GEF-8 PROJECT IDENTIFICATION FORM (PIF)

TABLE OF CONTENTS

GENERAL PROJECT INFORMATION 3

Project Summary 4

Indicative Project Overview 5

PROJECT COMPONENTS 5

PROJECT OUTLINE 10

A. PROJECT RATIONALE 10

B. PROJECT DESCRIPTION 15

Project description 15

Coordination and Cooperation with Ongoing Initiatives and Project. 34

Core Indicators 36

Risks to Project Preparation and Implementation 39

C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES 41

D. POLICY REQUIREMENTS 43

Gender Equality and Women's Empowerment: 43

Stakeholder Engagement 43

Private Sector 44

Environmental and Social Safeguard (ESS) Risks 44

E. OTHER REQUIREMENTS 45

Knowledge management 45

ANNEX A: FINANCING TABLES 45

GEF Financing Table 45

Project Preparation Grant (PPG) 45

Sources of Funds for Country Star Allocation 46

Indicative Focal Area Elements 46

Indicative Co-financing 46

ANNEX B: ENDORSEMENTS 48

GEF Agency(ies) Certification 48

Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s): 48

ANNEX C: PROJECT LOCATION 49

ANNEX D: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING 50

ANNEX E: RIO MARKERS 50

ANNEX F: TAXONOMY WORKSHEET 50

General Project Information

Project Title
Towards a better understanding of the Amazon Aquifer Systems for its protection and sustainable management

Region	GEF Project ID
Regional	11108
Country(ies)	**Type of Project**
Regional Bolivia Brazil Colombia Ecuador Guyana Peru Suriname Venezuela	FSP
GEF Agency(ies):	**GEF Agency ID**
UNEP IADB	
Executing Partner	**Executing Partner Type**
Amazon Cooperation Treaty Organization (ACTO)	Others
GEF Focal Area (s)	**Submission Date**
International Waters	4/10/2023

Project Sector (CCM Only)
Mixed & Others

Taxonomy
Focal Areas, Mercury, Chemicals and Waste, Artisanal and Scale Gold Mining, International Waters, Freshwater, Aquifer, Learning, Transboundary Diagnostic Analysis and Strategic Action Plan Preparation, Climate Change, Climate Change Adaptation, Ecosystem-based Adaptation, Biodiversity, Biomes, Rivers, Stakeholders, Communications, Awareness Raising, Behavior change, Strategic Communications, Public Campaigns, Local Communities, Type of Engagement, Consultation, Information Dissemination, Participation, Civil Society, Non-Governmental Organization, Academia, Community Based Organization, Beneficiaries, Private Sector, Gender Equality, Gender results areas, Knowledge Generation and Exchange, Capacity Development, Participation and leadership, Gender Mainstreaming, Gender-sensitive indicators, Women groups, Sex-disaggregated indicators, Capacity, Knowledge and Research, Theory of change, Knowledge Exchange, Field Visit, Targeted Research, Knowledge Generation, Workshop

Type of Trust Fund	Project Duration (Months)
GET	48

GEF Project Grant: (a) 13,461,468.00	GEF Project Non-Grant: (b) 0.00
Agency Fee(s) Grant: (c) 1,211,532.00	Agency Fee(s) Non-Grant (d) 0.00
Total GEF Financing: (a+b+c+d) 14,673,000.00	Total Co-financing 131,236,473.00
PPG Amount: (e) 300,000.00	PPG Agency Fee(s): (f) 27,000.00
PPG total amount: (e+f) 327,000.00	Total GEF Resources: (a+b+c+d+e+f) 15,000,000.00
Project Tags CBIT: No NGI: No SGP: No Innovation: No	

Project Summary

Provide a brief summary description of the project, including: (i) what is the problem and issues to be addressed? (ii) what are the project objectives, and if the project is intended to be transformative, how will this be achieved? iii), how will this be achieved (approach to deliver on objectives), and (iv) what are the GEBs and/or adaptation benefits, and other key expected results. The purpose of the summary is to provide a short, coherent summary for readers. The explanation and justification of the project should be in section B "project description".(max. 250 words, approximately 1/2 page)

Beneath much of the Amazon basin lies the Amazon aquifer systems (AAS). While presumably it underlies parts of Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela, its actual extent and dynamics are not well understood, and it is anticipated that it could extend much further than is currently known. The demand for quality water has increased in the Amazon Basin and, despite the large volume of surface water in the region, all countries use groundwater extensively as an alternative source of safe water. Groundwater in the Amazon basin plays a major role in the hydrological and ecological cycles and largely influences rainforest ecosystems and climate variability, especially during the dry season. Groundwater is locally threatened mainly by uncontrolled exploitation, pollution (urban and from economic activities), and climate change effects, affecting aquifer levels, recharge, and changes in groundwater regimes.

The project seeks to promote a common understanding of the AAS to strengthen existing regional governance and the integrated management of groundwater for its protection and sustainable use, and thereby enhancing water security and ecosystem resilience in the Amazon region. It aims to tackle the insufficient transboundary aquifer knowledge, the lack of agreements for a common protection and governance strategy and the lack of public awareness on the topic. It will support countries, as they go through the Transboundary Diagnostic Analysis – Strategic Action Program (TDA-SAP) formulation process, creating mutual trust through joint fact findings, facilitating the consensus on a common long-term vision for the shared AAS, and assisting stakeholders with relevant management strategies and actions to promote water security.

This project yields direct environmental and water supply benefits for the 2,255 direct beneficiaries involved in the pilot projects and expects to achieve 3,650 ha under improved sustainable practices and aquifer protection, under a collaborative management approach- for the Amazon Basin, understanding the Amazon Aquifers as an integrated system. By enhancing multi-state cooperation to reduce threats to the aquifer systems and preventing its degradation from overexploitation and pollution, the project will improve water security, resilience of vulnerable communities that depend on groundwater and ecosystems. This project is

considered transformative since it will deliver significant changes and global environment benefits at a regional scale in an area of global environmental concern such as the Amazon Region.

Indicative Project Overview

Project Objective

Beneath much of the Amazon basin lies the Amazon aquifer systems (AAS). While presumably it underlies parts of Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela, its actual extent and dynamics are not well understood, and it is anticipated that it could extend much further than is currently known. The demand for quality water has increased in the Amazon Basin and, despite the large volume of surface water in the region, all countries use groundwater extensively as an alternative source of safe water. Groundwater in the Amazon basin plays a major role in the hydrological and ecological cycles and largely influences rainforest ecosystems and climate variability, especially during the dry season. Groundwater is locally threatened mainly by uncontrolled exploitation, pollution (urban and from economic activities), and climate change effects, affecting aquifer levels, recharge, and changes in groundwater regimes. The project seeks to promote a common understanding of the AAS to strengthen existing regional governance and the integrated management of groundwater for its protection and sustainable use, and thereby enhancing water security and ecosystem resilience in the Amazon region. It aims to tackle the insufficient transboundary aquifer knowledge, the lack of agreements for a common protection and governance strategy and the lack of public awareness on the topic. It will support countries, as they go through the Transboundary Diagnostic Analysis – Strategic Action Program (TDA-SAP) formulation process, creating mutual trust through joint fact findings, facilitating the consensus on a common long-term vision for the shared AAS, and assisting stakeholders with relevant management strategies and actions to promote water security. This project yields direct environmental and water supply benefits for the 2,255 direct beneficiaries involved in the pilot projects and expects to achieve 3,650 ha under improved sustainable practices and aquifer protection, under a collaborative management approach- for the Amazon Basin, understanding the Amazon Aquifers as an integrated system. By enhancing multi-state cooperation to reduce threats to the aquifer systems and preventing its degradation from overexploitation and pollution, the project will improve water security, resilience of vulnerable communities that depend on groundwater and ecosystems. This project is considered transformative since it will deliver significant changes and global environment benefits at a regional scale in an area of global environmental concern such as the Amazon Region.

Project Components

Component 1 Consolidation and expansion of the current understanding in the functioning of and threats to the Amazon Aquifer Systems (AAS)

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
6,000,000.00	58,494,277.00

Outcome:

Outcome 1
Improved technical-scientific knowledge about the AAS and drivers of change to inform decision making for resource planning and sustainable groundwater management considering each country´s context.

Output:

Output 1.1
An assessment of current state of the groundwater resources building *inter alia* on geological, geophysics, hydraulics, hydrodynamic, hydro-chemical, isotopic hydrology, and hydrogeological studies.
Output 1.2
A geo-referenced base map of the Amazon Aquifer Systems supported by a GIS infrastructure including specific vulnerability maps based on available or new information from each country.
Output 1.3
A water security analysis and, hydrological and hydrogeological scenario modelling of aquifer behavior, with focus on frontier zones of the Amazon Aquifer Systems (AAS), under different climate change and socio-economic development scenarios.
Output 1.4
Documented targeted research on:
- Hydraulic interconnection with surface water with a focus on border areas, including a study of recharge mechanisms.
- Understanding pollution threats to groundwater (i.e., As, Pb, Hg, and others to be determined by member countries).

Output 1.5
An agreed AAS Transboundary Diagnostic Analysis.

Component 2 Towards a multilevel management system for the AAS

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
520,446.00	5,073,852.00

Outcome:

Outcome 2

Agreed elements for promoting transboundary cooperation and coordinated groundwater management at regional and national level

Output:

Output 2.1
Assessment and gap analysis of legal, regulatory frameworks and institutional capacities for groundwater management in the region and countries including model policies and regulations toolkits for necessary reforms.
Output 2.2
White Paper with recommendations for (i) improving national legal, technical, and institutional frameworks on groundwater management and regional coordination and (ii) strengthening ACTO's cooperation role on groundwater resources management
Output 2.3
Design of a sustainable regional groundwater monitoring network interoperated with the Amazon Regional Observatory (ARO) and validated by each member country.
Output 2.4
A proposed road map for sustainable groundwater management and for strengthening policy and legal context in Suriname and Guyana.

Component 3 Pilots for improved transboundary groundwater management and use

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
4,300,000.00	41,920,899.00

Outcome:

Outcome 3

Demonstrated strategies for improved groundwater management and water security in transboundary critical areas

Output:

Output 3.1

A series of pilots testing good management practices to reduce stress on the aquifer systems and increase water security in the face of climate change variability potentially including the following but not restricted to it and to be further reviewed during PPG [1][1]:

(i) Innovative approaches for groundwater well management between Brazil and Bolivia (Cobija-Brasiléia) in a potential area of 260,000 ha, affecting over 72,000 people.
(ii) Promoting multi-municipal cooperation mechanisms for groundwater management and for aquifer protection (recharge zone and water quality) in Puerto Asis, Valle del Guamuez and Orito (Colombia), and other regions (potential area 540,000 ha; 120,000 people).
(iii) Promoting natural recharge areas and aquifer protection through integrated water management and environmental management for enhanced water security in San Carlos de Rio Negro -Casiquiare (Venezuela). Affected population ~10,000 inhabitants in a potential area of 2,500 ha.
(iv) Aquifer vulnerability mapping through isotopic analysis and application of protection measures in shallow aquifer areas of Coronel Portillo – Pucallpa (Peru). Affected population: ~37,500 people in a potential area of 150,000 ha.
(v) Thematic mapping, vulnerability, identification, and protection of the Aquifer System, as well as recharge zones on Napo River Basin (Ecuador), applying innovative measures (approx. 20,000 people).
(vi) Testing innovative approaches for the sustainable management and protection of transboundary sedimentary aquifers (Guyana and Suriname). Affected population: 60,000 people in a potential area of 150,000 ha.
(vii) Identifying best practices for promoting drinking water security through groundwater protection in small indigenous communities in Suriname (approx. 2,000 people).

Evaluation of gold mining effects on aquifers and ecosystem in the Madre de Dios River and implementation of protection measures (Brazil, Bolivia and Peru). Affected population: ~8,000

[1] Preliminary pilots' sites. The exact places beneficiary populations and technical specifications for the pilots will be defined in the PPG stage together with the member countries.

Component 4 Development of a Strategic Action Plan for the AAS

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
1,100,000.00	10,723,951.00

Outcome:

Outcome 4 Agreed and endorsed strategy for the protection and rational use of the shared aquifer systems

Output:

Output 4.1 AAS SAP developed and endorsed at ministerial level. Output 4.2 Agreed regional technical guidelines for the protection and sustainable use of the AAS. Output 4.3 A financial strategy for implementing SAP strategic actions

Component 5 Reinforced institutional capacity, gender mainstreaming, communication and awareness raised on the AAS

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
400,000.00	3,899,618.00

Outcome:

Outcome 5
Strengthened institutional capacity, gender mainstreaming, communication and awareness raised

Output:

Output 5.1

Training and capacity building activities for strengthening groundwater management at regional (including ACTO) national, municipal, and local levels.
Output 5.2
Groundwater and gender action plan adopted by countries and ACTO.
Output 5.3
Communication strategy and knowledge management plan for enhanced awareness and understanding on the AAS.
Output 5.4
Documented participation to IW LEARN activities, creation of a project website, and preparation of experience notes (1% of project budget).

M&E

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	**Co-financing ($)**
500,000.00	4,874,520.00

Outcome:

Outcome:

Effective project oversight and appropriate monitoring & evaluation of project implementation progress and assessment of its results

Output:

Output:

Documented evaluation and periodic reports (i.e., Mid-Term review, independent terminal evaluation) of the assessment of project performance, including the evaluation of the level of progress in attaining the project objectives, degree of effectiveness and recommendations of corrective measures, if necessary.

Component Balances

Project Components	GEF Project Financing ($)	Co-financing ($)
Component 1 Consolidation and expansion of the current understanding in the functioning of and threats to the Amazon Aquifer Systems (AAS)	6,000,000.00	58,494,277.00
Component 2 Towards a multilevel management system for the AAS	520,446.00	5,073,852.00
Component 3 Pilots for improved transboundary groundwater management and use	4,300,000.00	41,920,899.00
Component 4 Development of a Strategic Action Plan for the AAS	1,100,000.00	10,723,951.00
Component 5 Reinforced institutional capacity, gender mainstreaming, communication and awareness raised on the AAS	400,000.00	3,899,618.00
M&E	500,000.00	4,874,520.00
Subtotal	**12,820,446.00**	**124,987,117.00**

Project Management Cost	641,022.00	6,249,356.00
Total Project Cost ($)	**13,461,468.00**	**131,236,473.00**

Please provide justification

PROJECT OUTLINE

A. PROJECT RATIONALE

Briefly describe the current situation: the global environmental problems and/or climate vulnerabilities that the project will address, the key elements of the system, and underlying drivers of environmental change in the project context, such as population growth, economic development, climate change, sociocultural and political factors, including conflicts, or technological changes. Describe the objective of the project, and the justification for it. (Approximately 3-5 pages) see guidance here

Beneath much of the Amazon basin lies the Amazon aquifer systems (AAS). It comprises the hydrogeological province/unit of the Amazon, where various types of aquifers made up of unconsolidated and consolidated sediments are located (United Nations, 2022). While it is understood that it underlies parts of Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela, its actual extent and dynamics are not well understood and could extend much further than is currently known (Rosario, Custodio, & Cardoso, 2016).

