GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title:	National Program for the environmental Sound Management and Live Cycle Management of Chemical Substances.		
Country(ies):	Ecuador	GEF Project ID:[1]	9203
GEF Agency(ies):	UNDP (select) (select)	GEF Agency Project ID:	5706
Other Executing Partner(s):		Submission Date:	2015-07-27
GEF Focal Area(s):	Chemicals and Wastes	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities ☐ IAP-Commodities ☐ IAP-Food Security ☐	Corporate Program: SGP ☐	
Name of parent program:	[if applicable]	Agency Fee ($)	825,550

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES[2]

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	Trust Fund	(in $)	
		GEF Project Financing	Co-financing
(select) CW-1 Program 1 (select)	GEFTF	350,000	2,000,000
(select) CW-2 Program 3 (select)	GEFTF	4,345,000	19,000,000
(select) CW-2 Program 4 (select)	GEFTF	3,795,000	15,113,702
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
Total Project Cost		8,490,000	36,113,702

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

Project Objective: To protect human health and the environment by adopting an environmental sound management and live cycle management of chemical substances in Ecuador.

Project Components	Financing Type[3]	Project Outcomes	Project Outputs	Trust Fund	(in $)	
					GEF Project Financing	Co-financing
1. Strengthen institutional capacity and the regulatory and policy framework for the Sound Management of Chemicals (SMC) based on a Life-Cycle Approach.	TA	1.1 Key public and private institutions and entities capacitated to operationalize the regulatory and policy framework for the LCM of chemicals and wastes, including aspects related to Sustainable Production and Consumption.	1.1.1 Assessment on effectiveness of existing legislative and policy framework for LCM of chemicals completed and recommendations for its improvement issued. 1.1.2 Relevant policies, regulations and standards to achieve the LCM of Chemicals revised	GEFTF	800,000	5,000,000

[1] Project ID number will be assigned by GEFSEC and to be entered by Agency in subsequent document submissions.
[2] When completing Table A, refer to the excerpts on *GEF 6 Results Frameworks for GETF, LDCF and SCCF*.
[3] Financing type can be either investment or technical assistance.

			and/or developed. 1.1.3 Institutional, financial and capacity building plans developed and implemented for various entities (public and private) to enable them to address chemicals of concern. 1.1.4 Interagency Ministerial Coordination Mechanism (ICM) established to improve coordination, collaboration and decision-making on issues pertaining to SMC (incl. a sub-coordination mechanism on ASGM) 1.1.5 Analytical laboratory capacity assessed and strengthened to improve monitoring of hazardous substances and wastes in environmental media and biological samples to support decision-making (including accreditation and development of methodology and indicators to determine health and env. impacts). 1.1.6 Capacity built to undertake Cost-Benefit Analysis (CBA) and Cost-of-Inaction assessments for priority chemicals and waste issues.			
			1.2 Use of products and chemical processes, which pose a reduced risk to human and environmental health promoted.	1.2.1 Methodology for product analysis and identification of alternatives developed (in coord. with 2.5.1 and 3.2.1) to support decision making for prohibition and restriction.		

			1.2.2 Industry incentives (in coord. with 1.1.2) developed and implemented that support conversion to processes which pose less risks and result in less harmful products.			
2. Eliminate POPs stockpiles and reduce the use and release of initial and newly listed POPs (including those contained in products).	TA	2.1 Import and use of newly listed POPs as well as products containing newly listed POPs reduced. 2.2 120 tonnes of obsolete POPs and non-POPs pesticides disposed of. 2.3 25 g-TEQ/year of UPOPs releases reduced through the introduction of BEP and BAT in UPOPs release priority sectors (in combination with development and implementation of policy and regulatory measures as part of 1.1.2).	2.1.1 In-depth inventory of "old" and "new" POPs competed, building on the data resulting from the NIP update. 2.1.2 Existing technical guidelines for the management of new POPs assessed and revised/improved. 2.2.1 Obsolete pesticides repacked, transported and destructed at a certified facility. 2.3.1 UPOPs releases from agricultural waste burning practices reduced, through introducing changes in agricultural practices. 2.3.2 UPOPs releases from the open burning and incineration of healthcare waste reduced through introducing BEP/BAT in the health sector. 2.3.3 UPOPs releases from the open burning of Municipal Solid Waste reduced in priority communities. 2.3.4 UPOPs releases from the co-processing of hazardous wastes in cement kilns and incinerators avoided	GEFTF	3,500,000	13,061,370

			(emission standards; technical manuals and guidelines; pilot interventions for priority waste streams).			
		2.4 Capacity increased for the identification, management and remediation of sites contaminated with POPs, Mercury and other priority chemicals of concern.	2.4.1 Strategy and guidelines for the identification, determination of contamination levels, management and technical approaches for the prevention and remediation of contaminated sites developed. 2.4.2. Capacity built in the identification, management and remediation of contaminated sites by means of a number of priority remediation interventions.			
		2.5 POPs releases reduced by 30 tonnes through the gradual phase-out of POPs containing products (in combination with development and implementation of policy and regulatory measures as part of 1.1.2).	2.5.1 In-depth assessment of products that contain POPs completed and alternatives identified. 2.5.2 Build institutional capacity to undertake Cost-Benefit Analysis for phase-out, phase-down and substitution of POPs containing products. 2.5.3 Nat. Plans and/or Policy(ies) for the ESM and phase-out of POPs containing products developed and national (import) standards on POPs in products developed. 2.5.4 POPs release reductions, phase-out and/or waste management demonstrated for priority products.			

			2.5.5 Standards and technical guidelines for the safe final disposal of POPs containing products developed. 2.5.6 Capacity of customs built to improve the monitoring of POPs and products containing POPs.			
3. Reduce the use and releases of Mercury from priority sectors.	TA	3.1 Mercury releases from the Artisanal and Small Scale Gold (ASGM) mining sector reduced by 750kg/a through the introduction of BEP and BAT and establishment of financial lending structures.	3.1.1 Limited in-depth Mercury baseline assessment completed in project ASGM communities to obtain critical info missing from existing baseline studies. 3.1.2 Identification and assessment of viable lending project partners to service ASGM loans completed. 3.1.3 Artisanal and Small Scale Miners formalized through the creation of cooperatives. 3.1.4 Financial lending arrangements/revolving funds set-up to provide loans to legalized ASGM miners/cooperatives for the purchase of Mercury-free processing equipment. 3.1.5 Capacity of 3 mining communities built to shorten the gold supply chain and apply BAT/BEP approaches to reduce Mercury releases and adopt socially and environmentally sound mining practices.	GEFTF	3,300,000	15,300,000

		3.2 Mercury releases from priority sectors (other than ASGM) reduced by 35 Kg/a through the gradual phase-out of Mercury containing products and introduction of improved waste management and storage practices (in combination with development and implementation of policy and regulatory measures as part of 1.1.2).	3.2.1 In-depth assessment of products that contain Hg completed and alternatives identified. 3.2.2 Institutional capacity to undertake Cost-Benefit Analysis for phase-out, phase-down and substitution of Mercury containing products built. 3.2.3 Nat. Plans and/or Policy(ies) for the ESM and phase-out of Mercury containing products developed for priority sectors (other than ASGM) and national (import) standards on max. Hg content in products developed. 3.2.4 Mercury release reductions, phase-out and/or waste management demonstrated in priority sectors (e.g. healthcare, lighting, power generation, etc.). 3.2.5 Standards and technical guidelines for the safe storage, packaging, transportation, data management, inspection/monitoring, and final disposal of Mercury containing wastes and products developed. 3.2.6 Capacity of customs built to improve monitoring of elemental Mercury, Mercury containing substances and products containing Mercury.			

4. Raise awareness, ensure project monitoring and disseminate project results and experiences.	TA	4.1. Awareness raised on the Sound Management of Chemicals (starting with initial and newly listed POPs and Mercury) and knowledge created on BEP and BAT approaches for reducing harmful releases. 4.2 Project results monitored; results sustained and lessons-learned and experiences disseminated.	4.1.1 Targeted awareness raising approaches and plans developed and implemented (as required) for each project sector. 4.2.1 M&E and adaptive management applied in response to needs and Mid-term Evaluation (MTE) findings. 4.2.2 Lessons-learned, best practices and experiences collected and disseminated at national, regional and global level to support replication.	GEFTF	500,000	1,152,332
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
			Subtotal		8,100,000	34,513,702
			Project Management Cost (PMC)[4] (Including Direct Project Cost up to $ 80,000)	GEFTF	390,000	1,600,000
			Total Project Cost		8,490,000	36,113,702

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust funds here: ( )

C. INDICATIVE SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount ($)
Recipient Government	Ministry of Environment.	Grants	2,272,332
Recipient Government	Ministry of Environment.	In-kind	9,841,370
Recipient Government	Ministry of Health.	In-kind	10,000,000
Recipient Government	Ministry of Agriculture, Livestock, Aquaculture and Fisheries.	In-kind	5,000,000
Recipient Government	Ecuadorian Accreditation Service.	In-kind	5,000,000
Recipient Government	Ministry of Mining + INIGEMM	In-kind	4,000,000
Total Co-financing			36,113,702

[4] For GEF Project Financing up to $2 million, PMC could be up to10% of the subtotal; above $2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS [a)]

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	(in $)		
					GEF Project Financing (a)	Agency Fee (b)[b)]	Total (c)=a+b
(select)	(select)		(select)	(select as applicable)			0
UNDP	GEFTF	Ecuador	Chemicals and Wastes	POPS	4,345,000	412,775	4,757,775
UNDP	GEFTF	Ecuador	Chemicals and Wastes	Mercury	4,145,000	393,775	4,538,775
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
Total GEF Resources					8,490,000	806,550	9,296,550

a) Refer to the Fee Policy for GEF Partner Agencies.

E. PROJECT PREPARATION GRANT (PPG)[5]

Is Project Preparation Grant requested? Yes ☒ No ☐ If no, skip item E.

PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

Project Preparation Grant amount requested: $200,000					PPG Agency Fee: 19,000		
GEF Agency	Trust Fund	Country/ Regional/Global	Focal Area	Programming of Funds	(in $)		
					PPG (a)	**Agency Fee**[6] (b)	**Total** c = a + b
(select)	(select)		(select)	(select as applicable)		0	0
UNDP	GEF TF	Ecuador	Chemicals and Waste	POPS	100,000	9,500	109,500
UNDP	GEF TF	Ecuador	Chemicals and Waste	Mercury	100,000	9,500	109,500
Total PPG Amount					**200,000**	**19,000**	**219,000**

[5] PPG requested amount is determined by the size of the GEF Project Financing (PF) as follows: Up to $50k for PF up to$2m (for MSP); up to $100k for PF up to $3m; $150k for PF up to $6m; $200k for PF up to $10m; and $300k for PF above $10m. On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

[6] PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.

F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS[7]
Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	*Hectares*
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	*Hectares*
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	*Number of freshwater basins*
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	*Percent of fisheries, by volume*
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO_{2e} mitigated (include both direct and indirect)	*metric tons*
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	*150 metric tons*
	Reduction of 1000 tons of Mercury	*3.14 metric tons*
	Phase-out of 303.44 tons of ODP (HCFC)	*ODP tons*
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	*Number of Countries:*
	Functional environmental information systems are established to support decision-making in at least 10 countries	*Number of Countries:*

PART II: PROJECT JUSTIFICATION

1. *Project Description.* Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, GEF focal area[8] strategies, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

THE GLOBAL ENVIRONMENTAL PROBLEMS, ROOT CAUSES AND BARRIERS THAT NEED TO BE ADDRESSED

The proposed project aims to address two global environmental problems, i) the release of Persistent Organic Pollutants (POPs) and ii) the release of Mercury (Hg). Both are persistent substances that do not readily break down in the environment, bio-accumulate in the food chain, and are able to travel long distances far away from the place where they were produced. Because of their detrimental impact on human and environmental health, they are considered a global threat.

[7] Provide those indicator values in this table to the extent applicable to your proposed project. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the *GEF-6 Programming Directions*, will be aggregated and reported during mid-term and at the conclusion of the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and/or SCCF.

[8] For biodiversity projects, in addition to explaining the project's consistency with the biodiversity focal area strategy, objectives and programs, please also describe which Aichi Target(s) the project will directly contribute to achieving.

In order to reduce and ultimately halt the release of POPs and Mercury at national, regional and global levels, the international community has taken action by initiating the control on the release of POPs through the ratification of the Stockholm Convention on POPs while Mercury is expected to be controlled within the near future once the Minamata Convention on Mercury has been ratified.

Ecuador is considered one of the 17 biodiverse richest countries in the world. Despite its relatively small size in terms of area and population (~ 15 million), it holds approximately 10% of the world's biodiversity. Its geographical location, the influence of complex marine currents and the presence of the Andes, influence the occurrence of a wide variety of ecosystems and microclimates. In addition to the vast biological richness of Ecuador, it has a substantial percentage of species found only in this region of the world. Because of the importance of Ecuador's ecosystems, its new constitution (2008) is the first in the world to recognize legally enforceable Rights of Nature, or ecosystem rights.

The fact that Ecuador is such a biodiverse rich country and extremely vulnerable to the mismanagement of environmental resources, makes the Sound Management of Chemicals (SMC) and Wastes a critical element in achieving national and global environmental sustainability.

To advance the Sound Management of Chemicals, and in particular reduce the release of POPs, the Government of Ecuador signed the Stockholm Convention on August 28, 2001 and ratified the Convention on June 7, 2004. The country's first National Implementation Plan (NIP) for the implementation of the Stockholm Convention was submitted to the Stockholm Convention Secretariat in June 2009. The update of the NIP (to include newly listed POPs and update data on the "initial" POPs) is expected to be finalized by the end of 2016. Based on the findings and conclusions of the 2009 NIP the following national priorities were identified: 1. Policy Strengthening; 2. Strengthening of the POPs Monitoring and Evaluation Capacity; 3. Improved management of PCBs; 4. Improved management of POPs pesticides; 5. Reducing emissions of unintentional POPs; 6. Management of Contaminated Sites; and 7. Information management, awareness creation and undertaking research. With the exception of priority no. 3 "*Improved Management of PCBs"* which is currently being addressed by the GEF/UNDP project "*Integrated and Environmentally Sound PCBs Management in Ecuador*", the other priorities identified in the NIP have not been addressed on a large scale.

