Project Information Document (PID)

Appraisal Stage | Date Prepared/Updated: 03-Dec-2021 | Report No: PIDISDSA33285

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Project Name	Parent Project ID (if any)
Latin America	P172893	Integrated watershed management of the Putumayo-Içá river basin	
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
LATIN AMERICA AND CARIBBEAN	17-Jun-2021	11-Mar-2022	Environment, Natural Resources & the Blue Economy
Financing Instrument	**Borrower(s)**	**Implementing Agency**	**GEF Focal Area**
Investment Project Financing	Wildlife Conservation Society	Ministry of Environment, Ministry of Environment and Sustainable Development, Secretaria de Estado de Meio Ambiente, Ministry of Environment, Water and Ecological Transition, Wildlife Conservation Society	Multi-focal area

Proposed Development Objective(s)

To strengthen the enabling conditions for the participant countries to manage the shared freshwater ecosystems of the Putumayo- Içá
basin in the Amazon region

Components

Governance and capacity for informed and participatory decision making on IWRM
Management interventions towards shared IWRM
Project Management, Communications, Monitoring and Evaluation

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	12.84
Total Financing	12.84

of which IBRD/IDA	0.00
Financing Gap	0.00

DETAILS

Non-World Bank Group Financing

Trust Funds	12.84
Global Environment Facility (GEF)	12.84

Environmental and Social Risk Classification

Substantial

Decision

The review did authorize the team to appraise and negotiate

Other Decision (as needed)

B. Introduction and Context

Country Context

The Amazon River basin hosts the world's largest rainforest and river system.[1] The Amazon basin spans approximately 6.8 million km^2 across countries in South America (Brazil, Peru, Colombia, República Bolivariana de Venezuela, Bolivia, Guyana, Suriname, and Ecuador) and the French Guiana territory. It hosts various ecosystems, which include a combination of lowland and mountainous forests, natural savannas, and wetlands that are traversed by numerous rivers, including the world's largest, the Amazon. The region includes 210 million ha of protected areas (PA) and around 3,000 indigenous territories covering over 200 million ha. Forty percent of the world's remaining rainforests are located in the Amazon, including the largest flooded forests. Stretching at least 6,800 km from the high Andes to the Atlantic, the Amazon River is considered either the second or the first longest river in the world. The Amazon River discharges 15–16 percent of the freshwater entering the oceans annually, with an average discharge of approximately 219,000 m^3 every second.[2]

Conserving the Amazon basin is of critical global, regional, and local importance. Freshwater contributes significantly to the vast biodiversity and ecological equilibrium of the basin. The Amazon basin is rich in biodiversity, housing about 40,000 plant species, at least 2,750 freshwater fish species,[3] 1,300 species of birds, 427 species of mammals, 400 species of amphibians, and 370 species of reptiles.[4] Many plant and animal species have evolved within the Amazon

[1] WWF. 2016. *Living Amazon Report*. The numbers in this paragraph all refer to this report, unless otherwise indicated.
[2] Richey, J. E., C. Nobre, and C. Deser. 1989. "Amazon River Discharge and Climate Variability: 1903 to 1985." *Science* 246: 101–103.
[3] Dagosta, Fernando C. P., and Mário De Pinna. 2019. "The Fishes of The Amazon: Distribution and Biogeographical Patterns, With a Comprehensive List of Species." *American Museum of Natural History* 431: 1–163.
[4] WWF. 2018. *Rios Sanos, Gente Aana – Abordando la Crisis de Mercurio en la Amazonia*, *un reporte para WWF por Dalberg*.

wetlands, the richest freshwater aquatic habitats in the world. The Amazon provides numerous ecosystem services, including (a) *provisioning* material goods like wood, medicines, food, and clean freshwater; (b) *regulating* hydrological, biogeochemical cycles, and regional and global climate; (c) sustaining *cultural* practices; and (d) *supporting* the provision of habitat thus contributing to the maintenance and generation of regional biodiversity. The Amazon's extensive riverine network also plays an important role as a transportation system.

The region's main economic activities include agriculture, livestock, logging, fishing, mining, hydrocarbon extraction, and harvesting of wild fruits and other plant species. Fishing is the basin's main source of income and food for riverside communities. The area is characterized with considerable fish resources, with a current production of almost 400,000 tons per year involving about 200 species. Fish also represents the main source of protein for riverine populations, with a per capita consumption between 100 grams and 550 grams per day.[5] Gold mining, both legal and illegal, are widespread in the lowlands and mountainous areas of the Amazon basin. Amazon countries produce approximately 400 metric tons of gold annually, supplying almost 10 percent of the world's demand.[6] Artisanal and small-scale gold mining (ASGM)[7] operations are responsible for 15 percent of Amazon countries' gold production, employing approximately 1.4 million people.[8] Illegal gold mining is of particular concern because of the environmental damage associated with it and the large number of people affected by this unregulated economic activity.

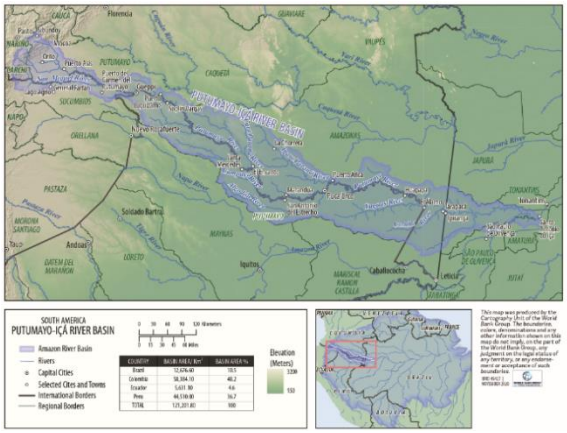
The population of the Amazon is estimated at 47.4 million people including 410 indigenous groups. Brazil is home to approximately 61 percent of the Amazon's total population, Peru accounts for almost 9 percent, Colombia for 3 percent, and Ecuador for 2 percent.[9] Since the 1970s, the Amazon is the scene of an important urbanization process; almost 75 percent of its population now resides in urban areas. Although in recent years poverty and extreme poverty have declined, especially in cities, the Amazon still has higher poverty rates than national averages in each Amazon country. The Coronavirus Disease 2019 (COVID-19) pandemic has exposed the high vulnerability of communities in the Amazon where the virus rapidly spread affecting as of October 4th, 2021 more than 3.3 million people in the Amazon region of the Project participant countries, of which over 91,000 have died.[10] The emergency has exposed the region's poor health infrastructure and the long time it takes to travel to the few urban centers. The situation has been alarming for Indigenous Peoples who not only face reduced population from loss of life, but have concerns over losing traditional knowledge[11] possessed by the vulnerable elderly.

Sectoral and Institutional Context

The Putumayo-Içá River is the 10th longest tributary of the Amazon River, providing globally significant biodiversity and ecosystem services. The Putumayo-Içá River basin covers 118,000 km^2 along approximately 2,000 km and accounts for approximately 1.7 percent of the Amazon basin. The Putumayo-Içá[12] drainage includes Colombia, Ecuador, Peru,

[5] https://wwf.panda.org/knowledge_hub/where_we_work/amazon/vision_amazon/models/natural_resources_management_amazon/fish_management/#:~:text=Fish%2C%20a%20vital%20part%20of,the%20country's%20rivers%20and%20lakes.
[6] WWF. 2018. *Healthy Rivers, Healthy People*.
[7] Defined by the Minamata Convention on Mercury as "gold mining conducted by individuals or small enterprises with limited capital investment and production."
[8] WWF. 2018. *Healthy Rivers, Healthy People*.
[9] Red Amazónica de Información Socioambiental Georeferenciada (RAISG). 2020. *Amazonía bajo presión*. www.amazoniasocioambiental.org.
[10] https://redamazonica.org/covid-19-panamazonia/. Of this total, within the Project area more than 67,000 people have been infected with the virus of which over 1,800 have died as of October 4th, 2021. This data corresponds information from the areas of Brazil (Alto Salimoes), Colombia (Leticia, Puerto Leguizamo-Solano, Mocoa Sibundoy), Ecuador (Sucumbios), Peru (San Jose Amazonas).
[11] Traditional knowledge—the collective understanding of traditions and practices used by indigenous groups to sustain and adapt themselves to their environment. This knowledge has proven critical to global efforts to protect and renew nature.
[12] Andean countries refer to the main river as the Putumayo. In Brazil it's called Içá.

and downstream, Brazil,[13] where it discharges into the Amazon River. The Putumayo-Içá serves as a corridor connecting key ecosystems from its headwaters in the Andes Mountains that flow into an intricate web of rivers, lakes, and flooded forests in the lower plains as it flows into the Amazon River. Rivers and streams harbor a great variety of microhabitats capable of sustaining the region's unparalleled biological and cultural diversity and ecosystem services. Of the large Andes-Amazon tributaries, the Putumayo-Içá is the only one likely to remain as a free-flowing river, considering there are no plans for construction of large hydroelectric dams. The middle and lower portions of the watershed houses one of the largest well-conserved areas of forest in the world with nearly 90 percent of intact forests and less than 1 percent of tree cover loss in the last 18 years.[14] Along a myriad of ecosystem services, forest cover provides resilience to climate change by regulating increased seasonality, reducing risks of extensive fires from increased temperatures and droughts, and flooding and erosion from increased rains. Seventy-five percent of the basin is located in indigenous territories, conservation areas/PA, or proposed areas for conservation.[15] The watershed is rich in fish (400–600 species),[16] amphibian, reptile, bird, and mammal species, standing out as one of the most diverse places in the entire Amazon basin.[17] In addition, the forests of the Putumayo-Içá watershed act as carbon reserves and sink; showing areas with larger contents than other forests in the Peruvian[18] and Colombian[19] Amazon. In addition, significant peatlands can be found in the lower portions of the basin.



The Putumayo-Içá basin includes some of the most remote, economically underdeveloped communities with the lowest population density, including 18 Indigenous Peoples groups as well as non-indigenous *campesino* and *ribereño* communities. Demographic data is only partially available for the region due to its remoteness and dispersion of information across national boundaries. Overall population density of the watershed is on average less than 14 people/km^2, with density declining from 75.4 people/km^2 [20] at its headwaters in the west to less than 5 people/km^2 [21] in the middle and lower reaches. The socioeconomic conditions and dynamics of the watershed vary along the basin. Public infrastructure is scarce and mainly limited to a few large cities with more than 55,000 inhabitants. The basin is mostly a roadless wilderness, except for a road network in the upper reaches in Ecuador and Colombia that supports larger towns, oil developments and agricultural activities. Most communities are located along the banks of rivers that

[13] The basin includes 4 Peruvian districts, 3 Brazilian municipalities, 26 Colombian municipalities, and 6 Ecuadorian *cantones*.
[14] Intact forest landscapes are unbroken expanses of natural ecosystems large enough that all native biodiversity, including viable populations of wide-ranging species, are maintained. Estimation for the region of Encanto, Tarapacá and San Antonio de Içá, Global Forest Watch 2020.
[15] Note that information from within watershed boundaries is uneven given that data collection varies between the four countries and the provinces within each country. Provincial boundaries do not correspond to watershed boundaries.
[16] Amazon Institute for Scientific Research (SINCHI). *Segundo Encuentro binacional corredor cultural y biológico Putumayo Perú-Colombia*. *Leticia octubre* 2018; a single park in Peru—Yaguas—harbors 550 species of fishes, which is more fish than anywhere else in Peru, and about two-thirds of Peru's continental fish diversity in a single river, the Yaguas River.
[17] See, for example, Pitman, N., R. C. Smith, C. Vriesendorp, D. Moskovits, R. Piana, G. Knell, and T. Wachter, eds. 2004. *Perú: Ampiyacu, Apayacu, Yaguas, Medio Putumayo*. Rapid Biological Inventories Report 12. Chicago: The Field Museum.
[18] Asner, G. P., D. E. Knapp, et al. 2014. *The High-Resolution Carbon Geography of Peru*. A collaborative report of the Carnegie Airborne Observatory and the Ministry of Environment of Peru. https://gao.asu.edu/publication/the-high-resolution-carbon-geography-of-peru-english.
[19] Asner, G. P., J. K. Clark, et al. 2012. "High-Resolution Mapping of Forest Carbon Stocks in the Colombian Amazon." *Biogeosciences* 9: 2683–2696.
[20] CorpoAmazonia. 2009. "Plan de Ordenación y Manejo de la Cuenca Alta del Rio Putumayo."
[21] Pitman, N., E. Ruelas Inzunza, C. Vriesendorp, et al. 2013. *Perú: Ere-Campuya-Algodón*. Rapid Biological and Social Inventories Report 25. The Field Museum. Note that data are only partially available for the watershed given its remoteness.

are navigable throughout the year.[22] Public lighting is only available in a few communities, and electricity is generally limited to health clinics and houses with their own generators. In most communities, trash pick-up and common area cleanup is done by communal work teams.

Fisheries are a major source of income for the riverine communities and agriculture, cattle ranching, mining, and logging are limited to specific areas. These activities significantly contribute to local economies and have driven changes in land cover and water quality. Subsistence livelihoods revolve around fishing, hunting, timber and non-timber forest products (NTFP), and small-scale agriculture, while illegal artisanal mining and illicit crops, primarily by immigrants to the watershed, are growing activities. The highly eroding, low-nutrient soils of large areas of the watershed make large-scale agriculture unlikely. However, the sustainable production of NTFP[23] is a potential alternative with socioeconomic benefits and relatively fewer impacts on ecosystems, but which has not been sufficiently developed and scaled up.

The strategic location of the Putumayo-Içá River, which connects the Amazon floodplains with the Northern Andes, facilitates fluvial movement and commercialization. The middle Putumayo-Içá has more commerce of natural resources (for example, fish and timber and NTFP) and agricultural goods than the lower Putumayo-Içá. The main ports in Colombia, Puerto Asis, and Puerto Leguízamo have been important for this commercialization, with historical volumes of more than 200 tons of fish per year for the latter,[24] as well in Brazil's Puerto de San Antonio do Içá that reported 345 tons of fish in2018.[25] Fisheries in the Colombian-Peruvian-Brazilian border are characterized by their international nature. For internal consumption, the basin provides around 90 kg of fish/person/year.[26] In addition, freshwater turtles and tortoises have been an important resource for riverine communities in the Amazon for centuries. The eggs and meat of the giant South American river turtle (*Podocnemis expansa*) and the yellow-spotted river turtle (*P. unifilis*) are key elements of the diets, trade activities, and traditions of local communities and Indigenous Peoples.

