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:	Improving Environmental Management in the Mining Sector of Suriname, with Emphasis on Gold Mining		
Country(ies):	Suriname	GEF Project ID:[1]	9288
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5627
Other Executing Partner(s):	National Institute for Environment and Development in Suriname (NIMOS)	Submission Date:	September 29, 2015
GEF Focal Area(s):	Multi-focal Areas Biodiversity*, Climate Change Mitigation, Sustainable Forest Management	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 ($*)	720,959

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
Biodiversity-BD-4: Mainstream biodiversity conservation and sustainable use into production landscapes/seascapes and sectors Program 9: Managing the human-biodiversity interface	GEF TF	3,258,877*	14,428,470
Climate Change Mitigation-CCM-2: Demonstrate systemic impacts of mitigation options Program 4: Promote conservation and enhancement of carbon stocks in forest, and other land use, and support climate smart agriculture.	GEF TF	1,800,484	7,971,530
Sustainable Forest Management SFM-1: Maintained Forest Resources: Reduce the pressures on high conservation value forests by addressing the drivers of deforestation	GEF TF	2,529,680	11,200,000
Total Project Cost		7,589,041	33,600,000

*****Applying the STAR flexibility mechanism of GEF-6, a total of US$ 579,284 of LD STAR is being channelled to the BD focal area (including PPG). The figure in Table A includes LD STAR of $522,141 as well as BD STAR of $2,736,736. These figures are shown with fee in Table D.

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

[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*.

Project Objective: Strengthen the enabling environment for the management of mining and promote uptake of environmentally responsible mining technologies in Suriname in order to reduce negative impacts on biodiversity and forests, mitigate climate change, and enhance local livelihoods.						
Project Components	**Financing Type[3]**	**Project Outcomes**	**Project Outputs**	**Trust Fund**	**(in $)**	
					GEF Project Financing	**Co-financing**
Component 1: Institutional, policy and planning framework strengthened for improved management of gold mining in Suriname	TA	Outcome 1: Strengthened institutions, inter-institutional cooperation and regional cooperation, resulting in: - increased capacity of Ministry of Natural Resources, NIMOS and other key institutes to manage gold mining (as measured by capacity index). - Percentage of total area of small and medium scale mining operations with regular enforcement of mining guidelines/ requirements (target to be established in PPG phase) - Establishment of Environmental Planning and Information Office in NIMOS - Enhanced level of information exchange through regional cooperation mechanism with Brazil, Guyana and French Guiana, and through the Guiana Shield Facility and the World Wildlife Fund Outcome 2: Policy and planning framework strengthens environmental oversight of gold mining activities, as measured by: - # of guidelines/requirements for gold miners that	Output 1.1: Institutional strengthening, training and development of government capacity to carry out planning, develop and enforce mining regulations / guidelines, including through Mining Service Centres. Output 1.2: Regional cooperation mechanism promotes information exchange with neighboring countries of the Guianas Output 2.1: Economic, social and environmental, valuation studies heighten decision-makers' awareness of a) the impacts of uncontrolled mining and of regulated, environmentally responsible mining	GEF TF	**Total Comp. 1: 4,692,545** BD: 1,695,306 CCM: 997,239 SFM: 2,000, 000	Sub-total Comp 1: 28,193,544

[3] Financing type can be either investment or technical assistance.

		are developed in a participatory fashion and beginning to be implemented - # of guidelines/ requirements for gold mining that stipulate preservation of carbon stocks/ promote sustainable forest management (specific targets to be established during PPG phase) - Approved Mining Strategy to guide activities in a sustainable fashion - # ha of land under improved management to protect globally significant biodiversity through strengthened planning and management (target: 2,400,000 ha) - # of tons of CO_2e mitigated (annual target: 194,469 tons of CO_2e) through avoided deforestation	(including on vulnerable groups), b) the need for improved management of the sector and c) the costs and benefits of different livelihood options and select alternative land uses Output 2.2: Strengthened environmental guidelines for gold mining with increased oversight and enforcement Output 2.3: Draft Mining Strategy and support for designation of small and medium-scale mining zones strengthen planning by taking into consideration environmental factors, including the need to reduce deforestation and maintain carbon stocks Output 2.4: Proposal on public/private partnerships details how social/ environmental funds established by large-scale mines for communities can adequately integrate actions to promote biodiversity conservation, integrated watershed management, sustainable forest management, climate change mitigation and sustainable local livelihoods.			
Component 2: Increased adoption of environmentally responsible practices among gold miners and communities in	TA	Outcome 3: Uptake of more environmentally sustainable gold mining practices increased resulting in:	Output 3.1: Research and pilot projects identify the most feasible and sound mining methods to	GEF TF	**Total Comp. 2: 2,535,113** BD: 1,408,386 CCM: 717,508	Sub-total Comp 2: 3,700,000

the Greenstone Belt leading to multiple global environmental benefits		- # of miners adopting better practices (including establishment of tailing ponds, methods to reduce mercury, among others) - # of ha under sustainable forest management (target: 500,000 ha) - # metric tons of reduced mercury (target: 5) (*note- all targets to be confirmed during PPG phase*) - level of awareness among population of environmental impacts of small and medium-scale gold mining using non-environmentally friendly techniques (as measured by surveys)	promote among gold miners Output 3.2: Establishment of Mining School with one environmentally-sound demonstration site including BD friendly and mercury-free techniques and technical support for Mining Service Centres significantly increase training available to gold miners, complementing government and other investments in socio-economic development, health and security for miners [Output co-financed by US DoS] Output 3.3: Education campaign increases awareness of negative environmental, health and social effects of current gold mining practices, including from mercury use, particularly on vulnerable groups [Output co-financed by US DoS] Output 3.4: Increased stakeholder engagement and organization supports improved governance at the community level and facilitates uptake of technologies Output 3.5: Pilot-scale implementation of alternative sustainable livelihoods increases understanding of costs and benefits of different livelihood options		SFM: 409,219	
			Subtotal		7,227,658	31,893,544

Project Management Cost (PMC) [4]	GEF TF	361,383	1,706,456
Total Project Cost		7,589,041	33,600,000

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	NIMOS	Grant	1,400,000
Recipient Government	Ministry of Natural Resources – Commission to Regulate the Gold Sector (OGS) and Geological Mining Service	Grant	22,000,000
Other	US Department of State	Grant	500,000
CSO	World Wildlife Fund	Grant/ In kind	1,000,000
CSO	Suriname Conservation Fund	Grant	1,250,000
CSO	Suriname Environmental and Mining Foundation (SEMIF)	Grant	2,500,000
GEF Agency	UNDP Suriname	Grant/in kind	500,000
Recipient Government	Grassalco (state-owned gold mining company)	In kind	1,000,000
Recipient Government	Ministry of Physical Planning, Land and Forest Management - SBB	Grant	250,000
GEF agency	Interamerican Development Bank	Grant/Loan	3,200,000
Other	Brazil, Guyana, French-Guyana	Grant/in kind	tbd
Total Co-financing			33,600,000

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
UNDP	GEFTF	Suriname	Biodiversity		2,736,736	259,990	2,996,726
UNDP	GEFTF	Suriname	Climate change		1,800,484	171,046	1,971,530
UNDP	GEFTF	Suriname	Land degradation		522,141	49,603	571,744
UNDP	GEFTF	Suriname	Sustainable Forest Management	SFM	2,529,680	240,320	2,770,000
Total GEF Resources					7,589,041	720,959	8,310,000

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

[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.

E. PROJECT PREPARATION GRANT (PPG)[5]

Is Project Preparation Grant requested? Yes X 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: $109,590					PPG Agency Fee: $10,410		
GEF Agency	**Trust Fund**	**Country/ Regional/Global**	**Focal Area**	**Programming of Funds**	**(in $)**		
					PPG (a)	**Agency Fee[6]** (b)	**Total** c = a + b
UNDP	GEF TF	Suriname	Biodiversity	(select as applicable)	39,520	3,754	43,274
UNDP	GEF TF	Suriname	Climate Change Mitigation	(select as applicable)	26,000	2,470	28,470
UNDP	GEF TF	Suriname	Land Degradation		7,540	716	8,256
UNDP	GEF TF	Suriname	SFM		36,530	3,470	40,000
Total PPG Amount					**109,590**	**10,410**	**120,000**

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	*0.5 million hectares*
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)	*194,469 tons of CO_{2e} mitigated (annually for 20-year period)*
3. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Reduction of 1000 tons of Mercury	*5 metric tons (through funding from US DoS)*

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, 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.

1) Global environmental problem, root causes and barriers

[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.

[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.

1. Suriname is the smallest sovereign state in South America with a land area of approximately 163,000 $km^{2.}$. It has extremely high levels of tropical rainforest cover, forming part of the Amazon river basin. It is estimated that 90% is still forested, corresponding to approximately 14.8 million hectares (Report to CBD 2012), and it is considered a 'High Forest Cover- Low Deforestation Rate' country. These forests harbour significant levels of biodiversity, serve as an important carbon sink and maintain key ecological services, such as watershed protection, soil quality maintenance and climate regulation . At a regional level, the Guiana Highlands are one of the four largest remaining continuous and large intact forested ecoregions of the world. It is also important to note that Surinamese forests are located within two of WWF's Global 200 ecoregions, which are considered significant for the conservation of global biodiversity, namely, Guyanan moist forests and Guyana Highlands moist forests.