Similarly, the Republic of Ecuador signed the Minamata Convention on Mercury on October 10, 2013. The country is currently in the process of preparing for the ratification of the Minamata Convention. The public consultations for ratification have already taken place and the ratification is expected to happen soon. As part of the GEF/UNEP/LATU "*Development of Mercury Risk Management Approaches in Latin America*" project, the Government expects to strengthen their Mercury baseline information, identify information gaps and update the 2008 Mercury Inventory which was undertaken with the support of UNITAR.

Based on the result presented in the 2008 Mercury Inventory, two main categories appear to be responsible for the majority of Mercury releases: *Products containing Mercury* and *Artisanal and Small Scale Gold Mining* – ASGM. Although a number of activities and initiatives have been initiated to reduce releases of Mercury, many challenges remain to date in achieving significant Mercury reductions.

BARRIERS THAT NEED TO BE ADDRESSED

1. INADEQUATE INSTITUTIONAL COORDINATION AND CAPACITY, AND UNDERDEVELOPED POLICY/REGULATORY FRAMEWORK TO SUPPORT THE SOUND MANAGEMENT OF POPS AND MERCURY BASED ON A LIFE-CYCLE APPROACH

Every single evaluation of an SMC related project implemented in Ecuador has identified the lack of inter ministerial coordination as a major shortcoming in achieving the LCM of chemicals and wastes. In particular, coordination on issues related to release reductions of POPs, Mercury and hazardous and toxic substances need to be significantly enhanced. While the country has developed an effective basic legislative and regulatory framework for the management of chemicals and wastes generally, this remains somewhat fragmented, contains gaps, is occasionally contradictory and is limited in practice by enforcement capacity deficits. Key to having an effective overall chemicals and waste management policy is the policy adoption

and implementation of sustainable economic instruments and financial mechanisms to provide market driven incentives that are endorsed and taken up by the principle stakeholders in the public and private sector.

2. LIMITED CAPACITY AND KNOWLEDGE FOR THE ELIMINATION OF POPS STOCKPILES AND REDUCTION IN THE USE AND RELEASE OF INITIALLY AND NEWLY LISTED POPS.

In the most up to date National Implementation Plan for the Stockholm Convention on POPs (2009, GEF/SDC/UNEP) three (3) strategic objectives and seven (7) main programmes/priorities have been taken up. With the exception of programme no. 3 "*Improved Management of PCBs*" which is currently being addressed by the GEF/UNDP project "*Integrated and Environmentally Sound PCBs Management in Ecuador*", the other priorities identified in the NIP have not been addressed extensively. POPs issues have been addressed to some extent, but mostly from a policy and regulatory perspective (introduction of bans on import and use) and adoption of standards for emission control. However, in terms of actual Global Environmental Benefits (GEBs) achieved in reducing POPs releases and stockpiles, activities have not yet resulted in significant reductions. With respect to newly listed POPs, with the exception of e-waste (through a regional UNIDO project), and POPs pesticide bans on use and import, no advances have been made. At the source of this is the limited capacity (financial and technical) and knowledge/experience on how to reduce stockpiles and releases, and phase-out products containing newly listed POPs.

3. LIMITED CAPACITY FOR THE COORDINATED REDUCTION IN THE USE AND RELEASE OF MERCURY FROM PRIORITY SECTORS.

Based on the results from the Mercury release inventory (2008, UNITAR), two main categories appear to be responsible for the majority of Mercury releases in Ecuador: *Products containing Mercury* and *Artisanal and Small Scale Gold Mining* – ASGM. Even though the Government has put considerable efforts (national and international financed initiatives) to reduce the use of Mercury in ASGM, there remains a need for continued training on Mercury free mining, increased capacity for higher efficiency milling and gold recovery processes, awareness raising on Mercury risks, technology transfer and possibly most importantly the establishment of a financial lending structure accessible to miners and financial incentives to support the movement towards Mercury-free mining in ASGM. With respect to Mercury in products, two challenges remain, the complete phase-out of certain products for which the Government has already taken initial action, while the phase-down of other products needs to be initiated. Secondly, there exists a lack of storage and disposal options for Mercury containing wastes, and guidelines on how to manage and treat such wastes. As such the majority of it ends up in landfills and open dumps.

4. SOCIO-ECONOMIC BARRIERS:

Socio-Economic Barriers play a particularly important role in the phase-out of Mercury from the ASGM sector, while they might also play a role (ableit smaller) in other project components, in particular phase-out of products containing Mercury and newly listed POPs. With respect to ASGM an inherent characteristic of the evolution from traditional environmentally sub-standard ASGM applying amalgamation techniques to Mercury-free and more environmentally friendly mining techniques, is the formalization of individuals who are currently productively involved in and dependent on the informal sector, albeit at a cost to health and living conditions and often subject to tax seeking behavior and insecurity. Often though there is considerable mistrust among informal miners towards government agencies and entities trying to formalize the sector, as they are afraid that their right to the land where they are mining might be taken away, or they are afraid they will be evicted and have their equipment confiscated because they have no legal title to the land on which they are working.

Another barrier to the adoption of more environmentally friendly techniques remains access to lending structures for miners to be able to get access to and purchase new and proven technologies that can produce Mercury-free gold. With respect to lending structures, it is important that miners are supported through a formalization process, as otherwise they cannot obtain access to loans or revolving funds. Additionally it is critical to establish financial lending arrangements and/or revolving funds for ASGM that can provide loans to legalized ASGM miners/cooperatives. Another important aspect that should be considered is that miners need to be able to acquire land titles (as it is an import aspects of being formalized and gaining access to

loans). This could be achieved through streamlining and reforming legislation to make it easier for miners to acquire land title and harder for inactive titleholders to hold on to large titles. The above mentioned interventions, need to be combined with capacity building, training, awareness raising and efforts to help shorten the gold supply chain to ensure more of the profits stay with the miners than with the middle man.

5. INADEQUATE AWARENESS ON LCM OF CHEMICALS, POPS, MERCURY AND WASTE ISSUES.
Closely linked to all of the above, is the relatively low level of awareness regarding the Sound Management of Chemicals, POPs and Mercury throughout their Life-Cycle, which is a major barrier to effective implementation of solutions. This is particularly true for Mercury management in ASGM as well as the management of wastes (whether related to obsolete POPs, biomass, municipal solid waste, Mercury containing wastes, etc.) where public awareness and acceptance of the need to selectively separate and direct waste to a dedicated environmentally sound system is critical for its successful implementation. This applies to the general public, but also across all stakeholder groups including those in the product supply chain and service providers. In the case of the introduction of less-harmful alternatives and improved practices, awareness does appear to exist but could certainly be reinforced.

THE BASELINE SCENARIO AND ANY ASSOCIATED BASELINE PROJECTS

The following section on Baseline Scenario and Associated Baseline Projects has been structured in line with the proposed three (3) project components.

I. Institutional capacity and the regulatory and policy framework for the Sound Life Cycle Management (LCM) of Chemicals (SMC): Over the past few years the Government of Ecuador has taken concerted action to improve the Sound Management of Chemicals (a summary of baseline projects has been provided below), however it would like to further advance its efforts to achieve the Life-Cycle Management of Chemicals and Waste. The main challenges which are currently being encountered in achieving the Life Cycle Management of Chemicals are the following:

- *Limited coordination between a large number of stakeholders that have responsibilities pertaining to the sound management of chemicals and waste.* Every single SMC project evaluation has identified the lack of coordination as a major shortcoming to achieve during the LCM of chemicals and wastes. In addition, coordination on issues related to release reductions of POPs and Mercury also need to be significantly improved.
- *Underdeveloped policy and regulatory framework for the LCM of chemicals and wastes*. Even though a policy and legislative framework for the management of chemicals and wastes is in place, the regulatory and policy framework pertaining to initial listed POPs releases (in particular UPOPs), newly listed POPs, Mercury contained in products, waste management (hazardous, healthcare, biomass and Municipal solid waste), management of contaminated sites, among other important sectors requires further enhancement to ensure it supports the country in achieving the LCM of chemicals and to ensure the country can meet its obligations under Stockholm and Minamata.
- *Limited number of accredited laboratories and limited capacity on long-term human health impact studies*. Although the country disposes of laboratory equipment, technicians and methods developed for the analysis of chemical pollutants, accreditation to validate the analysis/monitoring of hazardous and toxic chemicals and emissions in various environmental media and biological samples, in particular POPs, Mercury and Persistent Toxic Substances (PTS), is not in place. The enabling environment for such laboratories, such as the presence of particular norms to encourage laboratories to take the necessary steps towards accreditation and companies to request their services, should be enhanced. A particular gap is the absence of a laboratory certified for mineral analysis that could support the characterization of ores and minerals to increase gold production yields. Further needs exist in undertaking long-term health-impact studies that could support decision-making on addressing SMC priorities at national level.
- *Limited Capacity on conducting Cost-Benefit Analysis (CBAs).* One of the main challenges identified by the Ministry of Environment and the Ministry of Health is the absence of experience and capacity to

undertake in-depth Cost-Benefit Analyses (CBA) for the improved management of priority chemicals and wastes, substitution of hazardous chemicals by alternatives, enactment of import restrictions, among else. If available, CBA outcomes would be used for national decision making and would inform the development and adoption of norms and import restrictions.

Associated Baseline Projects: The government of Ecuador has already initiated a number of activities, programmes and initiatives, which constitute the project's baseline. As certain of these baseline projects aim for the same or similar objectives as the proposed project, some of these initiatives will be considered as a co-financing source for the project:

- A Coordinating Mechanism on Chemicals exists, established between the MAE, MoH and MoHC, however exchanges mostly take place bilaterally. The MAE has submitted a request/degree for the establishment of a control and regulation agency, but to date an agreement on the EcoCode has not yet been found. Dangerous chemicals would fall under the agency's responsibility.
- As part of the activities supported by the Zero Mercury Plan – the Ministry of Environment (MAE) in partnership with the National Council for Control of Narcotic and Psychotropic Substances (CONSEP), adopted a list consisting of 35 hazardous chemical substances, to improve technical cooperation and control on their use registration by SISALEM and the System of Control and Supervision (SISVYF). The establishment of the registration system (within MAE) as well as awareness raising related to registration requirements and procedures are underway.
- Rules for chemical products (including Mercury) and waste management, have been embedded by the MAE in the provisions of the Regulation on the Prevention and Control of Pollution by Hazardous Chemicals, Hazardous and Special Waste (published in the Official Register No. 631 of February 1, 2012). MAE has also established procedures for: a) Registration of hazardous waste generators, b) Management of hazardous wastes prior to the waste disposal licensing; and c) Transport of hazardous materials (Agreement No. 026 Second Supplement published in the Official Register No. 334 of May 12, 2008).
- *PRTR*: Ecuador participated in a global UNEP/UNITAR/PRTR project from 2010 – 2012 during which a national PRTR system was established. Since 2013, the government, making use of national budget allocations, has continued the management of the system, which has been integrated into the national Unique System of Environmental Information (SUIA) which is a large environmental data management system managed by the Ministry of Environment.
- *Extended Producer Responsibility (EPR) Programme*: Ecuador has already developed an EPR programme. A general EPR paragraph has been taken up in the legislation and, which in turn is then applied to various types of wastes. For now, the EPR principle is being used for cell phones, glass, tires, plastics, pesticides and batteries (Mercury containing button cells). A managerial agreement exists for other types of electronic wastes. The MAE has set compulsory recovery targets in order for companies to obtain permits for the following year. In 2013, 0.5 million cell phones were collected through the EPR programme as well as 0.5 million used tires (for the latter no disposal options have been confirmed yet, while cell phones are exported to The Netherlands and Canada).
- *Eliminating Lead in Paint in the Andean Free Trade Region (Peru, Bolivia, Ecuador and Colombia)*: The project is being implemented by MIPRO and aims to minimize the impacts of lead in paint on humans and the environment through capacity building on import and usage, awareness raising and by demonstrating the phase-out of lead from paint production.
- The Ministry of Industries and Productivity (MIPRO) in partnership with UNIDO, implemented the National Program on Resource Efficiency and Cleaner Production (RECP), which is currently in the final stages of its implementation. The project resulted in the creation of an "*Resource Efficiency and Cleaner Production Center*" which contributes to industrial development through the dissemination of concepts, methods, and practices of efficient resource use and cleaner production to improve environmental performance of public and private companies and organizations, to raise awareness on CP and RE and to change patterns of consumption. The project also led to the establishment of the Sub-Secretariat of Renewable Energy and Energy Efficiency (SEERE), which is responsible for drafting, proposing and implementing the national policy on energy (electricity, oil and other fuels)

and has been instrumental in the large-scale introduction of energy-saving lamps, and public lighting replacement.

II. Management of POPs and Contaminated Sites: In 2009 the Government of Ecuador concluded the preparation of its National Implementation Plan, with the support of the Swiss Agency for Development Cooperation (SDC). In table 4 (see section 6 of Consistency with National Priorities) the Strategic Objectives and Main Programmes of the NIP have been summarized, which are: 1. Policy Strengthening; 2. Strengthening of the POPs Monitoring and Evaluation Capacity; 3. Improved management of PCBs; 4. Improved management of POPs pesticides; 5. Reducing emissions of unintentional POPs; 6. Management of Contaminated Sites; and 7. Information management, awareness and research.

With the exception of priority no. 3 “Improved Management of PCBs" which is currently being addressed by the GEF/UNDP project “Integrated and Environmentally Sound PCBs Management in Ecuador”, the other priorities identified in the NIP have not been addressed on a large scale.