Currently, it is estimated that the AAS has an extension of approximately 3,950,000 km^2, of which 2,000,000 km^2 are from the Alter de Chão Formation and 1,200,000 km^2 from Içá (UNESCO, 2007). The geometrical characterization of the AAS in each of the Amazon sub-basins is still preliminary. The initial calculations of aquifer reserves indicate water volumes between 45,000 and more than 160,000 km^3 (Matos, Cavalcante, & Silva, 2013) (Galán & Herrera, 2015), placing it thus among the largest aquifers systems in the world (Matos, Cavalcante, & Silva, 2013).

Initial estimates suggest that as much as 123,838 km^3 of water may be found in the AAS in Brazil alone with a potential extraction yield of 250 km^3/annum (ANA, 2015). A more detailed estimate of the Içá-Solimões aquifer in Urucu indicates that a sustainable extraction rate could be as much as 3 x 10^{-3} km^3 /yr over a 120 km^2 study area (Galvão, Lopes, Demétrio, & Martins, 2020).

For many riverine communities, groundwater is the only alternative water supply of acceptable quality, due to natural and anthropic contamination of surface waters (UNESCO, 2007). The Brazilian states of Pará and Amapá, frequently affected by droughts, both rely on groundwater for more than 50% of their freshwater withdrawals ((UNESCO, 2007) (United Nations, 2022)). In Bolivia, the city of Santa Cruz is supplied almost exclusively from deep wells located in the north of the city[1][2]. In Colombia, groundwater is also used in the city of Leticia. In Perú, main cities, small towns and indigenous communities located near the Ucayali River, use groundwater for human consumption (Tovar, Sayán, Pérez, & Guzmán, 2006).

Water scarcity and unsafe water resources disproportionally affect women and children. Worldwide, when access to water is limited, women and children spend more than 125 million hours daily collecting water, in containers that can weigh up to 20 kg. This significantly limits the available time they could spend in productive activities, education, or recreation. Analysis shows that school enrollment increases by 15% when communities have drinking water and sanitary facilities (Monje et al, 2016[2][3]). In Peruvian Amazonia, only 3.3% to 8.2% of the population has access to safe water. Women and girls do not have access to preventive and timely education and health, adolescent pregnancy is very high, and they are vulnerable to intrafamily gender violence, as well as in the labor and social spheres (USAID, 2013[3][4]).

Groundwater is also used for irrigation in agriculture, for industrial supply (e.g. Pucallpa and Iquitos in Peru) and in rural population centers for drinking water (UNESCO, 2007) (Tovar, Sayán, Pérez, & Guzmán, 2006).

Several studies ((Frappart, y otros, 2019) (Fan & Miguez-Macho, 2010) (Ferreira, Custodio, & Cardoso, 2016) (Miguez-Macho & Fan, 2012) (Pokhrel Y. , Fan, Miguez-Macho, Yeh, & Han, 2013) (Pfeffer, 2014) (Lin, 2015) (Porter, Kendall, Coe, & Hyndman, 2020)) suggest that groundwater in the Amazon basin, plays a major role in the hydrological and ecological cycles, and largely influence the rainforest ecosystems and climate variability, especially during the dry season. However, to understand better these relationships and better manage this transboundary resource, in response to an altered climate and landscape, more studies are required ((Frappart, y otros, 2019) (Porter, Kendall, Coe, & Hyndman, 2020) (Miguez-Macho & Fan, 2012)).

Groundwater in the Amazon region is locally threatened mainly by uncontrolled exploitation, pollution (urban and from economic activities), and potential climate change effects, affecting aquifer levels, recharge and changes in groundwater regimes.

In the last decades, an increasing number of groundwater wells have been constructed for drinking water purposes in the Amazon region; however, the chemical quality of the groundwater resources is poorly studied (de Meyer, 2017), and guidelines for wells construction and groundwater sustainable use are not adhered to. Groundwater is accessed mainly through shallow artesian wells that are susceptible to environmental contamination around water extraction points. In urban areas, where the aquifer has a high-water table close to the surface, there is a high potential for contamination due to poorly constructed wells, absence or poor protection measurements for sanitation and the lack of basic sanitation (UNESCO, 2007).

For example, in Manaus (Brazil), groundwater samples showed high contamination by thermotolerant coliforms (UNESCO, 2007). Another study conducted in schools in the Santarém region, where the population is fully supplied by groundwater, showed that most water samples were contaminated with total coliform and with *E. coli,* which could cause serious intestinal disorders for children (Meschede, Figueiredo, Alves, & Segura-Muñoz, 2018). In the study conducted by ANA (2015) some wells (e.g., in Rio Branco Aquifer) presented abnormal values of calcium, magnesium and sulfate, attributable to agricultural practices and wrong use of fertilizer (ANA, 2015).

In Iquitos and Pucallpa (Peru), groundwater for human consumption in unconfined aquifers, had aluminum, arsenic, or manganese at levels harmful to human health. De Meyer (2017) recommends determining the minimal and maximal depths of wells construction corresponding to non-contaminated aquifers, to avoid aquifers with geogenic contaminants to protect people's health (de Meyer, 2017). Groundwater pumping may contribute to the release of geogenic pollutants (such as arsenic) from the rock matrix and to their subsurface transport (UNESCO, 2007), and therefore it should be carefully studied where to place and how to build and monitor wells.

In Ecuador, despite the low populations around Limoncocha, a study showed that 30% of the 11,000 ha. area surveyed of the unconfined aquifer were considered as "high risk" to pollution due to agriculture, oil exploitation, tourism, and municipal services (Jarrín, Salazar, & Martínez-Fresneda, 2017).

In Guyana, groundwater is an invaluable resource for domestic and industrial purposes, unfortunately the lack of relevant, up to date data and essential policies have a significant impact on the protection and management of groundwater resources (EPA Guyana, 2016).

Mining, agriculture, pasture ranching and oil exploration activities in the basin have increased in recent years, but the effects on groundwater quality are yet unknown (Andrade, y otros, 2018) (Mestanza-Ramón, y otros, 2022). Groundwater pollution is a practically irreversible and very costly process, which is why it must be avoided with proper management of the activities that cause negative impacts (United Nations, 2022).

Climate impacts are becoming increasingly pronounced as extreme weather events are becoming more common in the Amazon region. Indeed, flooding and drought events over a 10-year period between 2005 and 2016 were equivalent to impact of events over the 65-year period between 1926-1989 (J.A, Williams, Alves, Soares, & Rodriguez, 2016). The Amazon basin may experience warmer but drier dry seasons. Pokhrel (2014) conducted a study to find out whether the groundwater buffering effect could reduce the anticipated water stress under future climates projected by IPCC climate model simulations. They found that "the slow soil drainage constrained by shallow groundwater can buffer soil water stress, particularly in southeastern Amazon dry season". Therefore, it seems that groundwater could influence positively by reducing water stress in the Amazon basin (Pokhrel, Fan, & Miguez-Macho, 2014). More studies are however needed to establish the role and relationship between groundwater, surface water and the biome.

Climate change generally affects water availability which impacts men and women differently due to their socially constructed roles and responsibilities[4][5]. International tensions over AAS groundwater resources have revolved around overexploitation and transboundary pollution which need to be understood better including through improved monitoring and additional studies including on the limits, characteristics, reserves, flow, etc. of the aquifer systems (Villar, 2016).

The protection of groundwater resources is a great challenge in the region. As in many parts of the world, groundwater in the Amazon riparian countries is not the focus of policy and decision-makers as it is not "seen" and poorly understood in comparison to surface water resources. Additional emphasis is however needed to protect and sustainably use this "*invisible giant"* in the Amazon region. Groundwater overexploitation and pollution can cause irreversible impacts and the loss of important reserves for present and future generations. In the case of transboundary aquifers, states need to identify their zones of high vulnerability and take joint protection measures, especially in the boundary areas (Villar, 2016). In the context of increasing water scarcity in many parts of the world, it is imperative to recognize the importance and functions of groundwater systems, and the need to manage them properly to ensure human and ecosystem well-being (United Nations, 2022).

The below section highlights the main barriers to the protection and sustainable use of the AAS.

Barrier 1: Insufficient transboundary aquifer knowledge

In the 1980s, UNESCO, with the support of all South American countries, developed and published the Hydrogeological Map of South America (1:5,000,000) forming the basis for the definition of the Hydrogeologic Unit-Provinces of the Continent. In 2000, the UNESCO/OAS ISARM Americas "Program Transboundary Aquifer Systems in the Americas" was created to promote recognition and knowledge in relation to the transboundary aquifers of the continent. One of the conclusions in this study is that "in general, the problems that affect transboundary groundwaters in the Americas are related to the lack of information. Data that is vital to water management is often fragmented or unavailable. Lack of information affects how politicians and the public perceive this valuable underground resource, and limits understanding of its importance for food security and poverty alleviation. This generally translates into fragmented policies and the absence of long-term integrated water resource management strategies" (UNESCO, 2007).

Much of what is known today about the AAS comes from studies carried out in the Aquifers of Sedimentary Basins of the Amazon Hydrogeological Province in Brazil (2015). The level of information and data management in relation to AAS between country members is very uneven. To better understand and facilitate a consolidated common knowledge base and, the sustainable use and management of the AAS, it is necessary to carry out technical studies and on-the-ground pilot projects where supposedly the aquifer systems lie.

The boundaries, the hydraulic behavior, the interconnections between the regional geological formations and the structural stratigraphic characteristics of the transboundary aquifers are poorly understood. At the same time, the present and future demands of the resource by different stakeholders need to be estimated, under adverse effects of variability and climate change. Understanding and quantifying the different environmental problems (e.g., degradation of quality due to pollution from various sources) in the AAS, and identifying their root causes is also fundamental for the sustainable use of groundwater, and to guarantee water security in the region.

Barrier 2: Lack of agreements for shared governance

The Amazon Cooperation Treaty, signed by the eight Amazonian countries in 1978, seeks to promote actions in favor of the development of the region and, at the same time, ensures a balance between economic development and environmental conservation. The Amazon Cooperation Treaty Organization (OTCA) was established as an intergovernmental organization in 1998, which functions as a platform for political and regional cooperation dialogue.

Countries are seeking to conduct groundwater studies focused on environmental protection and sustainable development of groundwater resources in the sedimentary aquifers of the region, and to build multilateral partnerships. In 2013, member countries have discussed a first project proposal to strengthen cooperation in matters of transboundary groundwater resources among Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela, with the participation of Guyana and Suriname[5][6], in a regional meeting in Manaus. Since then, some countries have begun to study their groundwater resources, however there is still a gap in the different political, legal, regulatory, and institutional frameworks between countries for the management of groundwater systems, as well as the lack of understanding of the importance of cooperation to address the challenges that affect the AAS.

Under the lead of ACTO, the Amazon SAP Implementation GEF IW Project (GEF ID #9770) is looking at a regional water governance mechanism[6][7]. Building on the ACTO existing governance structure, this project would provide further inputs to promote national and regional frameworks for the protection and sustainable use of the AAS. This would be achieved by supporting discussions and agreements to coordinate, harmonize and exchange information; to create and maintain well monitoring networks; to improve groundwater management, and to propose recommendations concerning groundwater allocation and protection, according to each country.

This project will help to diagnose and address the institutional inconsistencies and gaps through promoting a revision of legislations and an analysis of institutional capacities, advancing education and public awareness on groundwater management and improving technical capacity for groundwater assessment. Including gender-responsive elements as an input to improved transboundary cooperation in the AAS will also generate opportunities for more socially equitable groundwater management.

Barrier 3: Lack of a common protection strategy for the AAS

Countries, to a greater or lesser extent, have advanced in the protection of groundwater through *inter alia* national strategies, plans, projects, and technical studies (Appendix 1 and section C) at a national level, but so far, no common strategy exists, that is coordinated among those countries. The project will interact with and complement national initiatives and existing projects in the area of influence, and will promote a common

strategy between the countries to address the main problems affecting the AAS. Guidelines will be identified and agreed to manage sustainably the AAS.

Barrier 4: Low public awareness

There is a limited appreciation for the multiple services that the Amazon aquifer systems provide at all levels (society, scientific community, etc.). This represents a barrier to promote efficient policies and limits engagement of stakeholders. A greater understanding of the importance of the AAS will help enhance political will at a regional, national, and state level to address the current threats.

Justification

The project objective is to get a common understanding of the Amazon Aquifer Systems (AAS) -*the invisible giant*- to strengthen existing regional governance and the integrated management of groundwater for its protection and sustainable use, and thereby enhancing water security and ecosystem resilience in the Amazon region.

Without an adequate assessment on the main characteristics of the AAS to help define sustainable strategies for its use and management, and without national and joint legal, regulatory and institutional frameworks for groundwater, the globally shared goals of social and economic development will not be met, and the degradation of groundwater resources and their aquifer systems will be irreversible especially as in recent years the contribution of groundwater to aquatic ecosystems has become increasingly important as the Amazon basin continues to experience drought periods.

The long-term sustainability of water resources and the health of ecosystems in the Amazon Basin cannot be achieved without an adequate and shared understanding of regional groundwater (main characteristics and threats). At the same time, the establishment of multi-level cooperation frameworks for this important transboundary aquifer, perhaps the largest in the world, is of vital importance to ensure water security for populations dependent on this resource, and the Amazon dependent eco-hydrosystems. Moreover, ensuring water security conditions and improving access to quality water is key in a post-COVID19 recovery context, particularly considering the essential role that groundwater plays in securing water supply for vulnerable communities. In addition, due to the COVID-19 pandemic, governments have faced strong pressures to allocate national budget resources to the attention of the most urgent economic and health matters, thereby making scarce public resources even more difficult to allocate towards scientific and climate-resilient initiatives that are needed to inform planning and investments in water management and use. In this regard, this program offers a fundamental keystone to support the development and design of sustainable upstream planning for water-related investments in the Amazon.

The proposed project will build on the regional governance structure (currently strengthened through ACTO), and further support specific regional governance mechanisms for groundwater. It will be based upon both GEF and non GEF regional and national initiatives that were undertaken or are in progress in the Amazonian region, serving as baseline for the proposed project. Mainly, the GEF support to the *"Implementation of the Strategic Action Programme to Ensure Integrated and Sustainable Management of the Transboundary Water Resources of the Amazon River Basin Considering Climate Variability and Change"* (GEF ID 9770), initiated in February 2020, can be highlighted. This project focused on the AAS will coordinate activities and outcomes with the four Amazon SAP groundwater interventions (structured in Output 2.4), particularly in terms of helping to develop policy and best practices for management at the regional level (Components 2 and 4). Synergies will be strengthened through ACTO as executing agency and UNEP as implementing agency for both projects.