2. The high levels of biodiversity can be attributed, *inter alia*, to the significant forest cover , the large variety of habitats, the temperature, and relatively low population pressures to date. Surveys have identified approximately 715 bird species, 192 mammal species, 175 reptile species, 102 amphibian species, and, 5,100 plant species in Suriname (Report to CBD 2012). Since many areas have not been fully explored, the numbers are likely to be even higher. A recent rapid biodiversity assessment by Conservation International conducted in 2013 found 60 species that are believed to be new to science. At least 82 endangered species and 13 known endemic species are present in Suriname. Examples of endangered species include the *Vouacapoua americana* plant; the Blue-Cheeked Amazon bird (*Amazona dufresniana*); the White Lipped Peccary (*Tayassu pecari*), and the Giant Anteater (*Myrmecophaga tridactyla*), The Guiana Highlands which include Suriname are believed to have a 50% endemism rate.

3. While 13% of the country's land area has been set aside in protected areas, a substantial amount of forest and associated biodiversity is found within productive landscapes. Mining is a vital sector of Suriname's economy and has grown significantly over the last decade, particularly gold mining, contributing an estimated 1.62 billion USD in 2012 versus 34 million USD in 2000. In 2011, small-scale gold mining was believed to provide 20,000 direct jobs as well as a significant number of jobs in subsidiary services. The majority of mining is taking place in Suriname's Greenstone Belt, in which the majority of gold deposits are believed to be found, Unfortunately, due to its largely unregulated and uncontrolled nature, mining, and in particular small and medium-scale gold mining (SMGM), is causing significant negative environmental impacts on forests, freshwater, fish and other groups of species.

4. Small and medium-scale mining is posing a serious threat to the country's forests and associated biodiversity, as a result of the unplanned clearing of land for mining operations, poorly managed operations, the deleterious practices employed, and general absence of land rehabilitation. While Suriname still maintains high levels of tropical rainforest cover and the deforestation rate is still relatively low at between 0.02 and 0-07% (Tropenbos International Suriname 2011), gold mining is contributing to higher rates of deforestation than any other activity (Centre for Agriculture Research of Suriname 2011)[8]. Between 1999 and 2007, satellite imagery showed that deforestation caused by gold mining increased from 8,295 ha to 27,253 ha (Office National des Forêts 2010). The deforestation rate caused by informal gold mining is estimated at 2,621 ha per year (Playfair 2011). According to the Foundation for Forest Management and Forest Control (SBB), the deforestation rate between 2000 and 2009 was estimated to be 3000 ha/yr. Between the period of 2009 and 2013 this deforestation rate increased to 9000 ha/yr (Foundation for Forest Management and Forest Control), mainly attributed to mining and urbanization. Deforestation contributes significantly to species decline and loss, directly through habitat loss and indirectly through issues such as increased soil erosion and water turbidity. In addition, mining is contributing to forest fragmentation, which also has significant negative impacts on biodiversity, such as on primates, which cannot maintain viable populations in small isolated patches.

5. Mining is a substantial source of carbon emissions as a result of conversion to other land uses estimated at 1,740.2 Gg $CO_{2.}$ As such, the sector is the second largest emitter in the manufacturing industries and construction category and is an important contributor to climate change. Gold mining also contributes to land degradation; without land rehabilitation, the land may be infertile for tens of years before regeneration begins to occur, with significant impacts on associated biodiversity. Increased turbulence and turbidity/ siltation of waterways is another significant environmental impact resulting from mining activities. In Suriname, it was estimated that 2,201 km of

[8] Centre for Agriculture Research of Suriname. 2011. Spatial drivers of deforestation in Suriname.

waterways were affected by the impacts of gold mining in 2007. Other impacts include air and noise pollution and associated loss of fauna, and hunting of fauna in mining communities. In addition to these serious environmental impacts, informal mining in Suriname's interior is also associated with conflict and potential for violence, in part because of the limited presence of institutions and police in the area and lack of regulation of the industry.

6. Significant impacts on biodiversity also arise from the high levels of mercury use among most small and medium-scale miners (Fourth National Report to the Convention on Biological Diversity 2012), with an estimated 10,000–20,000 kg entering the environment annually in Suriname. As a highly toxic heavy metal, it is linked to freshwater contamination as well as bioaccumulation in fish, among other effects. Studies carried out in Suriname over an eight-year period from 2002-2010 looked at mercury levels in bottom sediment and in predatory fish at 53 sites. Average sediment levels surpassed the Canadian standard in most sites, excluding the coastal plains. A total of 41% of the predatory fish had mercury levels that exceeded the European Union standard for human consumption, with the highest levels recorded in the Brokopondo Reservoir which is near several important gold mining areas. In the Upper Coppename River where mercury levels are also high, atmospheric deposition of mercury is suspected to be the source of mercury in this pristine area. These studies suggest that the impacts of mercury from gold mining may not be limited to mining areas, but may reach pristine, high biodiversity areas including nature reserves, such as the Central Suriname Nature Reserve, which covers 10% of the land area of the country. This reserve comprises 1.6 million ha of primary tropical forest with montane and lowland forests that harbour a high diversity of fauna (over 5,000 vascular plant species identified so far); 400 bird species such as harpy eagle (*Harpia harpyja*), Guiana cock-of-the-rock (*Rupicola rupicola*) and scarlet macaw (*Ara macao*); eight species of primates; the jaguar, giant armadillo (*Priodontes maximus*), giant river otter (*Pteronura brasiliensis*), and the tapir (*Tapirus terrestris*), among others.

7. The root causes of these threats are related first and foremost to poverty in the hinterland, and the lack of viable economic alternatives in many areas apart from mining. In addition, strong economic and political interests play an important role in the growth of this sector and in the lack of sufficient controls in place. Surrounding communities in the interior do not fully understand the environmental impacts of current small- scale gold mining practices for short-term economic gain versus the long term economic value of the forest ecosystem for livelihoods. A number of barriers exists that are undermining effective action to address the threats associated with small and medium-scale gold mining, as described in the following Table:

Barrier	**Description**
Institutional capacity constraints	Key institutions such as the NIMOS, the Geological Mining Service Division of the Ministry of Natural Resources, and the Presidential Commission to Regulate the Gold Sector suffer from limited personnel and lack of sufficient qualified personnel. For example, NIMOS's ability to regulate mining would benefit from greater training of staff on issues such as planning, GIS and database systems, regulation and legislation, and public participation policy. Generally, there is insufficient specialized expertise within institutions on sustainable gold mining practices and on how to better control small and medium-scale mining activities. Suriname suffers from "brain drain", both in terms of qualified individuals moving to other institutions and companies with higher levels of compensation and of individuals moving to other countries (as many as 50% of Surinamese reside outside of Suriname).
Weak interinstitutional communication and coordination	There are a number of governmental and non-governmental institutions involved in environmental management. An analysis by NIMOS of government institutes found that almost all Ministries have some environmentally related mandates. However, lack of specific environmental legislation contributes to unclear and overlapping actions or is cause for inaction in addressing environmental issues, including as it relates to regulating and monitoring the mining industry. Limited interinstitutional communication translates into a situation where initiatives are often uncoordinated. There is currently no Environmental Planning and Information Office within NIMOS' structure or any other body that could adequately respond to this situation.
Insufficient monitoring and enforcement capacity	NIMOS does not have the capacity to monitor the impacts of small, medium and large-scale mining in the field, due to lack of training and equipment, few officers, and limited legislative mandates. Similarly, the Ministry of Natural Resources does not have adequate monitoring and enforcement capacities. The Presidential Commission to Regulate the Gold Mining Sector was established in December 2010 to strengthen controls in the hinterland gold mining and to reduce illegal mining. Initiatives have included setting up Mining Service Centers in strategic locations to establish government presence (focused primarily on policing, registering and permitting). However, the aim of

	these Centers has been to restore order in the hinterland, with less focus being placed on monitoring and enforcement of the permitting system and of environmental aspects due to weaknesses in the legislative and institutional framework and capacity limitations.
High level of illegal mining activity	Linked to the weak monitoring and enforcement capacity is the substantial amount of illegal small and medium-scale mining that is occurring without concessions or permits. As such, there is little adherence even to the standards that do exist within the existing legislation. It is believed that more gold is produced from illegal and legal small and medium-scale gold mining as from legal large-scale mining activities, with estimates of at least 400,000 ounces of gold per year coming from these sources.
Weak legislative and planning framework in terms of mining	There are no mandatory environmental and social impact assessments (ESIAs) in Suriname, only voluntary general guidelines for ESIAs and guidelines for the mining sector. No legislation/regulations exist in relation to emission standards in the mining industry either. The existing Mining Act requires updating as it dates back to the Mining Decree E-58 of 1986. While a new Mining Code was drafted as far back as early 2000s, it has not been approved. This draft includes more stringent controls on environmental impacts, public participation mechanisms, and rehabilitation requirements. Nevertheless, even without an updated Mining Code, additional health, air, water and soil standards could be developed using the current legislation through Ministerial Decrees and other instruments. It should be noted that Suriname has not yet signed and ratified the Minamata Convention on Mercury. However, it has started to address mercury management, for example, by carrying out a participatory process to outline a roadmap toward ratification of the Minamata Convention. It has signaled its intent to sign and ratify the Convention and will request Enabling Activity funds. Suriname does not have a land use plan or policy in place. The Presidential Commission to Regulate the Gold Sector (OGS) has mapped out nine mining areas, however, these are not based on a comprehensive analysis of different possible land uses or on environmental considerations. Moreover, the Platform for Entrepreneurs in the Hinterland has also defined mining areas, but this exercise was not carried out in coordination with all institutional actors. Finally, there is no agreed upon Mining Strategy for Suriname that could provide guidance on development pathways.
Insufficient understanding of the economic, environmental and social costs and benefits of uncontrolled mining, regulated mining and alternative land uses among decision-makers	Comprehensive studies have not been carried out to determine the economic, environmental and social costs and benefits of current uncontrolled gold mining practices, regulated more environmentally responsible mining and alternative land uses. Some studies in the hinterland over the past years have investigated issues such as the impacts of gold mining on physical soil characteristics, level of vegetation recovery, freshwater quality, mercury contamination, and human health. However, such research has not been carried out in all key sites affected by mining activity. It is important to note that the information that has been gathered often does not reach decision-makers due primarily to weak knowledge management mechanisms and coordination. It should also be noted that there is insufficient information exchange and cooperation with other countries at the regional level.
Insufficient knowledge among miners about environmentally-responsible gold mining techniques and lack of incentives to change current mining methods	Suriname does not have a Mining School nor any formal requirement for training of miners. There have been few opportunities to pilot alternative mining methods and no demonstration sites to showcase these methods have been established. Limited previous training has been given to miners, such as on the use of mercury retorts by WWF. In addition, the recently established training unit within OGS has done some ad-hoc work to learn about best practices but does not have sufficient specialized in-house technical expertise to effectively implement a training program. There is therefore no ongoing, regular training being provided to miners, nor is there readily accessible user-friendly material available on alternative environmentally sound mining techniques. As such, many miners do not have up-to-date knowledge on environmentally responsible mining practices, such as proper tailings and water management, mine closure, replanting, and land rehabilitation. Small-scale miners also do not sufficient information on viable alternatives to the use of mercury or incentives to stop its use in gold mining.
Lack of widespread education among miners, community members, and the general public on the impacts of mining	The miners themselves, the communities in which they live, and the general public in the coastal areas of Suriname have insufficient awareness about the negative environmental, health and social effects of current gold mining practices, including on vulnerable groups, such as children, women, indigenous and maroon tribes. Moreover, the value of biodiversity and of healthy ecosystems to local communities is poorly understood. This can be attributed to insufficient advocacy and outreach to raise public awareness as well as limited information sharing of the research that has been carried out in the past.