The main outstanding issues related to the management of POPs in Ecuador are:

- *The presence of obsolete pesticides creating contaminated sites and polluting water sources and soil*. The NIP identified 14.45 kg obsolete POPs from the AGRO-AGROCALIDAD lab; 1,636.36 kg of DDT (Guayaquil) and 2 mg Aldrin, (total POPs pesticides: 1,650 kg) as well as a total of 5,737.92 kg of non-POPs obsolete pesticides. The Ministry of Agriculture, Livestock, Aquaculture and Fisheries - MAGAP (Agrocalidad Department) is ready to dispose of approximately 15.5 tonnes of obsolete pesticides, which have been confiscated over a period of 15 years. In addition, the Ministry expects that an additional 120 tonnes of mixed obsolete POPs and non-POPs pesticides (mostly unlabeled) have been buried at farms throughout the country (in the past it was common practice to bury obsolete pesticides) and the identification of these burial sites, as well as the removal and sound disposal of obsolete pesticides, followed by soil remediation is a priority of the Ministry.
- *Unintentional releases of POPs (UPOPs) from waste burning practices*. The 2009 NIP, identified the following principal sources of UPOPs: i) Uncontrolled combustion processes – 50.20 g-TEQ/yr; ii) Waste incineration – 11.63 g-TEQ/yr and iii) Power Generation and Heating – 11.52 g-TEQ/yr. The main categories that have been contributing to these releases are the open burning of municipal solid waste (MSW), the incineration and open burning of healthcare waste (HCW), the open burning of agricultural waste (sugar cane, rice husk) including the burning of biomass for the generation of heat and electricity for the sugar cane processing facilities, and the operation of cement kilns.
- *Management of contaminated sites*. The identification and remediation of contaminated sites, has become a presidential issue, in particular related to pollution by hydrocarbons from legacy drilling and refinery operations, but also related to pollution caused by POPs (PCBs and POPs pesticides), Mercury, and other hazardous and toxic substances. The Ministry of Environment is eager to develop a strategy and guidelines for the identification, determination of contamination levels, management and technical approaches for the prevention and remediation of contaminated sites, as well as build necessary capacity to identify and remediate contaminated sites, however to date no funding has been allocated for this purpose yet.
- *Improve the management of newly listed POPs*. The NIP update, supported by UNIDO, will shed more light on the issues, challenges and needs of Ecuador in managing the newly listed POPs, and is expected to be finalized by the end of 2016. It is expected though that the NIP will identify a number of priority issues related to new POPs, which the proposed project would be able to take on – considering it’s timing.

Associated Baseline Projects: The government of Ecuador has already initiated a number of activities, programmes and initiatives, which constitute the project’s baseline. As certain of these baseline projects aim for the same or similar objectives as the proposed project, some of these initiatives will be considered as a co-financing source for the project:

- *POPs pesticides*: The MAGAP recently provided US$ 190,000 from national resources to FAO to facilitate the exportation and sound disposal of approximately 15.5 tonnes of obsolete pesticides, which have been confiscated over the past 15 years.
- *Co-processing in cement kilns*: The Coordinator Ministry of Strategic Sectors, as part of the implementation of the PCB management project, are in the process of developing a Waste Management strategy which focuses on the co-processing in cement kilns of hazardous wastes (e.g. low content PCB oils) and certain special waste (tires, agricultural plastics). Currently an assessment is being undertaken to identify the types of wastes that can be co-processed, the amounts of such wastes available on a yearly basis and which changes will need to be made to existing cement kilns. Ultimately, the co-processing of hazardous wastes will have to comply with the requirements set out in Ministerial Agreement 048 "*Technical Standard for the co-processing of hazardous waste in cement kilns*".
- *HCWM*: The Ministry of Health (MSP) has prohibited incineration of HCW at facility level. Unfortunately the norm has some contradictions and HCW waste has started showing up on dumpsites and landfills, some of which are subject to open burning. Although in Quito mostly autoclaves and microwaves are used for waste disinfection, outside of Quito the situation pertaining to the management of HCW is largely unknown. MSP is currently in the process of developing technical norms for the management of various Healthcare Waste streams.
- *Newly listed POPs*: All initial and newly listed POPs pesticides have already been banned. In the transition period (just after the ban) they were sometimes found being used or illegally imported, but nowadays newly listed POPs pesticides, like Lindane and Endosulfan are not found anymore[9]. With respect to newly listed POPs flame retardants, a regional GEF/UNIDO project is strengthening national initiatives and enhancement of regional cooperation for the environmentally sound management of POPs in waste of electronic or electrical equipment (WEEE), but other POPs flame retardant aspects are not being addressed.
- *Contaminated sites*: The National Secretariat of Higher Education, Science, Technology and Innovation (SENESCYT) provides seed money for PhD and MSc students to conduct research in support of their thesis. Some of this research is geared towards the remediation of contaminated soils (e.g. PCB contaminated soils).
- *Municipal Solid waste Management*. Since April 2010, the Ecuadorian National Government, through the Ministry of Environment, has been implementing the National Program for Integrated Management of Solid Wastes (PNGIDS). The main objective of the PNGIDS is to promote the management of solid waste in Ecuadorian municipalities. The program, which recently has been extended until 2017, has as objective the elimination of the open dumps in all municipalities. To date, 15 Decentralized Autonomous Governments (GADs) have benefitted from geo-membranes (lining for landfills) and studies on solid wastes management were funded for 47 GADs, of which 24 have been completed and 23 are being undertaken.
- *Pesticides and related products for agricultural use*. Through the standard NTE INEN 2875: 2013 requirements for the handling and disposal of empty pesticides containers has been set. Empty pesticide and agricultural chemical containers have to be triple washed before disposal.
- As part of a MAE/SAICM QSP/UNDP/UNEP "*Ecuador, UNEP and UNDP Partnership initiative for the implementation of SAICM*" project a study was undertaken to assess the potential environmental impact and risks of hazardous chemicals and waste from Ecuador's productive sector.

<u>*III. Mercury Management*</u>: In 2008, the Government of Ecuador developed a national Mercury release inventory with the support of UNITAR, as part of the project "*Pilot Project on Strengthening Inventory Development and Risk Management – Decision making for Mercury: A Contribution to the Global Alliance on Mercury*". The results from the Mercury release inventory are presented in table 1 below. Even though these results are preliminary and the Government of Ecuador is expected to further strengthen Mercury baseline information, identify information gaps and update the 2008 Mercury Inventory, as part of the GEF/UNEP/LATU "*Development of Mercury Risk Management Approaches in Latin America*" project in

[9] 1980 was the last year lindane and Endosulfan were found.

2016, the figures presented in the table provide a good first estimate of the scope of the challenges faced by the Government of Ecuador in improving the management of Mercury and reducing Mercury releases.

TABLE 1 PRIORITY CATEGORIES FOR IDENTIFIED RELEASE SOURCES

Category	Total releases [tonne Hg/a]	
	Min	Max
1. Deliberate uses of Mercury for products and processes[10]	27.2	27.2
2. Waste Disposal in Landfills and Water Treatment	13.8	26.6
3. Primary production of metals	4.9	22.5
4. Consumer products containing Mercury	9.9	14.3
5. Fuel extraction and energy use	0.4	9.1
6. Production of other minerals and materials containing Mercury impurities	0.2	6.3
7. Waste Incineration	0.2	2.4
8. Crematoriums and cemeteries	0.06	0.2

Source: Table 6.2. Total Mercury releases in Ecuador (2005). National Inventory of Mercury releases and products containing Mercury – Ecuador.

Based on the results from the Mercury release inventory, two main categories appear to be responsible for the majority of Mercury releases: *Products containing Mercury* (Cat 1, Cat 2 and Cat 4)[11] and *Artisanal and Small Scale Gold Mining* – ASGM (Cat. 3.). As such, any programme that would aim to reduce Mercury releases in Ecuador would be expected to be focusing on these categories.

Artisanal and Small Scale Gold Mining (ASGM): Related to Mercury releases, the first priority of the Government of Ecuador is to phase-down the use of Hg in ASGM. Artisanal and small-scale mining is well established in Ecuador. There are approximately 92,000 workers directly employed in artisanal and small-scale mining, 65% of which work in gold mining (60,000). Of the total ASGM work force, 7% are women and 5% are children[12]. The number of people working in ASGM fluctuates with the gold price. Often people employed in agriculture might turn to ASGM when the price of gold increases. These changes in the ASGM work force present particular challenges for training and capacity building.

ASGM primarily occurs in four regions in Ecuador: Azuay (South); El Oro (South); Morona Santiago (South East); and Zamora Chinchipe (South East). Although the majority of the ASGM activities are concentrated in the South, close to the border with Peru, additional ASGM hotspot are found in the Amazon (North East) and the North of the country.

The ASGM communities of Portovelo/Zaruma in the El Oro region, have received considerable attention and support, from a small USDoS project entitled "*Reducing Mercury Use and Release in Andean Artisanal and Small-Scale Gold Mining*" and a regional UNIDO/GEF project "*Implementing Integrated Measures for Minimizing Mercury Releases from Artisanal Gold Mining*", however ASGM in other parts in the country have received much less support.

The final report of the U.S. DoS project (Marcello M. Veiga, 2014) highlighted a number of challenges. The report indicated that the main bottleneck to implement substantial changes to reduce the use of Mercury and

[10] This category includes: Dental amalgam (660.75 kg Hg/a); gauges and manometers (26,555.41 kg Hg/a); Chemicals and laboratory equipment (0.8 kg Hg/a)

[11] *Products containing Mercury* (Cat 1, Cat 2 and Cat 4) consists of Category 1 including Dental amalgam (660.75 kg Hg/a), Gauges and Manometers (26,555.41 kg Hg/a) and Chemicals and laboratory equipment (0.8 kg Hg/a); Category 2 including thermometers (1,984.08 kg Hg/a), electrical and electronic switches, contacts and relays (3,303.77 kg Hg/a), light sources containing mercury (2.4 kg Hg/a) and Mercury containing batteries (9,036.36 kg Hg/a); and Category 3 including sanitary landfills (9,805.40 kg Hg/a), Informal dumpsites (12,648 kg Hg/a) and water treatment (4,191.78 kg Hg/a).

[12] Despite article 81 and 82 of Ecuador's Code of Childhood and Adolescence which prohibits child labor, it has been challenging for the government to ensure that child labor is eliminated from the ASGM sectors

improve mining practices is the financial situation of the owners of the processing facilities. The project prepared a pre-feasibility study of small gold plants to demonstrate to miners and authorities that the capital to establish an efficient and clean plant cannot be fulfilled with micro-credits, as an efficient and clean plant needs capital ranging from US$ 10,000 - US$ 20,000 per tonne of ore being processed per day. It was stated that micro-credits will not make a substantial difference in the modernization of these centers. This is a challenge, as generally banks and governments are not prepared to take such large risks. Cooperatives can play an important role though in reducing the capital costs.

INIGEMM (the National Institute on Metallurgical Mining and Geological Research) indicated that approximately 5 tonnes of gold production are registered each year. However in reality it estimates that between 10 – 11 tonnes of gold are produced. Based on the official 2005 gold production figures (5,338 kg of gold), the 2008 Mercury Release Inventory estimated that between 5 tonnes (min) and 22.5 tonnes (max) Mercury are released annually. However in reality the amount of gold produced might be at least twice as high. The 2008 Mercury Release Inventory also reported that 8.15 tonnes of Mercury were imported in 2005 alone, which according to the Ecuadorian Customs Corporation (CAE) is predominantly used for gold extraction.

The actual quantity of Mercury being emitted from ASGM is hard to estimate and depends on the practices and extraction methods used, however it can be assumed that actual gold production is most likely at least twice as high as officially reported, while Mercury imports are also higher than reported (illegal imports, in particular originating from bordering countries are not captured in CAE figures).

The U.S. DoS final project report (Marcello M. Veiga, 2014) indicates that in Ecuador the main problem of Mercury loss is the amalgamation of the whole ore in copper-plates, or in grinding circuits or in sluice boxes. Mercury losses can be as high as 10 times the amount of gold produced when Mercury is added to the grinding process. A concentration process can significantly reduce the use of Mercury. Helping small-scale miners to access innovative technologies, by implementing loan/credit systems, can have a dramatic impact on Mercury use in the region. Once a concentrate is produced, by gravity methods (e.g. centrifuge) and flotation, gold can be extracted using Mercury-free technologies, or directly sold to smelters. An added benefit can be that when concentration processes are applied, cooper minerals are also concentrated which can provide for an additional source of income. The use of classical flotation system present in 40 processing plants in Portovelo, and the presence of good mines and processing plants are proof that concentration is the way to reduce or even eliminate Mercury, and that the evolution of mining practices is feasible.

According to the 2014 mining cadastre (ARCOM), there are around 2,510 miners, producing 3.7 tonnes of gold in the provinces of Zamora Chinchipe, Loja and Azuay. Through this project intervention, it is expected to reduce around 750 Kg/a of Mercury, during project implementation (from the second year onwards).

Although a number of baseline activities are underway or have been completed, there remains a strong need for continued training on Mercury free mining[13], increased capacity on improving milling and recovery processes (in particular practices for concentration) with higher efficiencies for various types of ore[14], awareness raising on the risks of Mercury, technology transfer and in particular the establishment of financial mechanisms and incentives to support the movement towards Mercury-free mining in ASGM. The main challenge, which according to experts impedes the conversion to Mercury-free mining appears to be a lack of lending structures accessible to miners as well as the existence of financial incentives which encourage miners to continue using Mercury-free mining practices. In addition, social and economic issues

[13] Unfortunately, the planned for ITCAM training center, which was expected to be established in Portovelo with support provided by multiple partners, has not yet materialized. ITCAM was expected to provide technology education for miners, act as a hub to organize, formalize and negotiate mining titles and provide services to analyze and test ores.

[14] A number of good practices have been established in Portovelo, including a 10 tonne/day Mercury-free processing plant, which could serve as demonstration and example plants for the proposed project and which could be replicated/adapted to the project's ASGM communities.

remain at the bottom of challenges faced in ASGM, and in order to put in place sustainable solution, these social and economic issues also need to be resolved.