While the rivers and streams of the Putumayo-Içá are in relatively good environmental condition when compared to others in the Amazon basin, there is an increased risk of deforestation, water pollution, and biodiversity loss. These environmental threats are higher in neighboring basins, but they have been increasingly encroaching into new areas with weak governance and natural resource use planning, including areas in the Putumayo-Içá. If not addressed effectively and on time, these threats could affect the integrity of the watershed, its capacity to provide global benefits, the well-being of its inhabitants, and its role transferring nutrients from the Andes to the Amazon plains. Increased rates of deforestation can increase erosion and run-off of soils, generating changes in sediment dynamics and subsequently affecting the physical structure and water quality of ecosystems, food quality, and availability for freshwater biota and biodiversity. Water pollution is caused mainly by mercury from gold mining and other contaminants from oil extraction and poor waste management. Besides impacts on the natural ecosystems, the impact on populations regularly exposed to contaminants, like mercury, may include effects on the nervous, digestive, and immune systems, as has already been observed in a few sites of the basin. Biodiversity loss is caused by the unsustainable use of wildlife and plant species and the introduction of non-native species.

[22] https://www.bbc.com/mundo/noticias-america-latina-52578619.
[23] NTFP such as camu camu (*Myrciaria dubia*), copaiba (*Copaifera officinalis*), aguaje (*Mauritia flexuosa*), andiroba (*Carapa guianensis*), Açai (*Euterpe oleracea*), among others.
[24] Bonilla-Castillo, C. A., Agudelo, et al. 2012. "Dinámica de la pesca comercial de consumo en el medio Rio Putumayo: tres décadas de desembarques en Puerto Leguízamo." *Revista Colombia Amazónica* 5 (2012): 129–149.
[25] https://www.mamiraua.org.br/publicacoes/desembarque/.
[26] Agudelo, E., J. Gonzalez, and L. Moya. 2006. *Perspectivas para el ordenamiento de la pesca y acuicultura en el área de integración fronteriza Colombiana-Peruana del río Putumayo*. Bogota: Instituto Nacional de Desarrollo.

The proposed Project will address main drivers for the environmental threats of deforestation, water pollution, and biodiversity loss in the basin, aiming to maintain its high conservation status. The first relates to the lack of consideration for the biological, cultural, and spatial complexity of freshwater ecosystem dynamics in jurisdictional-level planning and management decision making. Decisions related to interventions involving infrastructure, agriculture, fishing, and hydrocarbon activities do not fully consider the integrated dynamics of the basin's watershed, resulting in accumulated impacts downstream. Second, is the unsustainable and unregulated natural resources use practices. For example, due to overfishing, previously common fish species consumed by the local population in the Putumayo-Içá are now scarce. In addition, unregulated fishing amongst the countries results in regional-level mismanagement that particularly affects migratory fish species.[27] Illegal ASGM uses mercury that contaminates soil and water.[28] Improper oil extraction practices contaminate water with total petroleum hydrocarbons (TPH). The unsustainable use of agrochemicals, the indiscriminate use of pharmaceuticals in livestock, and lack of proper waste management systems also contribute to water contamination. Finally, changes in variability and seasonality due to climate change exacerbate other drivers, increase environmental threats and their severity. More frequent extreme weather events would affect the complex hydrological dynamic and the watershed's ecological resilience and socioeconomic welfare. Increased water temperatures and a decrease in dissolved oxygen, for instance, could reduce the self-purification capacity affecting animal populations.

To address the regional environmental threats and their drivers, the Project will support activities aiming to overcome the following barriers: (a) limited, fragmented, and inaccessible information to support decision making for integrated water resources management (IWRM);[29] (b) loss and under-representation of traditional knowledge in decision making and weakened governance systems; (c) weak governance for joint regional IWRM; (d) insufficient information and implementation of models for the mitigation of pollution impacts on the socio-ecosystems; and (e) insufficient opportunities, incentives, and capacities to develop sustainable and equitable natural resource use management schemes and value chains. Considering that much of the threats and drivers that affect the basin are interlinked and have cumulative effect along the watershed streams, effectively addressing them will require a multi-country, IWRM approach across jurisdictions. Multiple factors and barriers are beyond the proposed control of the Project, but it will address the prioritized challenges via a range of regional and national-level interventions that promote collaboration to enhance synergies. By enhancing knowledge about the basin and making it accessible to key stakeholders for decision making, strengthening governance structures, and piloting activities to address key issues and impacts around water contamination as well as sustainable manage natural resources, the Project will strengthen the enabling conditions required for the participant countries to conserve and manage the shared basin and promote its integrated management. Improving the capacity of participant countries to protect the basin and its high biodiversity guarantees the provision of ecosystem services, which are the foundation for the development and quality of life of its

[27] Maldonado, et al 2017. *Transboundary Fisheries Management in the Amazon: Assessing Current Policies for the Management of the Ornamental Silver Arowana (Osteoglossum bicirrhosum)*.

[28] According to the 2013 United Nations Environment Programme (UNEP) Global Mercury Assessment, ASGM is the largest single source of human-driven mercury pollution in the world, accounting for 37 percent of all emissions into the atmosphere and into local water sources. According to the Global Environment Facility Independent Evaluation Office (GEF IEO), Dec 2020, Evaluation of GEF Interventions in the Artisanal and Small-Scale Gold Mining Sector Document, Brazil, Colombia, Ecuador, and Peru are among the top eight countries in the world with the largest levels of mercury use in ASGM.

[29] IWRM is a process which promotes the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. It includes hydrologic and hydrobiological resources. According to the World Bank, an integrated water resources perspective ensures that social, economic, environmental, and technical dimensions are taken into account in the management and development of water resources. Source: http://web.worldbank.org/.

inhabitants. A recent study also highlighted the importance of conserving pristine areas in the Amazon, so as to maintain the region's low levels of spillover risks for future pandemics.[30]

Institutional and regulatory context

Brazil, Colombia, Ecuador, and Peru, participant countries that share the Putumayo-Içá basin, have an extensive regulatory framework about environmental-related issues guiding the complex multi-stakeholder, multisectoral, and multi-cultural scenario. The regulatory context includes a wide range of both national regulations as well as multilateral agreements and plans which promote the preservation of the environment for current and future generations. The Constitutions of all countries identify water resources as a state-owned strategic resource to be protected, used, conserved, and sustainably managed.[31] The Government of Brazil (GoBr) with its National Water Resources Policy (Law 9.433/1997) aims to ensure that present and future generations have the necessary access to water of a quality adequate for their needs, ensure the rational and integrated use of water resources, and prevent and protect against water crises due to either natural causes or the inappropriate use of natural resources. For the Government of Colombia (GoC), the National Policy for the Comprehensive Management of Water Resources (2010–2022) aims to guarantee sustainability of water resources through efficient management that aligns with territorial planning and ecosystem conservation. Ecuador's 2014 Organic Law on Water Resources, Uses and Exploitation aims to guarantee the human right to water as well as promote, regulate, and control the integrated management, conservation, restoration, and sustainable use of water resources. Peru's Water Resources Law (2009) and the National Water Resources Policy and Strategy (2015) regulate the use and integrated management of water and the role of the State and its entities in its management, and articulates water-related policies with those for land use planning, natural resources conservation, and sustainable use at the national, regional, local, and basin levels.

Related to water pollution, the four countries are part of the Stockholm Convention on Persistent Organic Pollutants and the Minamata Convention on Mercury and have national legislation to implement the objectives and commitments related with the conventions. The countries have developed national implementation plans to comply with the Stockholm Convention, ratified the Minamata Convention, and issued legislation regarding the use of mercury. Resolution 357/2005 by the Brazil National Council of the Environment (CONAMA) states the conditions and standards of water quality for different chemicals and water bodies. Mercury-related legislation includes Decree 97.507/1989 that requires permits for all mining extractive activities that use mercury and include the CONAMA's Resolution 396/2008 on the maximum mercury levels in water, among other resources. Ecuador implemented the Zero Mercury Plan in 2013 accompanying their signing to the Minamata Convention; the plan aims to eliminate the use of mercury in some products and processes. The Organic Law of Hydrological Resources, Uses, and Exploitation of Water (2014) dictates the compliance of water pollutants levels. For Colombia, Resolution 631/2015 established the parameters and permitted levels of discharge and Law 1658/2013 committed to eliminating the use of mercury in mining by 2018 and in other industries by 2023. The 2013 National Environmental Policy in Peru includes the general guideline for water quality and Decree 1103/2012 mandates the regulation and control of mercury in the country.

At the multinational level, the regulatory context includes a series of multinational agreements that demonstrate initial efforts of cross-boundary collaboration for environmental protection and sustainable use of natural resources. The proposed Project will align with and/or support implementation of relevant aspects of multilateral and bilateral agreements and results from cabinet meetings, including the following: (a) the Regional Strategy for Integrated Water

[30] Vale, M., P. Marquet, et al. 2021. *Could a Future Pandemic Come from the Amazon?* Conservation International. Even a small amount of deforestation can have large impacts on spillover, especially if the deforested areas were pristine.

[31] *Strategic Action Program: Regional Strategy for Integrated Water Resources Management in the Amazon Basin.* / ACTO/OTCA. Brasília, DF, 2018.

Resources Management in the Amazon Basin – Strategic Action Program (SAP-Amazon), endorsed in 2018 by the Amazon Cooperation Treaty Organization (ACTO)—an intergovernmental organization for political dialogue and regional cooperation that includes as members all Amazon countries; (b) the 2019 Pucallpa Action Plan (August 27, 2019), by which the Presidents of Colombia and Peru formally committed to the coordinated implementation of actions related to conservation and sustainable use of the Putumayo-Içá's natural resources;[27] (c) the December 2020 Andean Environmental Letter (*Carta Ambiental Andina)* agreed and adopted by the Andean council of the Andean Community (including Colombia, Ecuador, and Peru, among others), which includes objectives toward a green economy, sustainable management of natural resources, environmental awareness in the civil society, and climate change adaptation and mitigation actions; and (d) the Leticia Pact signed in 2019 by most Amazon governments, including the GoBr, GoC, Government of Ecuador (GoE), and Government of Peru (GoP), to generate a joint response to disasters that may arise in any Amazon country; strengthen regional actions to curb deforestation, selective logging, and illegal mineral exploitation; and advance in the generation of scientific knowledge. Despite the existence of an ample regulatory framework, there are shortcomings in procedures, policies, and inter-sectoral governance structures for multi-country integrated watershed planning and conservation of resources that influence the Putumayo-Içá basin. These include poor multisector regional coordination, and non-harmonized frameworks and instruments for shared natural resource management. There has also been weak capacity and resources to implement and supervise existing international agreements.

The institutional context for the Project is built on multiple institutions (in addition to the local, provincial, or municipal governments) that have different levels of responsibility for the conservation and sustainable development of the basin. Water resources management institutions in the Amazon vary according to the country's institutional context. The management of transboundary water resources in Brazil is a shared responsibility between the national and federal levels, having the Secretary of Environment of Amazonas State (SEMA) and the National Water and Sanitation Agency (ANABr) directly responsible for the management of the Putumayo-Içá basin. In Colombia, the responsible institution is the Ministry of Environment and Sustainable Development (Minambiente). In Peru, water resource management is shared by the Ministry of Environment (MINAM) and the National Water Authority (ANA) that is an institution attached to the Ministry of Agriculture and Irrigation. Finally, in Ecuador the competence of transboundary water management is within the Ministry of Environment, Water and Ecological Transition (MAATE). Specialized institutes as well as local environmental authorities provide technical support, control, and management of specific areas within the basin. In addition, the four countries have national technical institutions responsible for meteorology and hydrology, mining (hydrogeology/groundwater activities), and irrigation, among others, that also have responsibilities in water resources management and that will play a role in the Project as beneficiaries and within the implementing arrangements. The institutional context is also enriched by national- and regional-level organizations that represent Indigenous Peoples and that are described in the Project's Stakeholder Engagement Plan (SEP). Aiming to promote multisectoral, multi-national actions at the basin level will require addressing governance weaknesses, building on preliminary successes, and strengthening capacity for collaborative work. Finally, there are ongoing initiatives led by the governments and civil society of the Putumayo-Içá watershed aiming to preserve and sustainably use its resources, as well as build integrated participatory and adaptive management of the overall watershed and its land and hydrobiological resources. A separate document has been prepared to describe the baseline projects. The Project will build on successes from these initiatives and promote coordination, establishing synergies and increasing scale and impact.

Relevance to Higher Level Objectives

The proposed Project is consistent with the World Bank Group's (WBG) Country Partnership Frameworks (CPFs) in the four participating countries: Brazil (FY2018–FY2023),[32] particularly Outcome 18 *Areas of environmental significance under protection measures in target areas in Amazon and coastal/marine regions* under Focus Area 3: Inclusive and Sustainable Development; Colombia (FY2016–FY2021),[33] particularly with Pillar I *Fostering Balanced Territorial Development* and its Objective 2: *Enhanced Capacity for Natural Resources Management in Target Regions*; Ecuador (FY2019–FY2023),[34] in line with the 2025 Climate Change Targets and the Adaptation and Resilience Action Plan, contributions to the country's commitments under the Paris Agreement, and the Nationally Determined Contribution (NDC); and Peru (FY2017–FY2021),[35] particularly Objective 8: *Strengthen the management of natural resources* under Pillar III *Natural Resources and Climate Change Risk Management*.

The Project aligns with the WBG COVID-19 crisis response approach paper '*Saving lives, scaling-up impact and getting back on track*' (June 2020).[36] While not considered a COVID-19 response operation, it will assist countries in addressing the health threat and the social and economic impacts of the COVID-19 crisis, while maintaining a line of sight for their long-term development. The Project particularly contributes to the pillars related to *protecting the poor and vulnerable; ensuring sustainable business growth and job creation;* and *rebuilding better strengthening policies, institutions, and investment*s. The proposed Project will assist the countries to building a resilient, equitable, and inclusive recovery and by supporting green businesses in an area inhabited by economically a vulnerable populations. Conserving pristine forests also contributes to minimize risks of zoonotic diseases.

