REDD+ PROJECT PUEBLOS INDÍGENAS RESGUARDANDO LA SELVA

COINPA, CIMPUM, AIZA, AND AZICATCH

Together taking care of the fecund rainforest:

land that unites!

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1 PROJECT DETAILS

1.1 Summary Description of the Project

The REDD+ Project Pueblos Indígenas Resguardando la Selva (hereinafter, the REDD+ Project) is a community initiative of four indigenous associations of the Predio Putumayo Indigenous Reserve, whose purpose is the certification of actions related to the reduction of carbon emissions resulting from unplanned deforestation and forest degradation in around 3.6 million ha of the Amazon rainforest.

The Associations of Traditional Indigenous Authorities (AATI, as per its acronym in Spanish) currently involved in the project are the Indigenous Council of Puerto Alegría Association (COINPA), the Major Indigenous Council of the United Murui People (CIMPUM), the Association of Indigenous Authorities of the Puerto Arica Zone (AIZA), and the Indigenous Zonal Association of Cabildos and Traditional Authorities of La Chorrera (AZICATCH). All of them are present in the Predio Putumayo Reserve, in the department of Amazonas (Colombia).

The most widespread alternative land uses include subsistence farming and selective extraction of timber and other non-timber forest products. These two scenarios occur without exception almost everywhere in the Predio Putumayo Reserve, even under adverse biophysical conditions such as floodable forests, clayey or unstable soils, and unconsolidated sediment deposits from rivers or other minor watercourses. The project activities aim to preserve the traditionally sustainable relationship of indigenous peoples with the forest and to limit, manage, or improve other land uses, thereby reducing the impact of human activities on the natural environment, allowing for regeneration, and maintaining the structure and functionality of the forest. Similarly, the project addresses other dimensions of the socioeconomic development of indigenous peoples and climate change, which, although not directly related to land use, have an influence on it.

The project started on December 31, 2016, and is expected to have a total duration of 30 years. During this period, the reduction of 47.1 million tCO_2e is expected through the implementation of activities grouped into six strategic lines according to the life plans of the four AATI. Two lines will be formalized under VCS: (1) forests and conservation and (2) sustainable economy and food and water sovereignty. Three other strategic lines will be formalized under the Climate, Community, and Biodiversity (CCB) standard before the second Verified Carbon Standard (VCS) verification and correspond to ethno-education and indigenous languages, exchange of knowledge and new insights, and indigenous women and family. The line of self-government and indigenous autonomy intersects the VCS and CCB components and, for the moment, is managed through the implementation of the Participation, Communication, and Knowledge Appropriation Strategy (EPCAC, as per its acronym in Spanish), which deals with the different spaces for participation and communication among all the communities of the proponent AATI.

In the first monitoring period, a net reduction of 5,288,947 tCO2e and an annual average of 1,322,237 tCO2e/year were achieved. The activities implemented in the first (retroactive) monitoring period reflected an active process of developing local projects and actions as the first mitigation efforts against deforestation and forest degradation. These actions had impacts on the communities, mainly related to the improvement of infrastructure for mobility and adaptation to the effects of climate change such as flooding events; the improvement of housing, sports, and cultural spaces; progress in strengthening the community's justice system and self-government; and the promotion and participation in education and capacity building in the sustainable use and management of natural resources. During the monitoring period, the Co-managers Program was also initiated. These co-managers are leaders of the indigenous communities of the territory selected by the traditional authorities of the proponent AATI to work jointly with them in the formulation of the project and maintain continuous communication between the organizations and other stakeholders.

Finally, the project area is framed within the region of the Vision Amazonia Program: a strategy of the government of Colombia that seeks to promote a low deforestation development model in the Colombian Amazonia as part of national efforts against climate change.

1.2 Sectoral Scope and Project Type

The REDD+ Project is developed following the requirements of the agriculture, forestry, and other land use (AFOLU) projects. It is classified as an avoiding unplanned deforestation and degradation (AUDD) projects, as well as reducing emissions from deforestation and degradation (REDD) project. It seeks to reduce deforestation and forest degradation and promote the conservation of carbon stocks associated with above- and below-ground forest biomass, activities in accordance with the REDD+ actions defined by the United Nations Framework Convention on Climate Change (UNFCCC) in the paragraph 70 of Decision 1/CP.16.

Likewise, this REDD+ Project is part of the mitigation actions in the land use, land-use change, and forestry (LULUCF) sector, which are being carried out at the regional and national levels within the framework of the National Development Plan 2018-2022, the Colombian Low Carbon Development Strategy, the National REDD+ Strategy (ENREDD+), and the principles and objectives of the National Policy on Climate Change and the National Forestry Policy.

The project design was structured as grouped project to allow for the expansion of AUDD activity into different forest areas within the territory historically controlled by the four participating AATI's as a matter of priority.

1.3 Project Eligibility

The REDD+ Project meets the eligibility criteria for all AFOLU projects developed under the VCS program in its version 4.2 and the guidelines for the addition of new instances, as follows:

- The additionality criteria and baseline scenarios are homogeneous for all the initial instances of the project, according to the methodological guidelines of the VT0001 tool, version 3.0.

- The eligibility criteria will remain unchanged between the instances covered in the first verification and those added later. The eligible forest will correspond to forest cover with a minimum density of 30%, a minimum canopy height of 5 m and a minimum area of 1 ha.
- The monitoring and reporting procedure was designed to be broadly applied in the lower Colombian Amazon sub-region. This will ensure the unequivocal inclusion of new instances in future verification events.

The geographical boundary of the grouped project corresponds to the Predio Putumayo Indigenous Reserve, which is also included in the lower Colombian Amazon.

- The REDD+ Project and its activities will not lead to the violation of any law, regardless of whether the law is enforced or not.
- The REDD+ Project activities do not consider conservation, drainage, or hydrological degradation of native ecosystems to generate greenhouse gas (GHG) credits.
- The REDD+ Project certifies the decrease of net GHG emissions from reducing unplanned deforestation or forest degradation, activities covered by the scope of the VCS program.
- The REDD+ Project does not include carbon footprint assessments or carbon neutrality declarations.

Regarding the eligibility of forest areas for the generation of tradable emission reductions, the initial instance of the REDD+ Project is in line with the definition of forest submitted by Colombia to the UNFCCC for the purposes of ENREDD+ and particularly for the construction of the National Forest Reference Emission Level (FREL) (MADS & IDEAM, 2019, 2020). In addition, the areas were covered by forests for at least ten years prior to the start of the project.

With the forest/non-forest layers of the Forest and Carbon Monitoring System (SMByC, as per its acronym in Spanish) at 1:100,000 scale, a cartographic cross-mapping of the 2005-2012-2016 layers was performed. In this crossing, the information was reclassified considering eligible areas those areas that remained as stable forest and ineligible areas those areas with no stable forest or with gains or losses of forest cover in the same period.

The details of the sources of information and the cartographic processing carried out for this eligibility assessment are as follows:

1.3.1 Baseline information

The eligibility analysis in the project area for the 2005-2012-2016 period was performed by pre-processing and processing post-processing the forest/non-forest layers of the SMByC at a 30-m resolution. The pre-processing procedure consisted in guaranteeing for each raster year a spatial resolution of 30 m, equal number of rows and columns and a geometric correction in geographical coordinates GCS WGS 1984 (EPSG 4326), and finally in the processing stage, in vector format they are cut to the extent of the project boundaries, the areas smaller than 1 ha (minimum mapping unit) are cleaned, the spatial data are projected to the MAGNA Colombia Bogotá (EPSG 3116) planar coordinate system, and the consistency of the multi-temporal data of the SMByC forest cover classification result is checked by visual inspection; combining the cut layers; and assigning the output values for the forest

(1), non-forest (2), and no-data (3) categories to the forest/non-forest layers corresponding to the years 2005 to 2016 (eleven-year historical reference period). These layers come from the principal component analysis classification of SPOT, Ikonos, and QuickBird images, among others, of high and very high spatial, spectral, and radiometric resolution, to meet a spatial resolution of maximum 10 m, cloud cover of 20-50%, and quality indicator higher than seven (Galindo et al., 2014) (Table 1).

Table 1. Cartographic information used to delimit the eligible areas.

Layer	Spatial resolution	Minimum mapping unit	Geographical boundaries		Source data
			Latitude	Longitude	
Forest/non-forest cover. Fine resolution. Republic of Colombia. Year 2005.	30 m	1 ha	12°30.7' N – 4°13.5' S	66°01.4' W – 79°50.8' W	Landsat TM and ETM+ satellite images from the 2005 period
Forest/non-forest cover. Fine resolution. Republic of Colombia. Year 2012.	30 m	1 ha	12°30.7' N – 4°13.5' S	66°01.4' W – 79°50.8' W	Landsat TM and ETM+ satellite images from the 2012 period
Forest/non-forest cover. Fine resolution. Republic of Colombia. Year 2016.	30 m	1 ha	13°24.7' N – 4°14.7' S	66°39.4' W – 81°47.7' W	Landsat TM and ETM+ satellite images from the 2016

Source: Environmental Information System for Colombia (SIAC, as per its acronym in Spanish) – Metadata Management.

1.3.2 Cartographic processing

As part of the analysis and final quantification of gross deforestation, it is necessary to consider that the no-data area (1.4% of the project area) is excluded and, therefore, the recorded areas may be slightly smaller than those that correspond to forest or non-forest on the ground.

The no-data category included all pixels that could not be interpreted in the construction of the forest/non-forest raster, due to the presence of clouds, cloud shadows or other factors (damage to sensor), at the time the SMByC created the layers for each of the periods, and it also included the areas that were not analyzed by the SMByC due to the lack of fit between the administrative boundary layers used.

The steps below were followed to obtain the eligible area of the project:

- Clipping of layers from the Colombian Institute of Hydrology, Meteorology, and Environmental Studies (abbreviated IDEAM in Spanish) with the project area boundaries using the *Extraction by Mask* function in ArcGIS.
- Combination of the raster layers using the *Combine* function in ArcGIS.

- Detection of the pixels with changes in the forest (1) and non-forest (2) categories and of the no-data (3) pixels resulting from the sum of the original layers.
- Construction of the attribute table with the stable forest (1), stable non-forest (2), no-data (3) and deforestation (4), categories.
- Identify the accumulated non-data surfaces and apply them to the entire historical baseline.
- Elimination of isolated polygons smaller than 1 ha, using the *Eliminate* function in ArcGIS.