Associated Baseline Projects: The baseline projects listed below aim(ed) for the same or similar objectives as the proposed project component. As such a number of these initiatives, in particular components that are relevant for the proposed project, will be considered as a co-financing source for the project:

- The Ministry of Environment (MAE) has adopted on 11 December 2012 a control mechanism to better regulate and ultimately ban the use of Mercury in illegal mining (Presidential Commitment No. 19813: "*Importing Mercury*"). The control mechanism is supported by resolution 108 (September 16, 2013) issued by the committee of Foreign Trade (COMEX), which prohibits the distribution of Mercury for ASGM through any other distributors than those approved by Government. In addition, agreement 061, article 238 (May 4, 2015), general obligations for cleaner production are prescribed. After July 2016 the use of Mercury for ASGM will be prohibited. That said, it appears if the majority of Mercury is now illegally imported, and although gold production rates have remained the same, legal Mercury imports have declined dramatically, indicating that illegal importation of Mercury has increased dramatically.
- On January 11, 2013, the Government of Ecuador adopted Ministerial Agreement No. 003, which severely restricts the formulation, manufacturing, marketing, storage, use and possession of mercury, cyanide and sodium and potassium cyanide, substances relevant for the ASGM sector, in order to proceed with the gradual elimination of use of mercury in the country.
- In 2011, the Ministry of Non-Renewable Natural Resources of Ecuador (Ministerio de Hidrocarburos – MRNR) released the National Plan for Mining Sector Development for 2011 – 2015. Among its objectives, the plan takes into account the formalization and management of the mining sector, strengthening the capacity of the miners to operate in an environmental sustainable manner and increase benefits from miming resources.
- In 2013, the legal framework for mining was strengthened, through reform of the mining Law and its General Regulations. The Environmental Regulations for Mining Activities and the Regulation for Special Oversight of Small-Scale Mining and Artisanal Mining, as well as Art. 17 and Art. 86 of the revised law on Tax Equity and the Law on the internal tax system, already prohibit the use of Mercury in mining operations.
- In order to strengthen health services, the Ministry of Public Health, through Ministerial Agreement No. 0725-1162 (May 3, 2012), started the implementation of a Model for Comprehensive Family, Community and Inter-Cultural Health (MAIS-FC). This model strengthens health services nationwide, includes mining areas. MSP contributed US$ 1,034,014,726[15] from 2008 until 2015 in the provinces of Azuay, El Oro and Zamora.
- MSP presented in June 2015 the draft guidelines for the Management of Mercury containing wastes in healthcare establishments, which prescribe the steps for control, transportation and final disposal.
- The Government of Ecuador, through its Ministry of Mining and its National Research Institute for Geology, Mining and Metallurgy (INIGEMM), is supporting a 5-year project on the "*Improvement of Working Conditions of Small Scale and Artisanal Miners*" (US$ 4,800,000) in order to strengthen the ASGM miners' working environment through training and technical assistance for the application of clean technologies and best practices. Project components include awareness raising, land planning, formalization of the ASGM sector, transfer of technology, occupational safety and health, environmental management and social programmes which address gender issues, child labor and introduction of alternative livelihoods. As part of the project, a capacity building/miming training center was expected to be established in Portovelo, however to date it has not yet been established.
- To address the problems associated with the extremely high contamination levels of the Rio Puyango, the Government of Ecuador, through the Ministry of Environment (MAE), launched the "Comprehensive environmental management program in the Puyango River Basin" in 2014. The programme addresses land-based pollution causing down stream contamination levels (in Peru) to be

[15] https://public.tableau.com/profile/publish/Linkpresupuestario/Presentacin#!/publish-confirm

so high that water can no longer be used for drinking or irrigation. The programme addresses many different aspects related to land-based pollution, including ASGM, farming, deforestation, water-shed management, WATSAN, municipal solid waste management, water monitoring, among others. Funding (US$ 55,892,636) is entirely provided by the Government of Ecuador and the programme is expected to be implemented over a period of 3 years (2014 – 2016).

- In partnership with the MAE and INIGEMM, UNIDO – with funding provided by the GEF, started the implementation in 2012 of the project "*Implementing Integrated Measures for Minimizing Mercury Releases from Artisanal Gold Mining*" (GEF grant: 999,900 USD; co-financing: 2,676,764 USD). The objective of the project is to protect human health and the environment by implementing integrated measures aimed at minimizing mercury releases from ASGM activities affecting the transboundary Puyango - Tumbes River Basin in the south of Ecuador and north of Peru. The project aims to achieve this objective through: i) The transfer of technologies and technical assistance to support mercury reduction and sound tailings management; ii) An environmental monitoring programme in the Puyango & Tumbes river basins; iii) Increase knowledge of health risks related to mercury; iv) Promote fair-trade and fair-mined gold certification; and v) Increase capacity to implement the upcoming international mercury treaty.
- The government of Ecuador – through MAE also launched the "**Zero Mercury Plan**". The Plan focuses predominantly on ASGM and Mercury contained in consumer products. The plan's components include: i) Public Awareness Raising and Dissemination; ii) Strengthening of the Legal Framework, including implementation of a chemicals registration system on restricted chemicals and strengthening of border control and imports; iii) Technical Assistance and Capacity Building, including knowledge and technology transfer; technology incentive Certificates "Green Points" and tax exemptions for Mercury-free equipment (Agreement 027 MAE); iv) Programme Monitoring and Environmental Monitoring (water and soil); and, v) Remediation, including identification of sources of contamination and development of remediation guidelines. In particular, with respect to ASGM, activities have included a baseline assessment in El Oro and Morona Santiago, conducting awareness raising workshops in Azuay, El Oro and Morona Santiago and field demonstrations with artisanal and small scale miners in Azuay and Zamora.
- The University of British Colombia, with a grant provided by the U.S. Department of State, implemented a project entitled "*Reducing Mercury Use and Release in Andean Artisanal and Small-Scale Gold Mining*". Although the project mostly focused on providing support to miners in Peru's Piura region (north), the project also included a limited number of miners from Ecuador, provided them with training on alternative mining techniques, and established a Mercury-free processing plant in Portovelo, which was used to demonstrate Mercury-free practices to miners supported by the regional project.
- MAE, with GEF and UNDP support submitted a proposal (PIF approved) for the "*Sustainable Development of the Ecuadorian Amazon: Integrated Management of Multiple Use Landscapes and High Value Conservation Forests*" in March 2015 (US$ 12,462,550), which aims to catalyze the transformation of land use planning and management in the Ecuadorian Amazon (CTEA) by establishing a governance and sustainable production framework based on a landscape approach and by optimizing ecosystem services and livelihoods. It includes the implementation of land use and management plans in priority landscapes, one of them, the South of the Ecuadorian Amazon (includes Zamora Chinchipe province) where soil restoration and reforestation will be carried out in mining areas.

Mercury-containing consumer products: Related to Mercury releases, the second priority of the Government of Ecuador is the phase-down of Mercury containing products and restricting the use of high content Mercury containing products.

Mercury is used in a variety of products, including dental amalgam, medical devices like thermometers and blood pressure cuffs, electrical switches and relays, and fluorescent lamps. Alternatives to most mercury-containing products are generally available at reasonable prices. Mercury use in products can result in releases to the environment at various stages of the life cycle. Atmospheric emissions and resulting global

impacts from mercury-containing products are primarily due to waste management practices at the end of product life. Phasing-out products containing Mercury or decreasing mercury content in products can make a significant contribution to reducing atmospheric emissions, while proper handling and recycling of Mercury containing wastes can also reduce emissions.

The main priorities related to the management of Mercury in products for Ecuador are:

- *The continued phase-out and phase-down of Mercury containing products:* Which can be achieved through developing national plans and policies for the phase-out/phase-down of priority Mercury containing products. Preferably such plans and policies would be based on the outcomes and results of Cost-Benefit Analysis (CBA) which also help internalize the costs of suitable and available alternatives, to support decision making processes on phase-out an phase-down schedules and targets. Following the adoption of plans and policies, there is a need to demonstrate feasibility through demonstration and pilot projects which allow end-users to have influence on the alternative to be chosen as replacements and create trust and confidence in the potential success of phase-out programmes. Ultimately, these activities can be followed by the development of import standards and bans, and setting official national targets related to on phase-out and phase-down and ensure their enforcement.
- *Improve the management, treatment and/or disposal of Mercury containing wastes:* There are only three companies that have a license to treat Mercury containing light sources and which also appear to have on-going contracts with specific landfill cells. Except for those entities though, no treatment/disposal solutions for Mercury containing wastes exists, nor are standards or guidelines for the safe storage, packaging, transportation, data management, inspection and monitoring of Mercury containing wastes available. Even though an enabling environment for EPR exists, development and adoption of norms for Mercury containing products is pending.

Associated Baseline Projects: The baseline projects listed below aim(ed) for the same or similar objectives as the proposed project component. As such a number of these initiatives, in particular components that are relevant for the proposed project, will be considered as a co-financing source for the project:

- In 2008, the Government of Ecuador developed a national Mercury release inventory with the support of UNITAR, as part of the project "*Pilot Project on Strengthening Inventory Development and Risk Management – Decision making for Mercury: A Contribution to the Global Alliance on Mercury*". As part of the GEF/UNEP project "*Development of Mercury Risk Management Approaches in Latin America*", being implemented in partnership with LATU[16] (Uruguay) the project aims, among else, to strengthen Mercury baseline information, identify information gaps and update the 2008 Mercury Inventory. An update Mercury inventory is expected to become available in 2016.
- MSP and the MAE have signed an agreement on the phase-out of Mercury containing medical devices. In 2013 the MSP undertook an inventory on Mercury containing medical devices, which was followed by the development of a Mercury phase-out plan. Since then, public hospitals and HCFs are required to purchase Mercury-free devices, however until devices break Mercury containing medical devices remain in use (gradual phase-out). For the general public and private sector HCFs, the MSP initially wanted to put a ban in place, which eventually proved unrealistic as for certain products no alternatives could be identified. A norm for the phase-out of Mercury containing medical devices is being drafted.
- The Zero Mercury Plan also includes actions pertaining to the management of consumer products, which contain Mercury, in specific batteries, medical devices and light sources. Technical norms pertaining to the maximum Mercury content in batteries and light sources have already been approved, while a norm for the phase-out of Mercury containing medical devices is being drafted. The plan also aims to improve collection, and recycling (light sources), and the promotion of alternative technologies (medical devices). The plan includes support to the MSP on the development of the strategy for the phase-out of Mercury containing medical devices; Development

[16] Regional Basel and Stockholm Convention Centre for Latin America

of a norm on the management of spent Mercury containing lamps; adoption of the norm for EPR of batteries.

THE PROPOSED ALTERNATIVE SCENARIO, GEF FOCAL AREAS STRATEGIES, WITH A BRIEF DESCRIPTION OF EXPECTED OUTCOMES AND COMPONENTS OF THE PROJECT

Component 1: Strengthen institutional capacity and the regulatory and policy framework for the Sound Management of Chemicals (SMC) based on a Life-Cycle Approach.

Outcome 1.1 - Key public and private institutions and entities capacitated to operationalize the regulatory and policy framework for the LCM of chemicals and wastes, including aspects related to Sustainable Production and Consumption.

This project component's objective is, as reflected in the associated Outcome 1.1 and Outcome 1.2, to capacitate public and private institutions and entities to improve and operationalize the regulatory and policy framework for the LCM of chemicals and wastes, including aspects related to sustainable production and consumption, and create an enabling environment for promoting the use of less harmful products as well as the conversion of production and manufacturing processes to processes that use or release less harmful substances. In specific this project component will: Assess and further develop the policy and regulatory framework pertaining to LCM of chemicals; Build the capacity of institutions having responsibilities pertaining to SMC to enable them to address chemicals of concern; Establish an Interagency Ministerial Coordination Mechanism (ICM) to improve coordination on SMC among key institutions; Strengthen laboratory capacity to improve POPs/Mercury monitoring of environmental media and biological samples; and, Build capacity to undertake Cost-Benefit Analysis (CBA) to support national decision making. The project component also create national capacity for product analysis and the identification of alternatives to support decision making for prohibition and restriction, and develop and implement industry incentives that support conversion to processes which pose less risks and result in less harmful products.

Output 1.1.1 Assessment on effectiveness of existing legislative and policy framework for LCM of chemicals completed and recommendations for its improvement issued. The proposed project will support reductions in the harmful releases of POPs, Mercury and other PTS in a multitude of sectors. For certain of these sectors the regulatory and policy framework is pretty well established (POPs pesticides, ASGM, etc.), while for other aspects it remains underdeveloped (e.g. newly listed POPs, hazardous waste treatment, contaminated sites, etc.). In order to ensure that the proposed project can support targeted support towards the improvement of the regulatory and policy framework, it will undertake a comprehensive assessment that will review the effectiveness of the existing legislative and policy framework for the Life-Cycle Management of chemicals and provide detailed recommendations for its improvement. Identified needs, gaps and necessary improvements can subsequently be addressed as part of *Output 1.1.2*. During the PPG phase, additional information will be obtained on current gaps and needs that are already apparent.

Output 1.1.2 Relevant policies, regulations and standards to achieve the Life-Cycle Management of Chemicals revised and/or developed. Following the completion of the comprehensive legislative and regulatory gaps and needs assessment conducted as part of Output 1.1.1, the project will support the development or revision of those policies, regulations and standards that are deemed of most importance by national implementing partners, the project's steering committee and the Interagency Ministerial Coordination Mechanism - ICM (in the situation that it is already operational at that point in time). Throughout the project's duration, the project team will facilitate and monitor the submission and approval process of these revised/developed regulatory and policy measures.

Output 1.1.3 Institutional, financial and capacity building plans developed and implemented for various entities (public and private) to enable them to address chemicals of concern. Within the scope of the proposed project and the outcomes it is expected to achieve, the project will draw up and (after approval)

implement institutional, financial and capacity building plans for key project stakeholders to ensure that national capacity, expertise and experience is available or built to allow for the successful implementation of the project, achievement of its objectives and ensure the Life-Cycle Management of Chemicals in the long run. Institutional capacity building will also allow for the consolidation and replication of the project outcomes achieved.

Output 1.1.4 Interagency Ministerial Coordination Mechanism (ICM) established to improve coordination, collaboration and decision-making on issues pertaining to SMC (including a sub-coordination mechanism on ASGM). Although some bi-lateral coordination on SMC issue exists, between a limited number of institutions, it is critical that the Government of Ecuador establishes a high-level Interagency Ministerial Coordination Mechanism (ICM) which can assume the responsibility to facilitate inter-ministerial coordination and information exchange on issues related to the management of chemicals. The project will support the establishment of the ICM, through the drafting of required degrees. Preferably the ICM would have decision-making powers, and would oversee sub-committees on particular SMC related subjects (e.g. ASGM[17], POPs, HCWM, etc.). The project will also built the ICM's capacity and maximize its ownership by national institutions and partners, in order to ensure its sustainability. The project also aims to extend membership to private sector entities to increase its advisory role in relation to the import, production, retail, management and potentially the disposal of hazardous wastes. Throughout the project's implementation the ICM will be consulted on specific issues such as the co-processing of hazardous and special wastes in cement kilns; the application of a life-cycle approach to the management and disposal of products/wastes containing POPs, and very importantly on the development of legislative and policy instruments which might have potential implications and opportunities for their activities.

Output 1.1.5 Analytical laboratory capacity assessed and strengthened to improve monitoring of hazardous substances and wastes in environmental media and biological samples to support decision making (including accreditation and development of methodology and indicators to determine health and environmental impacts). Initially capacity building and accreditation needs will be assessed to identify in which areas accreditations are lacking and which ones are important to ensure the LCM of chemicals. Subsequently, in partnership with the Normalization Institute (SAE), which supports the accreditation of laboratories, the project will support the accreditation of national and public laboratories through capacity building. The number of laboratories that will receive project support will be determined during the project's PPG phase. The number of laboratories receiving support could potentially be adjusted based on the outcomes of the assessment conducted as part of the project. In addition, the project (as part of Output 1.1.1.) will also review which norms are needed so that accreditation would become necessary and seen as a priority by laboratories. Finally, the project will also support capacity building of relevant national and public laboratories necessary to investigate and monitor the long-term impact of chemicals on human health.