Besides being parties to the Minamata Convention on Mercury and the Stockholm Convention on Persistent Organic Pollutants, the participant countries are parties to the Convention on Biological Diversity, the UN Framework Convention on Climate Change, and the Amazon Cooperation Treaty, as well as a number of sustainable development initiatives. In addition, the Project aligns with each national development plan and the policies and programs consistent with them. **Brazil**´s National Strategy for Socioeconomic Development 2020–2030 has the objective to guide and articulate planning instruments for an equitable development. Its environmental axis supports the sustainable use of environmental resources and a transition to low carbon economies. In **Colombia**, the current National Development Plan[37] and particularly the Pact for Sustainability—*Produce while conserving and conserve while producing*—recognizes the need to advance an environmental agenda that consolidates biodiversity as a strategic national asset. The Project also aligns with Amazon Vision (VA–*Visión Amazonía* in Spanish), the umbrella government program established in 2013 to promote low carbon development in the region. **Ecuador's** new government will take office on May 24, 2021 and a new Development Plan (including policies toward sectors of strategic importance like environment), expected to be ready in the first months of governance,[38] will align with the proposed Project. **Peru's** Strategic National Development Plan (2020–2030) includes policy directions under National Objective 6.3:

[32] Report N° 113259-BR discussed by the Executive Directors on July 13, 2017.
[33] Report No. 101552-CO, discussed by the Board of Executive Directors on April 7, 2016.
[34] Report No. 135374-EC, discussed by the Board of Executive Directors on June 11, 2019.
[35] Report No.112299-PE, discussed by the Board of Executive Directors on May 2, 2017.
[36] https://documents.worldbank.org/en/publication/documents-reports/documentdetail/136631594937150795/world-bank-group-covid-19-crisis-response-approach-paper-saving-lives-scaling-up-impact-and-getting-back-on-track.
[37] https://www.dnp.gov.co/DNPN/Paginas/Plan-Nacional-de-Desarrollo.aspx. The National Development Plan from the GoE endorsing the project guaranteed the rights of nature, and aimed at conserving, recuperating, and regulating the management of natural heritage and foments a sustainable economy and bio-economy

Conservation and sustainable use of natural resources and biodiversity with an integrated and ecosystem approach and an environment that allows a good quality of life for people and the existence of healthy, viable, and functional ecosystems in the long term.

Finally, the Project aligns with the GEF-7 Programming Directions regarding the International Waters and Chemicals and Waste Focal Areas. In relation to the International Waters Focal Area, the Project will promote water security and "cooperation …. to support the need for water, food, energy, and ecosystems security and increase resilience for each nation." The Project will contribute to the objective of enhancing water security in freshwater ecosystems and aligns with the GEF's direction that sustainable environmental management of transboundary resources requires a common understanding of what pressures the shared ecosystems are facing, coupled with national and regional investment plans. For the Amazon basin this direction led to the Transboundary Diagnostic Analysis and development of the 2018 SAP-Amazon. The Project will add value to this regional effort by focusing on the shared Putumayo-Içá basin, providing detail analysis and supporting investments that respond to its specific needs. The Project will support some of the priority regional transboundary problems identified in the SAP-Amazon that are relevant to this basin, and will prepare with ample multistakeholder participation specific plans at the relevant jurisdictions, on prioritized topics and strengthening the specific required arrangements for effective investments. Project results will in turn inform similar efforts in other Amazon basins. The Project will promote cooperation, positively affecting people and environmental assets of global significance, including biodiversity, carbon stocks, freshwater fish stocks, and unique aquatic and terrestrial habitats. In the Chemicals and Waste Focal Area, the Project will "develop the enabling conditions, tools, and environment for the sound management of mercury as well as reduce its prevalence in artisanal mining." The Project will respond to the GEF-7 emphasis on facilitating the reduction of chemicals through stronger alignment with the shift to sustainable production and consumption and a multisector-based approach. The Project will support governments' joint efforts to promote best practices and control emissions from contaminants released from legal activities, control and enforce regulations against illegal practices, and mitigate their impacts. It will also strengthen national legislation and regulatory capacity for meeting obligations with regard to persistent organic pollutants (POP), mercury, and other chemicals listed in the chemicals and waste conventions. The Project brings added value to the Chemicals and Waste GEF portfolio, supporting with complementary interventions those financed via the GEF GOLD Program currently ongoing in Colombia and Peru (as well as a similar one in Ecuador).[39] Project interventions will support the countries in jointly addressing the environmental threat coming from mercury contamination in the basin before it reaches higher levels that would require larger investments to repair environmental damage and would cause further social/health negative impacts. Integrated with the International Waters Focal Area, the Project will support a shared vision and action plan for the basin, strengthening the capacity of the countries to advance toward sustainable management through proper land and water use planning for the basin. This approach considers that, given the basin's environment and physical cultural importance and tangible cultural heritage, mining activity remains largely restricted and when in use of mercury, remains illegal. The Project will also work with vulnerable downstream communities who consume mercury-contaminated fish and drink contaminated water, despite not mining themselves. Addressing the challenge of illegal mining in the basin, even via improved information and capacity building, adds complexity to the Project, but responds to the region's context, takes the opportunity of the existing political commitment, and builds capacity toward long-term sustainable water resources management. The IWRM approach will also have an important contribution toward conservation of key land and water biodiversity as well as increasing climate change resilience via better understanding of climate scenarios and potential impacts, and promoting climate smart sustainable practices.

[39] Preliminary conversations with GOLD Program teams allowed to identify areas of potential collaboration including non-mercury technologies, awareness raising campaigns along the gold value chain, and knowledge management/awareness raising. In addition, in the GEF IEO evaluation of ASGM projects, a note was made of the opportunity for GOLD Projects to, via knowledge exchange, reach vulnerable downstream communities affected by contamination from mining despite not mining themselves.

The project will also respond and contribute, particularly with component 1 and 3, to the GEF's objective within its knowledge management guiding framework[40] facilitating the collection, exchange and update of relevant knowledge within the countries and others involved in relevant recent and past experiences. Finally, as stated in the GEF's White Paper on a GEF COVID-19 Response strategy," restoring healthy environments is the foundation of social and economic health and the Project aligns and contributes with this objective.

C. Proposed Development Objective(s)

Development Objective(s) (From PAD)

To strengthen the enabling conditions for the participant countries to manage the shared freshwater ecosystems of the Putumayo- Içá basin in the Amazon region

Key Results

- Regional knowledge management strategy (KMS) providing relevant information for decision making towards conservation and sustainable natural resource use
- Action plan agreed for shared management of the basin designed and operational
- Share of targeted subproject beneficiaries with improved livelihood conditions

D. Project Description

The proposed Project will strengthen the enabling conditions for Brazil, Colombia, Ecuador, and Peru to work collectively to manage the freshwater ecosystems of the Putumayo-Içá basin. These enabling conditions include an improved knowledge base for decision making towards conservation and sustainable use of natural resources, as well as the strengthened multisectoral and multilevel governance for collaborative management of the basin's natural resources. The Project will respond to the challenges that have been identified to address the drivers of the basin's environmental issues and threats that could result in irreversible negative impacts on the basin's socioeconomic and environmental dynamics, and compromise its well-conserved state. Effectively addressing transboundary threats and drivers will require a multi-country IWRM approach, as the proposed Project intends. Even though, some of the environmental challenges are beyond the Project's scope, the Project is a strategic opportunity to address key threats in time when there is also the political and institutional commitment to strengthen enabling conditions for collaborative management beyond national-scale approaches, and in a context where building trust and collective action has been initiated and has the potential to be scaled up.

Environmental threats

The interconnection of freshwater ecosystems makes them prone to synergistic and cumulative impacts. Rivers, like the Putumayo-Içá, as transport-driven ecosystems, mobilize water and other dissolved and particulate, organic, and inorganic materials, all of which ultimately come from their drainage watersheds. This makes them highly dependent on the biophysical characteristics and vulnerable to human activities. The well-preserved rivers and streams of the Putumayo-Içá harbor a great variety of microhabitats capable of sustaining the region's biological and cultural diversity and ecosystem services. However, there are threats that could affect the integrity of the watershed and its capacity to provide global, national, and local benefits and wellbeing for its inhabitants. Much of the threats that affect the

[40] GEF. 2015. GEF Knowledge Management Approach Paper. GEF/C.48/07/Rev.01

watershed (including its water quality and quantity, ecological functions, and biodiversity) are transboundary in nature, and have cumulative effects along the watershed. Therefore, effectively addressing the interlinked threats and drivers requires a multi-country, regional approach as the proposed Project intends.

Deforestation is one of such environmental threats. While the rates of deforestation are currently low, compared to other Amazon subbasins, there is an increased risk of deforestation that can in turn lead to increased erosion and run-off of soils, generating changes in sediment and nutrient dynamics, subsequently affecting water quality, as well as the physical structure (geomorphology) of the river and thus the integrity and functioning of associated freshwater and terrestrial ecosystems and their biodiversity. The risks are higher in the upper basin, given growing immigration and economic activities that drive or favor unsustainable practices.[41] For the period 2001–2019, the average annual deforestation varied from the high levels of 3,500 ha in vicinities of Puerto Leguízamo in the upper portion in Colombia to 210 ha in Tarapacá in the lower part of the basin near the border between Colombia and Brazil.[42] The fact that deforestation is concentrated in the upper portions of the watershed, where slope is more pronounced, may accelerate rates of erosion and soil loss, and the resulting sediment load will pollute waterways, bury floodplains, and interfere with the accumulation of carbon in peatlands. In addition, removal of forest cover quickly washes away soil nutrients, slowing down forest recovery, as evidenced by the old landing strips in Tarapacá and Amacayacu National Park, abandoned since the 1980s but still not recolonized by plants.

Water pollution is another key environmental threat caused by a range of sources, including gold mining, oil extraction, agriculture, and domestic waste. Water in the Putumayo-Içá watershed is not highly polluted as compared to other Amazon subbasins. However, municipal sewage, oil spills, and more recently illegal activities are increasing contaminants (for example, coliforms, mercury, heavy metals, and POP) in water bodies and freshwater resources.[43] Mercury occurs naturally in the earth's crust, but human activities such as mining and fossil fuel combustion cause water contamination.[44] In the Putumayo-Içá basin as many areas of the Amazon, mercury pollution comes mostly from ASGM.[45] Mercury is converted to methylmercury by bacteria and plankton and is bio-accumulated in fish. Since it bioaccumulates, predators that are larger (for example, otters and dolphins) live longer, are located higher on the food chain, and have higher concentrations of mercury. Monitoring mercury levels in fish provides an ideal proxy indicator of health impacts of mercury contamination on humans. A study published in 2020 showed that mercury levels found in pirapucu (*Boulengerella cuvieri*) were four times higher than the safe limit established by the World Health Organization (WHO), and these higher levels were associated with nearby small-scale gold mining.[46] The impact on human populations regularly exposed to higher levels of mercury may include effects on the nervous, digestive, and immune systems and on lungs, kidneys, skin, and eyes.[47] Scientists have also highlighted risks in terms of deformities and learning

[41] Murad, Cesar, and Jillian Pearse. 2018. "Landsat Study of Deforestation in the Amazon Region of Colombia: Departments of Caquetá and Putumayo." Remote Sensing Applications: Society and Environment. 11. 10.1016/j.rsase.2018.07.003.
[42] Global Forest Watch 2020.
[43] Sampedro, C., and J. Lessmann. 2019. *Amenazas provenientes de actividades humanas hacia los ecosistemas de agua dulce en las cuencas Andino-Amazónicas del Ecuador*. https://www.corpoamazonia.gov.co/region/Putumayo/Putumayo_fisico.html.
[44] Mercury is among the 10 most dangerous chemicals for public health, and is a priority concern for the 128 signatory countries of the Minamata Convention. Approximately 80 percent of the total mercury emissions in South America is from the Amazon, where the presence of the metal is ubiquitous and highly dynamic. The presence of this metal is likely increasing, with global consequences, due to events of the last two years including extensive biomass burning and deforestation (by re-emission of mercury), as well as mining activities and the construction of large-scale projects such as dams. Crespo-López M., et al. 2021. *Mercury: What Can We Learn From the Amazon?*
[45] No official data on quantities of mercury used in AGSM are available since the mercury trade has become criminalized.
[46] Hacon, S. D., M. Oliveira-da-Costa, C. D. Gama, R. Ferreira, P. C. Basta, A. Schramm, and D. Yokota. 2020. "Mercury Exposure Through Fish Consumption in Traditional Communities in the Brazilian Northern Amazon." *International Journal of Environmental Research and Public Health* 17 (15).
[47] Mercury reaches the food chain in its most toxic form, methylmercury. Amazonian populations present levels over 6 ppm of hair mercury and, according to the 175:250:5:1 ratio for methylmercury intake: mercury hair: mercury brain: mercury blood, consume 2–6 times the internationally

difficulties, which limit cognitive development and consequently the chances of finding or performing jobs and income generating activities.[48]

Water pollution from other heavy metals[49] has been found at high concentrations in the Putumayo-Içá River.[50] For instance, impacts to the environment due to oil exploration were evident in the basin's Ecuadorian Sucumbios area, where between 1964 and 1992 approximately 60,000 liters of oil were spilled in the Lago Agrio exploration field and around 70 billion liters of water were contaminated. From the spills, persistent and inorganic and organic polluting substances, including TPH, contaminated soils, caused diseases in indigenous communities, increased greenhouse gas (GHG) emissions, and caused fragmentation of the region's ecosystems. The risk continues as large reserves of oil have been found in the upper area of the watershed on the Ecuador-Colombia border and oil and gas are currently being extracted.[51] The quality of the waters of the Putumayo-Içá watershed has also been compromised by sanitary sewage directly discharged into rivers. Additionally, solid waste from cities and towns and pesticides and other chemicals used in agriculture are also sources of water pollution. Contamination by hydrocarbons, urban effluents, mercury, or cadmium can damage migratory fish sperm and cause the death of their embryos and larvae, affecting the size of fish populations and their survival over time.