Limited stakeholder organization and collaboration at the community level	At present, many small and medium-scale miners are not incorporated in mining associations. This undermines the ability of institutions to carry out oversight, to share information with miners, and to promote uptake of new mining techniques. In addition, the limited level of organization makes it more difficult for miners to purchase required technologies. It should also be noted that stakeholder collaboration and conflict resolution skills are weak in many communities.

2) Baseline scenario and associated baseline projects

8. Under the baseline, the insufficient institutional capacity to promote small and medium- scale gold mining practices that adequately incorporate environmental considerations, will continue to be a reality. The Presidential Commission to Regulate the Gold Sector (OGS), which is a legal entity set up by Presidential Decree to strengthen Government presence in the gold mining areas, has begun establishing Mining Service Centers to increase control on illegal mining, issue permits, implementing regulations, guidelines and enforcing law and order. Nevertheless, it does not currently have the capacity to monitor or enforce environmental requirements. OGS's mission is almost complete and other institutions will need to step in to take over OGS's activities, including management of the Mining Service Centres. According to current plans, the OGS and the Geological Mining Department (GMD) will cease to exist during the early stages of GEF project implementation, and a Mineral Institute (MINAS) will be established under the Ministry of Natural Resources. The estimated budget for MINAS to be set up is USD 280,000, while the operational costs are incorporated in the baseline figures provided below for OGS and GMD.

9. OGS set up a training unit in 2013 with the idea of training miners on better mining methods and environmental management, however, it has indicated that it lacks the specific expertise to implement the training. In the absence of any other training opportunity for miners on environmental aspects, small and medium-scale miners will continue to carry out practices that lead to significant deforestation, loss of biodiversity, greenhouse gas emissions and water contamination, without sufficient knowledge of alternatives. Estimated expenditures by OGS (or later by MINAS if this is set up) are USD 25 million over the five years of the project.

10. NIMOS will continue to review EIAs for larger mining projects, but does not currently have a meaningful role to play in small and medium-scale gold mining areas nor monitoring and enforcement capacity to verify the impacts of such activities. It also requires support to further develop mining regulations and guidelines. Similarly, the Ministry of Natural Resources lacks enforcement officers to actively monitor small and medium-scale gold mining activities. The estimated baseline investments of NIMOS and the Ministry of Natural Resources and Geological Mining Service are USD 14.5 million over the 5 years of the project.

11. Inter-institutional coordination is currently limited, and it is unclear whether this situation would improve under the baseline. There have been plans since the late 90s to set up an Office for Environmental Planning and Information as part of the second phase of strengthening NIMOS, however, these have not materialized, due primarily to budgetary constraints, and to a lesser extent insufficient initiative and political will to expand the institution in the past. Now that NIMOS is an executive arm for the Cabinet of the President, there is greater political will to expand it with this Office. Regional cooperation mechanisms to specifically address the topic of mining do not exist and are not planned in the near future in the absence of the proposed GEF intervention. This situation means that opportunities for collaboration in management of the sector and in enforcement will be lost.

12. Within civil society, several organizations will continue to support actions to reduce the negative environmental impacts of mining. World Wildlife Fund recognises gold-mining as a regional issue (with significant movements of miners, mercury and gold across borders) and is committed to work on policy issues related to mining across the Guianas. WWF will work to promote ratification of the Minamata Convention by Suriname and to push for mercury use reduction in the sector. Suriname Conservation Foundation (SCF) may fund small projects to address the impacts of mining on biodiversity, especially near or within protected areas. Suriname Environmental

and Mining Foundation (SEMIF) has committed to supporting the establishment of a mineral institute, if and when the political and institutional decision is made to do so. However, these baseline projects (estimated at approximately USD 5 million over the course of the project) do not represent large-scale coordinated actions to put in place the necessary systemic changes to address the environmental impacts of gold mining.

13. The largest baseline project that will be implemented over the next few years is the REDD+ Readiness Preparation project[9] (USD 3.6 million of which an estimated USD 2 million will be spent during the time period of the project). This will entail the definition of development alternatives and will help identify the direction the country wants to go in terms of the sustainable use of its forests. In addition, REDD+ will play a critical role in increasing the ability to monitor deforestation and forest degradation, including from mining. World Bank will implement a Strategy for 2015-2018 that is focused on two main elements: 1) improved linkages between large-scale extractive industries and agricultural investments and the local economy (Outcome 6) and 2) strengthened environmental, social and corporate governance standards in the extractive industries and agriculture (Outcome 7). The indicator for Outcome 6 is increased investments in extractive industries, while the indicator for Outcome 7 is an updated regulatory framework for environmental, social and corporate governance in extractive industries, in line with international standards. The World Bank intervention will be complemented by the proposed UNDP/ GEF project, as the latter focuses on reducing environmental impacts of small and medium-scale mining and includes various aspects not addressed in the World Bank strategy, such as institutional strengthening to manage mining, strengthened planning and zoning, and demonstration sites to promote uptake of sustainable technologies.

3) The proposed alternative scenario, with a brief description of expected outcomes and components of the project.

Component 1: Institutional, policy and planning framework strengthened for improved management of small and medium-scale gold mining

14. This project component focuses on establishing a more supportive enabling environment for the management of the environmental impacts of gold mining. This will entail significant strengthening of the main institutions with a role to play in this sector. NIMOS, the environmental regulatory agency, will benefit from training of local personnel through courses and workshops on topics such as planning, GIS and database systems, ecosystem services, public participation, policy, regulation and legislation. The project will also fund field equipment for sampling. Given that there is currently limited inter-institutional information sharing and coordination taking place among key institutions, the project will provide some support for the establishment of an Office of Environmental Planning and Information within NIMOS. This is considered a key structure to create a broader and stronger framework for NIMOS' position as the agency responsible for consulting, planning and guiding environmental policy for the Government of Suriname. This Office will increase inter-institutional cooperation on environmental issues, including mining, and enhance knowledge management. Among its functions, this Office would produce policy papers, such as on environmentally responsible mining for metals and minerals in Suriname. With regard to forest management, this Office will play an important role in facilitating cross-sector policy and planning, and as such help to avoid the loss of high conservation value forests, among other objectives. Project support for the establishment of this Office could include background analysis, development of recommendations and policy papers and facilitation of meetings, among others. The project will also support the strengthening of the Inter-Ministerial Advisory Committee (IMAC) through awareness raising and training. IMAC is a body consisting of the permanent secretaries of all the key ministries and directors of institutions in which reporting and joint decision-making on environmental projects takes place. IMAC is chaired by NIMOS and as such, project support to IMAC will strengthen NIMOS' ability to coordinate the implementation of national environmental policy.

15. The Ministry of Natural Resources will be provided with support and training to enhance its capacities to manage the gold mining sector. Initially this will be through the Commission to Regulate the Gold Sector, specifically the Training Unit. The project will build the capacity of the Training Unit and the Geological Mining

[9] "Strengthening national capacities of Suriname for the elaboration of its REDD+ strategy and design of its implementation framework".

Service (GMD) so that they can more effectively train and guide gold miners on best practices. In the event that the proposed institutional restructuring takes place that would see a Minerals Institute (MINAS) established, replacing OGS and GMD' role in managing gold mining activities, the project will provide support to this process, particularly through planning and development of blueprints to guide the establishment and operation of MINAS. Training through the project will also be provided to the District Commission level Environment and Health Units and Medical Missions to increase understanding of the environmental policies in place regarding small and medium-scale gold mining and the potential health and environmental impacts thereof.