Moreover, this proposal is highly synergetic and coordinated with the Concept Note "*Improving Climate Resilience by Increasing Water Security in the Amazon Basin*" recently submitted by IADB to the Green Climate Fund (GCF). It is an ambitious program seeking to increase the resilience of vulnerable communities and key socio-ecological ecosystems in the Amazon Basin, to anticipated impacts of climate change on water availability and quality, its temporal and spatial distribution, and the ecosystems' capacity to provide key hydro-environmental services. In this context, the GEF funded proposal will introduce a complementary focus on groundwater management and protection. During the development of both proposals at later stages, further synergies and opportunities will be identified and assessed, with the purpose of maximizing the strategic partnership towards achievement of the highest possible positive impact and taking advantage of blended finance and innovative financing structures in place.

Strengthening knowledge about the aquifer dynamics, relevance, problems, and possible solutions at both regional, national and local levels, is essential to take informed decisions based on science andto protect and sustainably manage the AAS in a coordinated manner.

This project will provide direct environmental and water resources benefits to 2,255 inhabitants (1,105 women and 1,150 men) of different communities involved in the pilot projects. By preventing degradation from overexploitation and pollution, the project will improve water security conditions, resilience of groundwater dependent ecosystems, ecosystem services and sustainable food production systems.

The project will advance sustainable water management policies through the Amazon region, which is particularly important from the global perspective. Current understanding indicates that the groundwater resources of the Amazon Basin likely exceed the renewable surface water resources and provide important waterflow to the rivers and tributaries during dry seasons and particularly through droughts which help maintain the aquatic ecosystems during these times of water stress. As the Amazon Basin is the most biodiverse area in the world the importance of maintaining and supporting the fragile aquatic ecosystems in times of water stress must not be disregarded.

The project will play a critical role in demonstrating on the ground "best practices" to promote water security through coordinated groundwater management of the Amazon region. The project will contribute to data generation and sharing of data at local, national and regional levels, filling knowledge gaps, and providing a better understanding of the significance of the aquifer systems and its critical role at supporting aquatic biodiversity. The project will also test a range of interventions and investments contributing sustainable groundwater management at local levels, through the pilot projects.

[1] https://cebem.org/revistaredesma/vol10/pdf/informacion/recursos_hidricos_bol.pdf
[2] Monje, Andrea; Nuñez, Anamaria y Subiza, Dolores (2016). *¿Tiene género el agua?* Infografía BID. Disponible: https://publications.iadb.org/publications/spanish/document/%C2%BFTiene-g%C3%A9nero-el-agua.pdf
[3] USAID (2013). *Diagnóstico de Género en la Amazonía: Amazonas, Loreto, Madre de Dios, San Martín y Ucayaly*. Lima, Perú: Autor. Disponible: https://pdf.usaid.gov/pdf_docs/pnaec707.pdf
[4] https://unfccc.int/sites/default/files/resource/sbi2019_inf8.pdf
[5] http://otca.org/en/wp-content/uploads/2021/01/Newsletter-no-7-GEF-Amazon-Project-1.pdf
[6] Outcome 1.1: Institutional strengthened water governance at regional (ACTO) and national level, leading to improved basin management, ecosystem status and livelihoods

B. PROJECT DESCRIPTION

Project description

This section asks for a theory of change as part of a joined-up description of the project as a whole. The project description is expected to cover the key elements of good project design in an integrated way. It is also expected to meet the GEF's policy requirements on gender, stakeholders, private sector, and knowledge management and learning (see section D). This section should be a narrative that reads like a joined-up story and not independent elements that answer the guiding questions contained in the PIF guidance document. (Approximately 3-5 pages) see guidance here

Project Description

The project supports the principles of "*The law of transboundary aquifers*" resolution adopted by the UN General Assembly on 16 December 2013, and it is aligned with the SDG targets 6.4 (Water use and scarcity) and 6.6 (Water-related ecosystems), while fifty-three (53) targets show interlinkages with groundwater use, management and/or sustainability; sustainable utilization of groundwater resources is critical to achieving sustainable development and UN Agenda 2030 (UNU-INWEH, 2018).

The Framework for Action[1][8] to achieve the goals of the Shared Global Vision for Groundwater Governance 2030[2][9], as part of the GEF Global Groundwater Governance Project, will also guide the project design and execution, "to ensure control, protection and socially sustainable utilization of groundwater resources for the benefit of humankind and dependent ecosystems"[3][10].

The project seeks to promote a common understanding of the importance and functioning of the Amazon Aquifer Systems (AAS) -*the invisible giant*- to promote regional governance and management of groundwater for its protection and sustainable use and, for enhanced water security and ecosystem resilience in the Amazon region. It will support countries, as they go through the Transboundary Diagnostic Analysis – Strategic Action Program (TDA-SAP) methodology, a highly collaborative process, at creating mutual trust by joint fact findings, facilitating the consensus on overall long-term visions for the shared AAS, and assisting stakeholders on the strategies and actions needed to move towards water security.

The project process will be highly participatory, gender responsive, and collaborative, fully involving all key stakeholder groups (national and local government, communities, utilities, hydrometeorological centers, academia, geological surveys, private sector, CSOs, etc.), seeking to build consensus actions to manage the AAS sustainable and equitably. The project will build upon the experience of the Amazon watershed TDA/SAP development process (GEF ID 2364), and currently the Amazon watershed SAP implementation project (GEF ID 9770). In both previous projects, key stakeholders dealing with surface and groundwater have been identified and engaged. Best practices from both projects in engaging with relevant stakeholders' groups (e.g., national, and local/regional government authorities, NGOs/CSOs and private sector bodies, in particular those related to the water supply and sanitation, and well drilling) will be continued, with special emphasis on those that specifically deal with groundwater management.

A Problem Tree for the issues impacting the AAS (Figure 1) identifies a preliminary assessment of the main problems, their causes and their effects and was used to identify the priority activities that are required to achieve the agreed outcomes and objectives of this GEF project. The Problem Tree supported the definition of the project Theory of Change (Figure 2).

The Problem Tree identifies three main problems that will be addressed by this project to reduce the remaining barriers (see section A. Project Rational) and mitigate the root

causes to reduce ecosystem and socioeconomic impacts. The main problems identified are:

- **Problem 1: Uncontrolled use of the groundwater resources due to lack of regulations;**
- **Problem 2: Limited knowledge about the aquifer systems, its functioning and transboundary problems;**
- **Problem 3: Groundwater pollution.**

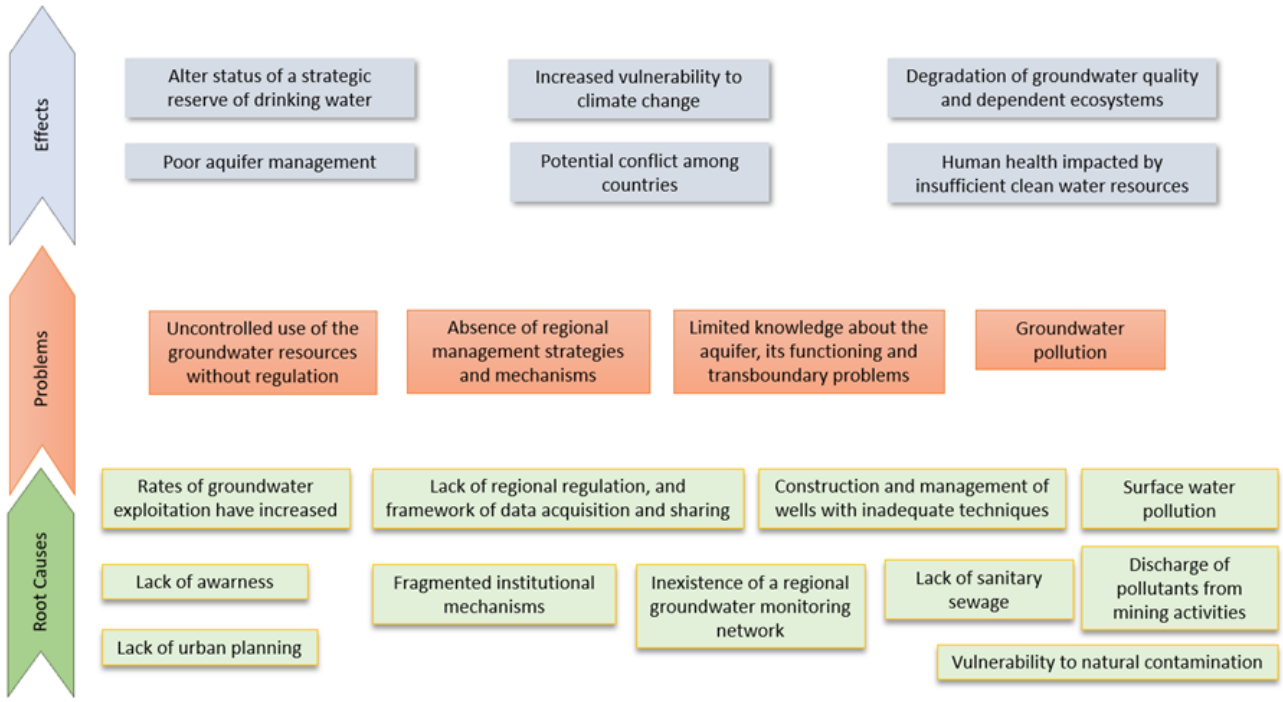

Figure 1. ASS - Problem Tree

The ToC (figure 2) illustrates the logic of the project in tackling the above problems through a suite of planned outputs and their expected outcomes. Through the implementation of the project's five interlinked components, it is expected that the project will generate a long-term legacy (impact) to the "sustainable, integrated management and use of the Amazon Aquifer System to improve water security". The

ToC also summarizes the key expected intermediate states that will be achieved and the main assumptions.

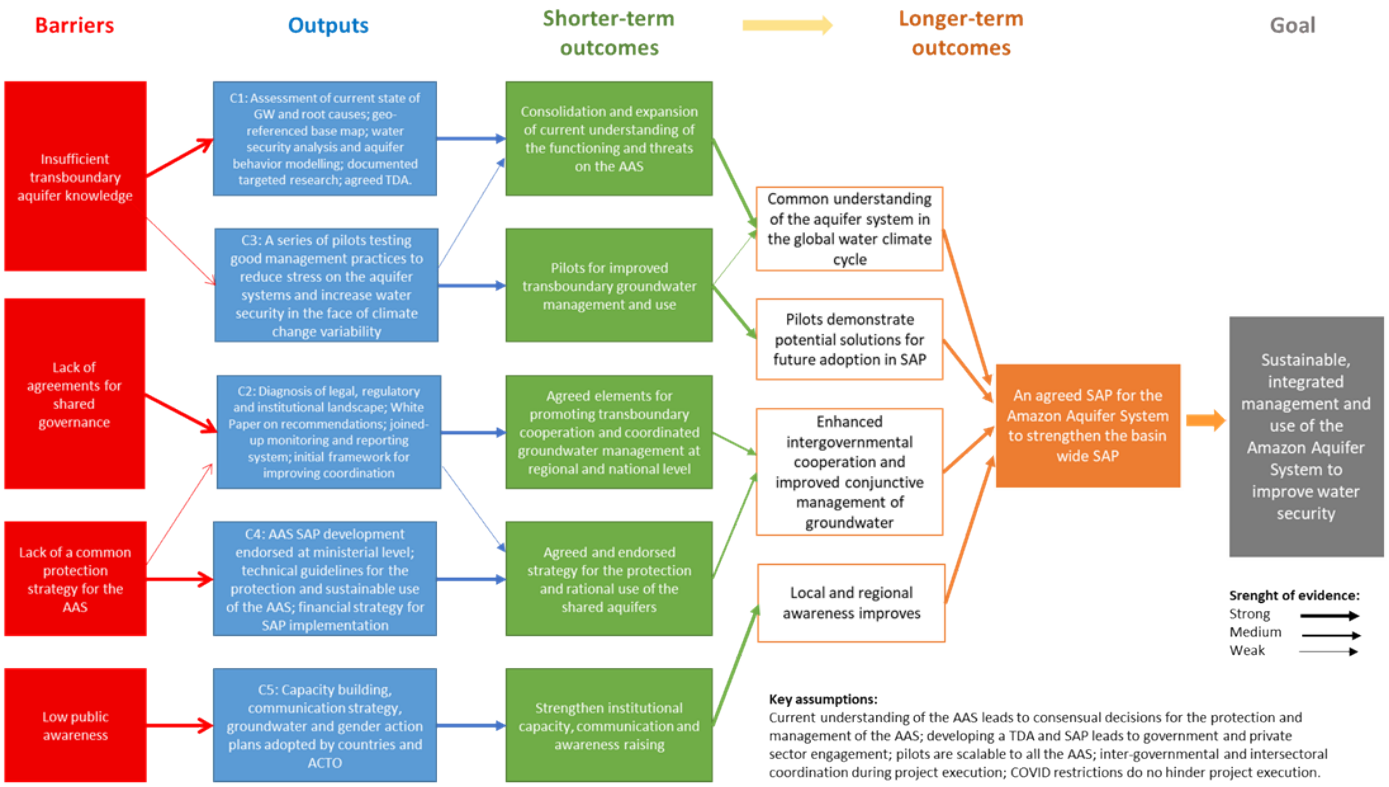

Figure 2. ASS - Theory of change

The specific components and activities proposed are:

Component 1: Consolidation and expansion of current understanding of the functioning and threats on the Amazon Aquifer Systems (AAS)

This key component aims at expanding the existing knowledge of the Amazon Aquifer Systems based on the standardization of information including e.g., on the issue of scale and geological formation classification which differ amongst each participating country, and to achieve common understanding among countries on key transboundary and national concerns affecting the AAS.

<u>Outcome</u>: Improved technical-scientific knowledge about the AAS and drivers of change to inform decision making for resource planning and sustainable groundwater management.

<u>Outputs</u>:

1.1 An assessment of current state of the groundwater resources building *inter alia* on geological, geophysics, hydrodynamic, hydro-chemical and hydrogeological studies.

Different studies will be carried out to (i) develop a sound scientific and technical basis for the determination of the main characteristics of the AAS, and to (ii) identify trends with main drivers for groundwater exploitation, pollution and recharge (e.g., land use change, wetland management, agricultural water use, wastewater management and pollution, etc.).

1.2 A geo-referenced base map of the Amazon Aquifer Systems supported by a GIS infrastructure including localized vulnerability maps.

A key element of the project will be the creation of an aquifer map and its translation into a user-driven geographic information system for decision making, including data on water abstraction, potential abstraction, recharge, aquifer depth, yield, permeability, aquifer thickness, pollution levels, etc., can be overlaid to show priority areas for action. These will be integrated in a GIS database, and where sufficient data permits, vulnerability maps will be produced.

1.3 A water security analysis and hydrological and hydrogeological scenario modelling of aquifer behavior, with a focus on the frontier zones of the Amazon Aquifer Systems (AAS), under different climate change and socio-economic development scenarios.