Biodiversity loss derived from human alterations of freshwater systems and unsustainable use of wildlife, among others, drives changes to the structure and composition of freshwater populations which in turn causes alterations in freshwater ecosystems functioning. Dysfunctional freshwater ecosystems are not able to provide services such as food, fibers, and medicines, as well as other indirect services like flood control, water filtration, pollution reduction, carbon sequestration, and recreation, thus affecting human wellbeing and nature. In some areas of the Putumayo-Içá watershed over-exploitation[52] of the silver arowana (*Osteoglossum bicirrhosum*) has caused a decrease in local populations, affecting local economies of fisheries. Similarly, in the Teteyé municipality on the Colombo-Ecuadorian border, at the San Miguel River and Agua Blanca stream, local organizations report that due to hydrocarbons exploitation and oil spills migratory catfish (species of the Pimelodidae family) are almost extinct.[53] Though communities are still capturing fish in the area (small sardines [Characiformes] and mojarras [Perciformes]), the freshwater ecosystem lost its capacity to maintain large migratory catfish (Pimelodidae) that are highly appreciated by local communities for self-consumption or for trade.[54]

recognized reference doses. A possible biphasic behavior of the mercury-related phenomena, with consequences that may not be observed in populations with lower levels, is hypothesized, supporting the need for improving our knowledge of this type of chronic exposure. Crespo-López, M., et al. 2021. *Mercury: What Can We Learn From the Amazon?*

[48] https://news.mongabay.com/2020/09/mercury-from-gold-mining-contaminates-amazon-communities-staple-fish/.

[49] Some of the pollutants that are present in the watershed and that the Project could mitigate through the different activities implemented include TPH, arsenic (Ar), barium (Ba), beryllium (Be), polychlorinated biphenyls (PCBs), cadmium (Cd), chromium (Cr), cyanide, hexachlorobenzene, lead (Pb), mercury (Hg), nickel (Ni), phenols, polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/PCDF), vanadium (V), methylmercury, and pesticides (for example, aldrin, chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, endrin, heptachlor, mirex, and toxaphene).

[50] Vellosa, Capparelli, et al. 2019. "An Integrative Approach to Identify the Impacts of Multiple Metal Contamination Sources on the Eastern Andean Foothills of the Ecuadorian Amazonia" *Science of the Total Environment* 709 (March 2020): 136088 (accepted for publication).

[51] Encalada, et al. 2019. *Los ríos de las cuencas Andino-Amazónicas: Herramientas, y guía de invertebrados para el diseño efectivo de programas de monitoreo*. Trama, Quito.

[52] People capture the fish and kill adult males to extract the juveniles from their mouths, where they take refuge.

[53] https://sostenibilidadpruebas.semana.com/medio-ambiente/articulo/el-petroleo-de-la-empresa-vetra-acabo-con-el-agua-en-puerto-asis/36348

[54] Guzmán-Maldonado, A., and C. A. Lasso. 2014. "Análisis comparativo (1990-2014) de la pesquería de peces ornamentales en el departamento del Amazonas, Colombia." *Biota Colombiana* 15 (1): 83–108.

Root causes/Drivers

The following are key drivers for the above environmental threats that the proposed Project will aim to influence.

Planning and management without proper consideration for freshwater socio-ecosystems[55] dynamics. The intricate dynamic of freshwater socio-ecosystems and its biological, cultural, and spatial complexities have not been sufficiently acknowledged in planning and management decisions. The dynamic involves hydrological (quantity and seasonality of water), hydraulic (water flow along the landscape), geomorphological (availability and connectivity of habitats along the river axis and between river and floodplains), and physicochemical (water quality) functions. The watersheds' streams and rivers comprise a dynamic balance within its floodplains and the patchwork of riverbanks, meanders, swamps, and peatlands. Decisions and interventions designed and planned without proper considerations of the diverse freshwater ecosystems, their dynamics and their function, cultural significance, the dependence of human activities on them, as well as the impacts of other human activities on such dynamics leads to unintended alteration of the natural dynamics of the watershed's aquatic ecosystems and subsequent degradation of its habitats. Disregard for freshwater dynamics in shared water systems, such as those leading to situations in which upstream users develop infrastructure and divert water resources away from tributaries or rivers, can leave downstream users with reduced water availability and more erratic flows. In the case of the Putumayo-Içá, decisions related to interventions such as road development and agricultural and hydrocarbon activities upstream, that are then causing accumulated impacts downstream, are not fully considering the basin's watershed integrated dynamic.

Unsustainable and unregulated (including illegal) economic activities and productive practices. Reduced volumes of capture in the fisheries are caused by the emergence of large-scale fishing techniques like nets and longlines and an expansion of some riverine human centers, which translates into higher demands and capture of non-reproductive individuals. Large catfish like dorado (*Brachyplatystoma rousseauxii*) and lechero (*Brachyplatystoma filamentosum*)—traditionally abundant in the middle Putumayo-Içá—have been replaced gradually, as their stocks were reduced, by other species like bocachico (*Prochilodus nigricans*) and other species of catfish.[56] Although anecdotal information suggests that the populations of these species in the Putumayo-Içá are under pressure, evidenced by reports of smaller catches and smaller sizes of individuals captured[57], their actual status throughout the basin is unknown. The highly locally consumed pirarucu or paiche (*Arapaima spp.*) is considered endangered due to overfishing. The reduced fish stock due to overfishing or fishing during ban periods forces communities to find new fishing grounds, intensifying the problem. The project will implement methodologies to quantify the stock status of these species in the Putumayo-Içá, and the extent to which overfishing has occurred. This will also allow tracking progress to reflect how these species can remain at sustainable levels of exploitation or are moved to more sustainable levels if already overexploited. Several indicators will be used to measure progress towards sustainable levels including the GEF core indicator of *Globally over-exploited fisheries moved to more sustainable levels* with baseline and targets to be confirmed in year 1.

Unsustainable use practices have also affected freshwater turtles and tortoises that are an important resource for riverine communities in the Amazon. Besides benefits in terms of food, tools, and medicinal uses, communities economically benefit from the sales of eggs and animals.[58] Large-scale use and commercialization of turtles (*Podonecmis*

[55] Referring to socio-ecosystems emphasizes the integrated relationship between socioeconomic, cultural, and ecological variables in shaping the dynamics that influence natural ecosystems.

[56] Bonilla-Castillo, C. A., E. A. Agudelo, C. L. Sanchez-Paez, and G. A. Gomez Hurtado. "Dinámica de la pesca comercial de consumo en el medio Rio Putumayo: tres décadas de desembarques en Puerto Leguízamo." *Revista Colombia Amazónica* 5 (2012): 129–149.

[57] Expert researcher from SINCHI Research Institute- Dr. Edwin A. Agudelo; personal communication.

[58] In the lower Putumayo-Içá a dozen eggs from *P. unifilis* costs around US$1 and the animal itself costs between US$10 and US$12. Páez, V. P., M. A. Morales-Betancourt, C. A. Lasso, O. V. Castaño-Mora, and B. C. Bock (Editores). 2012. *V. Biología y conservación de las tortugas*

unifilis and *P. expansa*) and their eggs has caused population declines. In the lower and medium Putumayo-Içá, local communities harvest the eggs of the yellow-spotted river turtle (*P. unifilis*),[59] which is now preferred since *P. expansa* is disappearing in some regions. Also, lack of information to determine quotas for eggs (and turtles when possible) often impedes establishing agreements toward sustainable use that could ensure the species' long-term persistence.

Unsustainable and illegal ASGM is present throughout the watershed. ASGM generates impacts on the fragile ecosystems of the Putumayo-Içá, but more so when there is limited use of modern best practices. This leads to low productivity, poor output quality, weak safety standards, and absence of environmental protection practices, as is often the case with illegal operations.[60] Illegal mining practices involve the use of mercury to extract gold from dredged sludge, contaminating soil and water.[61] Gold mining can be found along alluvial deposits in the mainstem of the Putumayo-Içá, San Miguel, Guamuéz, and Cotue Rivers. Its exploitation, which involves the use of mercury for amalgamation, contributes to mercury discharges which, as mentioned, contribute to water pollution. In addition, dredging and sluicing sediments and soils causes the discharge of huge amounts of sediment, an increase in erosion, and changes in floodplains and riverbeds. Given the basin's environment and physical cultural importance and tangible cultural heritage, mining activity shall remain restricted, and when using mercury shall remain illegal, guiding potential interventions with regard to ASGM.

Without proper regulations and the use of sustainable practices, extraction activities located mainly in the upper area on the Ecuador-Colombia border can drive water contamination and changes in its availability. Although safety procedures are in place, the risk of an oil spill in rivers of the watershed exists, leading to short- and long-term water contamination. In addition, not all companies of the oil and gas industry in the region have adequate water management plans that consider water dynamics beyond the site of operation, among others, because the national regulations on the matter do not require them, there is little participation of other stakeholders, and there is no thorough monitoring of water use beyond the one employed directly in the operations.

An unregulated agricultural sector is also a driver of changes in the water dynamics and a source of contamination. Water use is largely unregulated except for very specific large-scale plantations. Although regulating water use in all agricultural activities is beyond the Project's scope and capacity, a particular area of concern and which can be addressed relates to the unsustainable use of pesticides and the indiscriminate use of pharmaceuticals to manage livestock. The contaminants released from the agricultural sector add to the municipal and domestic waste and wastewater discharges along the river, which often contain POPs, other contaminants (including medicines), and more commonly plastics and microplastics. Finally, extensive, illegal, and unplanned roads drive deforestation and connectivity loss, threatening biodiversity and ecosystem services.

Changes in variability and seasonality due to climate change exacerbate other drivers, increase environmental threats and their severity. The basin is characterized by a tropical climate with high temperature and precipitation with a heterogeneous orography and climate. The Project area does not suffer from droughts or dry periods and rainfall occurs at different levels along the year with total annual precipitation of approximately 3,300 mm along the basin (Climate Change Knowledge Portal). Some areas in the basin have suffered from intense rain causing severe floods that affected

continentales de Colombia. Bogotá, D. C., Colombia: Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH).

[59] Bermúdez-Romero, A. L., M. Hoyos-Rodríguez, D. E. Álape-Sánchez, M. A. Morales-Betancourt, and C. Solano. 2010. *Tortugas Charapa y Taricaya (Podocnemis expansa y Podocnemis unifilis), un recurso de conservación prioritario*. Pp: 111–127.

[60] Illegal mining has also been associated with strong negative social impacts such as cultural erosion, prostitution, alcoholism, child labor, high-risk jobs, political corruption, and violence. It has also made the political systems vulnerable to bribes from mining interests.

[61] According to the 2013 UNEP Global Mercury Assessment, ASGM is the largest single source of human-driven mercury pollution in the world, accounting for 37 percent of all emissions into the atmosphere and into local water sources.

infrastructure and productive activities for local communities.[62] Intense rain has also produced landslides mainly in the head of the basin connected to the Andes. An analysis of climate variables for the Putumayo-Içá basin comparing the reference period of 1986–2005 with a 2040–2059 period for an RCP 8.5 scenario shows an increase of 2.09° C in the annual average temperature along the basin; an increase of 80 days on average in which the heat index will go over 35° C (the lower basin with 150 days increase while the head of the basin toward the Andes with almost no increase); an annual average increase in precipitation of 62.19 mm; an increase on dry day sequence of one day on average; and an average of 8 percent increase in the likelihood of encountering severe drought. Considering the magnitude, these results represent moderate climate risks. However, an increase in temperature and precipitation may affect the hydrological dynamic and the watershed's ecological resilience and likely its inhabitants' socioeconomic welfare. Increased water temperatures and a decrease in dissolved oxygen may lead to a reduction in the self-purification capacity and reduce the quality of freshwater ecosystems, which in turn affect key biological processes such as reproduction and dispersal of both animals and plant aquatic species. The estimated increase in precipitation may worsen the regular floods that the basin has experienced in the past. Higher-intensity rainfall and associated floods and potential landslides and erosion will lead to increased risks of water turbidity and mobilization of pathogens, while periods of drought will lead to higher concentrations of pollutants in the reduced water flows. Higher sediment loads could have negative consequences for biodiversity by increasing hypoxia mortalities due to fine sediment obstruction of the gills, interruption of the photosynthesis of aquatic plants, among others. Enhanced hot seasons have been identified as increasing the risk of underground fires in the peatlands with severe ecological impacts and carbon emissions.[63] Even though the future climate scenario does not show severe changes, a potential increase in the occurrence of other factors such as deforestation and population growth, among others, may increase the potential climate changes. Although the interventions to address this root cause go beyond its proposed scope, the Project will enhance climate change resilience via better understanding of climate scenarios, incorporating climate change into planning instruments, and promoting climate smart sustainable practices.

Barriers to address environmental threats and their drivers

To succeed in strengthening the enabling conditions to advance an IWRM, in order to address the most prevalent environmental threats and drivers that are present in the Putumayo-Içá, several challenges need to be overcome.

Limited, fragmented, and inaccessible information to support decision making for sustainable integrated water resource management. In the Putumayo-Içá watershed, there is already important information and there are several government institutions, civil society organizations (CSOs), and research institutions already generating additional data and information. However, this is mostly at the national level, is siloed in specific sectors, and thus not available to support holistic decision making by all relevant stakeholders. In addition, knowledge and information gaps and unequal and fragmented access to existing information result in uncoordinated, fragmented, and uneven management of natural resources. There is insufficient spatial understanding of the social and ecological dynamics and the pressures facing the whole basin and lack of basin-wide in-depth research and analysis of themes of transboundary concern. There are several data, information, and knowledge management systems that encompass the watershed, including the various national information systems and those that operate at the Amazon watershed

[62] Due to intensive rain, in July 22, 2021, the government of the Colombian Putumayo department declared a public emergency as more than 10,000 families have been affected in 12 municipalities due to loss in crops and animals, landslides over roads, loss of sewage service, among others.
[63] Field Museum. 2019. *Rapid Biological and Social Inventory: Bajo Putumayo-Yaguas-Cotuhé Colombia and Peru Region*.

scale (for example, Earth Observation, IWlearn,[64] Amazon Waters Initiative,[65] Citizen Science for the Amazon,[66] RAIGS,[67] Map of Life,[68] MapBiomas, and other non-governmental and governmental platforms), but efforts are required to ensure information flows to and between these portals and are accessible.