Output 1.1.6 Capacity built to undertake Cost-Benefit Analysis (CBA) and Cost-of-Inaction assessments for priority chemicals and waste issues. One of the main challenges identified by the Ministry of Environment and the Ministry of Health is the absence of experience and capacity to undertake in-depth Cost-Benefit Analyses (CBA) for the improved management of priority chemicals and wastes, substitution of hazardous chemicals by alternatives, development and adoption of norms and import restrictions and national decision-making. The project will support targeted capacity building and training to key institutions on how to conduct in-depth Cost-Benefit Analyses. A number of case studies to test the taught approaches for CBA will be undertaken, focusing of SMC subjects relevant to Ecuador and the project.

Outcome 1.2 - Use of products and chemical processes, which pose a reduced risk to human and environmental health promoted. This project outcome and its outputs aims to create an enabling environment for promoting the use of less harmful products (in terms of hazardous component these might contain) as well as the conversion of production and manufacturing processes to processes that use or release

[17] In particular with respect to ASGM there are many on-going smaller and larger initiatives. However at national level coordination and awareness on these activities, their experiences and lessons-learned appears to be very limited. Improved coordination on ASGM is therefore critical, therefore as one of the project's priorities under output 1.1.4 a coordination sub-committee on ASGM will be established.

less harmful substances that could pose a risk to human and environmental health. It aims to do so by firstly creating national capacity for product analysis and the identification of alternatives to support decision making for prohibition and restriction, through the development of a methodology. Secondly, this project outcome would result in the development and implementation of industry incentives that support conversion to processes which pose less risks and result in less harmful products.

Output 1.2.1 Methodology for product analysis and identification of alternatives developed (in coord. with 2.5.1 and 3.2.1) to support decision making for prohibition and restriction. This project output would be implemented jointly with Output 2.5.1 "*In-depth assessment of products that contain POPs completed and alternatives identified*" and Output 3.2.1 "*Output 3.2.1 In-depth assessment of products that contain Hg completed and alternatives identified.*" Its objective is to create the capacity of government institutions to facilitate decision making for the prohibition and restriction of products, which contain substances that could be harmful to human health and the environment. Currently, besides national regulations aligned with Stockholm Convention requirements and a limited number of hazardous substances that have been prohibited for certain uses, there is currently not a standardized approach/methodology in place that allows the government to prohibit or ban certain products of concern. This project output will therefore develop a methodology for product analysis and the identification of alternatives.

Output 1.2.2 Industry incentives (in coord. with 1.1.2) developed and implemented that support conversion to processes which pose less risks and result in less harmful products. Currently, there are no incentives in place in Ecuador which promote the development and use of products and chemical processes with a lower chemical risk to human and environmental health. Therefore, this project output, in close coordination with output 1.1.2 "*Relevant policies, regulations and standards to achieve the LCM of Chemicals revised and/or developed*" is expected to develop and implement industry incentives that support conversion to processes which pose less risks and result in less harmful products, by substituting certain chemicals by less harmful ones, redesigning products or adapting production processes in such a manner that releases of harmful substances would be significantly reduced. The project's PPG phase will assess in more detail the scope and strategy of the project activities that could support this output.

Component 2: Eliminate POPs stockpiles and reduce the use and release of initial and newly listed POPs (including those contained in products)

This component's overall purpose as reflected in the associated Outcome 2.1, 2.2, 2.3, 2.4 and 2.5 is to reduce the release of POPs into the environment from a number of priority sectors, which include the agriculture-, healthcare- and the waste management- and disposal- sector. In specific this project component aims to: reduce the import, use and management of newly listed POPs as well as products containing newly listed POPs; the disposal of 120 tonnes of obsolete POPs and non-POPs pesticides; the reduction of UPOPs releases from a number of priority sectors (agriculture, healthcare waste management, co-processing and municipal solid waste management); the improved management and remediation of contaminated sites; and, a reduction of 30 tonnes in the import and use of POPs containing products.

Outcome 2.1 - Import and use of newly listed POPs as well as products containing newly listed POPs reduced. Essentially this project outcome and its affiliated outputs aims to improve the management of newly listed POPs. In terms of POPs pesticides (initial and newly listed) Ecuador has already put into place all the necessary import and use restrictions in line with the Stockholm Convention, however further inventories have to be conducted to identify obsolete and buried stockpiles which the Ministry of Agriculture expect to find at farms throughout the country. The disposal of any remaining POPs pesticides is envisaged as part of project outcome 2.2. In addition this component will focus on building the capacity for the improved management of newly listed POPs such as industrial chemicals and by-products, as except for a GEF UNIDO supported project on e-waste, and the GEF/UNEP Global Monitoring Plan of POPs (including new POPs) no initiatives have yet specifically addressed newly listed POPs.

Output 2.1.1 In-depth inventory of "old" and "new" POPs competed, building on the data resulting from the NIP update. The NIP update, with support provided by UNIDO, is expected to start next year (2016), well in time of the proposed project's implementation launch (first quarter of 2017). In the preparation of the NIP update non-exhaustive inventories will be carried out for newly listed POPs, which will help to identify Ecuador's priorities related to the management of new POPs (pesticides, industrial and unintentional POPs). NIP findings, and preliminary identified priorities are expected to be communicated to national and international stakeholders during the PPG phase of the proposed project. Building upon NIP findings the proposed project will support an in-depth inventory of POPs pesticides at farm level and in-depth inventories of priority new POPs in the sectors identified as a priority[18].

Output 2.1.2 Existing technical guidelines for the management of new POPs assessed and revised/improved. Following an analysis of the policy and regulatory framework governing the management of POPs, technical guidelines and related norms will be drafted for the environmentally sound management (including storage, use, transportation) as well as disposal of newly listed POPs as well as products which contain such chemicals. Where necessary, as part of project component 1.1.6, Cost-Benefit Analyses will be carried out to support the identification of non-POPs alternatives and the feasibility of restricting import.

Outcome 2.2 - 120 tonnes of mixed obsolete POPs pesticides and non-POPs pesticides disposed of.
Project outcome 2.2 is exclusively dedicated the environmentally sound disposal of obsolete POPs and non-POPs pesticides.

Output 2.2.1 Obsolete pesticides repacked, transported and destructed at a certified facility. The identification of obsolete pesticides undertaken as part of Output 2.1.2 will be followed by an assessment of suitable environmentally sound disposal options. It is currently unknown what the ratio of POPs versus non-POPs obsolete pesticides will be. In addition to identifying suitable disposal options, this project output will also ensure the repacking, transportation and disposal of the obsolete pesticides at a certified facility.

Outcome 2.3 - 25 g-TEQ/year of UPOPs releases reduced through the introduction of BEP and BAT in UPOPs release priority sectors (in combination with development and implementation of policy and regulatory measures as part of 1.1.2). The NIP identified four sectors to be the main sources of UPOPs releases, these include agricultural waste burning practices; open burning and incineration of healthcare waste; open burning of Municipal Solid Waste; and the operation of cement kilns. Therefore, the project outputs envisaged will introduce Best Environmental Practices (BEP) and Best Available Technologies (BAT) in these priority sectors to significantly reduce UPOPs releases.

Output 2.3.1 UPOPs releases from agricultural waste burning practices reduced, through introducing changes in agricultural practices. Building upon the experiences from the UNDP-GEF UPOPs reduction project in Nigeria and the UNDP-GEF Chemicals and Waste Management Programme in Belize which both aim to reduce UPOPs releases from pre- and post harvest agricultural waste burning, project activities will introduce alternative approaches to pre- and post- harvest burning at 3 pilot-sites to be identified during the PPG phase, develop marketable products (hay, fodder, compost earth, fertilizer) from recovered biomass; assess the operation of biomass to energy installations and introduce BAT where economically feasible; and initiate the replication of alternative, non-burning, bush clearing methods at additional sites.

Output 2.3.2 UPOPs releases from the open burning and incineration of healthcare waste reduced through introducing BEP/BAT in the health sector. Making use of experiences and lessons-learned from a multitude of GEF/UNDP HCWM projects, the project will conduct a Healthcare Waste Management assessment in a demonstration district and facilities (to be identified during the PPG) making use of GEF/UNDP I-RAT tool;

[18] The priority sectors will be defined during the PPG phase.

draw up specifications for HCW treatment technologies and facilitate their procurement; introduce best environmental practices at the selected HCFs; and finally install, test and operate BAT technologies.

Output 2.3.3 UPOPs releases from the open burning of Municipal Solid Waste reduced in priority communities. Making use of the experiences and lessons-learned from the very successful GEF/UNDP Honduras project, activities will include the selection of demonstration/priority municipalities (during the PPG phase); capacity building of municipalities on MSWM (including the developing of Manuals and guides, provision of training); implementation of demonstration projects for reducing the burning of solid waste, waste separation, recycling and the production of waste derived products (e.g. compost); and initiate the replication of improved MSWM in additional municipalities.

Output 2.3.4 UPOPs releases from the co-processing of hazardous wastes in cement kilns and incinerators avoided (emission standards; technical manuals and guidelines; pilot interventions for priority waste streams). Cement kilns can present a solution for the disposal of hazardous waste streams (Ecuador currently does not dispose of a hazardous waste treatment facility), but can also be an important source of UPOPs releases (as well as other harmful substances). Project activities will support the Ministry of Environment and the Ministry of Sectorial Strategies to help assess the feasibility of the disposal of a variety of POPs sensitive waste streams (waste streams consisting POPs as well as waste streams that could lead to the generation of UPOPs) including test burns, building upon the Waste Assessment and Waste Treatment Policy under preparation. Project findings will lead to the review and revision of emission standards, the development of technical manuals and guidelines for the processing of POPs sensitive wastes as well as the demonstration of hazardous waste co-processing for a limited number of priority waste streams.

Outcome 2.4 - Capacity increased for the identification and remediation of sites contaminated with POPs, Mercury and other priority chemicals of concern. Project outcome 2.4 will build the capacity of the Ministry of Environment, as well as other key stakeholders in the identification and remediation of contaminated sites. To date, work on the remediation of certain PCB as well as hydro carbon contaminated sites has started, however a comprehensive effort at national level to support the identification and monitoring of hotpots, the creation of capacity to determine contamination levels, and the subsequent remediation of the most pressing hotspots is urgently needed.

Output 2.4.1 Strategy and guidelines for the identification, determination of contamination levels, management and technical approaches for the prevention and remediation of contaminated sites developed. Project activities (in coordination with project output 1.1.5) will aim to built the capacity of government entities, inspectorates and laboratories having responsibilities pertaining to the identification, control and monitoring of contaminated sites. Project activities will include training, exchange experiences and improve laboratories working together with regional centers (like CETESB), accreditation of laboratories and the development of a contaminated site database as an integrated component of SUIA (Sistema Unico de Information Ambiental). Based on the review of national and international research related to the identification, determination of contamination levels and technical approaches for the remediation of contaminated sites and the results of project out 2.4.2, the project will develop a set of technical guidelines for priority contaminants (POPs, Mercury and Hydro carbons).

Output 2.4.2. Capacity built in the identification, management and remediation of contaminated sites by means of a number of priority remediation interventions. In partnership with leading research institutions in the country (e.g. SENESCYT and INIGEMM, among others), a number of priority sites identified (Output 2.4.1) will be selected for demonstration trials of potential remediation approaches, to help identify remediation solutions which are successful in the Ecuadorian context. It is expected, that if successful practices and approaches are identified, these will be taken up in the national technical guidelines for remediation (Output 2.4.1) and results will be replicated throughout the country.

Outcome 2.5 - POPs releases reduced by 30 tonnes through the gradual phase-out of POPs containing products (in combination with development and implementation of policy and regulatory measures as part of 1.1.2).

Output 2.5.1 In-depth assessment of products that contain POPs completed and alternatives identified. Even though the country will start its NIP update process in 2016 to include newly listed POPs (including those contained in products) information on POPs containing products in a NIP update often remains general. A critical review of the information resulting from the NIP update will indicate which additional information is required to be obtained by the project. Additionally, and most importantly, this project output will identify feasible, cost-effective and reliable alternatives to POPs containing products, available at national and international level, a first step in their anticipated phase-out.

Output 2.5.2 Institutional capacity to undertake Cost-Benefit Analysis for phase-out, phase-down and substitution of POPs containing products built. This project component will be implemented and executed jointly with output 1.1.6 "*Capacity built to undertake Cost-Benefit Analysis (CBA) and Cost-of-Inaction assessments for priority chemicals and waste issues*", and Output 3.2.1 "*In-depth assessment of products that contain Hg completed and alternatives identified*", but will in particular focus on POPs containing consumer products. One of the main challenges identified during the proposal's preparation was the limited capacity of government institutions as well as the committee on import and export (COMEX) to undertake in-depth Cost-Benefit Analyses (CBA) for the phase-out of POPs containing consumer products, as well as associated waste management and disposal solutions. The outcomes of CBAs are critically important as they provide direction for regulatory actions subsequently taken by the government such as technical guidelines and norms on phase-out requirements and alternatives. This project activity will conduct training on how to undertake CBAs, identify potential alternatives for POPs-containing products and identify suitable waste management and disposal solutions for which associated costs are also taken up in the CBA. In addition, the project will also support the development of a Green Procurement guide for POPs-free product alternatives that can help large buyers, such as public institutions draw up procurement specifications for POPs-free alternatives.

Output 2.5.3 Nat. Plans and/or Policy(ies) for the ESM and phase-out of POPs containing products developed and national (import) standards on POPs in products developed. The project will develop and facilitate the validation of (a) National Plan(s) for the ESM of and phase-out of POPs containing consumer products, in line with the requirements of the Stockholm Convention as well as guidelines available under the Basel Convention. Products potentially containing POPs for which such (a) plan(s) would be developed will be identified during the PPG phase. The plan(s) will be based on the outcomes of the NIP update, which is expected to be completed before the project's start. The plan(s) will identify national priorities and include (at a minimum) detailed actions plans for the phase-down/phase-out of POPs containing consumer products. In addition, the project will also support the development of national (import) standards on POPs containing consumer products to facilitate implementation of the developed plans.