16. The project will support the ongoing work to establish Mining Service Centers (MSC) in key small and medium-scale mining areas. These Service Centers are meant to serve as areas for monitoring, enforcement and safety control in the field. At the moment, there are outposts in nine areas, with OGS officers and some police presence, but the full institutional compliment that was envisioned is not yet present. The project will facilitate the necessary discussions in order to encourage greater inter-institutional participation in these Centers. Furthermore, the project will need to ensure that the capacity and systems are established for these Service Centers to move beyond a focus on enforcing law and order and reducing illegal mining, in order to incorporate actions to effectively enforce environmental requirements and guidelines and thus reduce negative impacts on forests, biodiversity and climate change. This work will build on government investments in the MSC, mobile health clinics and other initiatives, which will lead to social and health benefits for communities, by improving security, increasing health services on issues such as HIV/AIDS and increasing services offered to vulnerable populations, such as prostitutes.

17. One of the main goals of this institutional strengthening is to enable the key institutions to have stronger oversight over gold miners and greater capacity to reduce negative environmental impacts, including deforestation. This will play an important role in helping to maintain carbon stocks as mining is the largest driver of deforestation in Suriname. Particular emphasis will be placed on strengthening institutional abilities to address mining taking place in protected areas, in particular, Brownsberg Nature Park, where threats are ongoing and where biodiversity levels are high. One of the options that has been proposed in the past and will be explored further is designating specific areas within this Park, where mining is already occurring, for continued mining, and offsetting this with an expansion of the Park's gazetted and managed area. This would need to be combined with increased institutional presence to ensure enforcement. The legal, social and environmental implications of this will be fully investigated during the PPG phase.

18. This Component would also include the establishment of a regional cooperation and learning mechanism with French Guiana and Guyana so that there would be periodic opportunities to discuss common issues related to small and medium-scale gold mining, including impacts on the Guiana Shield forests, associated biodiversity, and carbon emissions. This is an important element of addressing the environmental impacts of SMGM because without regional cooperation, miners may move between countries based on differences in environmental requirements, varying levels of enforcement, and different tax regimes. While it is not envisaged that regional harmonization of environmental requirements related to small and medium-scale gold mining will be achieved within the scope and time frame of this project, an important first step would be taken by setting up a regional cooperation structure, which could also pave the way for future collaboration with the Amazon Signature Program that is being set up by GEF to support basin-wide policy dialogue and action and alignment of national actions within a sustainable development model. The project will establish links with the Regional Sustainable Development Solutions Network (SDSN) for the Amazon, which aims to promote solutions for sustainable development in the region and to build a web-based platform to share relevant knowledge. The project will also explore the role that the Guyana Shield Facility[10] could play in regional communication and cooperation. The possibility of greater information sharing with other countries of the region outside of the Guianas will also be assessed during the PPG phase, such as with Brazil. The diagram in Annex 1 illustrates the relationship of the different institutional structures that will be created or strengthened through the project.

[10] The Guyana Shield Facility is a multi-donor funding for the long-term financing of national and regional activities to conserve ecosystems, protect biodiversity, and to sustain human livelihoods within the Guiana Shield eco-region.

19. To strengthen the policy framework for the management of the environmental impacts of gold mining, including impacts on forests, the project will support the development of environmental guidelines for small, medium-scale and large-scale gold mining. This will build on initial work carried out by NIMOS, which has started drafting such guidelines. Specifically, NIMOS has developed guidelines for EIAs for mining, as well as environmental requirements for gold shops, gold buying companies and others that cover issues such as environmental hygiene, safety, environmental norms for stacks, acid cubicles (where gold burning occurs), and storage of chemicals. Issues such as reducing forest degradation, deforestation and biodiversity loss will be covered in the guidelines to be drafted. This will therefore strengthen the policies pertaining to mining, which currently undermine the maintenance of forest resources. The project will also build on steps taken by OGS to strengthen oversight of small-scale gold mining activities in the field by issuing permits to miners, which include environmental requirements. These requirements are currently very general and lack necessary detail; generally, they merely indicate that sound environmental management practices should be followed without defining such practices. Neither are they enforced, which underscores the need for the project to support a clear definition of the environmental requirements. These requirements would address a number of issues including the need to minimize the area of land impacted by mining and thus reduce impacts on biodiversity, carbon stocks, and ecosystem services. Given the legislative environment in Suriname, the environmental guidelines may be voluntary to start with, but the project would work to build support for these to become mandatory instruments in time.

20. In addition to the development of environmental guidelines for gold mining, the project will support the drafting of a Mining Strategy, with a focus on the gold mining sector. This will facilitate the much-needed discussions and development of a consensus on which areas should be developed for mining and which should be maintained for conservation (maintenance of biodiversity, carbon stocks, of ecosystem services), agriculture, forestry and other purposes. In the absence of a 'Land Use Planning Strategy', discussions will take place to facilitate agreement and coordination of different economic alternatives and development pathways. The drafting of this Mining Strategy will require the identification of high conservation value forests where mining operation expansion should be avoided. The project will benefit from information to be gathered through the REDD+ Readiness Preparation project to monitor forest area change and will collaborate to the full extent in providing any relevant data it may obtain on forest loss (through the Mining Service Centres, for example). NIMOS is the implementing partner for both the proposed project and the REDD+ project and is therefore in the appropriate position to maximize synergies in terms of strengthening technical and institutional capacities to monitor forest loss.

21. As part of this Component, economic valuation studies will be carried out to identify the environmental, social, and economic costs and benefits of current uncontrolled gold mining practices and of regulated environmentally responsible mining. This research will include an analysis of the impacts of gold mining on vulnerable populations, including indigenous people and maroon tribes. It will also explore the impact on social structures, with an increase in migrant labour from other areas, movement of wives and children of miners to areas lacking access to health, education and other services, and the expansion of prostitution in mining areas. The results of these studies will be disseminated to high-level decision makers. Such quantitative data are considered to be necessary to increase support for mining-related regulations and support for strengthened management and enforcement. Studies will also be carried out to assess the costs and benefits of select alternative land uses and alternative sustainable livelihoods so that the different livelihood options can be compared based on real data.

22. The project will support OGS' work in defining zones for gold mining activities to ensure that environmental issues can be taken into consideration. For example, in order to avoid issuing mining permits in areas with particularly high levels of biodiversity, biodiversity research could be undertaken before new mining zones are defined as part of a proactive planning system. In addition, site-based rapid biodiversity assessments could be carried out before permits are issued, through partnerships with the national university. This zoning exercise will also need to involve an analysis of the issue of carbon stocks so as to minimize their loss.

23. Research will be carried out on the conditions associated with the existing social/environmental funds that have been established using a percentage of the royalties of large mining companies. A proposal will be developed to ensure that such funds adequately integrate funding for biodiversity conservation, integrated watershed management, sustainable forest management, climate change mitigation and sustainable livelihood options. The proposal will be

presented to key government stakeholders, including the Ministry of Finance, to promote its formal adoption as a national standard. Such public-private partnerships may play a critical role in providing the necessary funding to reduce the environmental impacts of gold mining on Suriname's ecosystems, while also ensuring socio-economic benefits for local communities. The latter could include benefits in the fields of health, security and economic development, building on government investments such as the establishment of Mining Service Centres. The feasibility of project support for mining standards certification and development of incentives for miners who engage in environmentally responsible mining practices/ use appropriate tecnologies will be further explored during the PPG phase; this could take the form of better price regimes and/or access to low interest loans. At this point, it is considered premature to include in the project design.

Component 2: Increased adoption of more environmentally responsible practices among small and medium-scale gold miners and communities

24. This Component will include three main elements: the identification of the most feasible mining methods through research and pilot projects; the establishment of a Suriname Mining School to provide training and demonstrate appropriate methods in key gold mining areas; and an awareness raising campaign. This Component will play a key role in enhancing the sustainability of mining practices on the ground and will support more environmentally, socially and economically feasible community livelihoods. The project will identify environmentally, financially and socially feasible mining techniques to promote with a view to reducing negative impacts on biodiversity, loss of forest cover and mercury use, as well as maintaining carbon stocks and ecosystem functionality. Various techniques will likely be identified based on the type of gold deposit and amount of gold present, types of miners and other factors. The identification of appropriate gold mining methods will involve learning from successful experiences in Suriname and in other countries in the region, literature review, as well as research with gold miners in Suriname to identify the practices with the greatest likelihood of uptake. The project will also tap into UNEP`s experience promoting mercury free mining in the region. Pilot projects will be established to test different mining techniques. Environmentally responsible solutions will look at the different stages of mining including mine planning, mining and concentration, processing, refining[11]. For example at the mine planning stage, systematic exploration, coordinated deposit management, and less land use could be promoted. At the mining and concentration stage, excavation planning, safe ore extraction, efficient crushing and grinding, improved and targeted sluicing and improved panning could be fostered. Sluice boxes with varying angles, length, and sluice box maths may be considered. In terms of processing, possible zero mercury methods that could be promoted include gravity-only processing plants, shaking tables in simple set-ups, chemical leaching, and direct smelting of concentrates, among others. World Bank funded a three-year project implemented by the Institute of Sustainable Mining (partnering with WWF Guianas) to promote Clean Gold Sluices (zero mercury use) in Suriname with promising results. Workshops were held and Cleangold adaptations were installed on soft rock mines as well in alluvial mine operations. Testing showed that gold recovery rates were equal to or higher than methods that had made use of mercury. At the refining stage, use of fume goods, proper chemical management and purity assaying will be assessed. Waste management at the processing and refining stages will be important to promote as well. The project will focus on identifying methods that are not only more environmentally responsible but that can save time through faster processing and recover greater amounts of gold in order to promote high uptake among small-scale miners.