Scientific knowledge is not necessarily transferred in ways that reach the broader public to build awareness on the value of conserving the natural systems and to decision makers so that they take fully informed decisions. For instance, there is insufficient awareness of the impacts on human and ecosystems' health generated from water contamination and this would be achieved with increased data and proper dissemination that will then reflect in response measures for the communities and prevention measures from the authorities.

Finally, scaled-up mechanisms and practices to involve communities in the collection and analysis of data are lacking. This is especially relevant as they are key decision makers, but also in response to the need for empowering communities to monitor their natural resources.[69] Also, in the basin individual and institutional stakeholders lack enough fora to exchange knowledge across boundaries.

Loss and under representation of traditional knowledge in decision making and weakened governance systems. Local and indigenous communities throughout the world have managed forests and water resources in countless ways that sustained their livelihoods and cultures. As in numerous places throughout the Amazon, in the Putumayo-Içá, Indigenous Peoples and local communities have an elaborate and deep understanding of their local environment, embedded in a diverse array of natural resource management practices that help conserve biodiversity and ecosystem resilience for generations. They envision the basin as a cultural corridor, connected by its resources and traditions. Typically, this traditional knowledge has been supported by and embodied in local languages, being transmitted orally from generation to generation, often in the form of stories, songs, folklore, and proverbs, as well as direct training of youth by elders. Traditional knowledge of the riverine communities and traditional fishers—indigenous, Afro-descendants, colonists, or mestizos—is starting to be recognized as a valuable resource that allows for a more holistic understanding of the natural resources and their complex ecosystems.[70] However, this knowledge remains poorly incorporated into the decision-making processes at different levels, but particularly those that go beyond the specific jurisdictions over which communities have control.

Traditional knowledge, forest management practices, and associated governance systems are also being eroded. Years of colonization and extractives development and recently occupation have changed life patterns and traditions. The urgency to find livelihood opportunities, and the apparently easy opportunities to find them outside of the traditional customs, has reduced youth interest to learn and retain traditions. All these different phenomena have threatened the physical and cultural existence of the Indigenous Peoples.[71] COVID-19 has had a significant impact in these matters as elders, traditional leaders, and champions of regional cooperation have died at disproportionate rates, and a wealth

[64] https://iwlearn.net/.
[65] http://amazonwaters.org/.
[66] https://www.amazoniacienciaciudadana.org/english/.
[67] https://www.amazoniasocioambiental.org/en/.
[68] https://mol.org/.
[69] COVID-19 has also raised the need to rely on community monitoring mechanisms that reduce the need for teams to travel to gather data.
[70] Duque, S. and E. F. Prieto-Piraquive. 2006. *ii Presentación*. Pags: 5–6. En: Dámaso, J. 2006. *El conocimiento ancestral indígena sobre los peces de la Amazonia: los lagos de Yahuarcaca. Documentos Ocasionales No. 7, Universidad Nacional de Colombia, Sede Amazonia*. Leticia. www.imani.unal.edu.co/ocasionales.htm.
[71] Rodríguez, J. M., A. P. Chaparro, and C. A. V. FoE. *Los indígenas del putumayo buscan recuperar la sustentabilidad de su cultura: Sobreviviendo al impacto del mercado energético en la Amazonia colombiana*. CENSAT Agua Viva FoE – (Colombia). http://www.mamacoca.org/docs_de_base/Cifras_cuadro_mamacoca/Indigenas_Putumayo_buscan_recuperar_su_cultura_2002.pdf.

of knowledge disappeared with them. In this context, and considering a significant portion of the Putumayo-Içá watershed is under the direct management of local communities, including Indigenous Peoples, ensuring proper dialogue, recognition, and consideration of traditional knowledge for decision management processes at all levels is critical.

Weak governance for joint regional resource management. A multiplicity of legal frameworks and regulations—policies, laws, rules, as well as existing multilateral agreements—determine the basin's development activities. However, there are still shortcomings in procedures, policies, and inter-sectoral governance structures for regional integrated watershed planning and conservation of resources, including poor multisector regional coordination, scarce harmonized frameworks for shared natural resource management, and weak enforcement mechanisms at regional scale. There has also been a lack of capacity and resources to implement and supervise existing international agreements.

Lack of multisectoral coordination for planning and management of water resources constitutes a barrier to forecasting and managing impacts, including unintended consequences of decisions made by one sector to another, or one country to others, and on the connectivity and health of water resources as a whole. A particular example relates to the use of fish and other aquatic resources (for example, turtles) which constitute a common pool of resources which require coordinated participatory management to ensure sustainability. An absence of a harmonized regulatory framework generates conflict among fisher groups and conflict of ownership over the resources. For example, the lack of homogenization of norms related to fishing seasonal bans, techniques, and management practices has impeded proper sustainable management.[72] At the local level and along the Peru-Colombia border, few agreements have been established *de facto* to regulate fishing grounds,[73] and there is also some progress toward collaboration and coordination of management measures, particularly between neighboring PA. But these are particular cases, and in order to overcome the various limitations including the lack of a watershed-wide identity and inoperative management structures, they need to be strengthened, systematized, and scaled up.

A significant barrier for effective governance is the insufficient participation mechanisms for involving stakeholders including the private sector, Indigenous Peoples and local communities, women, and vulnerable groups in consensus building and definition of joint actions. Existing management structures are mostly focused on national and subnational scales and do not engage local communities, understand upstream-downstream dynamics, and miss to incorporate the cultural and spiritual significance of the territory and its resources to the Indigenous Peoples and other local communities that inhabit it. The predominant top-down approaches for decision making tend to fail more when there is a disconnect with the local needs and a lack of information and understanding of the context and particularities. This is generally a consequence of poor adoption and engagement of local communities that instead end up creating their own rules to manage the resources they rely on.[74] Conflicting territorial aspirations between local communities (including Indigenous Peoples) and government agencies have been identified as key barriers for effective governance.[75]

[72] The Field Museum. 2016. *Rapid Biological and Social Inventory: Perú Medio Putumayo-Algodón*.

[73] Limits to subsistence fishing are set by unwritten agreements based on respect, trust, and solidarity. In the case of commercial fishing, and especially for black arowana and arapaima, the agreements are explicit and require that fishermen receive permission from the owners of the lakes where these fish are harvested.

[74] Doria, et al. 2020. *Challenges for the Governance of Small-scale Fisheries on the Brazil-Bolivia Transboundary Region*. Society and Natural Resources. https://doi.org/10.1080/08941920.2020.1771492.

[75] The Field Museum. 2019. *Rapid Biological and Social Inventory: Bajo Putumayo-Yaguas-Cotuhé Colombia and Peru Region*.

Another barrier to effective governance is the poor regional enforcement capacity to prevent and control causes of environmental problems. Authorities and prosecution officers responsible for water resource management lack the capacity and coordination mechanisms to maintain permanent and effective prevention and control strategies throughout these territories and address problems which are largely regional in nature. The lack of shared technical information hampers effective and coordinated enforcement efforts. The watershed does not have early warning systems that allow for decision making, including coordinated law enforcement. Finally, the lack of common procedures to collaborate across borders prevents full implementation of bilateral agreements and action plans.

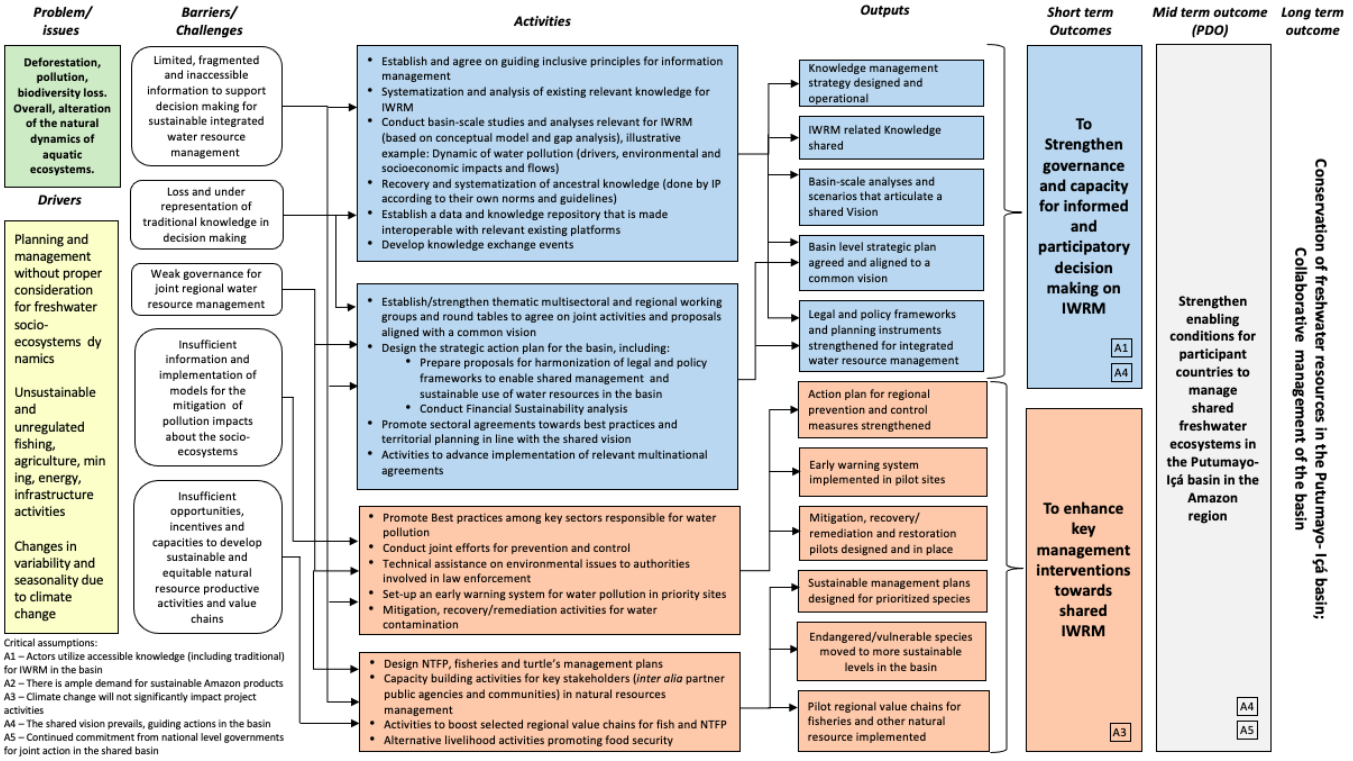
Insufficient information and implementation models for the mitigation of pollution impacts on freshwater socio-ecosystems. Joint solutions for tackling the transboundary impacts of water pollution are lacking. Early warning systems that can provide alerts about pollution events and inform response mechanisms do not exist and much less in an integrated way among participant countries. In addition, no pilots have been done in the watershed and systematized for low-cost remediation measures to mitigate the impacts of water pollution. Technologies are being researched and are rapidly being developed but have not yet been piloted in specific contexts and with a participatory approach to ensure broad adoption under varying conditions. Research has been done to identify techniques and materials for mercury remediation, including innovative bioremediation methods proven to be cost-efficient and environmentally friendly. Taking into account the natural concentration of mercury in the Amazon soils, it is expected that naturally some native organisms of the watershed could have a strong potential for bioremediation.[76] A preliminary assessment of the different option needs to be conducted to determine the most viable options considering the local context, the requirements of the specific technologies, and ensuring by all means the positive environmental and social impact of its deployment in specific sites.

Insufficient opportunities, incentives, and capacities to develop sustainable and equitable economic activities and value chains. Small- and medium-scale producers face limited understanding of demand and access to markets and how to improve efficiency. Similarly, cooperatives and community and producer associations lack capacity for business development, planning and operation, and minimum infrastructure, leading to low capacity for participation in sustainable production chains. There is inadequate transportation, manipulation of fish, as well as lack of cooling infrastructure to preserve fish during transportation or storage. In addition to the need for improving fleet and infrastructure in the ports and processing facilities, the need for improving the capacity of fishermen along the supply chain has been identified as key to reduce the loss of fish.[77] Capacity and experiences differ between countries, and there are scarce experiences of collaboration toward regional value chains and knowledge exchange in matters of common interest. Extension services are often weak and there are still insufficient logistical, technical, and institutional capacities and data to ensure that best practices and standards are implemented.

[76] Paisio, C. E., P. S. González, M. A. Talano, and E. Agostini. 2012. “Remediación biológica de Mercurio: Recientes avances.” *Rev Latinoam Biotecnol Amb Algal* 3 (2): 119–146.

[77] FAO (Food and Agriculture Organization). 2020. *Estimaciones de pérdida de pescado en l Amazonía (Brasil, Colombia y Peru)*.

Figure 1. Theory of Change



Project objective and components

The proposed Project will address the above barriers with specific interventions to strengthen governance and capacity toward informed decisions for IWRM in the shared watershed. The strengthened governance and capacity will be piloted via concrete actions that will generate direct on-the-ground benefits and lessons learned for future scaling up. The Project development objective, to be achieved after 5 years, will be to strengthen the enabling conditions for the participant countries to manage shared freshwater ecosystems in the Putumayo-Içá basin in the Amazon region. In the long term, such enabling conditions will allow countries to collaboratively manage the shared basin, mitigate or reduce the existing environmental threats, scale up successful pilots and advance towards the basin's conservation. The Project will build on and strengthen the on-going water and land conservation initiatives and efforts of governments and civil society involved in the Putumayo-Içá watershed. Actions will be driven by a bottom-up approach with an active participation of local communities and to reflect the multi-cultural, multi-stakeholder, and gender considerations into decision making.

The Project is structured into three interlinked components that require multi-country actions across different levels of implementation and who will jointly contribute with the enabling conditions for the participant countries to sustainably manage the shared water resources in the watershed.