Output 2.5.4 POPs release reductions, phase-out and/or waste management demonstrated for priority products. In order to demonstrate the phase-down and phase-out of POPs containing consumer products, the project will support the phase-out of a limited number of POPs containing products. These products will be identified during the PPG phase of the proposed project and be based on the outcomes of the NIP update. The project would support the identification of available and potential alternatives as part of *Output 2.5.1 "In-depth assessment of products that contain POPs completed and alternatives identified"*. Subsequently the project would support the adaptation of procurement processes and applying the Green Procurement Guide developed as part of *Output 2.5.2*. Furthermore, following the outcomes of the CBA related to waste management and disposal options, activities would be supported to identify and put in place suitable waste management/disposal solutions for POPs containing products. To ensure long-term sustainability, the development of Public Private Partnerships would be evaluated and if deemed feasible would be put in place in parallel with the introduction of Extended Producer Responsibility (EPR) schemes for the products under consideration.

Output 2.5.5 Standards and technical guidelines for the safe final disposal of POPs containing products developed. In order to create national capacity to improve the management of POPs containing waste products and address the challenges the country faces, the project will support the development of standards and guidelines for the safe disposal (in line with Basel Convention guidelines), of POPs containing waste products.

Output 2.5.6 Capacity of customs built to improve the monitoring of POPs and products containing POPs. This project output will support the entirety of Component 2 and aim to increase the capacity of customs to monitor the import of POPs and substances and products, which contain POPs. The project envisages increasing the capacity of the customs and revenue authority, its departments and other relevant stakeholders to put in place the necessary institutional framework to build an enabling environment that would allow for the improved monitoring of the import of POPs and POPs containing products in particular.

Component 3: Reduce the Use and Releases of Mercury from Priority Sectors

This component's overall purpose as reflected in the associated Outcome 3.1 and Outcome 3.2 is to reduce the use and releases of Mercury from two priority sectors which combined are the country's main source of Mercury releases: Artisanal and Small Scale Gold Mining (ASGM) and Mercury use in consumer products.

Outcome 3.1 - Mercury releases from the Artisanal and Small Scale Gold (ASGM) mining sector reduced by 750 Kg/a through the introduction of BEP and BAT and establishment of financial lending structures. In terms of outputs and activities as part of Outcome 3.1 (ASGM), the project would cover institutional capacity building for the implementation of the national mining ASGM policy and enactment of related regulations (as part of project component 1.1.2), the refinement and implementation of a supporting regulatory framework (as part of project component no. 1), the establishment of financial lending structures and financial incentives to support miners in making the necessary investment to go Mercury-free, and capacity building of mining communities in priority locations to support formalization of the sector, shorten the gold supply chain and apply BAT/BEP approaches to reduce Hg releases and adopt socially and environmentally sound mining practices. Following the introduction of successful practices in priority locations, this component would also replicate experiences in one additional geographical priority area and support the capacity building of customs to further reduce the illegal importation of Mercury intended for ASGM. During the PPG phase, it will be calculated and reviewed with more detail the project's reduction target.

Output 3.1.1 Limited in-depth Hg baseline assessment completed in project ASGM communities to obtain critical info missing from existing baseline studies. To help the project obtain an in-depth understanding of the on-going practices in the selected project ASGM communities and to help further shape and direct the project, it will be important to undertake an in-depth Mercury baseline assessment. The assessment will start by collecting and reviewing all readily available ASGM information for selected project locations (e.g. 2008 Mercury Inventory, 2016 expected update of the Mercury Inventory, results from the 2016 anticipated NAP and MIA EAs, INIGEMM data, among others). In the case that it is deemed necessary for additional information to be collected, the project will do so by establishing a team of locals that understand ASGM practices, Mercury use and gold production and who can integrate with the community and conduct a quick and in-depth baseline survey[19]. During the project's PPG phase priority ASGM communities that will benefit from project implementation will be identified through a rigorous review process, ensuring that no overlap with on-going or planned ASGM related activities occurs. For the purpose of the PIF's elaboration it is assumed that the project will support ASGM mining communities in the provinces of Zamora Chinchipe, Loja and Azuay.

[19] Assessment activities could include the development of a training and field guide to train surveyors and conduct survey training, followed by the planning and execution of the baseline survey itself, including the surveying of miners and milling operations for Mercury use, estimating overall cost of living, identifying gender and social aspects, disaggregating operating expenses into fuel, equipment repair, manual labor etc. and elucidating the Mercury supply chain.

Output 3.1.2 Identification and assessment of viable lending project partners to service ASGM loans completed. One of the key challenges to date for miners to shift towards Mercury-free processing of ore and extraction of gold, has been the fact that individual low-income and often informal miners, have little to no access to legal lending structures. Other than borrowing from middlemen and high-risk high interest loan providers, ASMG miners do not have easy access to financing. As an initial step the project will assess existing and potential lending structures (e.g. MFIs/banks, etc.), which, with additional support provided by the project, could facilitate the access to finance for miners and service the loans/revolving funds. Even though no such lending structures currently exist, the project will review similar initiatives established in other countries, as well as review in depth functional lending structures in Ecuador which support environmental goals and green jobs creation.

Output 3.1.3 Artisanal and Small Scale Miners formalized through the creation of cooperatives[20]. One of the main challenges that has been encountered by the government in effectively implementing the mining law and specific regulations related to ASGM and Mercury phase-out, has been the high percentage of informal miners and a lack of incentives for miners to formalize themselves, for example through the establishment or creation of cooperatives. Informal miners are not eligible for loans/revolving funds to purchase new and proven technologies that can produce Mercury-free gold; they are not allowed to acquire land titles and would not have access to premiums offered on reduced Mercury gold. For the reduction of the use of Mercury in ASGM it is therefore critically important to support miners to formalize themselves. In the past, the key challenges which have been mentioned in this respect are that miners do not have the time to put all the required paperwork together and that often the formalization process is very political and hard to resolve in a climate of conflict. These challenges have to be overcome by the project. The project aims to support the formalization or at least to have more formalized of 10% of the miners in the ASGM communities supported by the project (through capacity building to institutions and cooperatives, training, awareness raising, increasing profits for miners, etc.).

Output 3.1.4 Financial lending arrangements/revolving funds set-up to provide loans to legalized ASGM miners/cooperatives for the purchase of Mercury-free processing equipment. Based on the outcomes and results of output 3.1.2, project output 3.1.3 will support the development of (a) partnership(s) with (a) private or public financing and lending structure(s)[21], that would ultimately provide for a lending platform and service the loans/revolving funds for legalized miners and/or cooperatives, potentially making use of basin investment funds provided by the project. The PPG phase of the project will determine in more detail national needs in this respect as well as project activities that could be most effective and successful in establishing lending structures/revolving funds. It is also anticipated this project component would support the lending institution in developing loan related risk assessment procedures as well as loan application packages, as well as providing support on establishing mechanisms for verification and monitoring of the use of equipment (condition of the loans). Prior to the launch of the lending opportunities, awareness will be created among mining communities on the availability of the loan mechanisms and capacity will be build in mining communities on application procedures.

Output 3.1.5 Capacity of 3 mining communities built to shorten the gold supply chain and apply BAT/BEP approaches to reduce Hg releases and adopt socially and environmentally sound mining practices. The project ultimately aims to support priority mining communities to start processing ore without Mercury or with significantly less Mercury, build the capacity of miners to process ore applying BAT and BEP and finally support gold refiners/gold shops in introducing personal protections measures. In order to achieve these objectives, the project will build or rent mercury free processing facilities in or near the ASGM communities; develop a training program for miners; and, support gold shops in introducing personal protection measures. Furthermore, as much of the profits from gold extraction currently end up with the middle-man (gold buyers, plant operators and other middle-man) who often receive much of the profit from

[20] Formalization can be through cooperatives or mining organizations or small businesses.

[21] The identification of potential viable MFIs/banks partners will be undertaken as part of the project, starting with resources provided by MIX (http://www.themix.org/) and others.

gold), to ensure financial sustainability of Mercury-free mining practices, these profits would need to be redirected so that instead they can support miner development. Shortening/repairing the gold supply chain will be undertaken by organizing mining communities, formalizing negotiations and strengthening the position of cooperatives and legal miners in negotiations with buyers. Ideally the project would facilitate access of miners or cooperatives to regional and global programmes like the Better Gold Initiative and similar ones, that would link their product to refiners which purchase Mercury-free or reduce Mercury gold for a premium. The Artisanal Gold Council and BGI are working on establishing such relationships. During the project's PPG phase, opportunities in this respect will be reviewed in further detail.

Outcome 3.2 Mercury releases from priority sectors (other than ASGM) reduced by 35 Kg/a through the gradual phase-out of Mercury containing products and introduction of improved waste management and storage practices (in combination with development and implementation of policy and regulatory measures as part of 1.1.2). As part of Outcome 3.2, the project will support capacity building of relevant institutions to undertake Cost-Benefit Analysis (CBA) that provide insight into the type of Mercury-free alternatives available and the benefits and costs related to their phase-down and/or phase-out. CBAs would be followed by the development of national phase-out plans and policies for priority Mercury containing products and the further refinement and enactment of national (import) standards on max. Hg content in products and wastes. The project will also support national stakeholders in demonstrating the phase-down/phase-out of Mercury-containing products and accompanying waste management practices (if deemed cost-effective) in priority sectors (e.g. healthcare, lighting, power generation, etc.) and develop national standards and technical guidelines for the safe storage, packaging, transportation, data management, inspection and monitoring of Mercury containing wastes. During the PPG phase, it will be calculated and reviewed with more detail the project's reduction target.

Output 3.2.1 In-depth assessment of products that contain Hg completed and alternatives identified. Even though the country completed a Mercury Inventory in 2008 and is expected to update information contained therein as part of the GEF/UNEP/LATU "*Development of Mercury Risk Management Approaches in Latin America*" project in 2016, information on products containing Mercury often remains general. A critical review of the information resulting from these two processes will indicate which additional information is required to be obtained by the project. Additionally, and most importantly, this project output will identify feasible, cost-effective and reliable alternatives to Mercury containing products, available at national and international level, a first step in their anticipated phase-out.

Output 3.2.2 Institutional capacity to undertake Cost-Benefit Analysis for phase-out, phase-down and substitution of Mercury containing products built. This project component will be implemented and executed jointly with output 1.1.6 "*Capacity built to undertake Cost-Benefit Analysis (CBA) and Cost-of-Inaction assessments for priority chemicals and waste issues*", but will in particular focus on Mercury containing consumer products. One of the main challenges identified during the proposal's preparation was the limited capacity of government institutions as well as the committee on import and export (COMEX) to undertake in-depth Cost-Benefit Analyses (CBA) for the phase-out of Mercury containing consumer products, as well as associated storage, waste management and disposal solutions. The outcomes of CBAs are critically important as they provide direction for regulatory actions subsequently taken by the government such as technical guidelines and norms on phase-out requirements and alternatives. This project activity will conduct training on how to undertake CBAs, and identify suitable waste storage, management and disposal solutions for which associated costs are also taken up in the CBA. In addition, the project will also support the development of a Green Procurement guide for Mercury-free alternatives, that can help institutions (such as healthcare facilities, public building, etc.) draw up procurement specifications for Mercury-free alternatives. In coordination with *Output 3.2.3* the project will support a number of entities in introducing this Green Procurement Guide.

Output 3.2.3 Nat. Plans and/or Policy(ies) for the ESM and phase-out of Mercury containing products developed for priority sectors (other than ASGM) and national (import) standards on max. Hg content in products and wastes developed. The project will develop and facilitate the validation of (a) National Plan(s)

for the ESM of and phase-out of Mercury containing consumer products, in line with the future requirements of the Minamata Convention as well as guidelines available under the Basel Convention. The Mercury containing products for which such (a) plan(s) would be developed will be identified during the PPG phase. The plan(s) will be based on the outcomes of the National Mercury Release Inventory (2008) and outcomes of the MIA (if the MIA is underway before the proposed project starts implementation). The plan(s) will identify national priorities and include (at a minimum) detailed actions plans for the phase-down/phase-out of Mercury containing consumer products. In addition, the project will also support the development of national (import) standards on Mercury containing consumer products (e.g. Max Hg content level) to facilitate implementation of the developed plans.

Output 3.2.4 Mercury release reductions, phase-out and/or waste management demonstrated in priority sectors (e.g. healthcare, lighting, power generation, etc.). In order to demonstrate the phase-down and phase-out of Mercury containing consumer products, the project will support the phase-out of Mercury containing products in one or two sectors. These priority sectors will be identified during the PPG phase of the proposed project. A limited number of facilities will be identified and selected as demonstration facilities, with the expectation that experiences from these facilities will start being replicated at national level while the project is on-going. The project would support the identification of available and potential alternatives, and in order to create confidence in Mercury-free alternatives, prior to their introduction, undertake staff and comparative studies on Hg-free alternatives. Subsequently the project would support the adaptation of procurement processes based on staff/entity preferences and applying the Green Procurement Guide developed as part of *Output 3.2.1*. Furthermore, following the outcomes of the CBA related to waste management, storage and disposal options, activities would be supported to identify and put in place suitable waste management solutions for Mercury containing wastes. To ensure long-term sustainability, the development of Public Private Partnerships would be evaluated and if deemed feasible would be put in place in parallel with the introduction of Extended Producer Responsibility (EPR) schemes for the products under consideration.

Output 3.2.5 Standards and technical guidelines for the safe storage, packaging, transportation, data management, inspection/monitoring and final disposal of Mercury containing wastes and products developed. In order to create national capacity to improve the management of Mercury containing wastes and address the challenges the country faces, the project will support the development of standards and guidelines for the safe storage, packaging, transportation (in line with Basel Convention guidelines), as well as prepare guidelines for data management, inspection and monitoring of Mercury containing wastes.

Output 3.2.6 Capacity of customs built to improve the monitoring of elemental Mercury, Mercury containing substances and products containing Mercury. This project out support both project outcome 3.1 and project outcome 3.2 and aim to increase the capacity of customs to monitor the import of Mercury and substances and products, which contain Mercury. During the 2008 Mercury release inventory it became clear that it was challenging for the customs and revenue authorities to indicate the amount and type of Mercury and Mercury containing products, and to track the movement of elementary Mercury intended for ASGM. Therefore, the project envisages increasing the capacity of the customs and revenue authority, its departments and other relevant stakeholders to put in place the necessary institutional framework to build an enabling environment that would allow for the improved monitoring of trade in Mercury and Mercury-added products.

Component 4: Raise awareness, ensure project monitoring and disseminate project results and experiences

This component's overall purpose as reflected in the associated Outcome 4.1 and Outcome 4.2 is to raise awareness on issues related to initial and newly listed POPs as well as Mercury; to create knowledge on BEP and BAT approaches for reducing their releases; and, to ensure the monitoring of project results, the extraction of lesson-learned and the dissemination of project experiences.