25. A Suriname Mining School will be established, which will provide field training to gold miners and demonstrations of environmentally responsible mining techniques to guide miners on best practices, based on the techniques identified as most feasible for the different stages of mining as highlighted above. Rather than just offering seminars to miners, the School will provide the opportunity to miners to observe the mining methods being used and to put them into practice. At least one environmentally sound mining demonstration site (see paragraph 28 below for further explanation) will be established to accompany the Mining School, in which adequate planning, BD-friendly and mercury-free techniques, as well as monitoring will be demonstrated. The project will provide support to the training unit of the Commission to Regulate the Gold Sector, so that their officers can lead some of the

[11] UNEP and Artisanal Gold Council. Draft. Reducing mercury use in artisanal and smallscale gold mining: A practical guide.

training sessions. Technical support will also be facilitated to miners at the Mining Service Centres as these are the areas in which substantial mining is taking place (the operational details of how this will be done will be explored during the PPG phase). As part of the training, exchanges will be offered to gold miners to sites within Suriname and to other countries of the region to 'look and learn' from other experiences. The rolling out of training with miners will build on progress made in a previous project funded by the Suriname Environmental and Mining Foundation (SEMIF). The latter outfitted a building in one of the Mining Service Centers with training equipment and developed a curriculum for a mining training program, which was never implemented due to insufficient management capacity. The training on improved management of the environmental impacts of mining (including on forests and biodiversity) and on non-mercury mining methods (see paragraph 30 below) will complement interventions to be carried out through baseline and co-financing that will contribute to community socio-economic development, improved health and security. All interventions with communities and with gold miners, including with indigenous and maroon groups, will be based on the principle of free, prior and informed consent (FPIC). It should be noted that Godo Bank has expressed interest in providing finance to small-scale miners for the purchase of new environmentally responsible gold mining technologies and in managing and evaluating loan requests and there is further interest from the private sector on this issue.

26. The project will train both small and medium-scale gold miners. Medium-scale gold miners will benefit from the training activities, but it is also hoped that some medium-scale gold miners/gold mining companies could provide sites for demonstration of alternative gold mining methods. For example, Grassalco, a medium-sized state-owned gold mining company has recently set up a mining operation in an area that was previously mined by small-scale gold miners. Because of the generally inefficient methods used by small-scale gold miners, the company is still able to recover sufficient gold for a profitable operation. The company also plans to carry out land rehabilitation. In general, it is important to get medium-scale gold miners and mining license holders on board with more environmentally friendly gold mining techniques, due to the fact that they hold the mining licenses with which they permit small-scale gold mining to take place.

27. This training will be complemented by the production of user-friendly material for gold miners that summarizes appropriate gold mining practices as well as existing regulations and guidelines. This will be developed in various native languages of the indigenous and maroon groups and in the lingua franca Sranang Tongo, as well as in Dutch, Portuguese, French and English. A key element of this Component will be ensuring the sustainability of this training and provision of guidance by securing the necessary institutional commitments to institutionalize this work and to continue to provide the operating costs.

28. The project will support the establishment of a demonstration site to showcase biodiversity friendly and mercury-free technologies. The field work under this Component will be complemented by an education campaign to increase awareness among gold miners and among communities in the hinterland about the environmental and health impacts of current small and medium-scale gold mining practices, associated with freshwater contamination, mercury contamination, deforestation, soil infertility and loss of species, among others. This campaign will underscore the relevance of biodiversity and healthy ecosystems to local communities. The education campaign will reach out to vulnerable groups, including children, youth, women, prostitutes, indigenous and maroon tribes to ensure that they receive the information and that they do so in an appropriate form.

29. It is important to note that the set-up of non-mercury technologies in the demonstration site under Output 3.2 and the training related specifically to the use of non-mercury technologies under Output 3.3 will be *funded entirely by co-financing from the US Department of State* (with no funding from GEF for these specific activities). This funding has been leveraged specifically for this project and will be reflected in the project's Strategic Results Framework. The funds will play a key role in enabling Suriname to begin to take initial steps in the management of mercury in the small-scale gold mining sector, which is a pressing issue in the country. The funding will also consolidate a strategic partnership with the US government to work on mining and mercury use in the country. The mercury-related activities to be carried out with this project will set the stage for a potential future full-fledged project in the Chemicals and Waste focal area that could be submitted for funding from GEF once Suriname ratifies the Minamata Convention.

30. The project will support initial efforts being carried out currently to increase the level of organization of small and medium-scale miners as this will facilitate oversight of their activities and training, as well as the acquisition and uptake of more environmentally responsible mining technologies. This project support may come in the form of helping to organize and fund meetings, providing legal support to the establishment of mining associations, facilitating purchase of technologies, and others, as required. Training will be carried out to enhance stakeholder engagement and collaboration and strengthen conflict resolution skills, including within communities.

31. In addition to the promotion of more environmentally responsible mining technologies, the project will put in place one or more pilot projects on alternative sustainable livelihoods. The decision on which livelihood option(s) to establish will be based on the economic valuation studies that will be carried out under Component 1.

Contribution to GEF focal areas

32. The project will contribute to a total of three GEF focal areas as it is associated with multiple global environmental benefits. With regard to biodiversity, the project links directly with BD Objective 4: *Mainstream Biodiversity Conservation and Sustainable Use into Production Landscapes/Seascapes and Sectors*, Program 9: *Managing the Human-Biodiversity Interface*. Support will come in the form of strengthening policy and regulatory frameworks and modifying production practices in the mining extractive industry to be more biodiversity-friendly. This will include reducing chemical pollution and soil erosion, and limiting the footprint of mining in high value biodiversity areas, among other actions. The project will place special emphasis on strengthening enforcement of mining guidelines and policies near protected areas. The project will contribute to several Aichi Biodiversity Toals for 2020, as per the 2011-2020 Strategic Plan of the Convention on Biological Diversity:

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve and have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.
Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation are significantly reduced.
Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

33. The project will also contribute to Climate Change Mitigation 2, Program 4. CC2: *Demonstrate systemic impacts of mitigation options*, Program 4: *Promote conservation and enhancement of carbon stocks in forest, and other land use, and support climate smart agriculture*. Mining is a key driver of deforestation/land use change in Suriname. As a result, the project will promote improved zoning, development and enforcement of mining guidelines to reduce the level of deforestation and forest degradation (including through land reclamation), and substantial capacity building, with the ultimate objective of supporting the maintenance of carbon stocks.

34. The project will support achievement of SFM-1, *Maintained forest resources: reduce the pressures on high conservation value forests by addressing the drivers of deforestation*, as mining is the number one driver of deforestation in Suriname. The project specifically addresses Outcome 1, "Cross-sector policy and planning approaches at appropriate governance scales avoid loss of high conservation value forests". This will be achieved by facilitating cross-sectoral planning through the establishment of the Office of Environmental Planning headed by NIMOS under Component 1. Also under Component 1, the development of a Mining Strategy represents a key deliverable to strengthen policy and planning of this sector in cooperation with other relevant sectors, including forestry and protected areas. Combined with institutional capacity building and strengthening of institutional presence through Mining Service Centres, this will help avoid the loss of high conservation value forests and contribute to maintaining a range of environmental services and products derived from the country's forests. In addition, under Component 2, the project will engage with local communities and put in place pilot projects for alternative livelihoods to explore their economic feasibility and impacts on forests.

4) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing

35. The baseline actions described in Section 2 will contribute to reducing illegal gold mining and will serve to put in place local-level or small-scale interventions to increase awareness about the impacts of mercury and to promote alternative gold mining practices. This is likely to lead to some improvements in terms of gold mining practices, but the scale of action is unlikely to be sufficient to drive systemic change within the sector and to significantly reduce negative impacts on biodiversity and forest management, and to reduce land degradation and the impacts on climate change.

36. With the GEF Trust Fund increment, global environmental benefits will be achieved as outlined in the next section through significant institutional strengthening and coordination, enhanced inter-institutional collaboration, drafting of environmental policies for small and medium-scale gold mining and of a strategy for the sector, awareness raising and extensive training and provision of guidance to promote uptake of less environmentally harmful mining practices, among other elements.

37. Co-financing will play a key role in achieving project objectives. Significant co-financing will come from various government institutes that will complement project activities to curb the effects of gold mining. The Commission to Regulate the Gold Sector (OGS) will assign staff to enforce greater controls on gold mining in the interior. Similarly, NIMOS and the Geological Mining Division will also assign staff and funding to better regulate and control the impacts of gold mining. SBB will continue to assign staff to monitor forest cover and deforestation, including from mining. Leveraged co-financing from the US Department of State will provide funds for on-site piloting of mercury-free technologies and for training of miners in mercury-free technologies (under Outputs 3.2 and 3.3, respectively). WWF is committing co-financing to work to promote policy changes in the mining sector, particularly as they relate to mercury. SCF is expected to fund projects to reduce the impacts of mining, particularly on biodiversity within or near protected areas. SEMIF has expressed its commitment to provide funding for the proposed Suriname Mining School. Grassalco is funding the operation of a non-mercury mine and plans to carry out rehabilitation in the near future. Interamerican Development Bank financing will complement the project's objective as it relates to strengthening the policy framework through its promotion of stronger national environmental legislation. The specific nature of IADB support through co-financing will be further defined during the PPG phase.

38. Additional potential co-financing will be explored during the PPG phase from the other countries of the Guianas to support strengthened regional cooperation. In addition, potential bilateral funding from countries such as Brazil will be sought to help fund the development of environmental guidelines for Suriname.

5) Global Environmental Benefits

39. By tackling the mining sector, the project will contribute to significant global environmental benefits through a multi-focal area approach that includes actions to enhance biodiversity conservation, promote sustainable forest management, and reduce carbon dioxide emissions. This strategic large-scale intervention will combine national-level actions to strengthen institutions, policies, planning and zoning, with extensive local-level training and demonstration. Some of the specific mining practices to be promoted are described in the following table, along with the associated environmental benefits.