Component 1: Governance and capacity for informed and participatory decision making on IWRM. The Project will strengthen conditions for shared management of the watershed's water resources via enhanced governance[78] structures and a KMS designed and implemented for improved timely and relevant accessible information that responds to the basin's cultural and socioeconomic diverse nature. The scope of the KMS to be designed will go from data collection and knowledge recovery and systematization to information management to make it accessible for the diverse audiences and to promote decision making in matters related to IWRM. Building on each country's regulatory framework related to conservation and sustainable development, the Project will propose solutions and promote harmonization of such frameworks, procedures and protocols to facilitate not only joint activities but that national level policies and implementation of multinational agreements acknowledge the influencing effect of national interventions along the watershed with considerations for its hydrobiological resources. Strengthened governance will also be promoted by mainstreaming environmental considerations within other economic sectors that influence threats to the watershed´s ecosystem services. The component will build on existing processes that have allowed for agreements on specific natural resources management goals among some of the basin countries, but have not integrated all four countries and diversity of stakeholders. Governance will also be strengthened by providing relevant information so that decision making by the range of stakeholders from local level to policy makers will be informed towards IWRM. In addition, by promoting multi-stakeholder dialogue, collaboration and partnerships, the enabling conditions towards collaborative management under a common vision will be strengthened, translated into a strategic plan for the watershed's water resource management and then piloted via the Project's second component. The Project component will finance technical assistance, goods, services, workshops, subprojects and operational costs and has been designed along two subcomponents as follows.

Subcomponent 1.1: Traditional and scientific knowledge for informed decision making. The Project will enhance and improve access to relevant knowledge to support improved decision making and inform collaborative actions for IWRM. This will be achieved through a KMS that will collect, systematize, generate, and share relevant knowledge produced at different scales and to be made accessible to diverse audiences and stakeholders (including riverine communities and traditional fishers—indigenous, colonists, or mestizos). Subcomponent 1.1 will include the following activities:

(a) Design of the KMS, based on a conceptual model that identifies key variables conducive to IWRM,[79] information filling gaps for the identified variables, and, agreed upon, inclusive and harmonized guiding principles for information management, ownership and access to the information produced by the Project. The design will also incorporate considerations that reflect respect of the authority and ownership of Indigenous Peoples of their knowledge and traditions. Overall, the design and implementation of the KMS will be highly participatory, will support strengthening of existing national-level systems, and will recognize the multi-cultural, multi-generational, multi-stakeholder, and multi-national contexts.

[78] Environmental governance, broadly speaking, refers to the institutions, policies, rules, and practices that mediate how the international community, nation-states, corporations, and citizens interact with the environment at different levels—global, national, and local. Effective environmental governance means the participation and cooperation of all actors—governments, nongovernmental organizations (NGOs), the private sector, civil society and community groups, and ordinary citizens—in collaborative efforts toward sustainable development and environmental improvement. It involves citizens and CSOs in identifying, creating, and monitoring environment and sustainable development policies and processes. Source: https://sgp.undp.org/about-us-157/partnerships/ngo-environmental-governance-project.html.

[79] The conceptual model will specify the knowledge dimensions (general topics) that will need to be included in the system (for example, hydrology, connectivity, water quality, and hydrobiological resources), the specific information within each dimension (for example, variables), and the specific data required for each variable. Through a participatory process with local communities and relevant local governance structures (for example, fishermen organizations, indigenous communities, and relevant public institutions), additional information needs will be identified. Variables affected or influenced by the COVID-19 pandemic will also be considered in the model.

(b) Collection, systematization, research and analysis of relevant scientific knowledge to fill in knowledge gaps to promote shared IWRM. The Project will support participatory and multidisciplinary regional studies -conducted both via consultancies and specific subprojects- based on a gap analysis that identifies missing information required for implementing the Project activities. The gap analysis will consider the demands of information identified by the thematic groups supported by the Project. In addition, the Transboundary Diagnostic Analysis methodology developed by the GEF IWlearn[80] will be consulted to identify additional missing information required for the analysis of the transboundary problems addressed by the Project, and as the basis for the design of a basin-level action plan financed via Subcomponent 1.2. Illustrative analyses that have already been prioritized include those that value watershed ecosystem services, report on the biological status of the river systems, as well as the dynamic of water and other related resources' pollution from mercury and other contaminants (including pollution levels, pollution drivers, commercial flows, and environmental and socioeconomic impacts). In relation to mercury, data collection methodologies will be aligned with the guidelines as defined by the Minamata Convention. Collection and data analysis will include specific consultancies as well as community participatory mechanisms.

(c) Research by and for indigenous communities. The Project will offer via subprojects an opportunity for Indigenous Peoples to conduct processes for which traditional ancestral knowledge will be recovered, shared, and validated for their own decision making in ways that follow their own needs, norms, methodologies, and objectives. The use and dissemination of traditional knowledge will be determined with local and indigenous communities.

(d) Establishment of a regional data and knowledge repository for project-related information and provision of support towards interoperability with other existing platforms. The data, information, and knowledge compiled, generated, and exchanged by the Project will cross-feed with the relevant existing platforms and knowledge-sharing mechanisms (for example, national and subnational government information systems, GEF's IWLearn,[81] countries' research centers, among others).[82] The project will support strengthening of existing selected national-level systems to ensure interoperability and access to information produced by the project. This interoperability will contribute to the sustainability of the information gathered by the Project beyond its duration. Capacity-building activities will be delivered for relevant stakeholders to access and use knowledge, information, and data. The Project will also provide technology support, assistance for harmonization of knowledge management protocols, and guidance for interoperability with relevant institutions.[83] The KMS will also contribute to and be strengthened by the Amazon basin integrated regional platform of information on water resources that has been identified in the SAP-Amazon.

(e) Knowledge exchange events. The Project will support knowledge exchange activities—across national borders within the watershed and within specific communities—to share experiences and lessons learned, strengthening capacity of project beneficiaries. Exchange activities will also include teams and beneficiaries involved in other relevant projects and programs such as the Amazon Sustainable Landscapes Program and its knowledge exchange

[80] The Transboundary Diagnostic Analysis/SAP approach is a highly collaborative, step-wise, non-prescriptive process that has been applied by GEF International Waters projects over the last 26 years. Its underlaying principles are adaptative management, the ecosystem approach, sustainable development, poverty reduction, gender mainstreaming, climate variability and climate change, collaboration, stakeholder participation, step-wise consensus building, transparency, accountability, inter-sectoral policy building, donor partnerships, and government commitment (https://iwlearn.net/manuals/tda-sap-methodology/tdasap-methodology).

[81] Project staff and representatives from each country will participate in International Waters Conferences that happen during project implementation and other regional or global IWLearn workshops.

[82] Existing platforms include: Earth Observation, ACTO's Regional Amazon Observatory, IWLearn, Amazon Waters Initiative, Citizen Science for the Amazon, RAIGS, Map of Life, Map Biomass, Amazon Sustainable Landscapes Program Interactive Data Portal, and other nongovernmental, research, and governmental platforms.

[83] These institutions will be part of the Project's technical committee described in the institutional arrangements.

platform, the GEF-financed International Water projects[84] via the IWLearn platform,[85] the Colombian REDD Early Movers (REM) Program, and the existing GEF GOLD projects in Peru and Colombia, as well as an initial GEF ASGM-related project financed in Ecuador, for those matters that are relevant for the particular context of the watershed.[86] Participation in the IWLearn network activities, aligned with GEF's knowledge management approach, will include members of the PMU plus other key government stakeholders. Contents and methodology for the knowledge exchange activities will be demand driven, responding to the needs of stakeholders and agencies involved in the implementation of project activities. Results from the exchange activities will be systematized and disseminated to participants and broader audiences.

Subcomponent 1.2: Governance for integrated water resource management. This subcomponent will aim to strengthen multi-level, multi-stakeholder, and multisectoral governance around a common vision for the basin and as a key enabling condition for the basin's IWRM and promoting equitable access to women and other vulnerable populations. Several interlinked activities are included:

(a) Establishment and strengthening of new and existing thematic multisectoral and regional working groups and round tables. The Project will assist indigenous, campesino, and ribereño communities, as well as local institutions, environmental authorities, organizations, public sector, and research institutions to organize and periodically meet to discuss, in working groups, common challenges, and take informed decisions for the regional IWRM. These processes will also involve representatives from other sectors[87] that influence the environmental outcomes for the basin. The Project will not only create such working groups, but support existing thematic multisectoral and regional groups[88] or round tables organized to conduct land use planning, and coordinate actions on relevant themes fisheries management, water pollution, and PA management, among others. Promoting dialogue and agreements with multiple stakeholders (including key government agencies from PA management, fishing, mining/energy, agricultural sectors, as well as the private sector) via thematic groups will be conducive for an enabling environment to unlock further sector investment, as well as to open the opportunities to empower the voices of Indigenous Peoples, women and youth in decision-making processes at different scales. The Project will also support and build on the ongoing regional process initiated since 2017 between Peru and Colombia promoting multisectoral dialogue toward establishing a shared vision around a cultural and biological corridor for the basin.[89] Strengthening the process and involving Brazil

[84] An example of projects from which to derive lessons is the GEF Implementing Integrated Measures for Minimizing Mercury Releases from Artisanal Gold Mining Project, financed with International Waters and Chemicals Focal Areas with the objective to protect human health and the environment by implementing integrated measures aimed at minimizing mercury releases from ASGM activities affecting the Puyango River basin in Ecuador and the Tumbes River basin in Peru.

[85] As per the GEF guidance, allocating 1 percent of GEF IW financing to support IWLearn activities.

[86] Preliminary conversations with GOLD program teams have allowed to identify that among their components, the areas of potential collaboration involve the non-mercury technologies (that could be relevant for miners in Ecuador and Brazil), awareness raising campaigns along the gold value chain, and knowledge management/awareness raising. In addition, in the GEF IEO evaluation of ASGM projects, a note was made of the opportunity for GOLD Projects to, via knowledge exchange, reach vulnerable downstream communities affected by contamination from mining despite not mining themselves. The proposed Project provides such opportunity close to the countries' GOLD projects.

[87] Government health agencies within multi-stakeholder dialogues toward a shared vision for the basin will also be invited given its relevance not only due to the health impacts related to mercury contamination and potential collaboration for environmental health monitoring, but also the COVID-19 pandemic.

[88] These include, among others, the binational committees that work toward water resources management; the agreements between neighboring PAs in the basin particularly the triangle of PAs between Colombia, Ecuador, and Peru; and the process initiated in 2018 between Colombia and Peru toward a Putumayo cultural corridor that resulted in a binational action plan between indigenous communities, government agencies, NGOs, and research institutions toward a biological and cultural corridor for the Putumayo watershed and which will be scaled up adding Ecuador and Brazil.

[89] The process has continued since 2017 with support from international donors (for example, GEF/WB's Amazon Sustainable Landscapes, and Moore Foundation); the active involvement of international NGOs including the WWF and the Frankfurt Zoological Society; and the leaderships of

and Ecuador will expand the existing community of trust that is leading to the desired shared vision guiding regional decision making.

(b) Design, facilitated by the working groups, of a regional strategic action plan for the basin. Promoting a participatory process involving local communities and governments, as well as public and private institutions from multiple development sectors and the private sector, toward defining a common vision for the basin will result in a strategic action plan. By supporting a highly participatory plan where the voices of the local communities are heard, as well as those from multisectoral public and CSOs from the four countries, the Project will ensure ownership and stakeholder commitment. The agreed strategic action plan for the basin will also feed into the overall Amazon basin plans. The process will be tailored according to the specific context and progress achieved so far for the basin but will incorporate elements from the methodology that guided the SAP-Amazon and designed by the GEF. As part of the action plan design, the Project will support further detailed assessments of the legal, institutional, and policy frameworks and planning instruments conducive toward IWRM, so to prepare proposals for harmonization of policy frameworks and protocols to enable shared management (for example, in the sustainable use of key species and PA management protocols). The proposed harmonization will be aligned with and will consider and respect local and national regulations. Institutionalization of the action plan will also be supported by involving foreign affairs representatives. The Project will finance the application of the Natural Resource Governance Tool[90] to assess the proper governance structure to allow joint management of the basin. The Project will prepare financial sustainability analyses to estimate medium- and long-term costs for its implementation, assessing existing and potential future sources of financing.

(c) Technical assistance to promote mainstream IWRM considerations in territorial planning and sectoral practices, policies, and programs. The subcomponent will promote and support sectoral agreements for the sustainable use of water resources in the watershed. Through technical assistance the subcomponent will provide recommendations and environmental guidelines for the adoption of best management practices in specific sector industries that are being a source of contaminants. In addition, the Project will promote the development of guidelines and information to strengthen the territorial environmental planning to incorporate elements of the integrated water resources regional approach, as well as increase capacity to apply the normative frameworks to stop illegal and unsustainable practices in key areas.[91] The dialogue will acknowledge the existing land and water use planning at different levels (municipal, state, PA, among others) so that the common vision will be built on these processes but also improve them under an integrated approach. This technical assistance will include support for indigenous life plans to be designed or implemented as determined and designed by indigenous authorities.

(d) Activities to advance implementation of relevant multinational agreements including the Minamata and Stockholm Conventions as well binational/trinational agreements for harmonized conservation areas management. The Project will strengthen governance by supporting the implementation of relevant multinational agreements including the Minamata and Stockholm Conventions, the 2019 Pucallpa Action Plan, and the 2019 Leticia Pact for

the Field Museum of Chicago. This has already resulted in a binational action plan between indigenous communities, government agencies, NGOs, and research institutions toward a biological and cultural corridor for the Putumayo watershed.

[90] Detoeuf, D., M. Wieland, P. Cowles, and D. Wilkie. 2020. *The Natural Resource Governance Tool - Version 2*. Bronx, NY: WCS and Washington, D.C. USA: USAID.

[91] The effort to mainstream environmental considerations in other sectors will be supported via the Project, but in collaboration with other complementary co-financing interventions, given the complexity of the task; the need for an integrated approach that tracks and aims to influence macro-economic and sector decisions made by the participant governments related to transport, mines, and energy; as well as agriculture activities.

regional environmental management, among others, and specially the binational/trinational agreements[92] that involve collaboration between more than one of the participant countries including neighboring conservation areas.

Component 2: Management interventions towards shared IWRM. The component will enhance key management interventions toward shared IWRM through the implementation of actions to prevent, control and mitigate environmental and water pollution from mercury and other contaminants, and by supporting sustainable management and associated value chains of selected transboundary hydrobiological resources in pilot sites. The Project's key on-the-ground pilot activities to be financed will build on existing efforts from subnational and local public organizations and CSOs and its active involvement will support future scaling up. Component 2 will finance technical assistance, workshops, minor works, goods, subprojects, and operational costs and has been designed with two subcomponents.

Subcomponent 2.1: Water and environmental pollution associated with mercury and other contaminants. The subcomponent will design and support the implementation of pilot activities, via consultancies and subprojects, for the prevention, control and reduction of water pollution from mercury and other contaminants released by legal and illegal activities occurring along the watershed and to be piloted in selected sites. Representatives from sectors generating water pollution from legal activities (mining, agriculture, energy, and infrastructure) will be engaged in the Project, through knowledge sharing and capacity building on best practices and innovative technologies as well as in the working groups supported via Subcomponent 1.2. The activities will be designed with participation of key stakeholders and based on knowledge to be systematized and collected by the Project to better understand the nature, dynamics, and impacts of water contamination. It will also build on existing collaborative efforts in the watershed (including in neighboring PAs). The activities will involve three dimensions: (a) pollution sources (from ASGM, oil activities, urban developments, and agricultural activities); (b) environmental contingencies such as oil or chemical spills; and (c) pollution sinks where pollutants have been deposited. Considering these dimensions, the Project will support the following activities:

Prevention and control of contamination

(a) Training, capacity building and subprojects to promote the adoption of best practices in key sectors such as oil and gas,[93] agriculture,[94] waste and wastewater management,[95] and ASGM (in collaboration with GEF funded GOLD project and other projects in Ecuador where ASGM is legal). The project will foster multi-sectoral dialogue and agreements with companies involved with contaminant-generating industries, and support the review/improvement of legally binding technical instruments such as environmental impact studies, management plans, and contingency plans, which require companies to prevent, reduce and mitigate the effects of pollution.

(b) Strengthening joint efforts (supporting implementation of multilateral agreements) by subnational and national environmental authorities and civil society organizations for prevention and control of contamination through

[92] This includes the agreements established between the La Paya National Natural Park, Colombia; the Güeppí Sekime National Park, Peru; and the Cuyabeno Wildlife Reserve, Ecuador toward the conservation of the region.
[93] Strengthening and promoting adoption of new technologies and approaches developed by the oil and gas sector for a more efficient and cleaner use of water resources, as well as integrating them in comprehensive water management plans with a landscape or watershed perspective (that is, not just the specific conditions of the oil operation site).
[94] Working with companies manufacturing and selling chemicals, pesticides, and veterinary products in the upper basin to promote behavioral changes for a more rational use of these products based on a more comprehensive understanding of their impacts on freshwater resources.
[95] Strengthening campaigns that promote appropriate management of waste to reach smaller peri-urban centers and local communities, and to emphasize risks associated with disposal of chemicals, batteries, medicines, and plastics.

harmonization of surveillance, command and control procedures between countries, systematization of information and data associated with illegal mining, ensuring adequate data security and custody chain of the evidence, and improved detection tools for illegal mercury.

(c) Institutional capacity-building activities on environmental issues, specifically regarding the use of contaminants and their impacts on communities and ecosystems, to environmental authorities and prosecutorial agencies that are officially mandated to prevent the use of contaminants, including training to improve the estimation of economic and social impacts from mining.

(d) Strengthen the preparedness and response systems for contingencies by implementing pilot early warning systems for both environmental contingencies and for more discreet changes in water quality. The early warning system will be designed and piloted through two strategies. The first one will be designed to quickly identify (by the color, odor, and other characteristics easily identifiable through the senses and/or basic water variables) contingencies or events such as oil or chemical spills that abruptly alter water quality and affect the availability of aquatic resources for local communities. The identification of contingencies in the water should trigger communication with local communities, regional emergency management bodies, and environmental authorities, and these in turn are expected to initiate contingency plans and prioritize attention to local communities located downstream. The second action line will be designed to allow local communities to identify changes in water quality using low-cost, low-maintenance, and reliable basic detection equipment and participatory monitoring protocols.[96] The subcomponent will support activities to ensure that the early warning system promptly informs agencies to act and allow appropriate response activities.

(e) Communications and awareness raising campaigns[97] for both Amazon communities to respond to and prevent contamination and broader audiences in relation to impacts of mercury contamination and towards mercury-free gold consumption. In collaboration with GOLD projects and USAID, working with private sector companies and consumers involved in the gold chain to facilitate awareness raising toward the Putumayo-Içá basin.

Reduction/mitigation activities

(f) Support activities toward small-scale mitigation, recovery, remediation or restoration of the environmental liabilities associated with mercury-related pollution sinks identified in the prioritized sites of the basin. Remediation/restoration will be implemented through subprojects, which will be selected over a competitive process that will allow proponents to submit proposals. These subprojects will also act as hands-on practical field training of technologies which will in turn generate lessons to be shared with a broader audience. Specific criteria for subproject selection will be incorporated into the Project Operations Manual (POM) (as well as for all other subprojects) but this will include technical[98] and financial feasibility; low or moderate environmental risks and appropriate mitigation measures; involvement of local communities (from design to implementation and monitoring), with gender and cultural sensitivity; inclusion of capacity building components for local communities

[96] There are several experiences in the design and implementation of participatory water quality monitoring programs, associated with early warning systems, in Ecuador and Bolivia (http://institutodegeografia.org/nebe/) to learn from. Currently, within the WCS Citizen Science Program, a participatory community monitoring system will be implemented in the Napo River basin in Ecuador, which will include water quality alerts for local communities.

[97] Lessons learned from other projects show the importance and relevance of awareness of the negative effects of mercury to ensure positive outcomes remain beyond the Project duration (GEF IEO, Dec 2020).

[98] For example, the remediation of mercury by cyanidation will not be promoted, and technologies including non-native invasive species will not be considered for the selection process.

and relevant authorities; adequacy of monitoring plan with a specific baseline and targets; and scalability to other locations in the watershed. The selected subproject will build on existing efforts, experience, and knowledge of multiple institutions or consortia, several of which have created the Amazon Alliance for the Reduction of Impacts from Gold Mining.[99] Technical assistance will be provided to identify innovative and technological solutions. A menu of low-cost, environmentally sound alternatives based on recent research on novel materials and technologies for mercury remediation will be compiled in the POM to facilitate selection of the subprojects.

Subcomponent 2.2: Sustainable management and value chains for selected natural resources. This subcomponent will promote pilot sustainable management practices in prioritized sites for selected hydrobiological via subprojects and capacity building activities. This includes the following activities:

(a) Design and implementation of pilot sustainable management plans for selected hydrobiological resources. The Project will support via subprojects the establishment and strengthening of sustainable management plans and value chains for selected NTFPs and vulnlerable/threateaned and migratory fish and freshwater turtle species. To design and implement sustainable management pilots, the project will develop different analysis that will help establish the structure and status of fish species. Such analysis will include: rapid assessments, body length data assessments, larvae sampling coupled with DNA assays, among others. Information will be compared with information from other large tributaries, such as the Peruvian Ucayali and Madre de Dios, or Colombian Caquetá to contribute to a more regional strategy for managing the species. Stress reduction for overfishing and other threats will be achieved via the establishment of fisheries management plans (setting up inter alia fishing quotas, bans, and best practices) in sites along the river basin favoring connectivity and involving threatened/vulnerable species. Results from these activities will be measured via several indicators including GEF core indicator of *Globally over-exploited fisheries moved to more sustainable levels* with baseline and targets to be confirmed in year 1. Participatory management plans for commercial and subsistence fishing will be agreed, building on critical information provided by the project for improved practices and management. Sustainable management of prioritized resources will be guided by management plans that will be designed, strengthened, and implemented in strategic areas of the watershed. The subprojects receiving technical capacity from partner organizations will involve the establishment of management agreements; development of business plans and feasibility analysis involving the private sector and funding alternatives; fulfillment of commercialization requirements; establishment of commercialization routes; marketing strategies; and provision of minor infrastructure or equipment, value-added processing transformation, and technical assistance. Research, technology, and innovation services will be provided for adding value to the selected products. Details will be determined in the POM but selection of subprojects and the species involved will be based on the following criteria: (a) regional level (transnational/watershed) scope involving at least two of the participant countries; (b) contribution on stress reduction and management of pressures on hydrobiological resources with baseline data to measure progress); (c) commercialization opportunities (supply and demand); (d) direct benefits to local populations with emphasis on women and youth (empowerment, income, and employment);[100] and (e) alignment with local processes, including indigenous life plans, that incorporate traditions and ancestral knowledge. In addition, support will be provided to increase productivity, not to extend the area of production. Research, technology, and innovation services will be provided for adding value to the selected products. Experienced institutions will provide technical

[99] The Alliance currently integrates public and CSOs (World Wide Fund for Nature (WWF), Wildlife Conservation Society (WCS), Fundación para la Conservación y el Desarrollo Sostenible (FCDS), Frankfurt Zoological Society (FZS), Gaia Amazonas, Fundação Oswaldo Cruz (FIOCRUZ), Centro de Innovación Científica Amazónica (CINCIA), and the Colombian National Natural Parks Unit) and aims to involve other organizations to conduct joint efforts.

[100] This will be guided by the project's Gender Action Plan as well as experience from executing and partner agencies working with women in the Amazon.

assistance in the organizational, administrative, and planning processes for the different chains. The Project will also aim to facilitate regional business rounds between producer associations and private entrepreneurs to create market conditions with a differential price that reflects their origin and sustainable practices of the selected products.

Fisheries management plans will protect key species including, arawana - *Osteoglossum bicirrhossum*- (red list, vulnerable), pirarucu - *Arapaima gigas*- (vulnerable, CITES) and migratory species including fish species with local and transnational migrations (potentially including inter alia Gilded catfish or dourada -*Brachyplatystoma rousseauxii and* Zebra catfish -*Brachyplatystoma juruense*- and/or black prochilodus -*Prochilodus nigricans*-). Results from these activities will be measured via several indicators including GEF core indicator of *Globally over-exploited fisheries moved to more sustainable levels* with baseline and targets to be confirmed in year 1.

The process toward the establishment of a management plan involves the participatory social and environmental characterization and zoning of the area of intervention, including for the case of fisheries, the identification of the fishing areas, status of the fish population, and identification of strategies that support the establishment of fishing agreements. The management plans will involve the recovery, definition, and agreements of good practices, including those coming from traditional knowledge, for the fishing, storage, and transport stages. Formalization and renewal of fishing associations will be supported when needed, as well as the support to design monitoring mechanisms to ensure compliance to the management plans. The Project will also support the establishment of participatory conservation and sustainable use strategies for turtles (focusing on *Podocnemis unifilis, Podocnemis expansa*, *and Chelonoidis denticulata*). The Project will systematize turtle management experiences in the watershed and analyze, according to biologic, socioeconomic, and normative criteria, the opportunities for improving the conservation and sustainable management of these species. Finally, preliminary prioritized NTFPs include Camu camu (*Myrciaria dubia*), Copaiba (*Copaifera officinalis),* Aguaje (*Mauritia flexuosa),* Andiroba (*Carapa guianensis*), Açai (*Euterpe oleracea)*, honey, resin producer flora, among others, complementing efforts involving water resources.

(b) Small scale alternative livelihoods. The subcomponent will support the development of small alternative livelihood activities that will increase food security (local agricultural plots–chagras, small fish farms with native species, and other livelihood alternative activities) to help compensate the negative effects to their livelihoods as a result of the COVID-19 pandemic.

(c) Capacity building activities for key stakeholders (including, partner public agencies and communities, among others) in natural resources management to improve extension services and participatory monitoring. This will include dialogue and exchange of information and practices by which the project acknowledges the traditional knowledge in the region and which is essential for the basin's cultural and biological diversity.

Component 3. Project Management, Communications, Monitoring and Evaluation

Subcomponent 3.1: Project management, coordination and governance committees. This component will support the meetings and administrative requirements for the RSC and TC to be established and become operational. These committees will provide strategic guidance for coordinated actions, approval of work plans and budget, selection of subprojects, and resolution of potential jurisdictional and intersectoral disagreements, among others. More information is described in the implementation arrangements.

Subcomponent 3.2: Communications strategy. A communications strategy will be designed and implemented across the different components of the Project to ensure that the knowledge generated and compiled reaches target audiences, through appropriate languages and formats, taking into account ethnic and gender considerations, and with the purpose of serving as inputs for planning, management and policy formulation, and decision making. The communications strategy will consist of three lines of action: (a) internal communication, directed at the Project implementation team and the Project partners in each of the countries, with the purpose of keeping them updated on the progress of the different components; (b) community communication, directed at the Project beneficiaries with the purpose of generating ownership of both the Project and the conservation actions in the Putumayo-Içá watershed, and of creating spaces and channels of communication managed by and for the local communities that allow for socializing the Project's progress. The process will be participatory, inclusive, and sensitive to gender and cultural issues and will seek to build capacity to beneficiaries in communication techniques and tools to better access project related information and convey their activities and processes; and (c) external communication, directed to a universal public directly related or not to the Project, such as local communities and other users of the watershed, the private sector, government institutions, among others, with the objectives of disseminating information to raise awareness on key issues such as the importance of water resources and their sustainable management, associated ecosystems, traditional knowledge, impacts on habitats and human health due to water contamination by mercury and other pollutants, among other aspects. The website designed during project preparation will continue and be improved as a key tool to gather and share key information from the Project and its partners.

Subcomponent 3.3: Project Monitoring and Environmental/Social standards compliance. The PMU in collaboration with executing partners will put in place a system to track project results for all project components as a cross cutting activity, and to incorporate lessons towards adaptive management. This subcomponent will also support activities towards compliance of environmental and social standards, including the establishment of a culturally appropriate grievance redress mechanism. The subcomponent will also include project audits, evaluations and supervision missions

Lessons Learned

The Project draws on lessons learned from several WB projects focused on the sustainable management of resources in transboundary basins worldwide[101] and particularly in the Amazon basin, as well as other GEF-financed projects and those implemented by WCS and government agencies. Given the participatory process for its design, the Project also incorporates lessons and experiences from partner agencies, including those from the WCS-led Amazon Waters Initiative (AWI)[102] established to address the threats to the aquatic ecosystems of the Amazon. Some of the key lessons are as follows:

(a) A shared vision is critical for effective joint actions in the basin, collaboration with governments and implementing agencies from multiple sectors and other stakeholders, requiring adaptive management, flexibility, political know-how, clear stakeholders' roles, and valuing each other's perspective. Promoting engagement at the regional level needs to bear in mind the sovereign rights of each country to allow collaborative efforts that address threats that cross borders and generate impacts in multiple jurisdictions, and from upstream to downstream along

[101] Including lessons collected in the 2015 WB's Working Note Watershed Management Portfolio Review (FY1990–FY2015), GEF-financed projects in the Lake Victoria, Volta River basin, Sava and Drina Rivers, among others, and GEF's December 2020, *Evaluation of GEF Interventions in the Artisanal and Small-Scale Gold Mining Sector* Document. The Project design also builds on the experience from the Alliance for the Reduction of Impacts from Gold Mining and their strategies to reduce or eliminate illegal mining and/or its impacts, as well as WCS's work with the Critical Ecosystem Partnership Facility (CEPF) to reduce the impact of mining in the Tropical Andes. Further lessons will be incorporated into the Project's implementation systematized from its own activities, lessons from partners, and as part of the IWLearn platform.
[102] http://amazonwaters.org/the-initiative/.

rivers. Ensuring strong political support, national/subnational government ownership and relevance to government priorities, is a necessary requirement for project success.

(b) It is strategically vital to incorporate the diversity of knowledge and perspectives in decision-making processes. The articulation of indigenous and local knowledge and scientific knowledge is not only valuable to better understand the basin, it is also needed to recognize the contributions and rights of Indigenous Peoples and local communities in planning and other decision-making processes affecting the future of the basin. The Project will incorporate proven methodologies in the region involving active participation of the local communities.[103]

(c) Establishing foundations for trustful and cooperative relationships is essential for a regional project. Engaging with the multiple stakeholders active in the Amazon maximizes impact by finding synergies and avoiding overlaps.

(d) Transforming fisheries (and in general renewable natural resources) and harnessing their potential for growth is a long-term process. Social change and reforms in the fisheries sector and the subsequent recovery of over-fished stocks requires an extended time horizon. Such a process requires continuous dialogue and capacity building among stakeholders to maximize impact, learning, and sustainability. The Project has been designed to account for these time horizons and build on existing experiences.

(e) Putting in place adaptive management as the process for deliberately learning from management actions with the intent to improve subsequent management practices. The Project will design strategies based on the assessment of the specific issues and information collected, put them in practice in the pilot activities, monitor results, and gather lessons and adjust strategies accordingly.[104]

Innovation

Even though there have been several projects and initiatives for PA systems, mainstreaming of biodiversity, and natural resource management, the Project will include a suite of investments to be coordinated regionally across the four countries in this basin. Brazil and Ecuador will join innovative efforts of coordinated action, planning, and dialogue that have been initiated in this particular basin between Peru and Colombia toward a shared vision that also aligns with cultural tradition. The Project has been identified by all four governments as a pilot for regional integrated watershed management with the potential to generate lessons that can be scaled up in other Amazon basins. No similar effort has happened in a transboundary area that includes four of the Amazon countries. Promoting knowledge sharing of innovative practices among countries and other partners will raise awareness, commitment, and buy-in to incorporate an integrated watershed approach. Innovation, sustainability, and capacity to be scaled up will be among the criteria to select the mitigation, remediation, and restoration pilot sub-projects financed through Component 2. Other innovations include:

(a) Technological innovations: During project design and with support from the Disruptive Technology group at the World Bank, new ideas to incorporate technological innovations have been included. A spatial database for the basin was prepared and linked to the project's webpage (www.cuencaputumayoica.com) as a one-stop-shop for geospatial data and datasets that provide open access information about the basin. This, together with other platforms that the project will ensure interoperability, will become accessible in the long term by the relevant institutions. The Project will consider technological and innovative participatory tools for a data system that will collect, collate, organize and promptly analyze needed information and make it accessible to the diverse audience for better decision making related to IWRM. These innovative participatory tools include customized digital systems using cost-free, low connectivity

[103] These include the research-action-participation methodology (IAP for its name in Spanish: *Investigacion-Accion-Participacion*) that facilitates the integration of traditional and scientific knowledge as implemented in the GEF-financed project Mainstreaming Traditional Knowledge Associated with Agrobiodiversity in Colombian Agroecosystems.

[104] This lesson comes from the experience from the GEF-financed TDA/SAP-Amazon approach.

demand, open-source tools and hand-held devices to collect granular geo-tagged data that feeds into interactive dashboards and web maps. In addition, the Project was selected as one pilot in the World Bank portfolio to have the executing agency and government partners receive capacity building in remote participatory monitoring methods using tools like Kobotoolbox. The Project will develop and use online applications and smartphones for community-based monitoring (in partnership with WCS Citizen Science for the Amazon). In addition, the Project will also analyze the feasibility and further pilot potential agrotechnology systems for vegetable gardens and fisheries (following on the suggestion from the Amazon level Strategic Action Plan). Finally, WCS is a partner of the Artisanal Mining Grand Challenge, which seeks and recognizes innovations that improve the environmental and social outcomes of artisanal and small-scale gold mining (ASGM) in the Amazon region. The innovations that demonstrate to be measurable, and with an impact on reducing, mitigating, or eliminating harm to water resources, soil, biodiversity, and/or human health and well-being, will be promoted for the Putumayo-Icà basin. Other technological innovations to be used to facilitate harmonized action along the four countries involved include SMART (Spatial Monitoring and Reporting Tool) and Wildlife Insights (platform to maximize the potential of camera trap, already being piloted in the Amazon with GEF-ASL support).

(b) Business model innovations: Promoting value chains in the Amazon with products coming from remote areas and limited distribution systems will require innovation and scaling up of lessons from other successful business models and entrepreneurship forms. The pilot subprojects to strengthen the value chain of selected freshwater products will be selected based on their capacity to be sustainable, innovative, and scalable at the regional level. Innovations have already been discussed with private sector partners such as the National Business Association of Colombia (ANDI) who has prioritized the Putumayo-Içá region to channel private support due to its high conservation value and will be a key partner providing entrepreneurial assistance and business opportunities. Also, the project will take advantage of the ongoing experience of several initiatives in the region (including Amazon 4.0 project) that combine the natural wealth of the Amazonian environment with traditional forms of knowledge and cutting-edge technologies (biotech, digital, artificial intelligence etc.), to promote sustainable economic and social development, grounded in respect for biodiversity and local traditions and lifestyles. Collaboration will be sought with recently approved GCF projects that aim to support private sector led business bioeconomy development.

(c) Institutional innovation: The Program will support innovative ways to foster changes in informal institutions and strengthen multistakeholder governance structures. The Project will bring in thematic working groups and diverse institutions and actors, allowing the voices of the indigenous communities and most vulnerable to be heard in decision-making spaces, mainly women, youth and elders. While respecting stakeholder engagement approaches, the Project will also promote the recovery and exchange of traditions that for centuries have protected forests and rivers. Innovative changes in formal institutions will be mostly achieved through promoting multisectoral coordination to jointly address issues of common concern, including illegal mining and others. Finally, the project will promote the adoption of new methodologies to improve efficiency in operation, communication and coordination between institutions. It will also assess the political and institutional feasibility of establishing a single governance structure to guide IWRM in the basin.

(d) Policy innovation: The Project will promote analysis of national policies around issues of common concern to foster dialogue among stakeholders and learning and harmonization of activities developed around such policies that impact the region; mainstream environmental concerns into sectoral policies across countries, to build sustainability into government interventions; and strengthen new policies and frameworks that support integrated watershed management. By supporting the implementation of the SAP-Amazon at the appropriate specific basin scale, the Project will generate information and recommendations to improve existing legal and institutional frameworks to help strengthen IWRM in the specific context of this basin.

Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No

Summary of Assessment of Environmental and Social Risks and Impacts

The Environmental risk and impact have been determined as Substantial under the WB ESF. The project has environmental and social objectives, and the impacts are deemed to be positive, as biodiversity conservation efforts will be coupled with measures to mitigate and prevent water pollution from mercury.

Despite the environmentally positive design objectives, the Substantial risk is due to (a) the distant and vulnerable sites (sensitive areas) where the Project will be developed; (b) the complexity and variety of organizations and institutions present in the area, including various national, provincial, and local governments, environmental authorities, national PA administrations, indigenous authorities, national and international companies, and NGOs, all of which produce different kinds of information; (c) the potential pilot remediation methods for mercury contamination, which may require a good degree of expertise to avoid collateral environmental damages in the contaminated sites and along the transportation and final disposal areas; (d) despite its institutional capacity and work with experienced research entities, WCS lacks experience with remediation techniques and WB's ESF in a WB funded project; (e) the contextual risks related to the characteristic Amazon periodic flood regime and climate change effects; and (f) the potential risks of non-sustainable natural resources use. These risks and impacts are temporary and/or reversible, at a local level, and can be mitigated through a series of activities included in an Environmental and Social Management Framework (ESMF). As for the risks related to mercury remediation, these are expected to be lower in magnitude as compared to the mercury pollution levels present and future threats. The specific technique to be applied has not been selected yet, and the subprojects will only be selected during project implementation. Selected techniques will be those that: (i) minimize ordinary waste and hazardous waste production of the remediation alternative; (ii) do not consider remediation of mercury by cyanidation; (iii) demonstrate to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them; (iv) avoid activities relating to, or in preparation for, exploitation of any plant or animal species use in the remediation techniques that involve the significant conversion or degradation of natural or critical habitats; (v) avoid the introduction or promotion of non-native invasive species; and (vi) avoid significant conversion or degradation of critical or other natural habitats. Once these subprojects are selected, the environmental risk will be subject to a new evaluation. To address and mitigate potential risks, the implementing agency is drafting an ESMF to provide (a) a characterization of potential contextual, environmental and social risks and impacts for all project activities; (b) applicable legislation; (c) generic management and mitigation measures for likely impacts associated with the Project activities, particularly regarding natural resource productive activities and the pollution bioremediation activities; (d) implementation arrangements, structural organization, capacity-building measures, and budget; (e) the environmental control and follow-up measures for the Project.

Social Risks have been identified as Substantial. The Project activities are designed to generate positive results for the population's wellbeing and natural resources conservation. The Project will also generate social benefits in critical areas for the survival of local communities such as food security, health, the recovery of traditional knowledge, and at the same time it will have an impact on better practices for conserving biodiversity and ecosystem resilience over generations. The Project doesn't fund major infrastructure or activities with adverse impacts on physical, cultural, and/or archaeological sites or that lead to resettlement, involuntary displacement, or restrictions affecting communities' livelihoods. Despite these benefits, substantial social risks have been identified as follows: (a) in the Project areas, conflict and social unrest occurs; these are not new to the region and despite difficult circumstances, projects on the ground have been implemented and outcomes have been achieved; (b) the variety of organizations and institutions with a presence in the area (national, regional, and local governments, international and local NGOs, Indigenous Peoples, social organizations, among others) presents a complexity to promote dialogue and joint action; and (c) the vulnerability of social groups (especially Indigenous Peoples and women) may increase after the COVID-19 pandemic. In terms of mitigation measures, the Project will use a highly participatory approach that emphasizes community consensus and participation in managing the basin's resources. The Project will pay particular attention to the impacts and benefits for Indigenous Peoples and vulnerable social groups, particularly women; specific measures to reduce identified gender gaps, the needs of the most vulnerable, and indicators to monitor them will be proposed. WCS has a long history in this region and is recognized by local communities, which is why they are expected to have the capacity to prepare and manage the necessary instruments to mitigate social risk, including an Indigenous Peoples Planning Framework, a Process Framework, an SEP, and a Gender Plan. The Project implementation arrangements also include governance structures with participation of different institutions both public and private that will support informed and inclusive decision making and adaptive management.

In terms of climate change, as per GEF requirements, a climate risk screening was developed. This screening assessment has been included in the project documents and a summary in Annex 1, considering changes in variability and seasonality due to climate change increase environmental threats and their severity. The Project area does not suffer from droughts or dry periods and rainfall occurs at different levels along the year with total annual precipitation of approximately 3,300 mm along the basin An analysis of climate variables (including annual average temperatures, annual average precipitation levels, likelihood of encountering severe drought) for the Putumayo-Içá basin result in a moderate risk rating. The Project will enhance climate change resilience via better understanding of climate scenarios, incorporating climate change into planning instruments, and promoting climate smart sustainable practices.

E. Implementation

Institutional and Implementation Arrangements

The Project will be executed by the WCS in coordination with the Ministries of Environment of Colombia, Ecuador, and Peru and the Secretary of the Environment of the State of Amazonas in Brazil. The project will involve the active participation of other relevant public national and subnational agencies and CSOs. The POM, to be prepared by the time of the Project's effectiveness, will include details on the specific institutional arrangements, and roles and responsibilities of the different parties. The Project's governance structure comprises: (a) the RSC as the highest decision-making authority, in charge of project general oversight and direction and composed of the Ministries of Environment from Colombia, Ecuador and Peru (represented by the Minister or their delegate and the GEF Operational Focal Point -OFP), SEMA for Brazil (the project's focal point and technical delegate)[105] and WCS; (b) the TC that will

[105] The operational focal point will coincide with the GEF operational focal point for each country if determined by Colombia, Ecuador and Peru

provide strategic and technical orientation for project design, will be composed of representatives from scientific/technical units of the governmental entities whose jurisdiction overlaps the Putumayo-Içá basin and whose guidance will be enriched by the thematic working groups, experts invited and national level multi-stakeholder discussions; and (c) the Project Management and Support Unit (PMU) responding to the RSC and in charge of the Project's operational, technical, and administrative management. The PMU will be integrated by technical and administrative staff including a Project Director, a communications specialist, coordinators or specialists for each major thematic area, as well as social and environmental specialists. The administrative/operational staff will consist of a grant manager, procurement specialist, M&E specialist. In addition, there will be country engagement teams (CET) providing technical, logistical and administrative support as well as in-country coordination with regular communication with government representatives, and M&E.

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if so determined by the Ministry of Environment or a representative of its office. For SEMA as the institution in charge as determined by the Government of Brazil, the two representatives (technical and operational) will be from this institution.

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