Outcome 4.1 - Awareness raised on the Sound Management of Chemicals (starting with initial and newly listed POPs and Mercury) and knowledge created on BEP and BAT approaches for reducing harmful releases.

Output 4.1.1 Targeted awareness raising approaches and plans developed and implemented (as required) for each project sector. As the project addresses a wide variety of POPs and Mercury related challenges and will implement and demonstrate interventions in many different sectors, the project will design and implement tailored awareness raising approaches and plans (as required) for each project sector, instead of designing and implementing a more general POPs/Mercury awareness raising campaign. Awareness raising approaches can include training, development of training materials and approaches for training of trainers, mainstreaming of chemicals-related curricula at higher education programmes, health advice to population groups at risk, etc. etc.

Outcome 4.2 - Project results monitored; results sustained and lessons-learned and experiences disseminated.

Output 4.2.1 M&E and adaptive management applied in response to needs and Mid-term Evaluation (MTE) findings. As is standard practice for every UNDP project, continuous monitoring of project results and achievements will be ensured, while the application of adaptive management of the project after conclusion of the Mid-Term Evaluation will be warranted.

Output 4.2.2 Lessons-learned, best practices and experiences collected and disseminated at national, regional and global level to support replication. Considering the project will support many "firsts" in Ecuador, in terms of demonstration and pilot interventions in a multitude of sectors, the project aims to collect lessons-learned, best practices and project experiences and capture them in easy to update, share and understandable communication materials to ensure that replication of project results throughout the country is facilitated.

INCREMENTAL/ADDITIONAL COST REASONING AND EXPECTED CONTRIBUTIONS FROM THE BASELINE, THE GEFTF AND CO-FINANCING.

Even though the Government of Ecuador has made and will be making significant contributions to the project's baseline (baseline projects and their contributions have been presented in detail in Section 2 "*The Baseline Scenario and any Associated Baseline Projects*") and through co-financing (see Part I: C) the scope and impact of the proposed project that will address 6 of the 7 programmes prioritized in the 2008 NIP and the country's 2 main release sources of Mercury (ASGM and Mercury contained in products) through a comprehensive LCM SMC project approach can be considered entirely incremental.

Without the proposed project, financial lending arrangements to provide low-risk loans to legalized ASGM miners/cooperatives for the purchase of Mercury-free processing equipment would not be set-up; Mercury releases from priority sectors (ASGM and Mercury in products) would not be reduced so significantly; UPOPs releases from HCWM, biomass burning, co-processing in cement kilns and MSWM not reduced to such an extent; Contaminated sites would not be identified and managed; Obsolete POPs and non-POPs pesticides not identified and disposed; and, Emerging challenges posed by newly-listed POPs not addressed. As such the proposed project can be deemed as entirely incremental.

GEF TF contributions will be applied for the application Sound Management of Chemicals and Life-Cycle Management of Chemicals principles in all aspects related to POPs, Mercury and other hazardous chemicals and substances being addressed by the project. GEFTF contributions will further consolidate the enabling environment necessary for the sustained application of these principles in the long term.

GLOBAL ENVIRONMENTAL BENEFITS (GEFTF)

The Global Environmental Benefits (GEB) of the project will consist of the following:

- Reduction in releases of dioxins and furans (UPOPs) resulting from the improved management of municipal solid waste, healthcare waste, co-processing in cement kilns of hazardous and special wastes and the introduction of non-burn practices in agriculture. The project's reduction target will be calculated in more detail following completion of an initial assessment to be undertaken as part of the project's PPG phase. However for the purpose of the PIF it is estimated that a reduction of 25 g-TEQ/year will be achieved, with a sustained annual benefit.
- Elimination of 150 metric tonnes of mixed obsolete pesticides (POPs and non-POPs), including newly listed POPs pesticides and the phase-down of POPs containing products.
- Reduction of 3.14 tonnes of Mercury releases from the Artisanal and Small Scale Gold (ASGM) mining sector and the phase-down/phase-out of Mercury containing consumer products. The project's reduction target will be calculated in more detail following completion of an initial assessment to be undertaken as part of the project's PPG phase.

However, the most important aspect of the project is that with GEF financing, a multitude of POPs and Mercury priority sectors are being addressed, each of them applying individualized approaches for the introduction of BAT and BEP in a multitude of priority sectors, which can easily be replicated afterwards. Without GEF support, this would not be possible and would result in communities at local, regional and global level to continue to be exposed to harmful.

With GEF support, the country will be able to establish a comprehensive and holistic policy/regulation framework for the LCM of Chemicals, establish integrated strategies to reduce UPOPs, Mercury and POPs releases in prioritized sectors, allowing the country to meet its obligations under the Stockholm Convention and the Minamata Convention.

INNOVATION, SUSTAINABILITY AND POTENTIAL FOR SCALING UP

The most innovative aspect of the project is the establishment of financial lending arrangements as part of a GEF Chemicals and Waste project to provide low-risk loans to legalized ASGM miners/cooperatives for the purchase of Mercury-free processing equipment. Such a lending arrangement will go a long way in ensuring long term (financial) sustainability and ensuring potential for scale-up. To date, other GEF UNDP projects have instituted lending structures for biodiversity and green commodity related livelihood interventions, but for the Chemicals and Waste Focal Area this is entirely innovative.

Other project aspects which are quite innovative or have never been applied in Ecuador on a large scale are: the sound environmental management of the newly-listed POPs that will be addressed by the project given the limited base of existing knowledge and information regarding their status in the country; Reducing UPOPs releases from priority sectors such as agriculture and optimizing the co-processing of hazardous and special wastes in cement kilns; Undertaking extensive Cost-Benefit Analyses (CBA) for substitute and alternative options to hazardous chemicals; and the identification and remediation of contaminated sites.

Actually the fact that such a large comprehensive Chemicals and Waste programme, that ultimately aims to achieve the Life-Cycle Management of Chemicals in Ecuador by building the necessary capacity of a multitude of stakeholders and beneficiaries, is fairly innovative. It is not often that such a comprehensive programme is proposed by a country, as most often Governments tend to focus on 1 or 2 priority chemicals.

The potential for scaling up is enormous. This is mainly thought to be the case because of a number of reasons: Firstly, the government of Ecuador is known to allocate large budget allocations to address priorities of national interest (e.g. the Puyango River Basin project with a funding of 55 million US$). As such it is expected that when demonstration and pilot interventions have proven successful, the Government is likely to allocation funding to replicate successes. Secondly, because of the lending structure established in

support of ASGM, even though project activities will come to an end, sources of finance will remain available to miners to take up Mercury-free processing practices. Finally, the project will support a large array of pilot and demonstration interventions in various sectors that will lend themselves very well to replication in other parts of the country.

2. Stakeholders. Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes ☒ /no☐) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation.

The involvement of civil society (through NGOs, CBOs, local community organizations) will be ensured throughout the project's development and later on during project implementation. In particular for project components related to Artisanal and Small Scale Gold Mining (ASGM), Municipal Solid Waste Management and the phase-out of Mercury containing products which are more relevant to the general public and communities at risk, the involvement of community organizations will be part and parcel of the proposed project to ensure that awareness raising and the engagement of project beneficiaries is ensured, and to warrant that project beneficiaries are involved in the design of project activities as outcomes will directly influence their work and/or living environment and/or their livelihoods.

The project has, in principle, no negative implications for indigenous people. The project component, which will be most relevant for indigenous populations, is the ASGM project component. The project expects to focus its interventions on a number of priority locations where ASGM is practiced, these are: Azuay, Loja and Zamora Chinchipe. In these locations, it is expected that a certain percentage of the miners is from indigenous populations. However, as the project aims to improve practices in the ASGM communities that will improve environmental management and reduce releases of Mercury positively impacting human health, increase the efficiency of mining practices, increase the income for miners and formalize the sector allowing for improved control and monitoring, it is expected that the project will have a positive impact on the living and working environment of indigenous people.

The nature of the project's potential implications will be further explored during the project's PPG phase, and if necessary will be subject to further socioeconomic studies during the project's implementation phase. Extensive consultations will be held during PPG phase, during which a preliminary project implementation structure will be agreed upon (including a description of the specific roles and responsibilities of the national executing/implementing partner(s)) and stipulated in detail in the project document. The management arrangements will be finalized after the project has been endorsed by the GEF and the project document signed by the national executing/implementing partner(s).

A full assessment of all relevant stakeholders will be undertaken during the PPG phase. A preliminary list of key stakeholders has been provided below:

TABLE 2 LIST OF RELEVANT STAKEHOLDERS AND THEIR ROLES DURING PPG PHASE.

Stakeholder	Role in the project preparation
Ministry of the Environment (MAE)	National authority for environmental policies and regulations. Lead institution for the environment sector, hosting the GEF focal point, as well as the Stockholm, Minamata, Basel and Rotterdam Convention focal points.
Ministry for Coordination of Strategic Sectors (MICSE)	Responsible for elaborating the political agenda and strategies for strategic sectors; Coordinates the environmental policy.
Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP)	Lead institution for the agricultural sector; Manages the agricultural chemicals registry; Responsible for the management of agrochemicals and pesticides; Manages pesticides as well as obsolete pesticides and monitors storage, distributors, shops, etc.

Ministry of Health (MSP)	Monitors people's health; Responsible for the management of the healthcare sector, as well as chemicals, insecticides and disinfectant for domestic and medical use, including cosmetics; Environmental protection associated with healthcare activities (including medical waste and Mercury containing medical devices); Responsible for the management of environmental health.
National Council for Control of Narcotic and Psychotropic Substances (CONSEP)	Adopted a list consisting of 35 Narcotic and Psychotropic Substances; Responsible for improved technical cooperation, control on their use, as well as registration by SISALEM and SISVYF.
Committee of Foreign Trade (COMEX)	Supports the development of norms and regulations related to import and export. Monitors the mechanism prohibiting the distribution of Mercury for ASGM through any other distributors than those approved by Government.
Ministry of Mines & National Institute on Metallurgical Mining and Geological Research (INIGEMM)	Responsible for the transfer of technologies and provision of technical assistance to support Mercury reduction and the sound management of mining tailings; Supports an environmental monitoring programme in the Puyango and Tumbes river basins; Increases awareness among miners on the health risks associated with Mercury; Promotes fair-trade and fair mined gold certification; Builds ASGM related capacity for the implementation of the Minamata Convention.
Ecuadorian Accreditation Service (SAE)	Guarantees the safety and quality of products and services for consumers and the domestic and international commerce sector and enhances the national capacity for technical competencies through accreditation (e.g. undertakes capacity building for laboratories). Responsible for the accreditation of laboratories (including inspections and certifications as well as quality of analysis).
Ministry of Hydrocarbons	Responsible for the sustainable exploration and exploitation of hydrocarbons.
Ministry of Electricity and Renewable Energy	Entity responsible for meeting the electricity needs of the country through the formulation of relevant legislation, development plans and sectoral policies for the efficient use of resources; Responsible for the elimination of Mercury from electrical applications.
National Planning and Development Secretariat (SENPLADES)	Manages and coordinates the National Decentralized Participatory Planning System (development of the country at sectoral and regional level); Establishes strategic objectives and policies; Guides public investments and promotes the democratization of the state.
National Secretariat of Higher Education, Science, Technology and Innovation (SENESCYT)	Supports the pilot demonstration of potential remediation approaches, to help identify solutions for the Ecuadorian context.
Ecuadorian Standards Service (INEN)	Responsible for elaborating Standards, Technical Regulations and Methodologies to ensure compliance with civil rights related to security, the protection of human, animal and plant life, the preservation of the environment, consumer protection and promoting the culture of quality and improving productivity and competitiveness in Ecuador.
Municipal Governments	Responsible for environmental management and control under the Municipalities Law.
Private sector actors	Entities generating and receiving wastes destined for co-processing; Retailers/distributors as well as private entities that are users of products containing newly listed POPs or Mercury (e.g. private sector healthcare facilities), among else.
Civil Society	NGOs, CSOs, CBOs involved in waste management and/or ASGM; Community engagement; Formalization; etc.
Financial Institutions/Banks	Financial institutions/banks and similar structures (public and/or private) that could provide for a lending platform and service the loans/revolving funds for legalized miners and/or cooperatives.

3. Gender Considerations. Are gender considerations taken into account? (yes ☒ /no☐). If yes, briefly describe how gender considerations will be mainstreamed into project preparation, taken into account the differences, needs, roles and priorities of men and women.

In daily life, men, women, and children are exposed to different kinds of chemicals in varying concentrations. Biological factors — notably size and physiological differences between women and men and between adults and children — influence susceptibility to health damage from exposure to toxic chemicals. Social factors, primarily gender-determined occupational roles, also have an impact on the level and frequency of exposure to toxic chemicals, the types of chemicals encountered, and the resulting impacts on human health.
The PPG phase of the project will assess the gender aspects of the proposed project, ensure the participation, representation and buy-in of vulnerable worker and community populations in the project's formulation and mainstream gender into all activities to be undertaken as part of the full-size project as per the "UNDP Technical Guide on mainstreaming SMC" and the UNDP guidance note on "The why and how of mainstreaming gender in chemicals management".

Depending on the sector on which particular project component are focusing it might be either women, men or children most at risk. For example, in the ASGM sector it could be expected that men are mostly impacted by the use of Mercury applied to extract gold from ore, while women and children are likely to be impacted when Mercury is burned off at household level. In the healthcare sector, the majority of healthcare staff is female (~ 75%) as such the impact of the breakage of Mercury containing medical devices in the healthcare setting is most likely to have the highest consequences for women and their offspring. The release of UPOPs, from open burning practices, (co-)incineration etc., can be expected to have the severest impact on the living environments of communities located close to the source of these emissions. These examples indicated that each and every chemical of concern in a different sector and settings will have different gender consequences.

As such the project will assess in more detail the gender aspects of the proposed project and subsequently design and tailor capacity building and training programmes to the various project beneficiaries, population groups at risk and project stakeholders to enable the project to employ gender sensitive approaches to reduce exposure risks to men, women, children and their families.