Main Current Practice	Alternatives to be promoted by the project	Expected Global Benefits
Lack of consideration of biodiversity considerations when mining areas are identified	- Zoning/ permitting that is linked to rapid biodiversity assessments - Mining Strategy to better direct mining expansion away from high biodiversity biodiversity	- Increased protection of areas of high biodiversity and where presence of endangered and endemic species

Lack of management of tailings and other mine effluents	- construction and operation of appropriate stable tailings ponds/dams	- decreased water turbidity, siltation, channel alteration and changes to stream bottom characteristics - reduced mercury mobilisation - reduced loss of aquatic biodiversity
Inappropriate management of waste rock dumps, mining and tailing ponds, overburden, topsoil piles, household wastes, construction wastes and hazardous wastes	-Restoration and stabilization of waste piles - Adoption of waste management practices for other wastes	- reduced water contamination - reduced acid rock drainage
Use of mercury in mining and in gold burning, particularly among small-scale miners	- use of mercury-free equipment, such as shaking tables and crush and ball mill techniques	- decreased water contamination, benefitting biodiversity in the hinterland - reduced mercury contamination in high trophic value species

40. The mining methods to be promoted will improve soil and water quality in mining areas, and significantly increase the level of forest conservation and natural forest regeneration and with this, maintenance of globally important biodiversity and carbon stocks.

41. Specifically, the project will lead to an estimated 0.5 million ha of landscape under improved management to maintain globally significant biodiversity as well as ecosystem services and goods; 6.5 million tons of CO_2e emissions mitigated and a cumulative reduction of 5 tons of mercury. All targets will be confirmed during the PPG phase. In addition, the project will improve freshwater quality as current mining practices are associated with heightened turbidity levels and mercury contamination.

42. The target of 0.5 million ha under improved land management corresponds to 20% of the area of the greenstone belt in Suriname (the latter is the area in which the majority of gold deposits are believed to be found and where most mining occurs). The project will strive to change the way this area is managed through better planning of mining activities, enhanced enforcement, increased controls on the movement of people, supplies and equipment to forested areas, including at Mining Service Centres, the promotion of more environmentally responsible mining practices through capacity building, among other activities included in the project design. The climate change target was estimated as follows. The project will decrease the deforestation rate of 9000 ha per year by an estimated 10% each year, which corresponds to a total of 194,469 tonnes of CO2-e mitigated annually over a 20-year period (please see Annex 2 for a more detailed explanation and the results of application of the FAO EX-ACT tool).The decrease in deforestation and associated reduction in emissions of carbon dioxide equivalents will target the Greenstone Belt. Reduced deforestation will be achieved through various elements of the project including through the development of a Mining Strategy and designation of mining zones, strengthened institutional capacity, increased institutional collaboration, presence and enforcement and training on more environmentally responsible mining, among others. The target of a cumulative reduction of 5 tons of mercury is based on the following information. Small and medium scale production of gold is estimated at 500,000 ounces per year (i.e. close to 15,000 kg of gold per year), currently involving the use of an estimated 75 tons of mercury per year; the project will lead to an estimated 1.34% reduction in mercury use due to promotion of more environmentally responsible mining technologies, assuming a ratio of 1:5 gold: mercury, over the 5 years.

6) Innovation, sustainability and potential for scaling up

43. This Full-Sized Project adopts a novel multi-focal area strategy for Suriname to address the multiple threats posed by mining in an integrated and synergistic fashion and at the scale required for impact. The project will tackle pressing issues related to strengthening the institutional, policy and planning framework and increasing the uptake of more environmentally responsible techniques among g miners in order to set Suriname on the right path to dealing with these threats. The project will work at the national/ systemic level with relevant institutions and other stakeholders as well as at the field level to promote a shift toward more sustainable small and medium-scale mining practices. Economic valuation studies to increase the awareness of decision-makers of the costs of failing to address

this issue have not been carried out previously in Suriname and represent another innovative element of the project. There have been few previous GEF projects in the region on mining; this project will therefore contribute to the growing experience on addressing threats from extractive industries that have a significant impact on forest cover, biodiversity, greenhouse gas emissions, and mercury levels in the environment.

44. Sustainability will be ensured through a variety of means. The project will support substantial institutional strengthening and establishment of the necessary structures to permit more coordinated future actions, including through an Office of Environmental Planning and Information Management. The project will implement training programs with miners with field demonstrations and will work toward the institutionalization of this capacity building. Support for the development of mining guidelines for small and medium-scale miners, for zoning work, and for the drafting of a Mining Strategy will help create the policy framework needed for long-term impact. Awareness raising and education with communities and decision makers will reduce socio-political risks to sustainability. The promotion of mining methods that reduce environmental impact while at the same time increasing gold recovery rates will enhance financial sustainability. In addition, the REDD+ process in which Suriname is engaged complements this project through the implementation of the necessary preparations for the country to benefit in the future from financial mechanisms to avoid deforestation and reduce degradation.

45. The potential for scaling up at the national and regional levels are significant. Within Suriname, the pilot projects and mining demonstration site will be set up in key mining districts and information exchanges among miners will be promoted to increase uptake. The project elements related to institutional strengthening and policy will work at the national level to ensure that actions are taken to tackle the problem throughout the gold mining areas. Project support for a regional coordination mechanism will facilitate information sharing between the countries of the Guianas region and upscaling of successful approaches to reduce the environmental impact of small and medium-scale mining.

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

Stakeholder	Involvement in Project Design/ Preparation
World Wildlife Fund Guianas	WWF has worked in Suriname, Guiana and French Guianas since the 1960s and has had a WWF Guianas office since 1999. Mining represents one of the NGO's priority areas of action. The organization has amassed substantial experience in the promotion of more environmentally responsible mining techniques, public education, and advocacy for a favourable policy environment (including as it relates to the Minamata Convention). WWF has also carried out extensive research and produced various publications on mercury contamination, knowledge, attitudes and practices of small-scale miners, and the situation of small-scale mining in general. Discussions were held with WWF about the PIF during the second preparatory mission and follow-up correspondence carried out. This enabled potential areas of synergies to be identified, such as support from WWF in working with miners to promote non-mercury technologies. During project preparation, the successes and lessons learned from WWF's work in the region will be reviewed and the organization will be further consulted for their input into priority actions. Co-financing opportunities will be identified and opportunities for WWF Suriname to act as a responsible partner for specific project activities will be explored.
Suriname Conservation Fund (SCF)	SCF funds projects through earnings from an endowment fund that was originally established with funding from GEF, various governments, Conservation International, and others. Its focus area is to provide funding for projects that improve the protection or improve the sustainable use of the biodiversity of the Suriname rainforest. SCF is currently providing some funding to the No Mercury Campaign (an awareness campaign) and plans to organize a workshop on the effects of mercury in the near future. SCF is interested in supporting work to update the baseline on the environmental and health effects of mercury in Suriname, centralize the data, improve knowledge management, and disseminate the information to decision makers. SCF will be consulted during the PPG phase to explore opportunities for collaboration with this work and to identify co-financing possibilities.
Suriname Environmental and Mining	This Foundation was established in 2008 and receives 0.25% of the royalties of the operations of Rosebel Gold Mines N.V. (subsidiary of Iamgold corporation) in Suriname. SEMIF currently funds projects to reduce the environmental impact of mining, among other priorities, such as: 1) a project to develop training and awareness material for small-scale miners, including a book on how to carry out mining in a more sustainable

Foundation (SEMIF)	manner; and 2) The No Mercury Campaign, which uses publications, meetings and social media to teach people about the harmful impacts of mercury. Lessons learned and opportunities to build on this work will be reviewed during the PPG phase. In addition, SEMIF has funded the development of a curriculum and the outfitting of a building to provide training to small-scale miners, but the training program was never implemented. The project development team will assess how the project could build on this work in the rolling-out of a training program for small and medium-scale miners. Finally, opportunities for co-financing will be discussed with SEMIF, particularly in terms of their commitment to support the establishment of a Mining Institute (MINAS) and their funding of environmental mining projects.
Foundation Makamboa	This is an Association of small scale miners from the village of Nieuw Koffiekamp, situated in the concession of IAMGOLD - Rosebel Gold Mines NV. This is the first time a group of small scale miners has organized itself in a foundation. The Foundation will be consulting during project preparation.
Indigenous and Maroon tribes	There are several indigenous and maroon tribes living in the interior of Suriname, including Trio, Wayana, Arowak, Caraib, Saramaccan, Aucaan, Matuarier, Paramacca, Kwinti and Aluku People. These will be consulted during the course of PPG and project implementation. Within these communities there are active NGOs and CBOs which will be identified and consulted. All consultations will be carried out based on the principle of free, prior and informed consent (FPIC).
Platform Binnenlandse Ondernemers (Platform for entrepreneurs from the interior, focus on gold).	This is a platform that advocates for the establishment of small-scale mining associations within seven identified mining areas. Such associations could facilitate training and support uptake of less environmentally degrading mining techniques, such as shaking tables. Consultations will be carried out with this platform to determine how the project can best provide support for the establishment of these corporations/ associations, as well as capacity building to the members.
Miners	Consultations will be carried out with formally registered and informal small-scale mining groups, such as Godo Olo, MaLobi, Sela kreek, Pakira kondre, and upper Saramaccan area (Matuariers maroon group) to identify their concerns and project priorities with regard to training, mining methods, and others.

3. Gender Considerations. Are gender considerations taken into account? (yes X /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.