Hydrological and hydrogeological models will be developed to characterize, simulate and analyze the groundwater dynamics under varying conditions, including climate change, population growth, demographics (including gender aspects), dams, and land cover change due to deforestation. These models will help to identify gender-sensitive strategic recommendations for sustainable management and utilization of the selected shared aquifers under changing conditions.

Groundwater security indicators will be developed. The modelling will include climate scenarios as well as future water and land use scenarios which will be evaluated based on water (and groundwater) security indicators. The indicators will be developed in collaboration with the on-going SAP Implementation project.

1.4 Documented targeted research for improving the understanding of the (i) hydraulic interconnection with surface water, and (ii) pollution threats to groundwater[4][11]. Such understanding is essential to help determine and quantify the level of natural recharge, the interactions with the aquifer during dry and wet seasons, interactions, and the groundwater relations with the environment and aquatic ecosystem. Concentrations of arsenic (from natural sources[5][12]) on shallow wells have been found that are potentially harmful to human health in some areas; however, research is needed to identify *hotspots* where levels of toxicity are especially high, in areas that rely heavily on wells for

drinking water and where vulnerable groups are present. **As per the TDA/SAP methodology, as to formulate a strong TDA, in addition to analyzing and assembling existing information, based on the gap in the knowledge base, one can also focus the research on key issues, hence the "Targeted Research" label under Output 1.4 which will indeed contribute to the TDA.**

1.5 Agreed upon Transboundary Diagnostic Analysis (TDA). The TDA of the AAS will be developed, based upon jointly conducted science-based assessments of the current state of groundwater resources (1.1), and related modelling of regional behavior and evaluation of future scenarios (1.2) considering the AAS interconnection with surface water, and natural pollution due to arsenic and other pollutants (1.3) and additional information emanating from output 1.4.

The TDA will consolidate the agreement between countries on the main issues of transboundary concern requiring joint remedial and/or protection actions, and on those under national responsibility only.

Component 2: Towards multilevel cooperation of the AAS

This component seeks to improve groundwater management by proposing recommendations at the different management levels (e.g., national and regional levels) by (i) evaluating the existence and scope of policies and regulations at the national and regional level; (ii) analyzing the strengths and gaps of the institutions in charge of groundwater management; and (iii) developing a joined-up groundwater data monitoring and reporting system.

Outcome: Agreed elements for promoting transboundary cooperation and coordinated groundwater management at regional and national level.

Outputs:

2.1 Assessment and gap analysis of legal, regulatory frameworks and institutional capacities for groundwater management in the region and countries, including model policies and regulations toolkits for necessary reforms. This will include *inter alia* governance, socio-economic, legal, institutional and gender aspects; being the latest key since gender studies have been identified as a data gap at regional level after bibliographic revision in the eight riparian countries (ACTO, 1999[6][13]). This assessment

will also include, but not be limited to: (i) the review of existing legislative and policy frameworks related to groundwater and freshwater ecosystems; (ii) the evaluation of existing institutions in charge of groundwater administration and the gaps for its efficient management; (iii) an analysis of socio-economic considerations on groundwater, with focus on poverty, ethnic minorities, and gender inequalities.

2.2 White Paper on recommendations for improving legal and institutional frameworks on groundwater and regional coordination. Recommendations will be made to i) strengthen and articulate legal and institutional frameworks of member countries, to promote protection and sustainable conjunctive use of surface and groundwater resources; and ii) strengthen ACTO's role to support coordination for the regional management of groundwater resources.

2.3 Design of a regional groundwater monitoring network interoperated with the Amazon Regional Observatory. As an essential tool for groundwater management, a data monitoring and reporting system will be developed, under the Amazon Regional Observatory (ORA) system. Analytical methodologies, instrumentation, data transmission, collection and custodian protocols will be further defined, as well as data exchange mechanism and procedures agreements. It is envisioned that the monitoring system will be linked to a geographic information system which will provide information on water security for decision making and will use innovative satellite monitoring methodologies.

2.4 A proposed road map for sustainable groundwater management and for strengthening policy and legal context in Suriname and Guyana. Based on data and information from 3.1 (vi) (see below) a road map for developing sustainable use and protection of groundwater in Guyana and Suriname will be developed. Moreover, given the current state of affairs in Suriname and Guyana and the need to bring all countries on the same page first before envisaging regional coordination, this activity builds on the information gathered in 2.1. While activity 2.2 focuses on regional coordination, this activity will focus on developing a legislative and policy framework to strengthen groundwater governance in Suriname and Guyana. It will build on the information generated in 2.1 and 2.2 highlighting practical approaches to groundwater use.

Component 3: On-the-ground pilots for improved transboundary groundwater management and use

This component aims at gaining experience of the feasibility and effectiveness of groundwater related innovative solutions, best management practices, broader collaboration and joint action. Pilots will provide opportunities for learning exchange and capacity building at the local, state, and national level, and between the countries. Lessons learned resulting from its implementation will be integrated in the SAP formulation for its potential scalability. The figure below showcases the relation between the different pilots and how they will contribute to each component, ultimately representing how they will be considered in the SAP development. The project aims to

scale these pilots throughout the project area to achieve, pursuing their scalability transformative change.

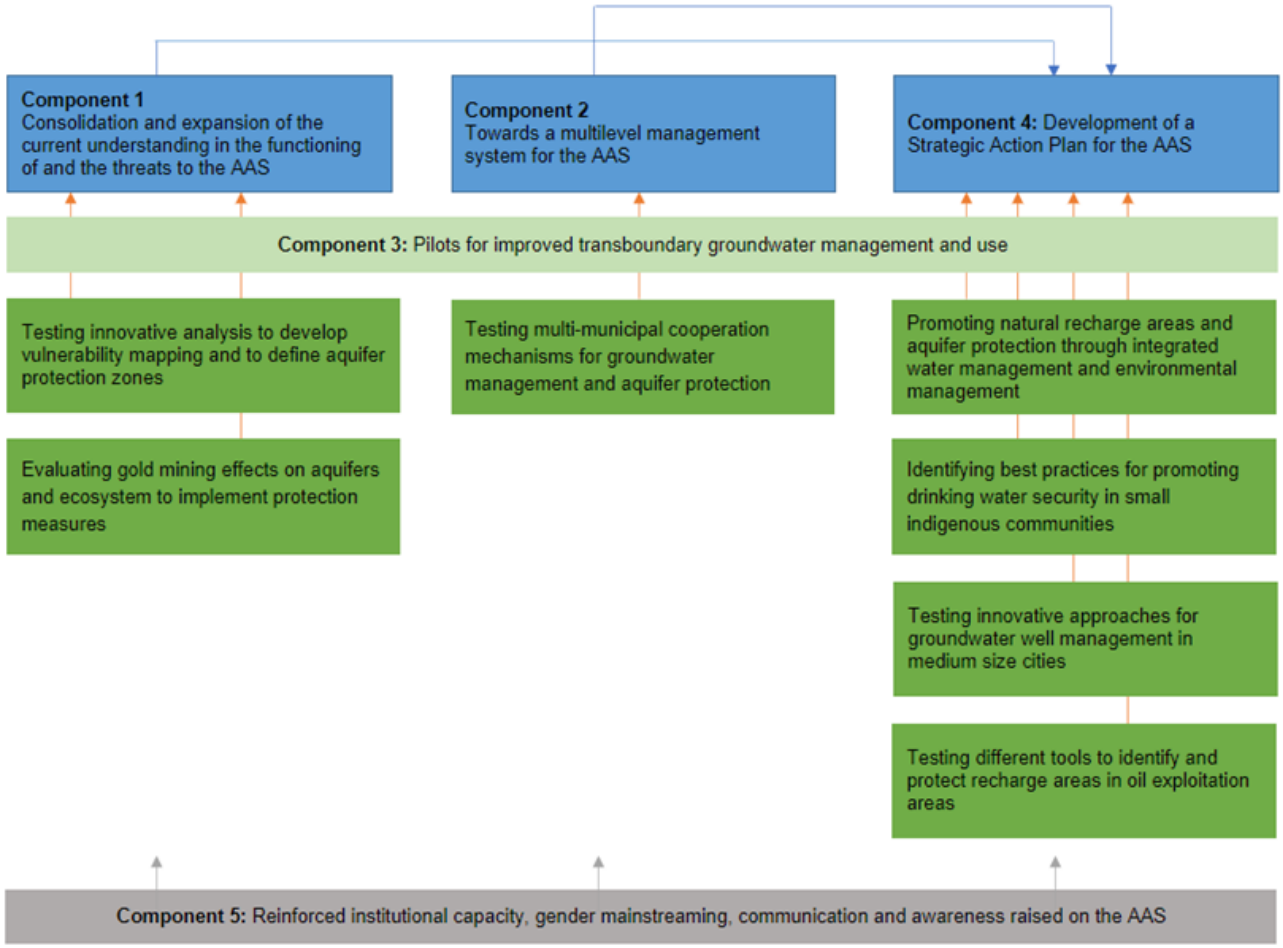

Figure 3. Contributions of the pilots to each component

<u>Outcome</u>: Demonstrated on the ground strategies for improved groundwater management and water security in transboundary critical areas.

<u>Outputs</u>:

3.1 A set of pilots testing good management practices to reduce stress on the aquifer systems and increase water security in the face of climate change variability. Pilots will facilitate testing and demonstrating in selected transboundary areas novel approaches and their benefits to a range of stakeholders. The results and lessons learnt will help to develop the SAP (component 4). Detailed scope and geographic focus for each pilot will be further developed during PPG, in consultation with the countries and considering critical issues such as gender mainstreaming, environmental and social safeguards and

private sector engagement. As a result of the extensive consultation process with the countries, preliminary pilots and their locations have been identified as follows:

i. ***Innovative approaches for groundwater well management between Brazil and Bolivia (Cobija-Brasiléia)***

The demonstration project is located around the tri-municipalities of Brasiléia and Epitacolândia in Brazil, and the city of Cobija, capital of the Province of Nicolás Suárez in Bolivia, with an estimated combined population of 72,000 inhabitants. Currently, there are no detailed hydrogeological studies but there is an urgent need to develop joint management practices. The project will build existing data from wells and prepare a consolidated hydrogeological overview (including hydrodynamic studies and isotope analysis: 222Rn, δ18O, δ2H). It will identify potential recharge zones for protection and/or remediation of aquifers; and advance governance mechanisms for transboundary groundwater management (including developing a Drilling, Operation and Maintenance Manual for Deep Tube Wells) and promote public awareness. The project will be a showcase for replication throughout the region for medium size cities.

ii. ***Promoting multi-municipal cooperation mechanisms for groundwater management and for aquifer protection (recharge zone and water quality) in Puerto Asís, Valle del Guamuez and Orito (Colombia), and other regions.***

The demonstration project will emphasize multi-municipal collaboration[7][14], piloting approaches to develop appropriate management, protection, and sustainable use mechanism for groundwater resources. It will update the existing conceptual hydrogeological models; identify priority pollution sources (including domestic and sanitary waste); identify areas of special hydrogeological importance and their relationship with the wetland system such as recharge areas, hydraulic interconnection with surface water, or protection perimeters of public wells, among others; develop management and protection measures; conduct public awareness and engagement; and conduct institutional strengthening and training. Other regions which may benefit from the multi-municipal approach will be identified during the project preparation stage.

iii. ***Promoting natural recharge areas and aquifer protection through integrated water management and environmental management for enhanced water security in San Carlos de Rio Negro (Venezuela).***

The project will map aquifers and recharge areas using satellite technology as those are important domestic water supply for the communities including indigenous groups living in the San Carlos area. The project will pilot generating information using remote sensing applications for small communities and build awareness tools tailored to local rural communities.

iv. ***Aquifer vulnerability mapping through isotopic analysis and application of protection measures in shallow aquifer areas Coronel Portillo – Pucallpa (Peru).***

The project will be implemented in the medium size city of Pucallpa[8][15]. It will focus on the use of isotopic analysis and water quality tools for developing vulnerability mapping; the identification and delineation of aquifer protection zones; the development of management plans; and creation and implementation of community awareness building tools.

v. ***Thematic mapping, vulnerability, identification and protection of the Aquifer System, as well as recharge zones in the Napo River Basin, applying innovative measures (Ecuador).***

The Napo River basin is shared with Ecuador and Peru. The study area has experienced deforestation and oil exploration. The project will pilot innovative measures for identifying protection and recharge areas through thematic and vulnerability mapping.

vi. ***Testing innovative approaches for the sustainable management and protection of transboundary sedimentary aquifers (Guyana and Suriname)***

The pilot will focus on the multiple northern and coastal aquifer systems of Guyana[9][16] with transboundary impacts in Suriname. The pilot will focus on prioritizing monitoring and modelling needs to create management and awareness building tools targeted at decision makers and the water supply sector. The project will involve developing monitoring system; advancement of the accreditation for the Government Laboratories, i.e. Water Quality Laboratory and Water Inc. Laboratory; and sensitization campaigns on the revised legislation for Government Ministers, stakeholders, private and public sector (linked to output 2.4).

vii. ***Identifying best practices for promoting drinking water security through groundwater protection in small indigenous communities (Suriname).***

Treatment of surface water is becoming increasingly costly and difficult due to contamination from gold mining and development especially for small indigenous border communities in Suriname. The project will support the design of a monitoring system for drinking water wells for the communities of Kwamalasmutu and Kawemhakan and develop information and communication tools for communities to manage new groundwater systems. The tools will have relevance for the many indigenous communities in the Amazon which are, or will be, in transition from surface water to groundwater as drinking water sources.

viii. ***Evaluation of gold mining effects on aquifers and ecosystems in the Madre de Dios River and implementation of protection measures (Brazil, Bolivia and Perú).***

Gold production has spread to the upper basin of Madre de Dios, Peru, and the highlands of Beni, Bolivia. Currently, thousands of small-scale miners are in operation and mercury has contaminated the waters and created considerable environmental problems. The effect of mercury and other metals on the aquifer systems are not known. The pilot will determine the effects of mining on groundwater quality and model contaminant pathways in the shallow aquifers. The information will be used map out aquifer and ecosystem vulnerability.

Component 4: Development of a Strategic Action Plan for the AAS

The component seeks to obtain political commitment of the countries to a strategic agenda of actions with matching investments as well as their commitment to the implementation of the identified priority actions for the protection and equitable utilization of the shared AAS.

<u>Outcome</u>: Agreed and endorsed strategy for the protection and equitable utilization of the shared aquifers

<u>Outputs</u>:

4.1 AAS SAP development endorsed at ministerial level. The gender sensitive AAS SAP will be consistent with the shared vision and TDA recommendations and the Amazon SAP. It will include clear priorities for action (e.g. policy, legal and institutional reforms, investments, etc.) to deal with problems identified in the TDA distinguishing actions with purely national benefits, and those with regional/global benefits. This negotiated document will be further endorsed at the highest level by all relevant sectors of government.

4.2 Agreed regional technical guidelines for the protection and sustainable use of the Amazon aquifer systems. Policy and institutional guidelines, recommendations and best practices designed to improve groundwater management at country/local level, and groundwater governance at local, national and transboundary levels from the Global Framework for Action will be tailor made and adopted. Technical guidance for shared aquifers will cover *inter alia* measures for the construction and management of new wells; registration and permit guidelines for new and in used wells; approaches for the closure and abandonment of wells; aquifer recharge, extraction levels and sustainable yield, water quality protection, and conservation of groundwater dependent aquatic ecosystems in the face exacerbated drought events.

4.3 A financial strategy for implementing SAP strategic actions. The financial strategy will include a portfolio of blended financing options and prioritized bankable multisector

investments for the protection and sustainable use of groundwater resources. The strategic finance plan will be initiated in parallel with the TDA and will engage prospective donors and the private sector in aligning investment plans with objectives and goals of the project. The financial strategy will outline a robust prioritized investment program and support governments in aligning the forthcoming needed investments within national investment plans for both source water protection (e.g., in recharge areas) and groundwater management, protection and monitoring. The financial strategy will also incorporate existing financing instruments, such as IADB Invest and the IADB Capital Lab for smaller scale investments.

Component 5: Reinforced institutional capacity, gender mainstreaming, communication and awareness raising on the AAS

This component will focus on strengthening institutional capacity at the national and regional levels. It will seek the systematic participation of stakeholders, including indigenous peoples and local communities, the inclusion of gender perspectives throughout all project activities, and the dissemination of project activities, results and lessons learned to raise awareness and promote behavioral change for aquifer protection and its sustainable management. This component will cut across the whole project to support the sound use and protection of the AAS.

Outcome: Strengthened institutional capacity, gender mainstreaming, communication and awareness raising.

Outputs:

5.1 Training and capacity building activities for strengthening groundwater management at regional (including ATCO), national, municipal, and local levels. Targeted capacity building for institutional strengthening, including with ACTO and national agencies, and structured capacity building in groundwater governance for decision makers and other stakeholders at national and regional levels (ensuring gender balance), designed following the guiding principles of the Groundwater Governance GEF project Training. Training would include *inter alia* environmental education for groundwater operators and municipalities; development programs for public participation, training of technical personnel; institutional knowledge sharing at a regional level; and addressing infrastructure needs.

5.2 Groundwater and gender action plan adopted by countries and ACTO. A Gender Action Plan, focusing on groundwater and complementing Amazon SAP's Gender Action Plan, will be developed in the PPG phase and will be implemented during the project. It will build on GEFs gender policies, IADB and UNEP Operational Policy on Gender Equity in Development and gender mainstreaming policies, on internal gender guidelines of ACTO, as well as national strategies when applicable. The Gender Action Plan will not only assist advancement of women's empowerment within the context of

the project, but also serve to promote a gender policy in the water sector of those countries currently lacking one.

5.3 Communication strategy and knowledge management plan for enhanced awareness and understanding on the AAS. The communication strategy will aim at enhancing local and regional awareness of groundwater importance as a key resource for water security in the basin in a socio-cultural manner. The main findings of the project, the agreements reached between the countries, the results and lessons learned on the management and conservation of groundwater, will be disseminated through different media and communication products in a socio-cultural appropriate manner, among decision makers, civil society, communities and others relevant stakeholders, such as indigenous peoples and local communities according with project's needs. This component will incorporate gender-sensitive communication strategies and the various approaches for gender mainstreaming across knowledge products, that will be defined at PPG stage. Where appropriate, it will include local language versions.

5.4 Documented participation to IW LEARN activities, creation of a project website, and preparation of experience notes (1% of project budget) Engaging in IW:LEARN activities will be 1% of GEF grant. Project knowledge captured will be disseminated through an internet-based platform and project website, sharing experiences through IW:LEARN, IWCs and COPs. Participation in IW:LEARN activities will be systematic in terms of contributing to the freshwater IW COPs, sharing lessons learnt (at least 3 Experience Notes), attendance to, and organization of webinars, participation to the IWCs. A project website, according to IW:LEARN standards, will be established and linked to the ACTO.

Apart from being used as an information provision hub, the website will be an instrument supporting the implementation of the project activities. It will support and incorporate a range of tools such as project management team working space, information database, interactive maps, forum discussions etc. Part of the IW:LEARN activities will be related to twinning with similar projects in other regions. Additionally, project monitoring will be conducted to inform adaptive management of the project. This includes establishment of a Project Steering Committee and annual PSC meetings, reports (PIR), and Mid-term review and final evaluation.

Monitoring & Evaluation

Outcome: Effective project oversight and appropriate monitoring & evaluation of project implementation progress and assessment of its results.

Output: Documented evaluation and periodic reports (i.e., Mid-Term review, independent terminal evaluation) of the assessment of project performance, including the evaluation of the level of progress in attaining the project objectives, degree of effectiveness and recommendations of corrective measures, if necessary.

Incremental Cost Reasoning

The GEF Grant will strengthen the organizational and institutional capacity of ACTO member countries at different levels (regional, national and local), being fundamental to get a common understanding of the AAS to improve existing regional governance and the integrated management of groundwater for its protection and sustainable use.

The incremental funding requested from the GEF is needed to harness the benefits that will materialize through the consolidation and expansion of the current understanding in the functioning of and threats of the AAS (agreed TDA); on-the-ground implementation of a series of pilots to showcase good management practices to reduce stress on the aquifer systems and increase water security in the face of climate change variability; and an agreed Strategic Action Plan the SAP with its financial strategy for implementing the agreed actions.

Countries have long realized that the lack of accurate data has proved to be an impediment to the sustainable management of groundwater. For this reason, despite having a well-funded and organized Water Agency and a National Geological Service, Brazil amongst other countries has endeavored to finance some hydrogeological explorations as to better understand the aquifer and to close the data gaps. These activities are however expensive and smaller and/or poorer countries like Guyana and Suriname or Venezuela, where groundwater plays a major role for sanitation and consumption, have not been able to study the aquifer systems at the same rate nor with the same scientific depth, owing to more pressing national priorities. Existing studies (see Project Rationale section) have all concluded that the paucity of information and the insufficient transboundary aquifer understanding has proved to be the number one barrier to its sustainable management. The Aquifer is, however, subject to increasing pressures, and for the riparian communities it has become an increasingly important water and food security issue.

The GEF resources are building on an extensive baseline of completed and ongoing national and regional initiatives, and the existing institutional capacity that participating countries will provide as a resource to this project. This baseline of current actions and resources includes multiple regional cooperation efforts, national activities, and GEF-funded projects. Specifically, the GEF investment will build upon the GEF Project ID 2364 that formulated the watershed TDA and SAP and the project ID 9770 which is looking into initiating SAP implementation. This proposed project will facilitate implementation of the SAP general groundwater directives by developing a specific action agenda on groundwater (component 4) as well as a complementary and robust quantified TDA (component 1). It is thus a direct response to those two projects. This proposal will include lessons learned from the specific few activities that TDA/SAP

project has related to groundwater and will build on tools developed in previous projects, such as the Amazon Regional Observatory (output 2.3).

Co-financing, coming from individual countries, current projects lead by ACTO and the IDB, will be enhanced by the GEF funding that will focus on understanding the current functioning and threats to the AAS, developing greater coordination at the regional level. It is also highly synergetic with the recently submitted Concept Note to the Green Climate Fund (GCF), an IDB proposal which aims to increase the resilience of vulnerable communities and key ecosystems (socio-ecological systems) in the Amazon basin to anticipated impacts of climate change on water availability and quality. Both projects target systemic and long-term improvements in water security conditions in the Amazon Region and, at the end, aim to enhance climate adaptation and reduce socio-ecological vulnerability. These proposals also seek to enable private and public investments, promote nature-based solutions interventions and will work towards capacity building and the institutional strengthening of regional, national and sub-national sectoral agencies in the Amazon Basin. When implemented, GEF & GCF funds will advance in transboundary cooperation, strengthening existing platforms, such as the Amazon Regional Observatory, and water governance.

Even though they share the same transformative paradigm, it is expected that this blending finance will serve as a vehicle to address existing barriers under distinct but complementary approaches. For instance, the GCF proposal will be focused on climate resilience at transboundary level with a strong focus on early warning system and climate-resilient investments, while the PIF will target scientific progress understanding groundwater resources for its protection and management. In other words, the GEF resources will advance in the knowledge and understanding of the groundwater system while piloting innovative solutions, while the GCF funds will expand the resources needed to grant access to data, information and decision support-systems to inform the holistic and systemic management of the system/watershed while scaling-up some of these innovative approaches by providing additional concessional and blended finance to support sectorial investments and project implementation.

With Component 1, the GEF proposal will provide relevant scientific data about the Amazon Aquifer System dynamics, feeding Component 1 of the GCF proposal, which is focused on understanding climate change impacts. Best practices and the results of on-the-ground pilots to be implemented in GEF Component 2 and their scaling-up potential will be strategic for GCF Component 2, targeted to catalyzing investments and innovative financing mechanisms. Moreover, successful lessons in terms of transboundary governance (regional guidelines, data sharing protocols, among others) will also be relevant for both proposals.

The proposed actions will ensure the SAP is implemented in a coordinated fashion and that sufficient capacity is established in the participating countries and in ACTO to support long-term integrated basin wide water resources management. Consultation

with a wide range of basin stakeholders is critical in jointly developing harmonized and compatible governance mechanisms at all levels in support of 'community-to-cabinet' management of the Amazon Region for the benefit of the ecosystem and livelihoods of the Amazon society. This project will continue to support such key basin wide dialogues and involve all sectors of society, including traditional peoples, CSOs/NGOs, the private sector, academia and government authorities.

Overall Project Governance

The preliminary project governance and internal communication mechanism for project is detailed in Figure 4. The general oversight of project activities will be undertaken by the Project Steering Committee (PSC) composed by country focal points representing the governments, the Project Coordination Unit (PCU), the Executing Agency (EA) (ACTO) and the Implementing Agencies (IAs) (UNEP and IDB).

UNEP and IDB as GEF agencies, will be responsible for overall project supervision to ensure consistency with GEF, IDB and UNEP policies and procedures, and will provide guidance on linkages with other IDB, UNEP and GEF-funded projects and activities.

ACTO will serve as Executing Agency (EA) for the project. In accordance with UNEP and IDB agreements and guidelines, the EA will coordinate the execution of the project providing overall technical management to project implementation and manage the funds provided to the project by UNEP and IDB on behalf of the GEF, in a manner consistent with their financial reporting requirements.

A Project Steering Committee (PSC) will meet twice a year (in person and via conference call) to monitor progress in project execution, to provide strategic and policy guidance, and to review and approve annual work plans and budgets. The PSC will be composed of participating countries' representatives and additional national experts as appropriate. The PSC will endorse annual operation plans and budgets, technical and financial reports, and will assist in providing project oversight. If required, the PSC may establish advisory groups for any identified need (i.e. technical advisory group). The IDB and UNEP would co-chair the first meeting. Thereafter, the chair will be undertaken on a rotational basis among participating countries. The PCU will serve as the secretariat of the PSC.

The Regional Project Coordination Unit (PCU) will be in charge of day-to-day project coordination, management of all activities including financial planning, budget and contracts oversight.

The National activities (component 3) will be coordinated by National Project Coordinator Units (NPCUs) that will act as an interface between the PCU and national partners, National Technical Working Groups and national TDA/SAP Task Forces and liaise with CSOs and local communities as appropriate.

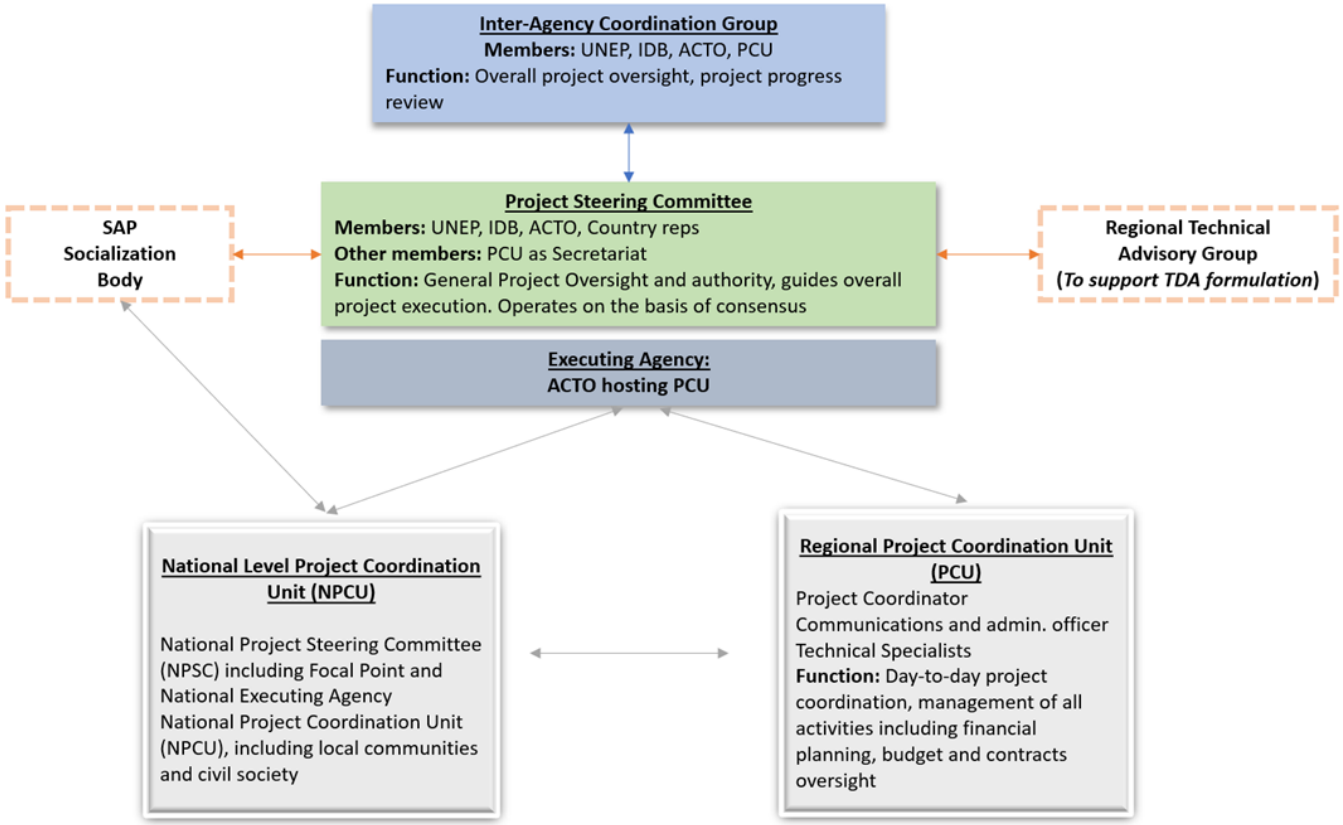

Figure 4. Indicative organogram

Bibliography

ANA. (2015). Volume XII – Resumo Executivo. Em *Avaliação dos Aquíferos das Bacias Sedimentares da Província Hidrogeológica Amazonas no Brasil (escala 1:1.000.000) e Cidades Pilotos (escala 1:50.000).* Brasília.