4 Risks. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable).

TABLE 3: OVERVIEW OF THE RISKS AND MITIGATION MEASURES

Description	Risk Rating	Countermeasures / Management responses
Lack of coordination of the relevant institutions and ministries	L	Coordination among various stakeholders will be ensured by involving them in the project steering committee and/or in specific project activities. In addition, the project will support the establishment of an Interagency Ministerial Coordination Mechanism (ICM) that will aim to improve coordination, collaboration and decision-making on issues pertaining to SMC. Not only will the ICM provide a platform for information exchange and improved coordination, but it is also expected that the ICM can take decisions on priority chemicals issues and as such will on a regular basis liaise with all relevant stakeholders.
New regulatory instruments cannot be adopted within the project's timeframe due to the extended length of the law making process.	M	The selection of the proper law-making process (i.e., decrees, guidance, standards, etc. embedded in existing regulations) and continuous support and oversight provided by the project team, will enable the speedy development, and review of an improved regulatory framework on SMC compliant with the relevant chemicals related Multi-lateral Environmental Agreements (MEAs).
Little confidence of beneficiaries in mercury-free or POPs-free alternatives, resulting in continued use of mercury and POPs	M	The project will share technical specifications, standards, test results, and experiences from other projects and international initiatives, which have made the shift to POPs-free and Mercury-free alternatives. To create additional confidence, the project will also undertake (a) staff preference study (ies) for

Description	Risk Rating	Countermeasures / Management responses
containing products.		priority products (staff will test and select Mercury/POPs free alternatives based on accuracy, ease of use and costs, which will give ownership of the selection process to the end users) and support a Cost-Benefit Analysis (including an analysis of the costs of inaction) on Mercury/POPs versus Mercury/POPs-free products to support informed decision-making. In addition, training on the use of mercury and/or POPs-free products will be provided to create confidence in the use of the new products.
ASGM		
Slower than expected implementation of BEP/BAT in the project's ASGM communities.	M	The project will build a team of local trainers that understand ASGM practices, Mercury use and gold production, and who can integrate with the community (or are already part of the community) and can ensure the training of miners and support the implementation of BEP/BAT. Secondly, the project will also closely collaborate with other ASGM mining initiatives in the region, and apply lessons-learned and experiences from other countries that have proven to be successful. Finally, the MTE/MTR will identify problems and recommend improvements half way through the project, while continuous monitoring of the project team will aim to address any delays in implementation based on needs as they arise.
Economic incentives perceived too low by artisanal gold miners to adopt BEP/BAT resulting in continued unsound practices and use of Mercury.	M	First and foremost, the project will aim to shorten the gold supply chain, so that more of the profits will end up with the miners than with the middlemen. The project will do this through 2 avenues: i) By setting up exchange points to provide legal points of sale for sustainably sourced gold; ii) By linking Mercury-free gold directly to global supply chains for sustainably sourced gold (e.g. through establishing customs agreements with national government and governments where large refiners are located; establishing transparent supply chains; introducing economic incentives (e.g. premiums) for sustainably sourced gold; Negotiate purchasing/exchange deals with large refiners).
Mistrust of miners towards Government agencies and entities (as well as their affiliates – such as UNDP) trying to support the formalization of the ASGM sector and the workers conditions of the miners, as ASG miners are often afraid that their property or right to the land on which they are mining might be taken away.	L	It will be important to build trust among the miners and the mining community, otherwise it will be challenging to implement any project activities. The project envisages therefore working closely with the leadership of the municipality, existing cooperatives and also through local NGOs that have worked with ASGM communities in the past. The project will focus on building a trust relationship with the mining community before it will start implementation of project activities. The project will also select miners and moderators from the mining communities, and train them as trainers, to build trust.
Even though legalized ASG miners are required sell their gold to the Central Bank – as stipulated in the Mining Law - Middlemen may resist change to shortening the gold supply chain, some of which may be linked to organized crime.	L	Improving the gold supply chain (or short circuiting it) with the objective to improve income for small-scale miners and legalize their status, would result in lowering the income for the middle man, who might be likely to resist this change. However, the project anticipates that with the creation of a cooperative with a legal status, miners stand stronger together and will receive more support from the Government considering they are paying taxes, resulting in less harassment.
Less demand for premium fair trade or green gold than supply of the same.	M	It is hard to build a market for premium green gold products. In addition to relying on green gold markets certified by Fairtrade and Fairmined, the project will also try to work with other entities to establish an ethical gold fund that could provide a certain premium for gold but ensure larger supply volumes (the project would support such an initiative through collaboration with other UN and non-UN support ASGM project).
Average Risk Rating	**M**	

5. Coordination. Outline the coordination with other relevant GEF-financed and other initiatives.

At national level the project expects to coordinate with the following relevant GEF-financed and other initiatives:

- GEF/UNDP: "*Integrated and Environmentally Sound PCBs Management in Ecuador*" (GEF grant: 2,000,000 USD; co-financing: 7,800,000 USD).

- GEF/UNIDO: "*Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs)*" (GEF grant: 205,000 USD; co-financing: 235,000 USD)
- MAE Ecuador: "Zero Mercury Plan (2012 – 2020)" (funding from 2012 – 2017: 300,000 USD, 2017 – 2020: 300,000 USD)
- GEF/UNDP: "*Conservation of Ecuadorian Amphibian Diversity and Sustainable Use of its Genetic Resources*" (GEF grant: 2,726,908 USD; co-financing: 14,205,255 USD)
- GEF/UNDP: "*Sustainable Development of the Ecuadorian Amazon: integrated management of multiple use landscapes and high value conservation forests*" (GEF Grant: 12,462,550 USD; co-financing: 49,338,350 USD)
- MAE "*Comprehensive environmental management program in the Puyango River Basin*" (financing: 55,892,636 USD; 2014 – 2016)
- PRAS: "*Repair Plan for the Puyango River*" (financing: 1,000,000 US$).
- INIGEMM: "*Improvement of Working Conditions of Small Scale and Artisanal Miners*" (financing: 4,800,000 USD)
- GoE/IDB: "*National Program for Investment in Water, Sanitation and Solid Waste* (PROSANEAMIENTO)[22]" (financing: 51,600,000 US$).
- GoE/MAE: "*National Program for Integrated Management of Solid Wastes (PNGIDS)*" (financing: 8,000,000 US$)
- MSP "*Model for Comprehensive Family, Community and Inter-Cultural Health (MAIS-FC)*" (financing: 1,034,014,726 USD[23] from 2008 until 2015 for the provinces of Azuay, El Oro and Zamora.
- MAE/SAICM QSP TF/UNDP/UNEP: *"Ecuador, UNEP and UNDP Partnership initiative for the implementation of SAICM"* (financing: 250,000 USD).

At regional/global level the project expects to coordinate with the following relevant GEF-financed and other initiatives:

- GEF/UNEP: "Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Latin American and Caribbean Region" (GEF grant: 3,636,000 USD; co-financing: 7,399,200 USD)
- GEF/UNEP/LATU: "Development of Mercury Risk Management Approaches in Latin America" (GEF grant: 916,000 USD; co-financing: 2,894,434 USD)
- GEF/UNIDO: "Strengthening of National Initiatives and Enhancement of Regional Cooperation for the Environmentally Sound Management of POPs in Waste of Electronic or Electrical Equipment (WEEE) in Latin-American Countries" (GEF grant: 9,500,000 USD; co-financing: 35,000,000 USD)
- GEF/UNIDO: "Implementing Integrated Measures for Minimizing Mercury Releases from Artisanal Gold Mining" (GEF grant: 999,900 USD; co-financing: 2,676,764 USD)
- GEF/UNEP: "Global Project on the Implementation of PRTRs as a Tool for POPs Reporting, Dissemination and Awareness Raising for Belarus, Cambodia, Ecuador, Kazakhstan, Moldova and Peru" (GEF grant: 2,000,000 USD; co-financing: 8,232,258 USD)
- MIPRO: "*Eliminating Lead in Paint in the Andean Free Trade Region"* for Peru, Bolivia, Ecuador and Colombia (Funding: 1,500,000 USD).

6. Consistency with National Priorities. Is the project consistent with the National strategies and plans or reports and assessements under relevant conventions? (yes ☒ /no☐). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.

The Republic of Ecuador signed the Stockholm Convention on August 28, 2001 and ratified the Convention on June 7, 2004. The country's first National Implementation Plan (NIP) for the implementation of the Stockholm Convention was prepared with assistance of the GEF as part of a regional UNEP programme and

[22] http://www.iadb.org/en/news/news-releases/2014-06-26/ecuador-water-sanitation-solid-waste,10852.html
[23] https://public.tableau.com/profile/publish/Linkpresupuestario/Presentacin#!/publish-confirm

submitted to the Stockholm Convention Secretariat in September 2006. Subsequently a NIP update with support from the Swiss Development Cooperation (SDC), UNEP and the GEF was finalized and submitted in June 2009. Ecuador will start its NIP update process in 2016 (with GEF and UNIDO support) to include newly listed POPs. The strategic objectives and main programmes of the most recent available NIP (2009) are presented in the table below.

TABLE 4 STRATEGIC OBJECTIVES AND MAIN PROGRAMMES OF THE NIP

Strategic Objectives	Programmes
1. Institutional Strengthening ***Objective*: Strengthen the institutional framework and coordination between different actors to support the implementation of strategies and intervention for POPs.**	**1.1 Policy Strengthening** *Objective*: Adapt and supplement the framework pertaining to the regulations of POPs.
	1.2 Strengthening of Monitoring and Evaluation Capacity *Objective*: Strengthen organizations involved in the monitoring and control of POPs.
2. Continuos Improvement in the Management of POPs ***Objective*: Manage in an Environmentally Sound Manner POPs stockpiles, waste sites stocks, contaminated sites and unintential releases of POPs.**	**2.1 Continuous improvement of the management of PCBs** *Objective*: Remove in an environmentally sound manner existing stockpiles of PCBs contained in oils, equipment and wastes by 2025.
	2.2 Continuous improvement of the management of POPs pesticides *Objective*: Eliminate in an environmentally sound manner obsolete POPs pesticides and non-POPs obsolete pesticides and prevent the generation of new stocks.
	2.3 Reducing emissions of unintentially produced POPs *Objective*: Reduce emissions of dioxins and furans.
	2.4 Management of Contaminated Sites *Objective*: Identify and manage POPs and non-POPs contaminated sites and prevent the generation of new contaminated sites.
3. Information generation, Awareness Raising, Conducting Training and Research ***Objective*: Create awareness among different groups of society on the risks associated with POPs.**	**3.1 Information management, creating awareness and undertaking research** *Objective*: Manage information, promote research, raise awareness and train different groups of society on the risks associated with POPs.

The proposed project is entirely in line with the Ecuador NIP and addresses all of its 3 strategic objectives as well as 6 of the 7 programmes prioritized in the NIP. The only programme intervention not covered by the proposed project (2.1) is already taken care of by the GEF/UNDP project "Integrated and Environmentally Sound PCBs Management in Ecuador" which is currently under implementation.

As such it can be concluded that the proposed project is entirely consistent with Ecuador's National Strategies pertaining to POPs.

The Republic of Ecuador signed the Minamata Convention on Mercury on October 10, 2013. With the support of UNITAR it developed a national inventory of Mercury releases in 2008. The Mercury release inventory identified two main "source/release" categories to be responsible for the majority of Mercury releases: *Products containing Mercury* and *ASGM* (see section on Baseline Scenario. As the proposed project aims to reduce Mercury releases from both ASGM as well Mercury in consumer products, the proposed project can be considered entirely consistent with national Mercury reduction priorities.

7. Knowledge Management. Outline the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Relevant project and initiatives that the proposed project will learn and benefit from are listed in section 5. In addition, the project expects to benefit greatly from the Honduras GEF/UNDP projects "Environmentally Sound Management of Products and Wastes Containing POPs and Risks Associated with their Final Disposal" and "Strengthening National Management Capacities and reducing releases of POPs in Honduras", the Nigeria GEF/UNDP project "Less burnt for a clean Earth: Minimization of dioxin emission from open burning sources in Nigeria" the GEF/UNDP/WHO/HCWH "Global Medical Waste Project" and ASGM related development projects being undertaken in the LAC region, such as those supported by UNIDO, USDoS, Artisanal Gold Council, Biodiversity Research Institute (BRI) and BIO-RED+.

The project will adapt the following knowledge management approach:

- The project implementation team, at the inception stage of the project, will develop a Knowledge Management Action Plan which will lay out the approaches for information collection and documenting project experiences and lessons-learned on a regular basis for each project sector and outcome.
- The project will (see also *Output 4.2.2)* capture experiences and lessons-learned in easy to update, share and understandable communication materials to ensure that replication of project results throughout the country is facilitated.
- Materials will be produced in both Spanish and English and will be posted on relevant websites of project stakeholders.
- In the ASGM area, the project aims to collaborate with the BRI project "Development and implementation of artisanal and small-scale gold miner training resources for reducing mercury use and release in South America" to make use of and contribute to the development of a series of training modules on appropriate and more efficient mining technologies for small-scale miners.
- Data resulting from research (e.g. remediation of contaminated sites introduction of BAT and BEP in ASGM, and disposal of various waste streams through co-incineration in cement kilns) will be captured – if feasible – in scientific articles through collaboration with INIGEMM and SENESCYT and published if accepted by internationally recognized journals.
- Release and emissions data, as well as data resulting from the in-depth assessments conducted as part of Output 2.1.1, 3.1.1 and 2.4.1 will be also be captured in existing systems such the Unique System of Environmental Information (SUIA) and the PRTR system integrated therein, to ensure that data collected and obtained by the project will remain available beyond the project's duration.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT[24] OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):

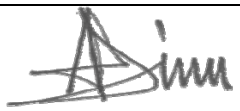
(Please attach the Operational Focal Point endorsement letter(s) with this template. For SGP, use this SGP OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Lorena Tapia Núñez	Minister of Environment, GEF OFP	MINISTRY OF ENVIRONMENT	**07/23/2015**

[24] For regional and/or global projects in which participating countries are identified, OFP endorsement letters from these countries are required even though there may not be a STAR allocation associated with the project.

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies[25] and procedures and meets the GEF criteria for project identification and preparation under GEF-6.

Agency Coordinator, Agency name	Signature	Date *(MM/dd/yyyy)*	Project Contact Person	Telephone	Email
Adriana Dinu, UNDP-GEF Executive Coordinator		07/27/2015	Mr. Jacques Van Engel Director, UNDP MPU/Chemicals	212-906-5782	jacques.van.engel@undp.org

C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION (APPLICABLE ONLY TO NEWLY ACCREDITED GEF PROJECT AGENCIES)

For newly accredited GEF Project Agencies, please download and fill up the required **GEF Project Agency Certification of Ceiling Information Template** to be attached as an annex to the PIF.

[25] GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF