential travel is undertaken and that where possible videoconferencing/Skype conference calls are utilized. For essential travel, FDTE will endeavour to maximize resources allocated for travel for workshops and necessary consultations, by booking in advance and travelling during low season, where possible.

The project global component will also identify needs across countries working with UNEP to propose common approaches that lead to reduced transaction costs.

**E. DESCRIBE, DESCRIBE THE BUDGETED M & E PLAN**

More detailed information about project monitoring and evaluation can be consulted in the project component 3 monitoring and evaluation.

*Table 4. Monitoring and Evaluation Budget*

<b>M&amp;E activity</b>	<b>Purpose</b>	<b>Responsible Party</b>	<b>Budget (US\$)*<sub>1</sub></b>	<b>Time-frame</b>
National inception and training workshops	Awareness raising, building stakeholder engagement, detailed work planning with key groups at the national level	EA	15,000	Within one month after the regional inception workshop
National inception reports	Provides implementation plan for progress monitoring at the national level	EA	0	Within two weeks following national inception workshop
Project Supervision and Monitoring	Technical and Administrative support provided on a regular basis ensuring that the project is being carried out according to the agreed work plan and budget	UNEP	0	Regularly
Technical Progress reports	Describes progress against annual work plan for the reporting period and provides activities planned for the next period	EA	0	Quarterly by 30 April covering

Financial Progress Reports	Documents project expenditure according to established project budget and allocations	EA	0	January to March; by 31 July covering April to June; by 31 October covering July to September; by 31 January covering October to December
Bi-annual meetings	Evaluate project progress with the members of the NCM, the national IA, MME and FDTE	EA	20,000	
Pre assessment of the NAP acceptance	It provides the latest diagnosis, to identify which NAP points are most sensitive to the various stakeholder groups and deserve specific planning of future actions for acceptance and engagement.	EA	0	Within four months following national workshop to introduce the NAP to the ASGM sector
Terminal report	Reviews effectiveness against implementation plan; Highlights technical outputs; Identifies lessons learned and likely design approaches for future projects, assess the likelihood of achieving design outcomes.	EA	0	Within one month of the project technical completion
Independent Financial Audit	Reviews use of project funds against budget and assesses probity of expenditure and transactions	Independent auditor recruited by the EA	0	Within 3 months of the project technical completion

Terminal evaluation	<p>Single report that reviews effectiveness, efficiency and timeliness of project implementation, coordination mechanisms and outputs;</p> <p>Identifies lessons learnt and likely remedial actions for future projects;</p> <p>Highlights technical achievements and assesses against prevailing benchmarks.</p>	Independent consultant recruited by UNEP	15,000	Within six months of the project technical completion
Total indicative M&E cost*1			50,000	

**F. EXPLAIN THE DEVIATIONS FROM TYPICAL COST RANGES (WHERE APPLICABLE)**

This proposal presents a budget significantly higher than the average of other projects for the preparation of the National Action Plans for ASGM, such as those presented by Paraguay, Guyana, Suriname, Peru and Chad.

The first reason for this difference is in the geographic and social dimension of the Project's scope:

? Spatially, there are more than 230 thousand km<sup>2</sup> of areas directly affected by mining, which spread over the 5.2 million km<sup>2</sup> of the Legal Amazon in Brazil. These areas are typically located in regions that are difficult to access, sometimes days away from the urban centers and possible bases of operation;

? In the human aspect, it is estimated that ASGM in Brazil directly employs 80,000 to 800,000 people, and the estimated impact of the project will affect the lives of at least 6.8 million people, with very different cultural aspects and social contexts that they can involve migrants and immigrants, traditional populations and minorities;

? In the sociological aspect, ASGM's activity in Brazil is quite heterogeneous in all its aspects. In relation to the techniques employed, for example, 16th century methods coexist with high technology and large scale typical of industrial mining. Labor and production relations are equally variable, with well-structured cooperative organizations at one end and clandestine activities and extremely exploratory work regimes at the other;

? In terms of the legitimacy of representation, there is also great diversity, evidenced by the almost 100 registered mining cooperatives (the 17 largest of which are key partners for project execution) and an at least equivalent number of unregistered associations.

The diagnosis of the situation of ASGM in the country, notably the identification of techniques that have to be banned and modernized, requires care and a significantly larger sample base in Brazil. Extrapolations from point data are highly discouraged because they could cause significant contexts to be disregarded for large regions, as previous studies cited in the justification for this project have pointed out.

For this reason, the project proposes a more intense field scientific activity than other projects with the same purpose, generating significant costs due to the distances and circumstances involved (including health care related to the context of Covid19), but which were carefully planned to represent the lowest possible expense. In this sense, for example, the travels will normally be made by land or in slow boats, to avoid costs of renting helicopters.

Another specific need of the project is linked to the articulation between the several key actors, in this context understood not only the dozens of cooperatives representing artisanal miners - who often have

conflicting views and interests - but also the different subnational governments involved (9 federal states and 772 municipalities), and other affected social segments.

Information, reflection, engagement and dialogue are essential for the success in establishing the goals for the National Action Plan. For this purpose, considering the context of the pandemic and the extrinsic costs of organizing and moving people to seminars, it is proposed establishing of specific articulation and communication plans that will be developed throughout projects duration. This obviously causes specific expenses, but that result in greater efficiency and savings compared to a traditional approach.

### Part III: Approval/Endorsement By GEF Operational Focal Point(S) And GEF Agency(ies)

#### A. Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s):

<b>Focal Point Name</b>	<b>Focal Point Title</b>	<b>Ministry</b>	<b>Signed Date</b>
Mr. Marcus Cesar Ribeiro Barretto	General Coordination of External Financing	Ministry of Economy	8/3/2021

## B. Convention Participation

Convention	Date of Ratification/Accession	National Focal Point
Minamata Convention	8/8/2017	Mr. Luiz Vicente Vicentin Aguilar

## ANNEX A: Project Budget Table

Please attach a project budget table.

UNEP BUDGET LINE/OBJECT OF EXPENDITURE			BUDGET ALLOCATION BY PROJECT COMPONENT/ACTIVITY				
			Component 1	Component 2	Component 3	Project Management	Total
		Global Technical Support for National Action Plan Development		National Action Plan development	Monitoring and Evaluation		
UC	BL	Budget Line Description	US\$	US\$	US\$	US\$	US\$
<b>010</b>	<b>10</b>	<b>PROJECT PERSONNEL COMPONENT</b>					
	<b>1100</b>	<b>Project Personnel</b>					
	1101	Project coordinator	-		-	69,000.00	69,000.00
	1102	Project assistant	-		-	15,900.00	15,900.00
	1199	Sub-Total	-		-	84,900.00	84,900.00
	<b>1200</b>	<b>Consultants w/m</b>					
	1201	International consultants	-		-	-	-
	1202	National consultants for national activities	-	604,000.00	-	-	604,000.00
	1299	Sub-Total	-	604,000.00	-	-	604,000.00

	<b>1300 Administrative Support</b>		-			
	1301 Support staff	-	-	-	-	-
	1399 Sub-total	-	-	-	-	-
	<i>Personnel Sub-Total (1100+1200+1300)</i>	-	604,000.00	-	84,900.00	688,900.00
<b>160</b>	<b>TRAVEL COMPONENT</b>		-			
	<b>1600 Travel on official business</b>		-			
	1601 Travel Project coordinator / staff / experts	-	70,200.00	-	-	70,200.00
	1699 Sub-Total	-	70,200.00	-	-	70,200.00
	<b>1999 Component Total</b>	-	<b>674,200.00</b>	-	<b>84,900.00</b>	<b>759,100.00</b>
<b>120</b>	<b>20 SUB-CONTRACT COMPONENT</b>		-			
	<b>2100 Sub-contracts (UN organizations)</b>		-			
	2101 UN Sub-contract (managed by UNEP)	50,000.00	-	-	-	50,000.00
	2199 Sub-Total	50,000.00	-	-	-	50,000.00
	<b>2200 Sub-contracts (SSFA, PCA non-UN)</b>		-			
	2201 Subcontract for national implementation	-	-	-	-	-
	2299 Sub-Total		-			-
	<b>2999 Component Total</b>	<b>50,000.00</b>	-	-	-	<b>50,000.00</b>
	<b>30 TRAINING COMPONENT</b>		-			
	<b>3200 Group Training (field trips, WS, etc)</b>		-			
	3201 Training on inventory development for the ASGM	-	-	-	-	-
	3299 Sub-Total	-	-	-	-	-
	<b>3300 Meetings/Conferences</b>		-			
	3301 Inception workshop	-	-	15,000.00	-	15,000.00
	3302 Final workshop for NAP endorsement	-	20,000.00	-	-	20,000.00
	3303 National Coordination Meetings	-	-	20,000.00	-	20,000.00

	3399 Sub-Total	-	33,920.00	35,000.00	-	55,000.00
	<b>3999 Component Total</b>	-	<b>33,920.00</b>	<b>35,000.00</b>	-	55,000.00
	<i>Contractual Services Sub-Total (2100+2200+3200+3300)</i>	<i>50,000.00</i>	<i>33,920.00</i>	<i>35,000.00</i>	-	<i>105,000.00</i>
<b>130</b>	<b>40 EQUIPMENT AND PREMISES COMPONENT</b>		-			
	<b>4100 Expendable equipment (under US\$ 1,500)</b>		-			
	4101 Operational costs	-	85,040.00	-	-	85,040.00
	4199 Sub-total	-	85,040.00	-	-	85,040.00
<b>135</b>	<b>4200 Non expendable equipment</b>		-			
	4201 Computer, fax, photocopier, projector	-	-	-	-	-
	4202 Software	-	-	-	-	-
	4299 Sub-total	-	-	-	-	-
	<b>4999 Component Total</b>	-	<b>85,040.00</b>	-	-	<b>85,040.00</b>
<b>125</b>	<b>50 MISCELLANEOUS COMPONENT</b>		-			
	<b>5200 Reporting costs (publications, maps, NL)</b>		-			
	5201 Summary reports, visualiz. & diffusion of results	-	10,000.00	-	-	10,000.00
	5202 Preparation of final report	-	10,000.00	-	-	10,000.00
	5299 Sub-Total	-	-	-	-	20,000.00
	5300 Sundry (communications, postages)		-			
	5301 Communications (postage, bank transfers, etc)	-	9,860.00	-	-	9,860.00
	5399 Sub-total	-	3,111.00	-	-	9,860.00
	<b>5500 Evaluation</b>		-			
	5501 Independent Terminal Evaluation (manag. by UNEP)	-	-		6,000.00	6,000.00
	5502 Independent Financial Audit	-	-	15,000.00	-	15,000.00
	5599 Sub-Total	-	-	15,000.00	6,000.00	21,000.00

<b>5999 Component Total</b>	-	<b>3,111.00</b>	<b>15,000.00</b>	<b>6,000.00</b>	<b>50,860.00</b>
<b>TOTAL</b>	<b>50,000.00</b>	<b>796,271.00</b>	<b>50,000.00</b>	<b>90,900.00</b>	<b>1,000,000.00</b>