Andrade, C., Lucia, F. d., Berhan, Y., Pereira, M., Santos, V. D., & Márcia, E. (2018). Modelling the Effects of Historical and Future Land Cover Changes on the Hydrology of an Amazonian Basin. *Water.*

Charity, S. D. (2016). *Living Amazon Report 2016: A regional approach to conservation in the Amazon. WWF Living Amazon Initiative.* Brasília and Quito.

de Meyer, C. M. (2017). Arsenic, manganese and aluminum contamination in groundwater resources of Western Amazonia (Peru). *Science of the Total Environment.*

Fan, Y., & Miguez-Macho, G. (2010). Potential groundwater contribution to Amazon evapotranspiration. *Hydrology and Earth System Sciences Discussions, 7*, 5131–5170.

Ferreira, F., Custodio, E., & Cardoso, G. (2016). Hydrogeology of the Western Amazon Aquifer System (WAAS). *Journal of South American Earth Sciences, 72*, 375-386.

Frappart, F., Papa, F., Güntner, A., Tomasella, J., Pfeffer, J., Ramillien, G., . . . Seyler, F. (2019). The spatio-temporal variability of groundwater storage in the Amazon River Basin. *Advances in Water Resources, Vol. 124*, 41-52.

Galán, C., & Herrera, F. (2015). Ríos subterráneos y acuíferos kársticos de Venezuela: Inventario, situación y conservación. Em *Ríos en Riesgo de Venezuela.* Douglas Rodríguez.

Galvão, P., Lopes, E., Demétrio, J., & Martins, M. (2020). Estimating groundwater resources of the Içá-Solimões Aquifer System in the Urucu Oil Province Central Amazon Region, Brazil, focused on a balance between availability and water demand. *RBRH vol.25*.

IPCC. (2018). *Summary Report: Global Warming of 1.5 °C.*

J.A, M., Williams, E., Alves, L., Soares, W., & Rodriguez, D. (2016). Extreme Seasonal Climate Variations in the Amazon Basin: Droughts and Floods. Em *Interactions Between Biosphere, Atmosphere and Human Land Use in the Amazon Basin. Ecological Studies.* Nagy L., Forsberg B., Artaxo P.

Jarrín, A., Salazar, J., & Martínez-Fresneda, M. (2017). Evaluación del riesgo a la contaminación de los acuíferos de la Reserva Biológica de Limoncocha, Amazonía Ecuatoriana. *Ambiente & Água - An Interdisciplinary Journal of Applied Science, vol 12*, 652 - 665.

Lin, Y. L. (2015). Potential negative effects of groundwater dynamics on dry season convection in the Amazon River basin. *Clim Dyn 46*, 1001–1013.

Macedo, M. a. (2015). *State of the Amazon: Freshwater Connectivity and Ecosystem Health.* Brasília, Brazil: WWF Living Amazon Initiative. 136pp: D. Oliveira, C. C. Maretti and S. Charity.

Matos, F., Cavalcante, I., & Silva, M. (2013). O sistema aquífero grande Amazônia – SAGA: um imenso potencial de água subterrânea no Brasil. *III Intenational Congresso on Subsurface Environmet*, (pp. 1-4). São Paulo.

Meschede, M., Figueiredo, B., Alves, R., & Segura-Muñoz, S. (2018). Drinking water quality in schools of the Santarém region, Amazon, Brazil, and health implications

for school children. ***Ambiente e Agua - An Interdisciplinary Journal of Applied Science.***

Mestanza-Ramón, C., Cuenca-Cumbicus, J., D'Orio, G., Flores-Toala, J., Segovia-Cáceres, S., Bonilla-Bonilla, A., & Straface, S. (2022). Gold Mining in the Amazon Region of Ecuador: History and a Review of Its Socio-Environmental Impacts. ***Land.***

Miguez-Macho, G., & Fan, Y. (2012). The role of groundwater in the Amazon water cycle: 2. Influence on seasonal soil moisture and evapotranspiration. ***Journal of Geophysical Research, Vol. 117.***

Nagy, L. F. (2016). ***Interactions Between Biosphere, Atmosphere and Human Land Use in the Amazon Basin.*** **SpringerLink (Online service).**

OTCA. (2018). ***Aguas Amazónicas: 10 Investigaciones sobre la cuenca hidrográfica más grande del mundo.*** **Brasilia.**

Pfeffer, J. F.-P. (2014). Low-water maps of the groundwater table in the central Amazon by satellite altimetry. ***Geophysical Research Letters, 41*****, 1981–1987.**

Pimentel, E., & Hamza, V. (2012). Indications of regional scale groundwater flows in the Amazon Basins: Inferences from results of geothermal studies. ***Journal of South American Earth Sciences, 37*****, 214-227.**

Pokhrel, Y., Fan, Y., & Miguez-Macho, G. (2014). Potential hydrologic changes in the Amazon by the end of the 21st century and the groundwater buffer. ***Environmental Research Letters.***

Pokhrel, Y., Fan, Y., Miguez-Macho, G., Yeh, P., & Han, a. S. (2013). The role of groundwater in the Amazon water cycle: 3. Influence on terrestrial water storage computations and comparison with GRACE. ***JOURNAL OF GEOPHYSICAL RESEARCH: ATMOSPHERES, VOL. 118*****, 3233–3244.**

Porter, B., Kendall, A., Coe, M., & Hyndman, D. (2020). Trends in streamflow, evapotranspiration, and groundwater storage across the Amazon Basin linked to changing precipitation and land cover. ***Journal of Hydrology: Regional Studies, 32.***

Rosario, F., Custodio, E., & Cardoso, G. (2016). Hydrogeology of the Western Amazon Aquifer System (WAAS). ***Journal of South American Earth Sciences, Volume 72*****, 375e386.**

Ruiz C, ,. N. (2020). Land use planning in the Amazon basin: challenges from resilience thinking. ***Ecology and Society*****, 25(1):8.**

Sabogal, C. (2018). ***Informe Regional sobre la situación de los bosques en la Región Amazónica.*** **Brasilia: OTCA - GIZ.**

Tovar, J., Sayán, J., Pérez, G., & Guzmán, A. (2006). Estado del conocimiento de la hidrogeología en Perú. ***Boletín Geológico y Minero, 117 (1)*****, 147-161.**

UNESCO. (2007). ***Sistemas Acuíferos Transfronterizos en la Américas – Evaluación Preliminar, Serie ISARM Américas N°1.*** **Montevideo, Uruguay.**

United Nations. (2022). ***The United Nations World Water Development Report 2022: Groundwater: Making the invisible visible.*** **Paris: UNESCO.**

Villar, P. (2016). International cooperation on transboundary aquifers in South America and the Guarani Aquifer case. ***Revista Brasileira de Política Internacional, vol. 59, núm. 1*****, 1-20.**

WWF. (2018). ***Healthy Rivers Healthy People.*** **Dalberg.**

[1] https://groundwaterportal.net/sites/default/files/Governance2.pdf
[2] https://groundwaterportal.net/sites/default/files/Governance1.pdf
[3] Idem
[4] Pollutants will be determined by member countries at PPG stage.
[5] The Solimoes River presents 1.5 mg/m³ of dissolved arsenic and in the Madeira River samples show 18.6 mg/m³ of particulate arsenic Invalid source specified..
[6] Amazon Cooperation Treaty Organization, 1999. ***Guía Metodológica para el diseño de políticas de desarrollo con enfoque de género, en la Región Amazónica*****.**
[7] Orito (population 38,744), Puerto Asis (population 67,200) and Valle del Guamuez (population 34,600).
[8] Population 75,000. Potential study area of 150,000ha.
[9] Potential affected population is 120,000 people. Potential area: 150,000 ha.

Coordination and Cooperation with Ongoing Initiatives and Project.

Does the GEF Agency expect to play an execution role on this project?

If so, please describe that role here. Also, please add a short explanation to describe cooperation with ongoing initiatives and projects, including potential for co-location and/or sharing of expertise/staffing

Strong linkages and synergies with the below listed projects will be analyzed and secured during PPG. The interaction and coordination with other relevant GEF and non-GEF financed initiatives will be done through the project coordination unit, information sharing and joint activities and events. Moreover, taking advantage of ACTO as the regional organization coordinating and/or executing several of those activities and programs. In Appendix 1, complementary plans, programs and projects at national level were identified for PIF development.

The following is a preliminary list of identified complementary GEF Projects:

1. "Implementation of the Strategic Action Programme to Ensure Integrated and Sustainable Management of the Transboundary Water Resources of the Amazon River Basin Considering Climate Variability and Change" (GEF ID: 9770). There will be very close ties and linked activities where possible, as the overall goal of implementation of the SAP is to promote an integrated water

resources management program in the basin and this proposal will provide key data about the inter-dynamics among surface and groundwater interfaces ruling aquifer recharge and eco-hydrologic functionalities. Consequently, the inclusion of groundwater resources is critical.

2. "Water Funds: A Conservation Climate Resilient Model for Stressed Watersheds in Latin America and the Caribbean" (GEF ID: 10048). The objective of this project, implemented by IADB, is developing and supporting water fund mechanisms for five Latin American cities by enhancing governance and connecting water users in urban areas with upper watershed land stewards that produce important hydrologic benefits through healthy watersheds. Since water funds have tested on-the-ground nature based solutions and innovative financing mechanisms involving the private sector and other stakeholders, there is potential for learning exchange.
3. "Integrated watershed management of the Putumayo-Içá river basin" (GEF ID 10531). The project is being implemented by the World Bank through the Wildlife Conservation Society and is addressing water management in the Putumayo basin in Brazil, Colombia, Ecuador and Peru. The project focuses on reducing pollution and in particular mercury from legal and illegal activities and improving multi-level and multi-sectoral governance.
4. "Adaptation to the Impacts of Climate Change in Water Resources for the Andean Region" (GEF 5384 WB/CAF). The knowledge and best practices generated by the Project (Bolivia, Colombia, Ecuador, and Peru.) will contribute to specific FSP intervention projects related to building community resilience and aquatic ecosystem protection to address climate change impacts (Component II), including water use efficiency and alternative water supply solutions in Andean communities and/or urban centres dependent on retreating glaciers and increasing the resilience of infrastructures.
5. "Implementation of the Guarani Aquifer Strategic Action Program: Enabling Regional Actions" (GEF ID:10139). The project was approved for implementation in December 2019 and will focus on delivering actions laid out within the Guarani Aquifer SAP. There will clearly be a strong linkage between this project and the Implementation of the Guarani Aquifer SAP not only on a substantive level, the later having already developed detailed action items, but also from a procedural level. Likely, Brazil's involvement will help to transfer knowledge from one project to the other.
6. "Amazon Sustainable Landscapes Program" (GEF 9272 WB/MFA). This project aims to protect globally-significant biodiversity and implement policies globally significant land use and restoration of native vegetation cover in Brazil, Colombia and Peru.

The following is a preliminary list of the main non-GEF projects and initiatives with which the project will seek relationships to strengthen short- and long-term results. During PPG, linkages and complementary activities will be assed.

Bolivia: Arroyo Bahía Basin Master Plan; National Water Quality System; National Water Balance

Brazil: Institutional strengthening, gender inclusion, socio-environmental management and tourism in Parintins, State of Amazonas (BR-L1615); National Network for Water Quality in the Amazon Basin; National Hydrometeorological Network in the Amazon Basin; RIMAS - Groundwater Monitoring Network; Hydrogeological Studies of the Urban and Periurban Regions of Manaus/AM - Subsidies for the Sustainable Use of Water Resources; Hydrogeological Studies of the Metropolitan Region of São Luís/MA - Subsidies for the Sustainable Use of Water Resources

Colombia: Network of hydrometeorological stations for the Amazon Basin related to the operation, maintenance and validation of IDEAM information.

Ecuador: Implementation of a Situation Room and Technical Training for the Integrated Management of Water Resources in Ecuador; Project: "Implementation of the Conservation, Protection and Recovery of Water Resources, through the Establishment and Management of Water Protection Areas (APH) as a Preventive Guarantee for Water for Human Consumption and Irrigation that Guarantees Food

Sovereignty"; ARCAL 5079 Project: Radio Analytical and Complementary Technical Application for the Monitoring of Contaminants in Aquaculture; Project: Establishment and Management of Water Protection Areas (APH) as a preventive guarantee for water for human consumption, Irrigation that guarantees food sovereignty and other uses and exploitation; Project: National Plan for Integrated Management of Water Resources by Hydrographic Basins of Ecuador and at the National Level- CISPDR Study.

Regionally: The Amazon Regional Platform of Indigenous Peoples and Local Communities within the ACTO framework; Amazon Regional Observatory: Water Resources Situation Room; Strengthening and Expansion of the Regional Amazon Observatory in the axes of climate change, forestry and climate change biodiversity; Development of a Regional Hydrological Platform and a Multisectoral Nexus model for the Amazon Basin (RG-T3489-P001); Improving Climate Resilience by Increasing Water Security in the Amazon Basin (GCF).

Core Indicators

Indicator 3 Area of land and ecosystems under restoration

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
0	0	0	0

Indicator 3.1 Area of degraded agricultural lands under restoration

Disaggregation Type	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.2 Area of forest and forest land under restoration

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.3 Area of natural grass and woodland under restoration

Disaggregation Type	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.4 Area of wetlands (including estuaries, mangroves) under restoration

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
3950	0	0	0

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.2 Area of landscapes under third-party certification incorporating biodiversity considerations

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.4 Area of High Conservation Value or other forest loss avoided

Disaggregation Type	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
High Conservation Value Forest	3,950.00			

Indicator 4.5 Terrestrial OECMs supported

Name of the OECMs	WDPA-ID	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)

Documents (Document(s) that justifies the HCVF)

Title

Indicator 7 Shared water ecosystems under new or improved cooperative management

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Shared water Ecosystem	Amazonas			
Count	1	0	0	0

Indicator 7.1 Level of Transboundary Diagonostic Analysis and Strategic Action Program (TDA/SAP) formulation and implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amazonas	2			

Indicator 7.2 Level of Regional Legal Agreements and Regional management institution(s) (RMI) to support its implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)

Indicator 7.3 Level of National/Local reforms and active participation of Inter-Ministeral Committees (IMC; scale 1 to 4; See Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amazonas	1			

Indicator 7.4 Level of engagement in IWLEARN throgh participation and delivery of key products(scale 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amazonas	1			

Indicator 11 People benefiting from GEF-financed investments

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	1,105			
Male	1,150			
Total	**2,255**	**0**	0	**0**

Explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators (max. 250 words, approximately 1/2 page)

Target levels for Core and Sub-indicators follow GEF-8 Guidelines on Indicators (https://www.thegef.org/sites/default/files/documents/2022-09/Results_Framework_Guidelines_2022_06_30.pdf).

Core Indicator N°4 (Area of landscapes under improved practices = 3,950 ha) was estimated considering that practices implemented under Component 3, through selected pilots in strategic areas, will lead to improved environmental conditions, aquifer protection and/or sustainable management practices. There are three pilots which highlight the mapping and the sustainable management of recharge areas for aquifers. The first one, in Ecuador, has identified a study area of approximately 22,000 km2 in the Napo River basin which has experienced both deforestation and oil exploration. It is anticipated that land management changes over the 48-month project may occur over 0.1% of the area, or 2,200 ha. The other, in Venezuela, will take place in a municipality of approximately 2,500 ha next to the Rio Negro. It is assumed that approximately 10% of this area will experience improved land management (250 ha). The other is looking for protection measures in shallow aquifer areas of Coronel Portilla – Pucallpa, and it is anticipated that the pilot will benefit an area of 1,500 ha. Core Indicator N°7 (Number of shared water ecosystems under new or improved cooperative management) is 1 since it refers to the Amazon Basin, understanding the Amazon Aquifers as an integrated System. Core Indicator N°11 (Number of direct beneficiaries) following https://gef9.extcc.com/sites/default/files/documents/2022-06/EN_GEF_C.62.Inf_.12.Rev_.01_GEF-8%20Results%20Measurement%20Framework%20Guidelines%20%28003%29.pdf strictly cover the high intensity direct beneficiaries within national and local government agencies as well the ACTO, who will be directly impacted by the improved ground water management practices engendered through this project. The direct beneficiaries total is 2,255 (F: 1,105 and M: 1,150). It was accounted for an average of 30 people within national and sub-national government organizations as well as 250 persons within the pilot related national executing agencies. The figure also includes 15 staffers at ACTO.

A more detailed assessment of the Core Indicators will be conducted during the project preparation phase when specific areas and activities are made more explicit.

Risks to Project Preparation and Implementation

Summarize risks that might affect the project preparation and implementation phases and what are the mitigation strategies the project preparation process will undertake to address these (e.g. what alternatives may be considered during project preparation- such as in terms of consultations, role and choice of counterparts, delivery mechanisms, locations in country, flexible design elements, etc.). Identify any of the risks listed below that would call in question the viability of the project during its implementation. Please describe any possible mitigation measures needed. (The risks associated with project design and Theory of Change should be described in the "Project description" section above). The risk rating should reflect the overall risk to project outcomes considering the country setting and ambition of the project. The rating scale is: High, Substantial, Moderate, Low.

Risk Categories	Rating	Comments
Climate	Moderate	Climate may be affected by land use change and change of evapotranspiration regimes, that will result in increased groundwater use, at the detriment of the ecosystem. Improved understanding of the AAS, from project PPG throughout project execution, will result in improved management and regulations of the AAS, in the face of climate change.
Environment and Social	Low	In recent years, the amazon population has heavily been relying on groundwater as an alternative water resource for domestic and industrial consumption. This project from project PPG throughout project execution will strengthen understanding of groundwater resources and management principles to promote sustainable practices for the protection of the aquifer system.
Political and Governance	Low	There is currently limited regional governance of the shared aquifer systems. However, this grant application captures the region willingness to strengthen the regional management mechanism for the shared aquifer. From PPG throughout project execution, the project will support countries and ACTO to consolidate a regional management approach. The political situation at the national level in some participating countries where pilots are scheduled to take place, will be

		monitored during the PPG and throughout execution phase.
Macro-economic		
Strategies and Policies	Low	Current regulations and policies while limited are implemented at the local level. From PPG throughout project execution, it is intended to support the strengthening of the national and regional regulatory and policy frameworks for improved groundwater management and use.
Technical design of project or program		
Institutional capacity for implementation and sustainability	Low	Groundwater management is happening nationally/regionally in isolation/disconnect with the other natural resource management framework, i.e. lack of policy and management coherence. From PPG throughout project execution, it is hoped that a better understanding of the institutional and legal contexts and the formulation for recommendations for reforms (e.g., promoting the joint management of surface and groundwater) will be duly agreed and part of the TDA and the SAP for improved cohesive management of the AAS.
Fiduciary: Financial Management and Procurement		
Stakeholder Engagement	Low	While the sustainable management of the aquifer is contingent on stakeholder engagement, this project from project PPG throughout project execution, will provide a platform for soliciting stakeholder groups inputs (TDA) and recommendations (SAP) for improved management of the AAS. The SAP will be endorsed at the highest political level in each of the countries.
Other	Low	COVID Risks There is still a risk of new variants of COVID emerging

		which could impact the project through higher infection rates and its consequences. The project will be responsive to conditions in the region and will adapt the implementation approach (e..g. remote meetings) if infection levels increase being guided by national authorities and WHO recommendations. In this context, water security is essential as part of the post COVID-19 response, keeping water & sanitation as top development priority for guaranteeing access to quality water, mainly for vulnerable communities highly groundwater-dependent.
Financial Risks for NGI projects		
Overall Risk Rating	Low	To be further reviewed at PPG.

C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES

Describe how the proposed interventions are aligned with GEF- 8 programming strategies and country and regional priorities, including how these country strategies and plans relate to the multilateral environmental agreements.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this.

For projects aiming to generate biodiversity benefits (regardless of what the source of the resources is - i.e., BD, CC or LD), please identify which of the 23 targets of the Kunming-Montreal Global Biodiversity Framework the project contributes to and explain how. (max. 500 words, approximately 1 page)

This project is aligned with Objective 3 of the **GEF-8 Programming Directions Framework** for the International Waters Focal Area: "*Enhanced water security in freshwater ecosystems*"[1][17]. Specifically, the project will support regional priority setting and fact findings by contributing to an updated Amazon basin TDA/SAP nuancing its chapter on groundwater; and will facilitate implementation of the regional ministerially approved Amazon basin SAP promoting groundwater management. In addition, the project will contribute to improving the groundwater policy context at regional and national levels; build capacity to gather and synthesize scientific, local and people science information into a consolidated state of the aquifer overview for improved decision-making processes (particularly through Components 1 and 5). It will also test integrated water management solutions to protect key aquifer recharge zones. Moreover, the project will provide nuanced information for a more accurate water security overview and through pilots will provide information on innovative technologies and approaches for aquifer protection and sustainable management.

In terms of **regional priorities**, the project is aligned with the mandate of the Amazon Cooperation Treaty supporting integrated sustainable development of the region and fostering a regional cooperation dialogue. In the *Strategic Agenda for Amazon Cooperation* (ATCO, 2010) two main priority areas are identified, which are fully aligned with the project namely: a) natural resources conservation and sustainable management; and b) sustainable development (understood as improving living conditions for people in the

basin). Within those main lines of intervention, water resources management is prioritized. The project will target those regional short- and medium-term objectives by contributing to: the promotion of an integrated approach for water resources management with a focus on adapting to climate change scenarios; the promotion of transboundary groundwater agreed actions, improving the technical understanding of the AAS and giving recommendations for legal and institutional frameworks; the participation and involvement of stakeholders in trainings and capacity building activities at different levels (regional, national, municipal and local) and the creation of space for technical discussion in order to agree on regional criteria for the protection and sustainable use of the AAS.

Planning instruments with respect to aquifer management differ from one country to the other in function of their **national priorities. Bolivia**, for example, in the *Economic and Social Development Plan 2021-2025*[2][18], identifies "*Sustainable and Balanced Environment, in harmony with Mother Earth*" as one of the 10 priority working areas aiming at "*Strengthening the integrated management of surface and groundwater resources, in order to achieve water security*". In **Brazil**, the project is aligned with the *Strategic Institutional Plan 2019-2022*[3][19] (ANA, 2021), which maps out the action's agenda in terms of water resources, supporting its mission to guarantee water security for sustainable development. In particular, it will contribute to the following strategic objectives: a) Regulation of water resources (identified as OE-02A); b) Hydrological data (OE-03), having a specific initiative for groundwater monitoring; c) Integrated and Planned Management (OE-06), having a specific project for promoting international cooperation in the Amazon Basin; d) Institutional Governance (OE-08); and e) Innovation (OE-13). Moreover, it is aligned with the *National Water Security Plan* and the governance challenges identified for groundwater for the country (ANA, 2022). The project is aligned with **Colombia**'s *National Development Plan*[4][20]; and in particular with its initiative for the Amazon Region "*Sustainable Development for a living Amazon*". In **Ecuador,** the project is aligned with the *National Plan for Integrated and Integral Water Resources Management of hydrographic basins and micro-basins in Ecuador* (CISPDR, 2016)[5][21], its proposed water protection measures and rational use of groundwater resources. Regarding **Guyana**, it is aligned with the objectives set in the Guyana Water Incorporated Strategic Plan 2021-2025 and the proposed Groundwater Management Plan of Guyana Water Inc. While in **Perú** it supports the *Water Resources Policy and National Strategy*[6][22] (ANA, 2013) and the *National Water Resources Plan* (updated in 2018 to include water security concept). In **Venezuela,** the project aligns with the *National Plan for Integrated Water Resources Management* (Groundwater Program) and in **Suriname** it is aligned with the *Multi-Year Development Plan 2022-2026*, identifying water security and green growth as priority areas.

[1] Refer to GEF-8 Programming Directions, GEF/R.8/17 https://www.thegef.org/sites/default/files/documents/2022-01/GEF_R.08_17_GEF-8_Programming_Directions.pdf
[2] https://observatorioplanificacion.cepal.org/sites/default/files/plan/files/PDES_2021-2025a_compressed.pdf
[3] https://www.gov.br/ana/pt-br/todos-os-documentos-do-portal/documentos-gges/Plano_Estrategico_Reviso_2021_v11_compressed2.pdf
[4] https://colaboracion.dnp.gov.co/CDT/Prensa/Resumen-PND2018-2022-final.pdf
[5] http://suia.ambiente.gob.ec/files/MEMORIA%20PLAN%20NACIONAL%20DEL%20AGUA.pdf
[6] http://www.ana.gob.pe/sites/default/files/default_images/politica_y_estrategia_nacional_de_recursos_hidricos_ana.pdf

D. POLICY REQUIREMENTS

Gender Equality and Women's Empowerment:

We confirm that gender dimensions relevant to the project have been addressed as per GEF Policy and are clearly articulated in the Project Description (Section B).

Yes

Stakeholder Engagement

We confirm that key stakeholders were consulted during PIF development as required per GEF policy, their relevant roles to project outcomes and plan to develop a Stakeholder Engagement Plan before CEO endorsement has been clearly articulated in the Project Description (Section B).

Yes

Since 2019, several consultations were conducted to engage stakeholders during proposal development. From regional workshops involving all riparian countries, to in-person and virtual bi-lateral meetings, engagement was facilitated through ACTO's representativeness mechanism (please refer to Appendix 2 for more details). During this period until the presentation of the proposal, there have been two regional workshops with all member countries, approximately 20 official communications (verbal notes) from ACTO to inform countries about PIF's progress; explaining which adjustments were made based on the feedback received, keeping them informed about latest drafts, expected timeline, co-financing criteria and endorsement letter processes. So far, there have been more than 40 bi-lateral meetings and numerous consultations from member countries in a continuous process of engagement, feedback and updates throughout the whole PIF elaboration process. In the meetings, the project concept was revised, and its components and activities were jointly elaborated with national experts from water, environment and foreign affairs sectors, among other organizations and institutions involved. Participants (57% women and 43% men) included focal points from ministries, sectorial agencies, and institutes, such as National Ministries and Agencies on Foreign Affairs, Planning and Development, Environment, Natural Resources, Meteorology and Hydrology, Aquifer Management, Energy, Spatial Planning, and Transboundary Waters among the most important. Therefore, this stage of PIF's development has count with the engagement and participation of approximately 130 technical and political representatives. A completed description of the most significant consultation instances is presented in the Appendix 2 (Details of Stakeholder Engagement Instances). This extensive engagement process has led to the official endorsement of the PIF by all countries (See Annex B). Finally, it is anticipated that the same level of active stakeholder participation and involvement will continue through the project cycle, supporting the development of the project during the project preparation phase as to seek feedback and agreement for the proposed actions and ensure alignment of the project with their national plans, programs and aspirations for effective project execution. In due time, appropriate studies will be made to identify the Indigenous Peoples and Local Communities, Civil Society Organizations, and Private Sector stakeholders of the project. The project process will be highly participatory, fully involving all identified key stakeholder groups, including private sector, seeking to build consensus actions to manage the AAS sustainable and equitably.

Were the following stakeholders consulted during project identification phase:

Indigenous Peoples and Local Communities:

Civil Society Organizations:

Private Sector: No

Provide a brief summary and list of names and dates of consultations

Since 2019, several consultations were conducted to engage stakeholders during proposal development. From regional workshops involving all riparian countries, to in-person and virtual bi-lateral meetings, engagement was facilitated through ACTO's representativeness mechanism (please refer to Appendix 2 for more details). During this period until the presentation of the proposal, there have been two regional workshops with all member countries, approximately 20 official communications (verbal notes) from ACTO to inform countries about PIF's progress; explaining which adjustments were made based on the feedback received, keeping them informed about latest drafts, expected timeline, co-financing criteria and endorsement letter processes. So far, there have been more than 40 bi-lateral meetings and numerous consultations from member countries in a continuous process of engagement, feedback and updates throughout the whole PIF elaboration process.

In the meetings, the project concept was revised, and its components and activities were jointly elaborated with national experts from water, environment and foreign affairs sectors, among other organizations and institutions involved. Participants (57% women and 43% men) included focal points from ministries, sectorial agencies, and institutes, such as National Ministries and Agencies on Foreign Affairs, Planning and Development, Environment, Natural Resources, Meteorology and Hydrology, Aquifer Management, Energy, Spatial Planning, and Transboundary Waters among the most important. Therefore, this stage of PIF's development has count with the engagement and participation of approximately 130 technical and political representatives. A completed description of the most significant consultation instances is presented in the Appendix 2 (Details of Stakeholder Engagement Instances).

This extensive engagement process has led to the official endorsement of the PIF by all countries (See Annex B). Finally, it is anticipated that the same level of active stakeholder participation and involvement will continue through the project cycle, supporting the development of the project during the project preparation phase as to seek feedback and agreement for the proposed actions and ensure alignment of the project with their national plans, programs and aspirations for effective project execution. In due time, appropriate studies will be made to identify the Indigenous Peoples and Local Communities, Civil Society Organizations, and Private Sector stakeholders of the project. The project process will be highly participatory, fully involving all identified key stakeholder groups, including private sector, seeking to build consensus actions to manage the AAS sustainable and equitably.

(Please upload to the portal documents tab any stakeholder engagement plan or assessments that have been done during the PIF development phase.)