46. The PPG phase will include a detailed analysis on the differential impacts of mining on men and women and on ways to ensure that key gender-related concerns are taken into consideration in the project design. Examples of potential differential effects that need to be assessed include exposure by male miners to mercury through skin contact, the particular vulnerability of women of child-bearing age and children to the health effects of mercury, the impacts of surface water contamination from mining on access to quality water for drinking and other household uses and impacts on fish quality; and the association between illegal mining, violence against women and prostitution. One of the experts hired during the PPG phase will be charged with mainstreaming gender into the project design and the project may also include culturally sensitive training on gender mainstreaming during project implementation. Project development will include the identification of the ways in which project could contribute to the 2013 draft Gender workplan, which includes the focal areas of education, labour, income and poverty, violence, health and decision making. The project development team will consult with the Chief of the Tribes, the Ministry of Regional Development, and with the National Women's Movement to identify key CBOs and NGOs in the hinterland. During project development, consultations will be carried out with the Ministry of Internal Affairs, which deals with gender issues to determine how best to incorporate gender considerations in project design. The project development team will also liaise with the newly formed Gender Coordination Group that is linked with implementation of Suriname's United Nations Development Assistance Framework/Plan (UNDAF/UNDAP).

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).

Risks	**Risk mitigation measures (to be further developed during PPG phase)**

Newly elected government could cause institutional restructuring and/or changes in policy	The project deals with an issue that has been identified by different governments in the past as one that needs to be addressed as small and medium-scale mining is occurring without adequate controls in place and the activity is increasing rapidly. In the event of a significant change in government policy, the project's objectives will be resocialized with all relevant stakeholders. The benefits of reducing illegal small and medium-scale mining and addressing associated threats in fiscal, environmental and health terms will be explained to stakeholders.
Shortage of qualified individuals to carry out project-related actions	During the PPG phase, a more detailed capacity assessment will be carried out and detailed stakeholder involvement plan developed. For consultancies that may have insufficient nationally qualified candidates, the hiring process may be opened up to foreign Dutch speaking experts.
Insufficient political will for approval and enforcement of environmental legislation due in part to economic interests in the mining sector	Revenues from gold mining are an important source of income for inhabitants of the hinterland but also for city dwellers in Paramaribo with links to the mining industry, such as medium-scale concession owners, owners of gold burning shops, owners of mining equipment, fuel and transport companies, and funders providing credit. These substantial economic interests may contribute to reduced political will for approval of environmental legislation. One example of this is the fact that Suriname still has not approved a framework Environmental Act or an updated Mining Code. However, the government of Suriname has recently made various commitments to strengthen its environmental legislation and increase enforcement. This includes commitments to ratify the Minamata Convention, and participation in a REDD+ initiative. Furthermore, the project is not dependent on the approval of environmental legislation for impact. It includes various elements including institutional strengthening, awareness raising and extensive training with miners, which will play an important role in managing the impact of small and medium-scale mining on the environment. Moreover, an important element of the project design is economic valuation studies which will lead to a costing of the externalities that are not normally understood to be part of mining. These studies will be disseminated to decision makers and politicians through an advocacy and awareness raising campaign. The fiscal implications of the increased level of illegal small and medium scale mining will also be explained. As a result, the project will contribute to greater understanding among decision makers of the many benefits of greater regulation and enforcement within the small and medium scale mining sector, including environmental, health, social and economic aspects. This will contribute to building support for eventual changes in environmental legislation. As noted in the coordination with other initiatives section, other donors and projects are also pushing for a strengthening of the framework of environmental legislation in the country.
Insufficient interest among miners to adopt alternative, environmentally sound technologies	As a precursor to any actions to promote new technologies and methods in the field, the project will support research to identify the most promising alternatives with the highest likelihood of uptake among miners. This may in fact involve a series of different options depending on factors such as the demographics of the target population in different areas, the properties of the gold deposits, and others. Successful examples from other regions will be reviewed and experts from other areas will be brought in as necessary. The promotion of environmentally responsible technologies (including mercury-free technologies) will always go hand in hand with training on how to increase gold recovery rates, as miners will likely respond to financial incentives. This is because the current practices being employed are highly inefficient with respect to gold recovery.
Capacity constraints to execute GEF projects (as demonstrated by difficulties experienced with previous GEF projects in Suriname)	Previous GEF projects in Suriname have not always been able to achieve all their expected Outcomes due primarily to institutional weaknesses, insufficient project ownership, political instability (e.g., frequent change in Ministers) and capacity limitations. The government and UNDP have therefore decided to employ the entire STAR allocation on one project so that efforts can be channeled into one project rather than being diverted over several smaller projects. This will facilitate government execution and UNDP oversight. In addition, UNDP support to NIM will be arranged and the possibility of WWF serving as a responsible party will be explored. With regard to the shortage of qualified experts, please see second risk in this Table. Synergies with the REDD+ work to be undertaken in the country will be sought to maximize impact. The PPG phase will include a more detailed analysis of lessons learned from previous GEF projects to ensure that adaptive strategies are employed to address these.

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

47. The project will work closely with the REDD+ project "Strengthening National Capacities of Suriname for the Elaboration of its National REDD+ Strategy and Design of its Implementation Framework" (2014-2017). The REDD+ project will work on measuring and monitoring forest area change, including from mining, through satellite monitoring; this information will be shared with the mining project to direct field actions to the key areas and to feed

into the awareness raising campaign with decision makers and communities. The REDD+ project will also strengthen human capacities in NIMOS and other REDD+ institutions. Efforts will be made to ensure that institutional capacity building efforts through the two projects are complementary and do not overlap. Finally, legal reforms in the environmental sector will be sought by the REDD+ project, which could strengthen the enabling environment for the mining project.

48. Information will be shared on lessons learned and successful experiences with the Medium-Sized UNDP/GEF project being carried out in Guyana, entitled "Enhancing Biodiversity Protection through Strengthened Monitoring, Enforcement and Uptake of Environmental Regulations in Guyana's Gold Mining Sector", in particular as it relates to strengthening enforcement and training miners on more environmentally responsible mining methods. Guyana is also carrying out an Enabling Activity/ Minimata Initial Assessment and data will be shared as needed. Information exchange will occur with the UNDP/GEF project, "Conservation of Biodiversity in Landscapes Impacted by Mining in the Choco Biogeographic Region", which is currently under implementation, particularly in terms of that project's incorporation of BD considerations into the political, legal, and planning frameworks within the mining sector. The project will also share information with the Biofuels project[12] funded by SIDSDOCK, which includes the rehabilitation of mined out bauxite fields.

49. The project will ensure synergies are achieved with the work of the Organization of American States and the Interamerican Development Bank, which will promote the strengthening of the framework of environmental legislation in Suriname, as well as with the World Bank Strategy for Suriname as it relates to mining. The project will also coordinate with the UNEP Small-Scale Funding Agreement (SSFA) for the project “Alignment of National Action Programme and Reporting Process under UNCCD process”, which will begin to strengthen coordination and provide training to increase CCD capacity in Suriname. All environmental projects will be reported upon through the previously mentioned Inter-ministerial Advisory Committee (IMAC)| of NIMOS, which will therefore facilitate coordination.

50. The UNDP Country Office will also play an important role in facilitating information exchange between different national projects and with other relevant projects in the region. Specifically, UNDP will promote information dissemination through the CO website and other social media means, through facilitation of South-South and triangular cooperation among different countries and by sharing project information particularly related to Component 1 with the UNDP EU-ACP global project on Extractive Industries.

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

51. This project is fully consistent with a number of different national strategies and reports, including the National Biodiversity Strategy (2006) and the National Biodiversity Action Plan 2012-2016. The latter includes as one of its sub-objectives: "responsible mining with minimisation of damage to the environment and biodiversity and environmental restoration". This includes the desired action: "enhancement of practices that limit environmental impact with small-scale mining". The Fourth National Report to the Convention on Biological Diversity (2012) notes that one of the most significant threats to biodiversity is illegal small-scale gold mining and the use of mercury, which negatively affect ecosystems.

52. The country's 2002 National Report on the Implementation of the United Nations Convention to Combat Desertification (UNCCD) notes the impact of small-scale gold mining on erosion and land degradation, pollution of surface and groundwater and other impacts. Priorities for action were noted including awareness raising, equipment and training for monitoring and control, institutional strengthening, and sustainable environmental management of the natural resource base, among others. Finally, the project is also consistent with the NCSA Capacity Development

[12] “Feasibility study of the commercial production of biofuels from dedicated biomass crops on mined out bauxite lands in Suriname”.

Action Plan, which highlights the need for capacity building at the individual, institutional and systemic levels for improved environmental management.

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.

53. The project will review relevant experiences in the region in the implementation of projects to reduce the environmental impacts of mining to glean insights on lessons learned with regard to policy and planning frameworks, institutional strengthening, education and awareness raising, training of small and medium-scale miners, and feasible mining methods, among others. These include the UNDP/GEF projects mentioned in Section 5, as well as other relevant projects within and outside of the region. It will be important to assess gold mining in the regional context because issues associated with small and medium scale gold mining do not distinguish between borders. Different regulatory, enforcement and fiscal regimes in neighbouring countries can influence the transboundary movement of small scale miners and the smuggling of mercury and gold, so any intervention to reduce the associated environmental impacts must take this into consideration.

54. To assess and document project experiences, the project will carry out annual lessons learned workshops to discuss project progress among stakeholders, disseminate results and plan ways forward. In addition to national stakeholders, the project will open up participation in these annual workshops to relevant project teams from the region. The project will develop a website as another way of disseminating information and sharing experiences. In addition, the project will upload key project products and advertise the dates of project-related events and workshops on the websites of relevant agencies such as NIMOS and the Ministry of Natural Resources. The UNDP Country Office will provide information on the project to openundp.org, which presents detailed information on UNDP projects. The UNDP Sustainable Development and Resilience Cluster will be used as a vehicle for information dissemination. Information can also be exchanged through meetings and conferences organized through the Guiana Shield Facility, which facilitates South-South cooperation.

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

A. RECORD OF ENDORSEMENT[13] 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)*
Ms. Ellen Naarendorp	Permanent Secretary	FOREIGN AFFAIRS	JULY 29, 2015
Mr. Cedric Nelom	Acting Director of the NIMOS	OFFICE OF THE PRESIDENT OF THE REPUBLIC OF SURINAME	JULY 29, 2015
Mr. Melvin Linscheer	Director National Security	OFFICE OF THE PRESIDENT OF THE REPUBLIC OF SURINAME	JULY 29, 2015

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies[14] 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

[13] 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.

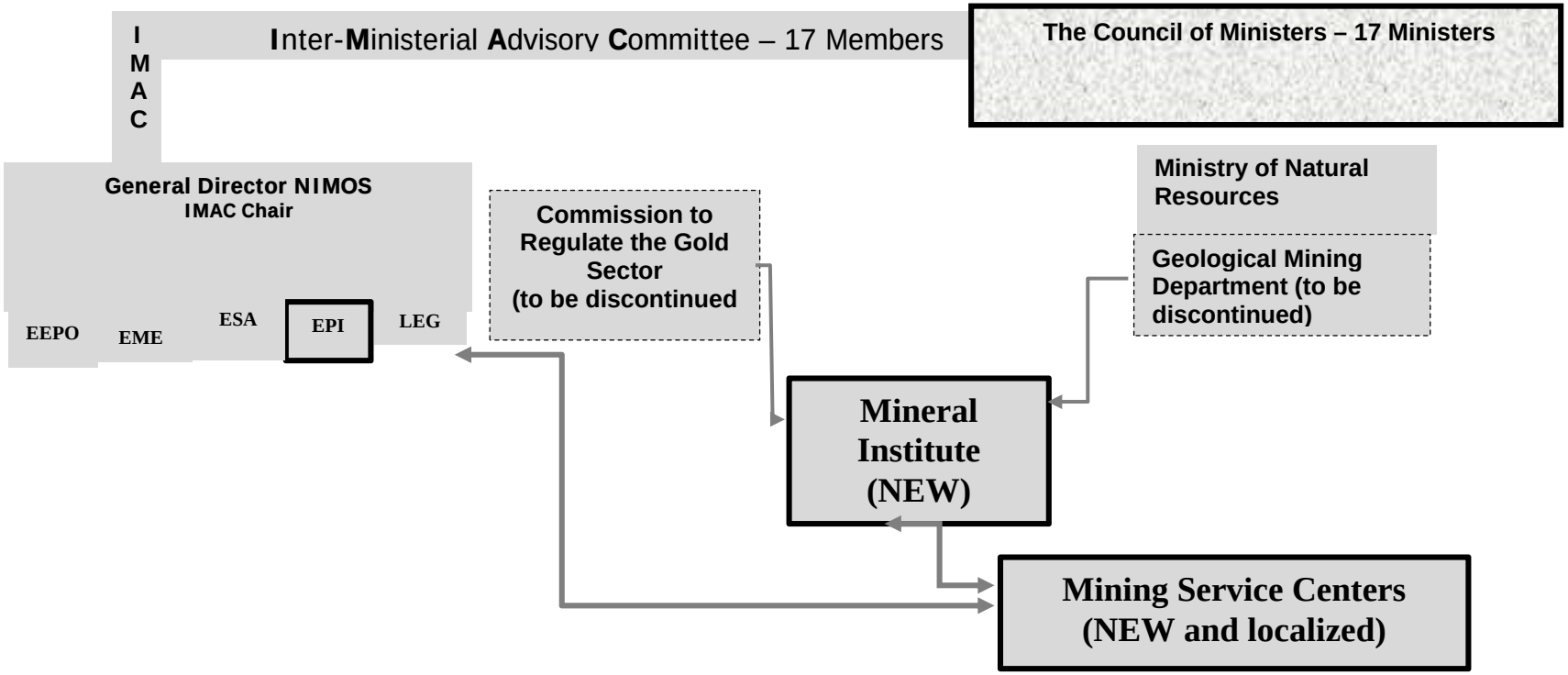
[14] GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF

Adriana Dinu, UNDP-GEF Executive Coordinator.		August 25, 2015	Lyes Ferroukhi, Regional Technical Advisor, EBD	+507 302-4576	lyes.ferroukhi @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.

Annex 1: Relationship among different institutions/initiatives that will be created or strengthened through the project



Legend:
EEPO: Environmental Education & Public Outreach
EME: Environmental Monitoring & Enforcement
ESA: Environmental & Social Assessment
EPI: Environmental Planning and Information (to be established with project and other support)
LEG: Environmental Legal Services

Annex 2: Carbon Calculations:

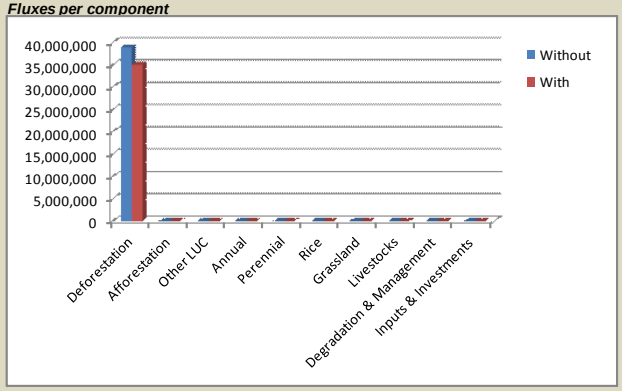
The baseline level of deforestation for Suriname is 9000 hectares per year, and the vast majority of this deforestation is occurring in the Greenstone Belt in which mining activities occur, since mining is the principal driver of deforestation. The FAO EX-ACT tool was used to estimate the carbon benefits associated with the project. The forest type selected for calculations was Tropical Rain Forest. The project is expected to lead to a 10% annual decrease in the national level of deforestation for the time period of the project. The sequestration was calculated based on a 20-year period. The annual carbon sequestration is estimated to be 194,469 tCO2-eq.
Please note that the tool will be reapplied during the project preparatory phase when more data become available through the REDD+ initiative in which Suriname is engaging.

Please see the Results tab from the EX-ACT FAO tool copied onto the next page.

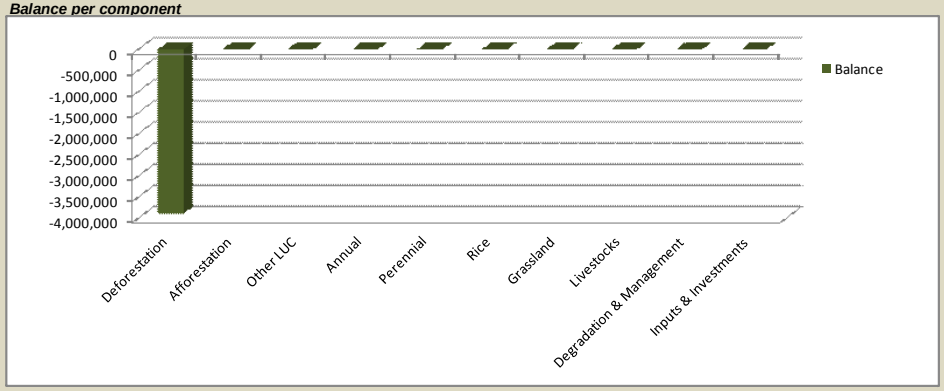
Project Name	Improving Environmental M	Climate	Tropical (Wet)	Duration of the Project (Years)	20
Continent	South America	Dominant Regional Soil Type	LAC Soils	Total area (ha)	14800000

Components of the project	Gross fluxes Without	With	Balance	Share per GHG of the Balance CO_2 Biomass	Soil	Other	N_2O	CH_4	Result per year Without	With	Balance
	All GHG in tCO2eq										
	Positive = source / negative = sink										
Land use changes											
Deforestation	38,893,800	35,004,420	-3,889,380	-3,231,030	-658,350		0	0	1,944,690	1,750,221	-194,469
Afforestation	0	0	0	0	0		0	0	0	0	0
Other LUC	0	0	0	0	0		0	0	0	0	0
Agriculture											
Annual	0	0	0	0	0		0	0	0	0	0
Perennial	0	0	0	0	0		0	0	0	0	0
Rice	0	0	0	0	0		0	0	0	0	0
Grassland & Livestocks											
Grassland	0	0	0	0	0		0	0	0	0	0
Livestocks	0	0	0				0	0	0	0	0
Degradation & Management	0	0	0	0	0		0	0	0	0	0
Inputs & Investments	0	0	0			0	0		0	0	0
Total	38,893,800	35,004,420	**-3,889,380**	-3,231,030	-658,350	0	0	0	1,944,690	1,750,221	-194,469
Per hectare	3	2	0	-0.2	0.0	0.0	0.0	0.0			
Per hectare per year	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0

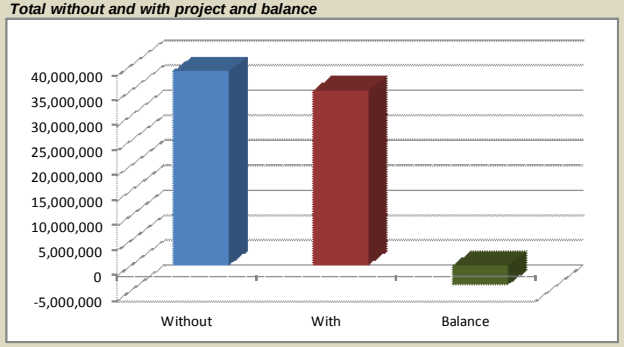
Fluxes per component



Balance per component



Total without and with project and balance



Share of the balance per GHG (plus origin for CO2)