Private Sector

Will there be private sector engagement in the project?

Yes

And if so, has its role been described and justified in the section B project description?

Yes

Environmental and Social Safeguard (ESS) Risks

We confirm that we have provided indicative information regarding Environmental and Social risks associated with the proposed project or program and any measures to address such risks and impacts (this information should be presented in Annex D).

Yes

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE

Low

E. OTHER REQUIREMENTS

Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described in the Project Description (Section B)

Yes

ANNEX A: FINANCING TABLES

GEF Financing Table

Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant($)	Agency Fee($)	Total GEF Financing ($)
UNEP	GET	Regional	International Waters	International Waters: IW-3	Grant	6,865,349.00	617,881.00	7,483,230.00
IADB	GET	Regional	International Waters	International Waters: IW-3	Grant	6,596,119.00	593,651.00	7,189,770.00
Total GEF Resources ($)						**13,461,468.00**	**1,211,532.00**	**14,673,000.00**

Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount ($)

300000

PPG Agency Fee ($)

27000

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG($)	Agency Fee($)	Total PPG Funding($)

UNEP	GET	Regional	International Waters	International Waters: IW-3	Grant	153,000.00	13,770.00	166,770.00
IADB	GET	Regional	International Waters	International Waters: IW-3	Grant	147,000.00	13,230.00	160,230.00
Total PPG Amount ($)						**300,000.00**	**27,000.00**	**327,000.00**

Please provide justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total($)
Total GEF Resources					**0.00**

Indicative Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing($)	Co-financing($)
IW-3	GET	13,461,468.00	131236473
Total Project Cost		**13,461,468.00**	**131,236,473.00**

Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Bolivia	Public Investment	Investment mobilized	1488055
Recipient Country Government	Bolivia	In-kind	Recurrent expenditures	425160
Recipient Country Government	Brazil	Public Investment	Investment mobilized	19256705
Recipient Country Government	Brazil	In-kind	Recurrent expenditures	398622
Recipient Country Government	Colombia	In-kind	Recurrent expenditures	5462875

Recipient Country Government	Ecuador	Public Investment	Investment mobilized	16870179
Recipient Country Government	Ecuador	In-kind	Recurrent expenditures	912471
Recipient Country Government	Guyana	In-kind	Recurrent expenditures	1037600
Recipient Country Government	Peru	In-kind	Recurrent expenditures	707760
Recipient Country Government	Suriname	Public Investment	Investment mobilized	3363146
Recipient Country Government	Suriname	In-kind	Recurrent expenditures	384600
Recipient Country Government	Venezuela	In-kind	Recurrent expenditures	572000
Others	Amazon Cooperation Treaty Organization (ACTO)	Other	Investment mobilized	517300
GEF Agency	Inter-American Development Bank	Other	Investment mobilized	77840000
Recipient Country Government	Geological Service of Brazil (GSB)	Other	Investment mobilized	2000000
Total Co-financing				**131,236,473.00**

Describe how any "Investment Mobilized" was identified

Investments mobilized were identified by each participating government using the GEF co-financing guidelines (https://www.thegef.org/documents/co-financing). All 8-riparian countries (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela) strategically identified and compiled their in-kind and public investment co-financing in support of the project implementation period and in alignment with project outcomes and outputs.

Those investments mainly originated from on-going initiatives, projects, studies and public investments related to hydrogeological studies, groundwater monitoring, sub-basin master plans groundwater elements, water balances, etc., with a view to complement the GEF investment and address its specific knowledge needs as identified during the development of the project components and maximize impacts.

As reflected in Appendix 2 (Details of stakeholder engagement participation mechanisms), the proposed co-financing by each participating country was reviewed during bilateral meetings with the implementing agencies to ensure alignment with the objective of the project and its focus on groundwater, and to guarantee compliance with GEF policies and guidelines. Projects were carefully selected considering their timeline and value added avoiding double counting with on-going GEF-Funded initiatives in the region.

Investments mobilized from ACTO include approved projects from different donors (e.g., AECID-UE, KW, ABC, CAF) that are aligned with the objectives and scope of the GEF AAS project and support ACTO’s water security agenda. These projects deal with the functioning and strengthening of the different modules of the Amazon Regional Observatory (specifically on water resources,

impact of climate change, forests, and biodiversity) and the Amazon Regional Platform of Indigenous Peoples and Local Communities within the ACTO framework.

Investments mobilized by IADB, while at this stage considered as estimates, come from the Water, Sanitation and Waste active portfolio in the Amazon riparian countries through different financing instruments such as loans and grants both at regional and national levels. All projects and technical cooperations are related to one or more components of the GEF AAS project and are focused on water security and the water & sanitation sector. The projects that have been incorporated include, for example, transboundary territorial reports on vulnerable indigenous peoples; support for the strengthening of the Amazon Regional Observatory, focusing on innovation and science dissemination; institutional capacity building at municipal level; mapping critical areas in relation to access to and quality of water and sanitation services; the development of a hydrological simulation model for the Amazon basin and NEXUS multi-sector modelling scenarios (integrating climatic, socioeconomic, land use, energy and water aspects) as well as the development of analytical and knowledge products in water security, forest management and protection of biodiversity.

The Concept Note submitted by the IADB to the GCF “Improving Climate Resilience by Increasing Water Security in the Amazon Basin” has also been partially considered as tentative co-financing. Both the AAS PIF and the GCF proposals are complementary and highly synergetic as they are looking to improve the hydrogeological understanding and the impacts of climate change (regional hot spot analysis). As was previously mentioned, the GCF proposed program is intended to increase the resilience of vulnerable communities and key ecosystems in the Amazon basin to anticipated impacts of climate change on water availability and quality, its temporal and spatial distribution, and the ecosystems’ capacity to provide key hydro-environmental services. As part of the proposed components, the GCF proposal will catalyze climate investments for climate-resilient and low carbon water supply, sanitation and waste (WSW) technologies and infrastructure, including Ecosystem Based Adaptation efforts and the implementation of nature-based solutions in areas that are strategic for aquifer recharge.

Finally, in addition to its co-financing accounted for within Brazil’s co-financing in support of the hydrogeological monitoring systems, the Geological Service of Brazil (GSB) is developing a regional project to be presented to the International Atomic Energy Agency (IAEA) that will deal with isotopic geo-hydrology studies in the Amazon region which will support the AAS TDA and could prove to be a useful co-financed pilot on isotope geo-hydrology.

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
Project Coordinator	Isabelle Vanderbeck	4/6/2023	Isabelle Vanderbeck	+12027254201	isabelle.vanderbeck@un.org
Project Coordinator	Raúl Muñoz		Raúl Muñoz	+12026745464	raulmu@iadb.org
GEF Agency Coordinator	Gmelina Ramirez	4/6/2023		+1225237663	gmelinar@iadb.org
GEF Agency Coordinator	Victoria Luque	4/6/2023		+254207624544	victoria.luque@un.org

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

Name	Position	Ministry	Date (MM/DD/YYYY)
Bolivia - Mr. Carlos David Guachalla Terrazas	Viceministro de Planificación y Coordinación	Ministerio de Planificación del Desarrollo	5/8/2023

Colombia - Ms Maria Teresa Becerra	Head of the International Affairs Office	Ministry of Environment and Sustainable Development of Colombia	5/8/2023
Guyana - Mr. Kemraj Parsram	Executive director	Environmental Protection Agency	5/2/2023
Peru - Ms Inés Pando Ávila	Head, General Office for Cooperation and International Affairs	Ministry of Environment	5/10/2023
Suriname - Ms Ivette Pengel	GEF OFP Suriname	Ministry of Spatial Planning and Environment	5/9/2023
Venezuela - Mr Miguel Alberto Serrano Orta	GEF OFP Venezuela	Director of Integration and International Affairs	4/21/2023
Brazil - Ms Livia Farias Ferreira de Oliveira	GEF Operational Focal Point	Ministério de Economia	4/28/2023
Ecuador - Mr. José Luis Naula	Coordinador - Dirección de Cooperación Internacional	Ministerio del Ambiente y Agua del Ecuador	5/10/2023

ANNEX C: PROJECT LOCATION

Please provide geo-referenced information and map where the project interventions will take place

The geographic boundaries of the project area are between longitudes 46ºW and 76ºW and latitudes 7ºN and 12ºS.

ANNEX D: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

(PIF level) Attach agency safeguard screen form including rating of risk types and overall risk rating.

Title
AAS IDB SF
AAS UNEP SRIF

ANNEX E: RIO MARKERS

Climate Change Mitigation	Climate Change Adaptation	Biodiversity	Land Degradation
No Contribution 0	Significant Objective 1	Significant Objective 1	Significant Objective 1

ANNEX F: TAXONOMY WORKSHEET

Level 1	Level 2	Level 3	Level 4
Influencing models			
	Transform policy and regulatory environments		

	Strengthen institutional capacity and decision-making		
	Convene multi-stakeholder alliances		
	Demonstrate innovative approaches		
	Deploy innovative financial instruments		
Stakeholders			
	Indigenous Peoples		
	Private Sector		
		Capital providers	
		Financial intermediaries and market facilitators	
		Large corporations	
		SMEs	
		Individuals/Entrepreneurs	
		Non-Grant Pilot	
		Project Reflow	
	Beneficiaries		
	Local Communities		
	Civil Society		
		Community Based Organization	
		Non-Governmental Organization	
		Academia	
		Trade Unions and Workers Unions	
	Type of Engagement		
		Information Dissemination	
		Partnership	
		Consultation	
		Participation	
	Communications		
		Awareness Raising	
		Education	
		Public Campaigns	
		Behavior Change	
Capacity, Knowledge and Research			
	Enabling Activities		
	Capacity Development		
	Knowledge Generation and Exchange		
	Targeted Research		
	Learning		
		Theory of Change	
		Adaptive Management	
		Indicators to Measure Change	
	Innovation		
	Knowledge and Learning		
		Knowledge Management	
		Innovation	
		Capacity Development	
		Learning	
	Stakeholder Engagement Plan		
Gender Equality			
	Gender Mainstreaming		
		Beneficiaries	
		Women groups	
		Sex-disaggregated indicators	
		Gender-sensitive indicators	
	Gender results areas		
		Access and control over natural resources	
		Participation and leadership	
		Access to benefits and services	
		Capacity development	
		Awareness raising	
		Knowledge generation	
Focal Areas/Theme			
	Integrated Programs		
	Biodiversity		

		Protected Areas and Landscapes	
			Terrestrial Protected Areas
			Coastal and Marine Protected Areas
			Productive Landscapes
			Productive Seascapes
			Community Based Natural Resource Management
		Mainstreaming	
			Extractive Industries (oil, gas, mining)
			Forestry (Including HCVF and REDD+)
			Tourism
			Agriculture & agrobiodiversity
			Fisheries
			Infrastructure
			Certification (National Standards)
			Certification (International Standards)
		Species	
			Illegal Wildlife Trade
			Threatened Species
			Wildlife for Sustainable Development
			Crop Wild Relatives
			Plant Genetic Resources
			Animal Genetic Resources
			Livestock Wild Relatives
			Invasive Alien Species (IAS)
		Biomes	
			Mangroves
			Coral Reefs
			Sea Grasses
			Wetlands
			Rivers
			Lakes
			Tropical Rain Forests
			Tropical Dry Forests
			Temperate Forests
			Grasslands
			Paramo
			Desert
		Financial and Accounting	
			Payment for Ecosystem Services
			Natural Capital Assessment and Accounting
			Conservation Trust Funds
			Conservation Finance
		Supplementary Protocol to the CBD	
			Biosafety
			Access to Genetic Resources Benefit Sharing
	Forests		
		Forest and Landscape Restoration	
			REDD/REDD+
		Forest	
			Amazon
			Congo
			Drylands
	Land Degradation		
		Sustainable Land Management	
			Restoration and Rehabilitation of Degraded Lands
			Ecosystem Approach
			Integrated and Cross-sectoral approach
			Community-Based NRM
			Sustainable Livelihoods
			Income Generating Activities

			Sustainable Agriculture
			Sustainable Pasture Management
			Sustainable Forest/Woodland Management
			Improved Soil and Water Management Techniques
			Sustainable Fire Management
			Drought Mitigation/Early Warning
		Land Degradation Neutrality	
			Land Productivity
			Land Cover and Land cover change
			Carbon stocks above or below ground
		Food Security	
	International Waters		
		Ship	
		Coastal	
		Freshwater	
			Aquifer
			River Basin
			Lake Basin
		Learning	
		Fisheries	
		Persistent toxic substances	
		SIDS : Small Island Dev States	
		Targeted Research	
		Pollution	
			Persistent toxic substances
			Plastics
			Nutrient pollution from all sectors except wastewater
			Nutrient pollution from Wastewater
		Transboundary Diagnostic Analysis and Strategic Action Plan preparation	
		Strategic Action Plan Implementation	
		Areas Beyond National Jurisdiction	
		Large Marine Ecosystems	
		Private Sector	
		Aquaculture	
		Marine Protected Area	
		Biomes	
			Mangrove
			Coral Reefs
			Seagrasses
			Polar Ecosystems
			Constructed Wetlands
	Chemicals and Waste		
		Mercury	
		Artisanal and Scale Gold Mining	
		Coal Fired Power Plants	
		Coal Fired Industrial Boilers	
		Cement	
		Non-Ferrous Metals Production	
		Ozone	
		Persistent Organic Pollutants	
		Unintentional Persistent Organic Pollutants	
		Sound Management of chemicals and Waste	
		Waste Management	
			Hazardous Waste Management
			Industrial Waste
			e-Waste
		Emissions	
		Disposal	
		New Persistent Organic Pollutants	
		Polychlorinated Biphenyls	
		Plastics	
		Eco-Efficiency	
		Pesticides	
		DDT - Vector Management	

		DDT - Other	
		Industrial Emissions	
		Open Burning	
		Best Available Technology / Best Environmental Practices	
		Green Chemistry	
	Climate Change		
		Climate Change Adaptation	
			Climate Finance
			Least Developed Countries
			Small Island Developing States
			Disaster Risk Management
			Sea-level rise
			Climate Resilience
			Climate information
			Ecosystem-based Adaptation
			Adaptation Tech Transfer
			National Adaptation Programme of Action
			National Adaptation Plan
			Mainstreaming Adaptation
			Private Sector
			Innovation
			Complementarity
			Community-based Adaptation
			Livelihoods
		Climate Change Mitigation	
			Agriculture, Forestry, and other Land Use
			Energy Efficiency
			Sustainable Urban Systems and Transport
			Technology Transfer
			Renewable Energy
			Financing
			Enabling Activities
		Technology Transfer	
			Poznan Strategic Programme on Technology Transfer
			Climate Technology Centre & Network (CTCN)
			Endogenous technology
			Technology Needs Assessment
			Adaptation Tech Transfer
		United Nations Framework on Climate Change	
			Nationally Determined Contribution