The resulting raster information was post-processed by changing the projection system to MAGNA Colombia Bogotá (EPSG 3116); transforming the resulting layer (raster) to vector format; constructing an attribute table with the eligible (stable forest), not eligible (stable non-forest and deforestation), and no-data categories; trimming the final eligibility layer with the boundaries of the project area; and quantifying the eligible forest areas for the period between January 1, 2006, and December 31, 2016.

Deforestation was understood as any change in areas classified as forest in 2005 and non-forest in subsequent years. All procedures were performed on ArcGIS, version 10.5.

1.3.3 Results

A total of 3,555,041 ha of eligible forest was found, corresponding to 98.5% of the project area as of December 31, 2016 (Table 2).

Table 2. Forest eligibility as of December 31, 2016.

Category	Area	
	Hectares	%
Eligible	3,555,041	98.5
Not eligible	3,098	0.1
No data	52,260	1.4
Total	3,610,399	100.0

Source: prepared by South Pole (2021).

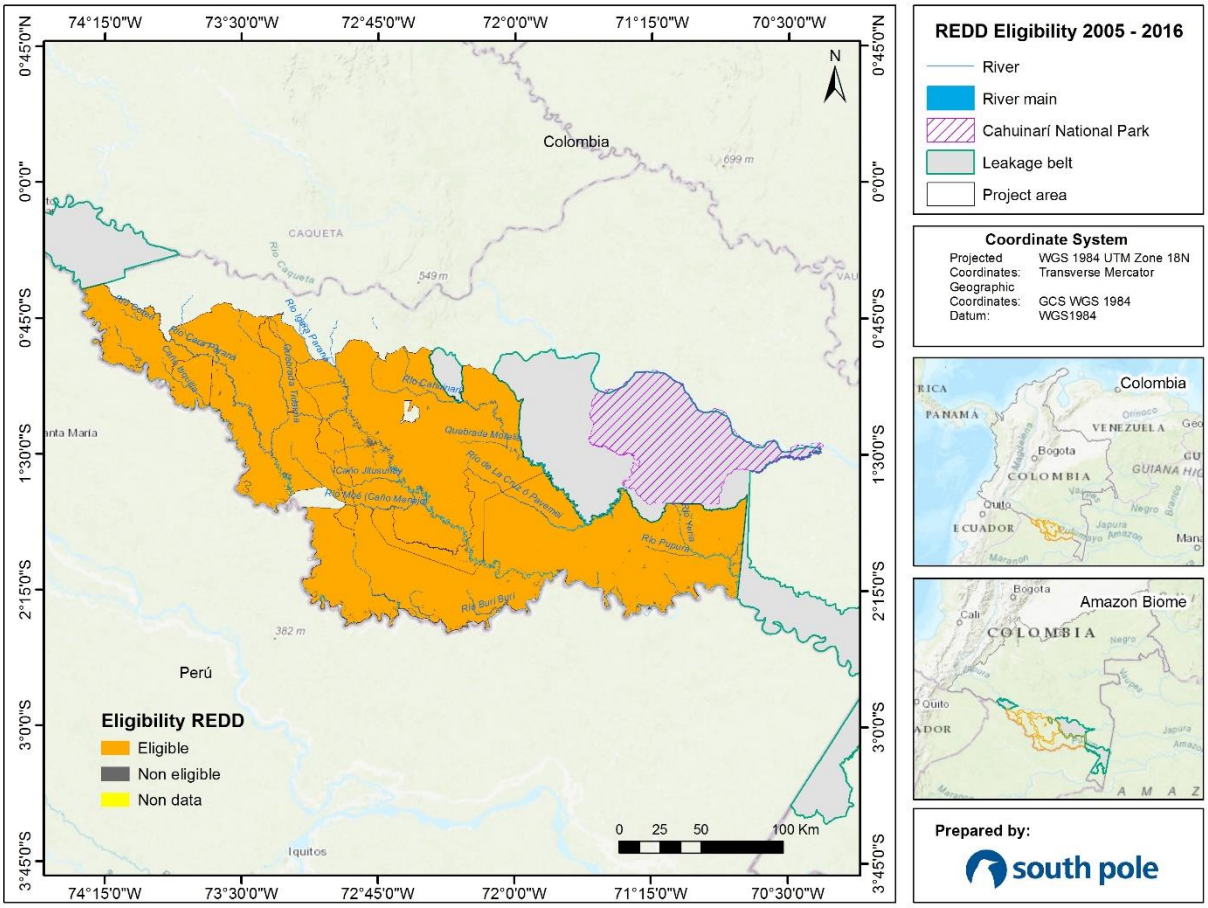


Figure 1. Forest eligibility map as of December 31, 2016.

Source: prepared by South Pole (2021).

1.4 Project Design

The REDD+ Project has been designed to initially include the first instance of activities corresponding to the territories of four AATI: COINPA, CIMPUM, AIZA, and AZICATCH, which are present in the Predio Putumayo Reserve, in the department of Amazonas (Colombia). The project considers the possible inclusion of additional instances within the Predio Putumayo Reserve during its crediting period.

The project was structured as a grouped project to allow for the expansion of the AUDD activity to different forest areas within the territory historically controlled by the four participating AATI. These areas share baseline and additionality characteristics and will be included after the first project validation and verification event, once the territorial management agreements are ratified with other indigenous groups neighboring the same Predio Putumayo Reserve and the Puerto Sábalo and Los Monos Indigenous Reserve and with the management of the Cahuinarí National Natural Park.

Figure 2 shows the geographical boundaries of the areas that make up the first instance and the potential expansion area of the project.

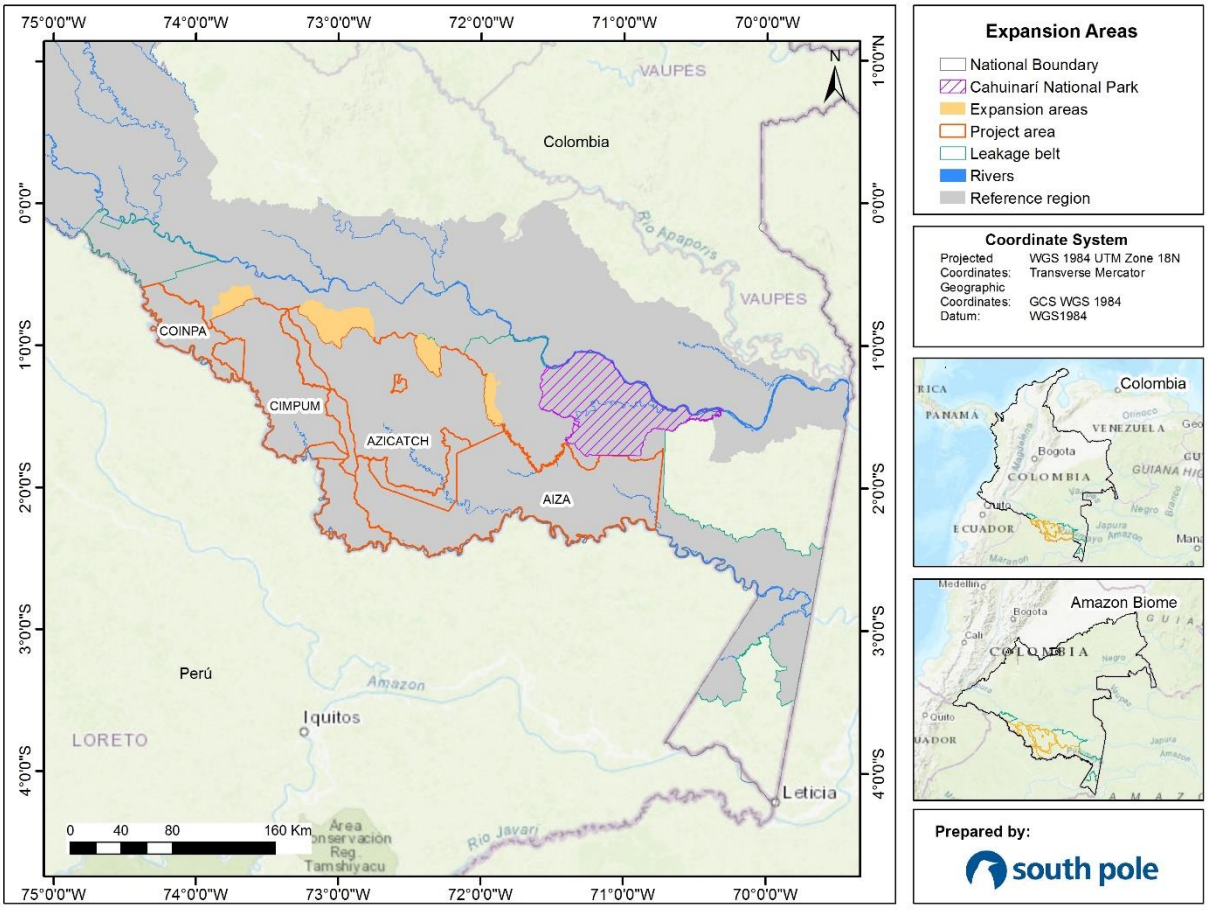


Figure 2. First instance of the project and expansion area.

Source: prepared by South Pole (2021).

Eligibility criteria for the grouped approach

About the eligibility criteria for the grouped design, prior to the inclusion of new instances, the project will consider, in addition to the criteria described in section 1.3, the following:

- The project must meet the applicability criteria of the methodology VCS VM0015 for REDD+ activities in AUD projects (see section 3.2).
- The start date of the new instances must be after December 31, 2016, considering both the start date of the first instance and the maximum retroactivity period allowed by the Standard (5 years) (see sections 1.8 and 1.9).
- The project activities for the new instances must fit in one of the six strategic lines defined for the first instance (see section 1.11.2).
- The new instances must be articulated within the governance structure proposed for the project, including the endorsement of the Indigenous Association (AATI) that legally represents its territorial jurisdiction.
- The project proponents must guarantee that they have control over the area of the new instance by means of written support that shows the results of the ratification of agreements on territorial management carried out with neighboring organizations.
- If there are communities in the new instances, they must be subject to dissemination and participatory construction processes within the framework of the EPCAC, like those carried out for the first instance. In this way, free, prior, and informed consent will be ensured (see section 2.2).

The new instances will be validated as part of one of the future verifications of the first four instances, if they have sufficient information to demonstrate compliance with the eligibility criteria mentioned above.

1.5 Project Proponent

Organization name	*Asociación Consejo Indígena de Puerto Alegría* [Indigenous Council of Puerto Alegría Association] (COINPA)
Contact person	Edgar Ricardo Sanda
Title	Legal representative
Address	Puerto Alegría, Amazonas, Colombia
Telephone	+57 3138501281
Email	aati.coinpa@gmail.com; cocaredd@gmail.com

Organization name	*Consejo Indígena Mayor del Pueblo Murui* [Major Indigenous Council of the United Murui People] (CIMPUM)
Contact person	Germinio Biguidima
Title	Legal representative
Address	Comunidad San José, Amazonas, Colombia
Telephone	+57 3227023557
Email	cimpum2024@gmail.com; cocaredd@gmail.com

Organization name	*Asociación de Autoridades Indígenas de la Zona de Puerto Arica* [Association of Indigenous Authorities of the Puerto Arica Zone] (AIZA)
Contact person	Abel Márquez Tobar
Title	General coordinator
Address	Puerto Arica, Amazonas, Colombia
Telephone	+57 3123962762
Email	aizaorganizacionindigena@gmail.com; cocaredd@gmail.com

Organization name	*Asociación Zonal Indígena de Cabildos y Autoridades Tradicionales de la Chorrera* [Indigenous Zonal Association of Cabildos and Traditional Authorities of La Chorrera] (AZICATCH)
Contact person	Manuel Joinama
Title	Legal representative
Address	La Chorrera, Amazonas, Colombia
Telephone	+57 3222518602
Email	chorreraazicatch2017@gmail.com; cocaredd@gmail.com

1.6 Other Entities Involved in the Project

Organization name	South Pole Carbon Asset Management S.A.S. (South Pole)
Role in the project	South Pole is a globally active carbon-project consultant with a successful track record in forest carbon projects. Its roles in the project include: • Supporting the carbon certification of the project. • Promoting and supporting the implementation of the EPCAC. • Support the operation, monitoring, and maintenance of the project by providing advice in the application of methodologies for the accounting of GHG reductions; field implementation of activities; drafting of the project design document (PDD); determination and analysis of the baseline; development of measurement, reporting, and verification plans; and registration, verification, and issuance processes. • Providing advice on audit processes for validation and verification and certification with a valid certification standard or program. • Trading the carbon credits generated by the project.
Contact person	NBS Climate Projects Team, LATAM
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1.7 Ownership

1.7.1 Land tenure conditions and land use rights

The land is part of the Predio Putumayo Indigenous Reserve in the department of Amazonas (Colombia), which, as a reserve, constitutes a special legal and socio-political institution made up of indigenous communities that have a collective ownership title and manage the territory according to the organization of the indigenous jurisdiction, cultural guidelines, and traditions. Therefore, the Predio Putumayo Indigenous Reserve is the materialization and fulfillment of the provisions of Article 14 of Law 21 of 1991, which recognizes the indigenous peoples' right to ownership and possession of the lands they traditionally occupy.

The Predio Putumayo Indigenous Reserve was constituted on April 5, 1988, by the Colombian Institute for Agrarian Reform (INCORA, as per its acronym in Spanish), today the Colombian Institute for Rural Development (INCODER, as per its acronym in Spanish), and was granted an extension of 5,818,702 ha and 5,000 m^2. However, Agreement 105 dated March 29, 2007, awarded a property known as La Chorrera, acquired in liquidation by INCODER from Caja Agraria, thus expanding the reserve to a final area of 5,819,505 ha. In this way, the Resolutions that prove the land tenure and the land use rights of the Predio Putumayo Reserve are as follows:

- Creation: Resolution 030 dated April 6, 1988.
- Expansion: Resolution 057 dated September 04, 1989.
- Certification: Resolution 1947 dated September 29, 2006.
- Clarification: Resolution 0105 dated March 28, 2007.

In accordance with Articles 329 and 330 of the Colombian Constitution of 1991, the indigenous authorities are competent and independent to govern their territories and freely manage their natural resources, although their right to use and enjoy the forest resources in the territory is restricted by the obligation to comply with the ecological function of the ownership; that is, they must be in charge of the protection and preserve of the renewable natural resources based on the uses, customs, and culture of the communities.

Colombian law recognizes indigenous persons and communities as collective subjects with fundamental rights, legally and extrajudicially represented by their traditional authorities. These correspond to the members of the communities who exercise, within the structure of the respective culture, a power of organization, government, administration, and social control.

The indigenous peoples of the Predio Putumayo Reserve are represented, at the national and international levels, by the Organization of Indigenous Peoples of the Colombian Amazonia (OPIAC, as per its acronym in Spanish). At the departmental level, these peoples do not have an organization as peoples of the other departments do; therefore, local government structures have been strengthened on the legal figure of the AATI, registered with the Colombian Ministry of the Interior. This figure constitutes the main administrative and political axis recognized in the indigenous peoples while the establishment of the indigenous territorial entities takes place in the region. The AATI are special public entities that are constituted as organizational and political subjects and have constitutional origins in the provisional Article 56, as a tool to promote the organization and administration of the indigenous territories. The AATI are recognized as organizations of indigenous representation in accordance with Decree 1088 of 1993.

Additionally, the cabildo figure constitutes the basic unit of community distribution and its functions include being a means of interrelation with external agents (public bodies, private companies, NGOs, etc.). It is also responsible for channeling, executing, and enforcing all actions statutorily agreed upon by the communities that are contemplated and in accordance with the stipulations of the life plan of each AATI.

1.7.2 Agreements with owners, possessors, and occupants of the project area

The four AATI participating in the project and South Pole signed agreements for the purchase of emission reductions generated by the REDD+ Project within each of their territories (Table 3). These documents stipulate the general terms and conditions that apply to the development of the project (from feasibility to verification) and the subsequent purchase of the emission reductions that were agreed upon by the parties. The agreements also specify the activities that will be developed by each of the parties, regarding the formulation and implementation of the project during the crediting period, and the subsequent responsibilities related to the purchase and sale of the verified emission reduction (VER) units.

The aforementioned documents were drafted and discussed with representatives of the communities of the four associations and were subsequently signed by legal representatives or general coordinators on duty.

Table 3. Agreements with each AATI for the project formulation and validation/verification.

AATI	Agreement	AATI representative	Date
COINPA	Puerto Alegría REDD+ Emission Reduction Purchase Contract	Edgar Ricardo Sanda, legal representative	March 27, 2019
CIMPUM	REDD+ Emission Reduction Purchase Contract of the Major Indigenous Council of the United Murui People	Jose Achin Guetty, legal representative	November 29, 2019
AIZA	REDD+ Emission Reduction Purchase Contract of the Association of Indigenous Authorities of the Puerto Arica Zone	Abél Marquez Tobar, general coordinator	November 27, 2019
AZICATCH	La Chorrera REDD+ Emission Reduction Purchase Contract	Bartolome Attama Toikemuy, legal representative	December 3, 2019

Source: prepared by South Pole (2020).

1.8 Project Start Date

The REDD+ Project is a retroactive initiative that began activities on December 31, 2016. This date was chosen taking the following into account:

- Resolution 1447 of 2018 establishes that only mitigation actions with a duration of less than five years, as of January 1, 2020, may be reported in the country for national accounting purposes. This Resolution applies to the entire Monitoring, Reporting, and Verification System of mitigation actions at the national level in Colombia and establishes the mechanism for the National Registry of Greenhouse Gas Emission Reductions (RENARE, as per its acronym in Spanish).

- To avoid double accounting with Vision Amazonia's REDD Early Movers (REM) program, the project will not claim emission reductions for the period in which that Program had received payment for results for one of the same mitigation activities (reduced emissions from deforestation). The REM program received payment for results for the 2013-2016 period. For each participating AATI, the activities that marked the project start date are different, given that each AATI originally wanted to formulate its REDD+ project independently. However, after signing the agreements with South Pole for the formulation and certification of these projects, and with the purpose of aligning the deforestation cartographic monitoring activities with the national forest/non-forest information published each year on December 31, the general date of the grouped project was set as December 31, 2016. The activities that confirm the start of the project in each AATI are shown in Table 4.

Table 4. Activities defining the start of the REDD+ Project in each AATI.

AATI	Activity	Date	Description
COINPA	Formulation of the Intercultural Environmental Management Plan of the Inga and Muina peoples of COINPA. Inter-Administrative Agreement No. 0145 of 2015 between Corporation for the Sustainable Development of the South Amazonia (CORPOAMAZONIA) and COINPA. The formulation of the plan ends with the conclusion of the participatory workshop, Intercultural Environmental Management Plan - COINPA, Corporación Ozono. - Workshop on social cartography - Workshop on priorization of problems and conflicts	April 7, 2016	Characterization, diagnosis of conflicts due to use and management of natural resources, and participatory formulation of the environmental management plan including programmatic content, project profiles, and budgets.
CIMPUM	Attendance to the courses of the associate degree in Forest Resources in agreement with	December 31, 2016[1]	Training for leaders of the CIMPUM communities in the settlement of San

[1] There is no documentary support for the activity that gave the start date of the REDD+ Project in CIMPUM's AATI; however, the audit team was able to verify the veracity of the information during the field visit through interviews with some members of the community. Due to the absence of support, the last working day of the year in which the activity was carried out is taken as valid.

AATI	Activity	Date	Description
	the National Training Service (SENA, as per its acronym in Spanish).		Rafael.
AIZA	Project titled *Human well-being indicators: proposal for monitoring indigenous peoples' ways of life and territories* in partnership with the SINCHI Amazonian Institute for Scientific Research (SINCHI Institute). Protocolization of the technical cooperation alliance between the SINCHI Institute and the Association authorities AIZA, socialization and endorsement of the application of the IBHI; training of indigenous facilitators and methodological adjustments.	February 28, 2016	SINCHI Institute - AIZA agreement; dissemination of the human well-being indicators for indigenous peoples (IBHIs, as per its acronym in Spanish) project; endorsement for IBHIs application; training of indigenous facilitators; methodological adjustments; baseline survey of 21 IBHIs by indigenous facilitators.
AZICATCH	Workshop and dialog on climate change, forests, and indigenous peoples. First approach in the process of agreeing and building the REDD+ Amazon Native (RIA, as per its acronym in Spanish) initiative.	September 14 to 16, 2015[2]	Considering the priorities of the Annual Operational Plan (POA, as per its acronym in Spanish), AZICATCH approached the authorities and *mayores sabedores* (elderly sages) to start an agreement process and build the RIA proposal in La Chorrera.

Source: prepared by South Pole (2021) based on the supporting information provided by the AATI.

1.9 Project Crediting Period

The crediting period runs from December 31, 2016, to December 30, 2046, for a total duration of 30 years.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	
Large project	X

[2] Support of prior consideration of a REDD+ initiative in the AZICATCH management area.

Year	Estimated GHG emission reductions or removals (tCO_2e)
2017	1,069,231
2018	1,159,588
2019	1,225,485
2020	1,276,890
2021	1,369,409
2022	1,438,849
2023	1,446,648
2024	1,476,366
2025	1,505,420
2026	1,545,538
2027	1,538,446
2028	1,522,291
2029	1,550,147
2030	1,631,889
2031	1,624,933
2032	1,692,064
2033	1,741,453
2034	1,762,620
2035	1,709,751
2036	1,710,546
2037	1,694,299
2038	1,666,262
2039	1,675,618
2040	1,663,502
2041	1,692,419
2042	1,695,959
2043	1,688,334

Year	Estimated GHG emission reductions or removals (tCO_2e)
2044	1,731,235
2045	1,761,828
2046	1,838,180
Total estimated ERs	**47,105,201**
Total number of crediting years	**30**
Average annual ERs	**1,570,173**

1.11 Description of the Project Activity

1.11.1 Background information that influenced the project design

Predio Putumayo Reserve context

The indigenous communities of the Amazonia region in Colombia have subsisted and achieved what they call *buen vivir* (good living) through a mixed economy that traditionally includes hunting, gathering, fishing, and various agricultural practices centralized in a model of intervention of the forest and flood zones called *chagra*. This type of economy has a moderate to negligible impact on the natural environment, but population growth, pollution of water sources, and pressures related to climate change have reduced its production capacity. In response, indigenous communities are shortening the periods of exploitation of their *chagras*, increasing the risk of deforestation of pristine forest, limiting the quantity and diversity of products extracted from the *chagras*, or abandoning traditional practices altogether to adopt less sustainable land and water uses from outside communities.

The Colombian Amazon has also been a setting of intervention by the state, illegal armed groups, settler communities, multiple private entities, and some international cooperation efforts. Prior to the 1970s, these interactions with outsiders had extractive motives, such as the rubber, quinoa, fur, and timber booms, and the effects were devastating to the integrity of indigenous communities and the environment. The establishment of the Amazon Forest Reserve through Law 2 of 1959, some intersectoral alliances with community actors, and multiple life projects for indigenous societies designed by state entities and non-governmental organizations (NGOs) have slowed down unsustainable practices in the Amazonian territory but lack applicability or durability and have an ineffective inclusion of indigenous communities that are far from urban centers or minorities such as women, youth, and the elderly. In turn, Vision Amazonia has been promoting a sustainable and inclusive development model for the Colombian Amazon region since 2013, but it has focused its efforts on the Andean foothills or other areas with marked transnational dynamics such as the Amazon trapezoid; as a result, the territory corresponding to the Predio Putumayo Reserve has not enjoyed its benefits.

The Predio Putumayo Reserve was established on April 5, 1988, by the Amazonian indigenous peoples and the INCORA, today the National Land Agency (ANT, as per its acronym in Spanish), through Resolution 030. The reserve has an area of 5,818,702 ha. With the legal and political consolidation of the reserve, the different ethnic groups of indigenous communities that inhabit this territory became more involved in participatory processes and, as the OPIAC points out, consolidated their "territorial governance mechanisms." Even before the consolidation of the REDD+ Project, the reserve has been organized by AATI, which group the different communities belonging to three large culture complexes or "baskets of thought" (Echeverri et al., 2000, 179):

The first cultural complex is known as the people of the Yurupari ritual, the people who blow tobacco. The Macuna, Letuama, Tanimuca, Yucuna, Barasana, and other Eastern Tucano peoples belong to this complex. The Yuhup-Makú are also interwoven here as hunter-gatherers. These peoples reach as far as the Caquetá River, without passing to the south (AZICATCH Life Plan, AZICATCH, 2006).

The second cultural complex is called people of the center, people who suck *ambil* (black tobacco paste). The Murui (Uitoto), Bora, Miraña, Nonuya, Ocaina, Andoque, and Muinane peoples belong to this group. In this cultural complex, they have seven languages, a similar social organization, and a complementary mythology in this cultural complex. This basket of thought covers the territory from the Caquetá River to the Putumayo River, and even extends south of the Putumayo River.

The third cultural complex is called Ticuna-Yagua, made up of the Ticuna, Cocama, and Yagua peoples, located in the Amazon trapezoid region. They are the people of the word, of the coca, of the *ambil*, of the *mambeaderos*—where they make their own decisions (AZCAITA Life Plan, Asociación Zonal de Consejo de Autoridades Indígenas de Tradición Autóctono [Zonal Association of the Council of Indigenous Authorities of Autochthonous Tradition], AZCAITA, 2008).

To a lesser extent, the reserve is inhabited by communities of the Inga people, also known as the people of the *yagé* (ayahuasca). They are located along the Putumayo River. These communities are mainly represented by COINPA and CIMPUM. The Inga people interact with the people of the center. Traditionally recognized for their trading vocation and their strengths in Curanderismo (folk medicine), the Inga people have gone beyond their area of origin in Valle del Sibundoy (Putumayo) to settle in different regions of the southwest of Colombia, in the Amazonia, and even beyond national borders.

Lifestyles

At the territorial level, the indigenous communities have had a way of life with a mixed economy typical of the Amazonian areas; they combine hunting activities, gathering of forest products, fishing, and agricultural practices that are essential to their worldview, as are the *chagras*. In this sense, the communities of Predio Putumayo use the territory for their daily sustenance, survival, and food and economic sovereignty. However, this relationship transcends the utilitarian view. Therefore, the forest is not only one, but it is classified and understood in its multiple spaces of use as a territory in which the communities and the forest goods offered converge, enriched in turn by the natives' adherence to codes of reciprocity with the ancestral entities that protect these goods (see *Documento soporte Caracterización Socioambiental*).

Deforestation and natural resource exploitation pressure

It is estimated that up to 9.7% of the Amazonia had been deforested until 2000 and that this percentage rose to 13.3% between 2000 and 2013, representing an increase of 37% in 13 years. (RAISG, 2015). The study on deforestation in the Amazonia between 1970 and 2013 shows that, since colonial times, the mining activity affected the Andean-Amazonian foothills and, as settlements were consolidated, sugar cane, rice, cocoa, and pasture crops were established. At the beginning of the 20th century, a period of extraction of non-timber Amazonian resources such as rubber began, "this boom caused the deforestation of relatively small areas and favored the formation of several of the main Amazonian cities that still exist today, such as Iquitos in Peru, Tena in Ecuador, and Leticia in Colombia, generally associated with river ports. Rubber is the predecessor of the modern Amazonian *fazenda* or hacienda, which initiated the replacement of Amazonian forests to establish agricultural areas in "wastelands" (RAISG, 2015: 4).

Furthermore, since the 1950s, there has been an increase in the extraction of wild animal skins (hunting missions known as *tigrilladas*) and fine woods, activities that lasted for more than two decades and still survive illegally, affecting the ecosystems and the conservation of the forest, flora, and fauna of the territory. There have been many the conflicts and violent and imposing events that have taken place in the territory that today corresponds to the reserve, including the irruption of evangelizing missions and the imposition of plans and life projects on indigenous societies by state entities and NGOs, as well as the presence of outlawed armed forces (SINCHI Institute, 2011) (see *Documento soporte Caracterización Socioambiental*).

Projects, participation, and actions for territorial sustainability

The Amazon region and its great ecological potential, home to various indigenous ethnic groups, has been the scene of intervention by public and private entities, international cooperation agencies, and its own inhabitants. The Colombian State, for example, has been developing projects, such as the declaration of the Amazon Forest Reserve zone (Law 2 of 1959), which link the forest economy and the conservation of renewable natural resources to address resource extraction threats. However, these management and intervention processes by external actors have produced both positive and negative effects, without achieving an articulation that favors the well-being of local indigenous communities and a balanced relationship with nature. The communities have continued their work of sustainable use of the forest, but they have experienced changes because of their relationship with other economic models and social actors that have different cultural systems. The interaction of indigenous thought with other cultures, whose understanding and relationship with nature is different, has caused conflicts, forest degradation, detriment to the identity process, and territorial transformation.

The historical process of intervention, but also of articulation for the conservation—although for some this means colonization—of the Amazon is being consolidated by the Colombian State with the constitution of research entities such as the Colombian Corporation for the Araracuara Amazonia at the end of the 1970s, later transformed by Law 99 of 1993 into the SINCHI Institute. This law created the National Environmental System (SINA, as per its acronym in Spanish), which then supported the creation of CORPOAMAZONIA.

The work of these public entities and the intersectoral alliances with community actors such as indigenous associations; public actors such as mayors' offices, the Amazonas Governor's Office, the Colombian Ministry of Environment and Sustainable Development (MADS, as per its acronym in Spanish), the armed forces, and National Natural Parks of Colombia; the institutional indigenous sector such as the OPIAC and the National Indigenous Organization of Colombia (ONIC, as per its acronym in Spanish); and non-governmental organizations such as the World Wildlife Fund (WWF), Gaia Amazonas, among others, has generated actions in the territory for its sustainability and the well-being of the population. However, there are still many problems to face, and many resources are needed to act (see details in stakeholder mapping).

At present, among the most relevant programs is that of Vision Amazonia, which includes the REDD+ Early Movers Program (REM) - Early REDD+ Initiatives; an initiative based on payment for results that seeks to support the reduction of emissions from deforestation in the Colombian Amazon Biome and its economic diversification. However, it is not jurisdictional according to VCS rules, it is a governmental payment for results program. The REDD+ project is not related to this program and therefore is not nested.

The balance of projects or activities carried out in the four ATTIs participating in the REDD+ Project prior to the start date is very limited. For example, (1) AIZA reported the strengthening of participatory and self-government spaces and the reaching of agreements for spatial delimitation, recovery, and conservation of water bodies. (2) In CIMPUM, the community actively participated in the last census of agriculture and received training on land tenure topics. In both cases, follow-up processes and their results are unknown. However, from the first spaces of consideration of an indigenous REDD+ initiative in 2016, the REDD+ Project has become an instrument to boost organizational processes on territorial issues in relatively isolated areas of the lower Colombian Amazon and to recognize the indigenous communities' contribution to the mitigation of global climate change through their practices of low ecological impact. Similarly, the project is expected to identify possibilities for local adaptation to the effects of climate change that cannot be mitigated and to evaluate the possibility of strengthening and diversifying the economic structure with national and international trade agreements that fairly remunerate the indigenous communities, including fair trade, direct trade, or premium pricing.

The Table 5 presents the main projects identified by each of the AATI, which supported the consolidation of the scenario before the REDD+ Project by showing the need to strengthen actions and, as a result, resources to curb deforestation and forest degradation (see Table 5).

Table 5. Projects or activities carried out by the AATI before the start of the REDD+ Project.

AATI	Year	Projects – Activities	Impacts
AIZA	2007	Control and surveillance of water sources and identification of persons responsible for control.	Promotion of traditional authorities' participation. Consolidation of agreements on recovery, conservation, use, and boundaries.
	2013	Meeting of traditional *sabedores* to develop the political guidelines for the AIZA Environmental System, from March 4 to 6, 2013, at the Maloca Consejo Anciano.	Regulation of the territorial management and control for the appropriate use of natural resources (there is a formulated plan).
	2015	Support for self-government. The AATI reports 12 projects with resources from the General Participation System (SGP, as per its acronym in Spanish), but no activities are detailed. 12 communities were included with a total of 884 beneficiaries.	Strengthening of self-government.
AZICATCH	2006	Project to strengthen the traditional practices and representations of the indigenous *chagra* of the Uitoto, Bora, Okaina, and Muinane belonging to the Central Cultural Complex of La Chorrera (Amazonas), in association with the MADS and the SINCHI Institute.	Support for a participatory research work to evaluate and reinforce the indigenous *chagras* as a strategy to face the new socioeconomic reality of the communities settled in the indigenous cabildos.
	2010	Climate change and REDD+ capacity building workshop. Collective construction process of the Readiness Preparation Proposal (R-PP) Colombia. Coordinator of the Indigenous Organizations of the Amazon Basin (COICA, as per its acronym in Spanish); OPIAC; Colombian Ministry of Environment, Housing, and Territorial Development; Patrimonio Natural; and WWF Colombia.	Education and appropriation of knowledge.
CIMPUM	2014	Participation in the Colombian National Census of Agriculture and training in land tenure.	Employment generation. Increased land tenure information.
COINPA	-	No data.	No data.

Source: prepared by South Pole (2021) based on the supporting information provided by the AATI.

1.11.2 Progressive assessment of the project activities in the retroactive scenario and definition of strategic lines of action

The project has gradually implemented activities to make progress with the formulation of a technically oriented strategic plan that is subdivided into six lines of action. Two lines of action will be formalized under the VCS,[3] three, under the CCB standard;[4] and one that intersects the VCS and CCB components of the project.[5]

This strategic plan is based on the AATI's life plans and the environmental management plans already formulated, so it includes the traditional efforts aimed at the conservation and protection of the Amazon rainforest, as well as the management of the forest and the territory as a space for the development of culture and social or political relations.

The strategic lines will be implemented in the crediting period of the REDD+ Project through 15 programs and 36 activities that address the central dimensions of indigenous life in their territorial autonomy to ensure forest conservation. The strategic lines, programs, and activities of the project are based on the principle of indigenous autonomy according to (1) tradition, education, and their own languages; (2) the indigenous search for *buen vivir* and the use of local elements with the lowest possible impact on biodiversity; and (3) the strengthening of ancestral land distribution practices, such as the *chagra*, which have proven to be the basis for the effective conservation of forest cover and biodiversity for centuries in the Amazonia.

In the same way, the lines support the subsistence and resistance process of the Amazonian ethnic communities to achieve governability and governance of their territory by contributing to slow down the agents and drivers of deforestation and forest degradation. They also seek to improve the living conditions of the people by reducing inequalities and social, economic, and political vulnerabilities that limit the survival and ancestral territorial control and accelerate the cultural transformation towards foreign models with extractive economies of high negative impact. The implementation of the lines will be carried out through a benefit distribution system that preserves the principles of traditional self-government with mechanisms for collective decision-making and monitoring to reduce possible problems, inadequate management, and conflicts. This system will require and call for the coordination of multiple stakeholders to motivate alliances with public and private actors. These alliances are necessary to achieve a considerable, transparent, and continuous contribution to a complex problem: deforestation and degradation in the Amazon rainforest.

Each strategic line of the project is described below, as well as its relationship with the national interpretation of REDD+ safeguards and the programs and activities planned.

[3] Strategic lines 1 (forests and conservation) and 2 (self-government and indigenous autonomy)

[4] Strategic lines 3 (education and indigenous languages), 4 (sustainable economy and food sovereignty) and 6 (indigenous women and families)

[5] Strategic line 5 (exchange of knowledge and new knowledge)

Strategic line 1. Forests and conservation

This line focuses on the management and care of forest cover, including the management of natural resources, land administration, recognition of ecosystem services and areas of use, environmental management actions aimed at the conservation of vulnerable species of flora and fauna, and protection and sustainable use of rivers and streams.

Line	Forests and conservation	
Objective	Strengthen, through its recognition, the environmental management of indigenous territories, the ecosystem services, the cultural values associated with biodiversity, and the sustainable use of natural resources.	
Problem	The ecological conditions and large extension of the Amazonian indigenous territories have historically made them strategic and attractive for the development of economic activities of multiple local actors, settlers, and companies. This has generated negative impacts such as deforestation and forest degradation, which are described in detail in the without-project and with-project territorial scenarios. These constant impacts on land management and nature conservation are caused by both internal and external processes. From the communities, there is an increase in the population, which is associated with an increase in *chagras*, fishing, hunting, and timber extraction. Due to contact with and influence from external pressures, chemicals for fishing; grazing for cattle raising; minerals extraction; and disposal of solid and liquid waste in rivers, in streams, and on the ground have been introduced. Moreover, there are pressures concerning the entry of new machinery (chainsaws, boats, motors) for extractive processes, new forms of resource exploitation, waste residues, foreign construction techniques, among others, which have new impacts on the environment, different from those that have ancestrally taken place in the territory. The transformation and reduction of the transfer process of traditional knowledge, including the relationship, management, use, and protection of the territory, understood as a whole, as indicated by the indigenous communities, as well as the transformations in the ecological calendar derived from climate change and the new provisions by the leadership and the state on environmental planning and zoning lead to the need for planned actions to prioritize the vision of forest conservation and sustainable practices associated with it.	
Program	**Activities**	**Associated national interpretation of REDD+ safeguards**
Community-based biodiversity research and monitoring	1. Ecological calendar and climate change. 2. Monitoring of threatened fauna and flora species. 3. Regulations on natural resource use, management, and conservation. 4. Identification and assessment of ecosystem services locally recognized; mapping and	E.11. Conservation of forests and their biodiversity. E.12. Provision of environmental goods and services.

	risk level. 5. Research on nature and biodiversity.	
Forest restoration and reforestation	1. Community forestry and reforestation with native trees whose timber is used in the region. 2. Restoration of degraded land.	E.15. Forest control and surveillance to avoid displacement of emissions

Strategic line 2. Self-government and indigenous autonomy

The autonomy, sovereignty, and self-determination of indigenous peoples are prioritized. This line aims at improving the self-government system in such a way that it be a suitable representation of the culture, communities, traditional indigenous authorities, and spiritual government.

It promotes an appropriate dialog with the other regional and national governmental entities for the successful articulation with the administration, governance, and political participation channels that favor the constitution and policies of the country. Building technical, operational, and human capacities in the indigenous population is essential to an adequate social management for the communities and their inhabitants.

Line	**Self-government and indigenous autonomy**	
Objective	Reinforce the consolidation of an autonomous self-government with technical, political, and social capacities suitable for the indigenous communities' leadership, based on the recognition of the traditional and spiritual authority of the territory and the ways of traditional participation and government.	
Problem	The new ways of government that emerged after the Colombian Constitution of 1991, as well as the regulations and Resolutions established in recent years for the political participation of indigenous communities, have favored the input of resources, decision-making, and participation in regional and national policies. This has posed a challenge due to the absence of political, leadership, and social management capacities in the territory. There is a pressing need to balance the communities' ancestral ways of administration and the new forms of government, without contradicting the spiritual governance of cabildos. This entails improving the indigenous population's political capacities and assessing the traditional ways of government that are based on the use of speech, thought, and care for the world.	
Program	**Activities**	**Associated national interpretation of REDD+**

		safeguards
Integrated territorial governance	1. Updating of life plan and recovery and strengthening of the council of elders. 2. Management of economic resources from governmental sources (SGP) and non-governmental sources (agreements and other projects). 3. Improvement of the capacities of the communities' justice system.	**A1.** Correspondence with the national legislation. **C7.** Respect for traditional knowledge.
Territorial distribution and zoning	1. Indigenous policy, traditional and cultural division, and territorial zoning and delimitation.	**F13.** Environmental and land distribution.
Interethnic and intersectoral socio-political relationship	1. Strengthening of juridical capacities in the indigenous world for the improvement of interinstitutional relationships and support networks for self-government. 2. Communication among communities by means of physical, transport, and telecommunications infrastructure.	**C8.** Territorial rights.

Strategic line 3. Environmental ethno-education and indigenous languages

The conservation of the languages of the communities favors the conservation of the ancestral knowledge, the care for the natural world, and the traditional practices that have promoted the conservation of the forest during centuries. In other words, the preserve of the languages fosters the conservation of the indigenous life and the knowledge that the Amazonian peoples have acquired to manage the forest and the territory and to take care of the biodiversity existing there.

Line	Environmental ethno-education and indigenous languages
Objective	Foster education within the communities as the starting point to get to know the ancestral, cultural, and intangible territory; understand the natural world; take care of biodiversity; and preserve the indigenous languages and essence.
Problem	The introduction of Western education into the territory dates to the times of Capuchin missions and the rubber boom. This brought about oblivion to the indigenous languages, underestimation of the autochthonous knowledge of the elders, and interruption of transfer of knowledge through teachings in the *chagra* and the *sabedores*; this added to the losses produced by progressive acculturation for years. Nowadays, many inhabitants are passive speakers who understand the language but do not use it, which means an increased difficulty

	for the preserve of the language. In this context, the indigenous traditions and languages have the potential to grow stronger by recognizing the indigenous values and essence in the modern world and giving the new generations the right to recognize and own their history to become actors of their own construction and interaction with other cultures.

Program	Activities	Associated national interpretation of REDD+ safeguards
Conservation, research, teaching, and professionalization in and from the indigenous languages	1. Teacher professionalization and improvement. 2. Updating and implementation of the community education project. 3. Recovery of the indigenous languages through bilingual teachers, dictionaries, use of the languages during early childhood and primary and secondary education.	**C7.** Respect for traditional knowledge.
Ethno-education and nature	1. Ethno-environmental training in non-polluting daily practices and generation of culturally and environmentally feasible alternatives. 2. Education in the Amazon world and other ways of thinking.	**C7.** Respect for traditional knowledge.
Political training and leadership	1. Training in indigenous politics and leadership in Colombia, including young people and children for an intergenerational strengthening. 2. Training in governmental interaction with institutions and building of capacities for management of projects in health, infrastructure, education, and self-government.	**B4.** Recognition of the forest governance structures. **D10.** Participation.

Strategic line 4. Sustainable economy and food sovereignty

The principle of self-sustainability and food sovereignty for this region is related to the indigenous concept of *buen vivir*, in which food is a central element: healthily feed the community with what the earth provides; cultivate and harvest following ancestral norms, but also including other types of knowledge to rethink the territory; and maintain the autonomy in food production.

Line	Sustainable economy and food sovereignty
Objective	Manage the use of natural resources in a sustainable manner as a guarantee of food sovereignty for the Amazonian indigenous peoples and as an opportunity for the development of sustainable productive practices that favor a green economy, human well-being, and social equality, as well as the reduction of environmental impacts on

	Amazon ecosystems.
Problem	The growing demand for natural resources generates an increase in the number of *chagras*, fishing, hunting and timber extraction; the use of chemicals for fishing; grazing for cattle raising; minerals extraction; and disposal of solid and liquid waste in rivers, in streams, and on the ground. There is an external flow of foreign foods to the communities, which are not cultivable in the region, promote other cultural dynamics, and, in turn, generate dependencies with new customs that are not sustainable in the Amazon environment. In this sense, the extractive economy and the loss of cultivation traditions and ancestral cuisines jeopardize biological and cultural conservation, as well as the well-being of the very communities.

Program	**Activities**	**Associated national interpretation of REDD+ safeguards**
Sustainable production and marketing practices	1. Strengthening of productive activities: *chagras* and ancestral crops, recovery of seeds and native fruit species, fish farming practices with native species, and breeding and reproduction of minor species. 2. Sustainable harvesting of timber and non-timber forest products. 3. Promotion of Amazonian entrepreneurship initiatives, sustainable tourism, and development and commercialization of handicraft products.	**B5.** Capacity building. **F14**. Sector planning.
Waste management	1. Management and transformation of biodegradable and non-biodegradable solid waste from economic and domestic activities.	**E11.** Conservation of forests and their biodiversity.

Strategic line 5. Exchange of knowledge and new insights

The effective conservation of forests in indigenous collective territories requires the preserve of ancestral practices and knowledge existing in the customs, the elders, or *sabedores*. This indigenous knowledge and the way we relate to the natural world based on it enable a healthy interaction with it.

Line	**Exchange of knowledge and new insights**
Objective	Strengthen ancestral practices and their relationship with the elders and *sabedores*, as a basis for the permanence of indigenous communities in the territory, under ancestral customs and for the effective transmission of indigenous knowledge to new generations. Promote the interaction of the young population with a globalized and interconnected world, based on the recognition of the capacities, history, cultural richness, and the appropriate valuation of being indigenous.

Problem	The current connection of the indigenous population with national and international media, with information coming from other environments, and with the access to new information and communication technologies have favored the massive arrival to the territory of knowledge external to the indigenous communities. This situation, added to the progressive process of colonization, cultural transformation, and the lack of recognition of the indigenous values and traditions, has led to the loss of traditions and ancestral knowledge, customs, languages, and dialects that support the autochthonous ways of seeing the world and interacting with the natural environment. Indigenous youth are even more vulnerable to the processes of cultural change, because of the loss of languages, connectivity with the world outside the reserve, and the abandonment of ancestral traditions, among others. Although cultural dynamics persist today, the absence of recognition of the value of social and cultural diversity in the young indigenous population is a catalyst for change and the disappearance of customs, including the transformation of the forest towards non-traditional practices with greater impacts on deforestation and forest degradation.

Program	Activities	Associated national interpretation of REDD+ safeguards
Strengthening of the elders' and *sabedores*' customs	1. Recovery of *sabedores*' ancestral knowledge, spaces for thought, *mambeaderos*, traditional *malocas* (large communal houses), and folk medicine. 2. Recovery of cultural and artistic practices, stories, myths and traditional tales, dances, celebrations, and offerings.	**C7.** Respect for traditional knowledge
New insights	1. Improvement of farming techniques. 2. Contemporary ways of cultural and artistic expression in the youth population and contemporary indigenous songs and narratives. 3. *Maloca* speech and thought in the youth.	**C8.** Distribution of benefits. **D10.** Participation.
Management of information and traditional knowledge	1. Creation of project bank and file of the association with the projects implemented in the communities. 2. New information and communication technologies with audio libraries and other forms of communications based on indigenous orality.	**B2.** Transparence and access to information **B3.** Accountability.

Strategic line 6. Indigenous women and family

The indigenous women support the beginning of education during childhood, the transfer of the mother tongue, the family economy, the capacity to farm the land, and the teachings about the care for the

world and the rules. The indigenous women are the center of the bond with the land and the first contact with the indigenous culture within the family.

Line	Indigenous women and family	
Objective	Reinforce the relationship of women in the contemporary indigenous world with the levels of organization in the communities, the value of their role as the beginning of the indigenous family, the teaching of the mother tongue, and the knowledge of the land and crops.	
Problem	The indigenous women represent the center of the family and the beginning of education at home and in the *chagra*. The current ways of relationship have made the woman distant herself from this vocation and disconnect herself from her role within the indigenous family. In addition, they have caused her absence in the processes of traditional political and cultural participation.	
Program	**Activities**	**Associated national interpretation of REDD+ safeguards**
Political and cultural leadership in indigenous women	1. Political leadership and participation of indigenous women. 2. Indigenous women's rights. 3. Indigenous gastronomy and culinary traditions.	**B8.** Capacity building. **C7.** Respect for traditional knowledge.
Childhood and family	1. Improvement of basic sanitation at homes. 2. Capacity building in teaching about traditions from home and the *chagra*.	**C8.** Distribution of benefits.

1.11.3 Participation, Communication, and Knowledge Appropriation Strategy

The REDD+ Project has become a driving force for organizational, community, and inclusive processes thanks to the EPCAC. This strategy is one of the key activities of the project and, although it does not relate particularly to any of the six strategic lines previously described, it makes them pertinent locally and effective because (1) it has used several approach methods and methodologies, such as workshops with involved stakeholders, interviews, and particular approaches with local leaders to understand the relationships between social groups in the territory and, thereby, determine real baseline scenarios; (2) it has favored and fostered the exchange of knowledge to identify threats to the forest resources, vulnerabilities, and associated risks; and (3) it has identified, employed, and technically trained local managers, who ensure the constant communication between South Pole, as technical advisor, and the AATI, as implementing agent. Thanks to this, the project in general is an organic adaptable entity that can evolve according to the needs of the Predio Putumayo Reserve.

1.11.4 Next implementations and monitoring

To ensure the consolidation and permanence of the benefits achieved through the 68 activities carried out as part of the REDD+ Project between 2017 and 2020, the priorities will continue to be the sociopolitical organization, the inclusion of women and youth or children in diverse processes within the territory, and the establishment of housing or public property infrastructure where necessary. However, the aim in the next years of the project crediting period (20-25 years following the retroactive scenario) is to directly manage the underlying causes behind deforestation and forest degradation. This includes the control of waste, the recovery of the ecologically sustainable indigenous traditions, the development of a subsistence farming system (*chagra*) better adapted to climate change, and the diversification and strengthening of sustainable productive mechanisms. All this is already included in the future interests of the four AATI participating in the project.

The direct management of underlying causes of deforestation and forest degradation, the preparation of communities for a better capacity to adapt to climate change, and the careful inclusion of all the local stakeholders are precisely the most important differentiating factors from the Vision Amazonia's REM program. Currently, that program only fosters the reduction of deforestation and focuses on the solution of immediate needs of the indigenous communities and not on the management of the causes behind these lacks.

Furthermore, the REDD+ Project has considered to formalize the efforts expended around climate adaptation, care for biodiversity, strengthening of self-government, and inclusion of minorities, applying the CCB standard benefits. This formalization will take place according to what was scheduled before the second verification event under the VCS standard.

1.11.5 Goals, Project Activities and Theory of Change (G1.8)

The project started on December 31 2016, and is expected to have a total duration of 30 years. During this period, the reduction of 49,3 million tCO2e is expected through the implementation of activities grouped into six strategic lines according to the life plans of the four AATI. In the first monitoring period, a net reduction of 5,288,947 tCO2e and an annual average of 1,322,237 tCO2e/year were achieved. The activities implemented in the first (retroactive) monitoring period reflected an active process of developing local projects and actions as the first mitigation efforts against deforestation and forest degradation. In addition to an estimated of 6,814 hectares of reduced forest loss in the project area measured against the without-project scenario. Please see section 1.10 for detail regarding the emission reduction expected per year.

The Theory of Change of the REDD+ Project "Indigenous Peoples Safeguarding the Rainforest" was constructed based on a detailed analysis of the causes of deforestation and degradation using the Expert Criteria and Problem Theory (Vester matrix). Expert consultation is a qualitative technique aimed at verifying and enhancing the accuracy of information analysis by generating consensus, consolidating multiple sources of information towards a common objective. For this process, a survey (Annex 11) was designed and sent to the technical team of South Pole who participated in the project through document construction as well as field visits, community engagement, and primary information gathering.

The objective of the survey was to validate the list of direct and indirect causes (social, cultural, economic, and political factors) of deforestation in the project's management area, which will subsequently be prioritized for resource allocation to their respective mitigation measures (Lines-programs-projects-activities), and also contribute to approximating the identification of community vulnerability levels in the territory.

Direct causes will be understood as human or natural (climatic) activities that directly affect forest cover for biomass use or other purposes. Indirect or underlying causes: social, economic, institutional, cultural, or climatic factors where the removal of forest cover is an effect or consequence.

Subsequently, the survey results were shared in a workshop and discussed in working groups to assess the level of presence in each Specific Targeted Thematic Objective (ATTI). The results of the Expert Criteria analysis are presented in the document Annex 11. Theory of Change REDD+ project Indigenous Peoples Safeguarding the Rainforest.

Following the evaluation of direct and indirect causes of deforestation and degradation identified by each ATTI, the overall process of constructing the Theory of Change proceeded in the following sequence:

1. Identification and definition of problems associated with deforestation and degradation in the project area.
2. Vester Matrix results.
3. Weighing the causes of deforestation and degradation using a hierarchy matrix.
4. Action plan and mitigation of deforestation causes.
5. Development of monitoring indicators for the products, outcomes, and impacts of the theory of change.

The description of each of these numerals and the final construction of the Theory of Change can be consulted in the following Annex (Annex 11. Theory of Change REDD+ project Indigenous Peoples Safeguarding the Rainforest) and the following table provides a detailed overview of the strategic lines of the REDD+ project, along with the products (short-term), results (medium-term), and impacts (long-term) for each conservation target or community focal group.

Table 6. ToC defined for the project

Cod.	Strategic line	Products (short-term)	Results (medium-term)	Impacts (long-term)
1.1	**Forest Conservation**	Report on Activities Conducted in Capacity Building for Biodiversity Monitoring.	Generation and Strengthening of Participatory Community Monitoring Capacities.	Biodiversity Conservation and its Ecosystem Services.

Cod.	Strategic line	Products (short-term)	Results (medium-term)	Impacts (long-term)
1.2	**Forest Conservation**	Community Biodiversity Monitoring Plan (Fauna).		
1.3	**Forest Conservation**	Community Biodiversity Monitoring Plan (Cananguchales).		
1.4	**Forest Conservation**	Community Biodiversity Monitoring Plan (Fish)..		
1.5	**Forest Conservation**	Record of Activities for the Recovery of Culturally Significant Timber Species for the Communities.	Assessment of Traditional Knowledge and Practices Associated with High Ecosystem Value Areas.	Enhancement of Food Sovereignty
1.6	**Forest Conservation**	Document for Formulation of the Environmental Management Plan of COINPA.	Commitment to the Ratification and Establishment of Agreements for Use and Conservation.	Strengthening of Governance and Self-Governance
1.7	**Forest Conservation**	Report of Results from the Project "Analysis of Ecosystem Services in the Territory of AZICATCH, Colombian Amazon."		
1.8	**Forest Conservation**	Evidence of Participation in Courses on Conservation, Natural Resource Management, etc.		
2.1	**Self-Governance and Indigenous Autonomy**	Report and Documentation of Activities for the Conservation and Restoration of Malocas		

Cod.	Strategic line	Products (short-term)	Results (medium-term)	Impacts (long-term)
2.2	**Self-Governance and Indigenous Autonomy**	Records of Hiring, Training, and Implementation of Activities by Cogestores.	Strengthened Organizations with Enhanced Community Management Capacities.	Promotion of Youth, Women, and Elderly Participation in the Project.
2.3	**Self-Governance and Indigenous Autonomy**	Attendance Lists for Awareness Sessions on Climate Change and REDD+ Projects		
2.4	**Self-Governance and Indigenous Autonomy**	Registry of Executed Projects (AIZA)	Enhanced Management Capacity in Local Governance	Reinforcement of Governance and Self-Government
2.5	**Self-Governance and Indigenous Autonomy**	Project Memory Sheets (CIMPUM)		Improvement of Living Conditions for Vulnerable Population Reinforcement of Governance and Self-Government
2.6	**Self-Governance and Indigenous Autonomy**	Minutes of Formalization of Board Committees with the Ministry of Interior		Generation and Enhancement of Capacities

Cod.	Strategic line	Products (short-term)	Results (medium-term)	Impacts (long-term)
3.1	**Education and Indigenous Languages**	Report on Results of the Human Well-being Indicators Project (AIZA - SINCHI)	Utilization and Conservation of Cultural Manifestations and Spaces	Preservation of Cultural Heritage
4.1	**Sustainable Economy and Food Sovereignty**	Systematization Report of Chagras in the Participating Associations of the REDD+ Project	Strengthened Traditional Cultivation Practices	Generation and Strengthening of Sustainable Production Systems
4.2	**Sustainable Economy and Food Sovereignty**	Records of Establishment and Improvement of Medicinal and Food Gardens		
5.1	**New Knowledge and Interculturality**	Certificate of Training Received by Cogestores	Acquisition of Knowledge in Technology Management, Software, Geographic Information Systems, and Climate Change	Generation and Enhancement of Capacities
5.2	**New Knowledge and Interculturality**	Memories from the Dialogue Workshop on Climate Change, Forests, and Indigenous Peoples within the Indigenous Amazonian REDD+ Initiative Framework		
5.3	**New Knowledge and Interculturality**	Designed and Disseminated Communication Materials	Utilization of Project Image and Communication Mechanisms	Strengthening of Governance and Self-Government
5.4	**New Knowledge and Interculturality**	Formulation and Dissemination Document of the Mechanism for Addressing Grievances and Complaints		
5.5	**New Knowledge and Interculturality**	Files with Results of the Corporate Image Design for the Project		

Cod.	Strategic line	Products (short-term)	Results (medium-term)	Impacts (long-term)
6.1	Indigenous Woman	Record of Climate Change and REDD+ Projects Socialization and Activities	Women's Participation in Socialization and Decision-Making Spaces	Promotion of Women's Involvement
6.2	Indigenous Woman	Certificate of Training Received by Comanagers females..		
6.3	Indigenous Woman	Record of Experience Exchange Activities among Women's Organizations and Leaders (Minutes, Attendance Lists, Memory Sheets, Photos, and Videos)		

Source: prepared by South Pole (2023).

1.11.6 Implementation Schedule

Date	Milestone(s) in the project's development and implementation
September 2015 - December 2016	Implementation of retroactive activities marking the start of the project
December 2016 – December 2021	Period of accounting for GHGs VCS Frist verification
March - July of 2019	Preliminary meetings with proposing associations
November - December 2019	Formalization assemblies start project design phase
September 2019	Start of the co-manager program
2019-2022	Collection of primary information for the identification and participatory choice of high conservation values (HCV)
December 2019 - May 2023	Participatory design of the project
February 2020 December 2020 February 2021 December 2021 February - March 2022 December 2022	Accountability assemblies and ratification of agreements

March, April and May 2021	Meetings with institutional stakeholders, NGOs and indigenous organizations
September 2020 - April 2023	Participatory formulation of the SDymB
December 2021 – December 2023	First verification VCS Audit process Site visit of the VVB
March - April 2023	Extraordinary assemblies for the consultation and approval of the SDyMB
April - December 2021 March 2022 July 2022 March - June 2023 September - December 2023	Early implementation of project activities and monitoring
July 2023	Biodiversity community motoring of the HCV
June 2024 and beyond	Implementation and monitoring of project activities
2024 - 2025	Second verification VCS
2025-2026	Second verification CCB
2027 onwards	Continuation of the project activities presented in the ToC Monitoring, evaluation and corrective action if there are required

1.12 Project Location

The first instance of the REDD+ Project is developed in ancestral management areas of the communities belonging to four AATI (COINPA, CIMPUM, AIZA, and AZICATCH) of the Predio Putumayo Reserve, in the department of Amazonas (Colombia). Its coordinates are 0° 34' 12.01'' S to 2° 26' 25.92'' S and 70° 43' 14.23'' W to 74° 25' 17.06'' W and its total area is 3,610,399 ha. Relevant information on the location of each AATI is shown in Table 7.

Table 7. General location of the four AATI in the project area.

AATI	Main settlement	Coordinates	
		Y (South)	X (West)
COINPA	Puerto Alegría	1° 0'19.38'' S	74° 0'53.22'' O
CIMPUM	San Rafael	1°43'35.53'' S	73°14'9.46'' O
AIZA	Puerto Arica	2° 8'56.98'' S	71°45'17.19'' O

AZICATCH	Centro Chorrera	1°26’29.21’’ S	72°47’44.90’’ O

Source: prepared by South Pole (2020) based on the cartographic information from the life plans of the four AATI.

The reserve is located between the banks of the Putumayo and Caquetá rivers, and it is a border zone with the Republic of Peru. The nearest major town is Puerto Leguizamo (Colombia), which is 171 km by river from the first settlement in the project area, Puerto Alegría. Predio Putumayo is bordered to the north by the Miritíi-Paraná, Nunuya, Monochoa, Puerto Zábalo-Los Monos, Andoque, and Mesai indigenous reserves, as well as the Serranía de Chiribiquete National Natural Park expansion zone; to the east by Tarapacá; and to the south and west by the Putumayo River and Peru (Figure 3).

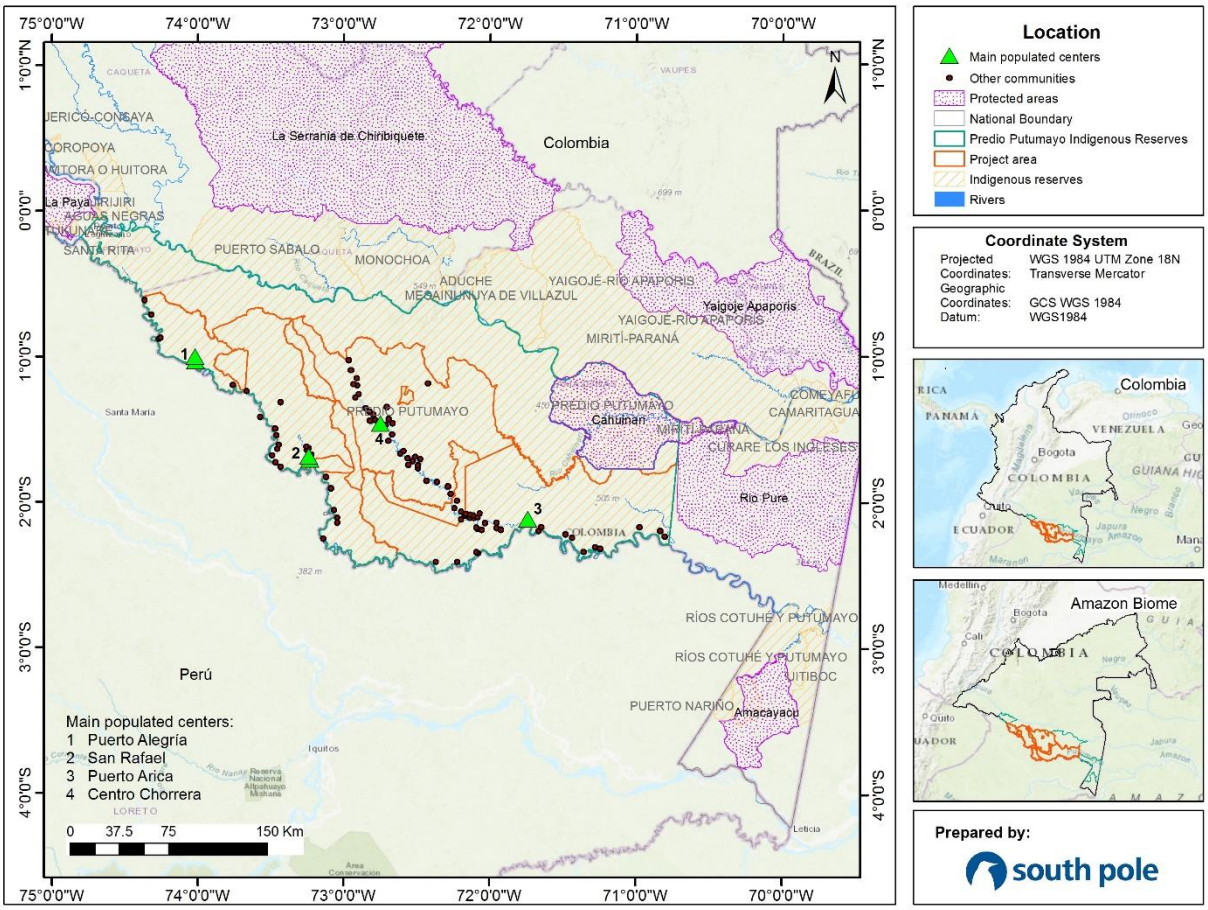


Figure 3. Map showing the location of the REDD+ Project management area and the four participating AATI.

Source: prepared by South Pole (2021).

1.13 Conditions Prior to Project Initiation

The current environmental conditions and those prior to the project initiation in the project management area are described below in terms of physical and biotic factors (climate, hydrology, relief, soils, land covers) and relevant socioeconomic aspects.

The baseline scenario is the same as the existing conditions before the project initiation. Section 1.11.1 shows the information that influenced the design of the REDD+ Project and section 3.4 offers more details about the historical scenario of deforestation and forest degradation and the associated agents, forces, and underlying causes.

1.13.1 Climate

The Colombian Amazonia is in the northwestern portion of the great Amazon basin. Its climatic, ecological, and biogeochemical processes respond to the interaction between the Andean and Amazonian systems and thus present complex dynamic patterns. The climate of the Colombian Amazonia varies along the northwest-southeast axis, with two distinct precipitation regimes, perpendicular incidence of solar radiation throughout the year, humidity, intertropical atmospheric circulation systems (northeast and southeast trade winds), and regional conditions, which generate special climatic characteristics in the region (SINCHI Institute & MADS, 2014; Marengo et al., 2018).

The average temperature in the project area is 25.8 °C, with its maximum in the months of February and November (26.3 °C), while the lowest temperature is recorded in May with 25.0 °C (Figure 4). Information on average monthly temperature recorded at the La Chorrera meteorological station shows four trends during the year. The first trend covers the range from January to February, with an increase in temperature up to a maximum of 26.3 °C. Then, there is a decrease until May, dropping 1.3 °C, with the lowest temperature recorded in May being 25.0 °C. Subsequently, between May and June, a progressive increase in temperature begins, until reaching its maximum in November. Finally, it decreases slightly in December.

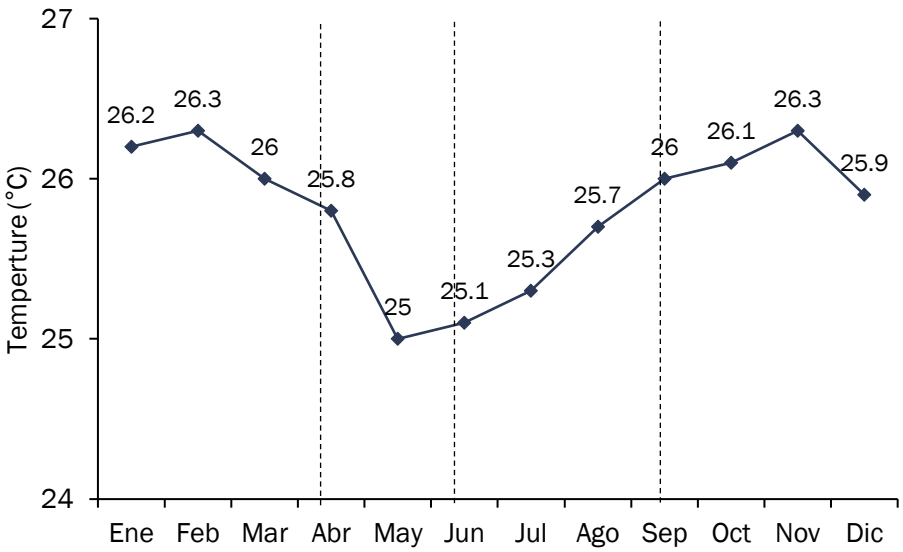


Figure 4. Multi-year annual temperature pattern in the REDD+ Project management area.

Source: compiled by South Pole based on climatologic information from the SINCHI Institute (2014) about the temperature in the La Chorrera [47075010] meteorological station.

According to the information of 13 meteorological stations of the IDEAM located in the department of Amazonas (Figure 5), the pattern of rainfall in the project area is unimodal and there are three trends of the multi-year monthly precipitation. The first occurs between January and April, when there is a gradual increase in the amount of rainfall from 200 mm/month to about 375 mm/month; the second, between April and June, when the highest amount of rainfall during the year occurs, April being the month with the highest rainfall (376.6 mm/month); and the third, between September and October, when—although there is still high rainfall—precipitation decreases around 33% and then remains more or less stable until January. The highest potential evapotranspiration (PET) occurs in December and January, with 119 mm/year, and the lowest PET occurs in May, with 101 mm/year (SINCHI Institute & MADS, 2014).

The estimated multi-year average annual precipitation value in the project area is 3,466 mm/year and is always above the PET; therefore, there is no water deficit at any time of the year. The climate is classified as *cálido húmedo* (CH) (warm humid) according to the Caldas-Lang types of climates and, in terms of Holdridge life zones, the entire project area corresponds to tropical moist forest (TMF).

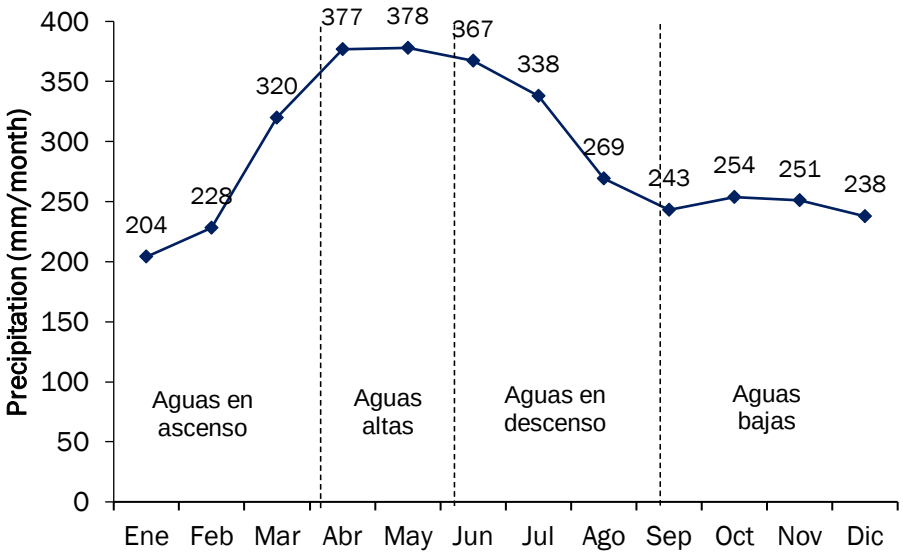


Figure 5. Multi-year annual precipitation pattern in the REDD+ Project management area.

Source: compiled by South Pole based on climatologic information from the SINCHI Institute (2014) about precipitation in the following meteorological stations of the IDEAM: Pto Belén [44130030], Monos Los [44130040], Angosturas [44130060], Monochoa [44130070], Quinche [44160010],

Refugio El [47040020], Pto Toloza [47040030], Remolino [47040040], San Agustin [47040050], El Encanto [4706001], Estrecho-Marandua [47060020], La Chorrera [47075010], and Arica [47080010].

1.13.2 Hidrology

The project area is located on the Putumayo River and Caqueta River basins. The Putumayo River originates in Valle del Sibundoy (foothills of the central-eastern mountain range of the Andes, Colombia) and flows into the Amazon River in Santo Antônio do Içá (Brazil). Its length is approximately 2,500 km and, from its source to its mouth, it has a navigable length of about 1,950 km. It is characterized by shallow but very rapid waters. The most important tributaries of the Putumayo River are the Cara-Paraná (150.8 km long), the Igara-Paraná (283.6 km), the Pupuña (127.5 km), and the Cotuhé (with 58.6 km belonging to Colombian territory) (SINCHI Institute & MADS, 2014).

The Caquetá River (at the northern part of the project area) has a total length of 2,200 km, of which 750 km are within the department of Amazonas. The river has abundant torrents and streams, and its most important tributaries are the Cahuinarí (377 km long), the Mirritί-Paraná (150 km), and the Apaporis (SINCHI Institute & MADS, 2014).

Being of Andean origin, the Caquetá and Putumayo rivers are characterized by white or yellow waters, low transparency, high nutrient contents, and high sediment loads of sand or silt size. They have a relatively high electrolyte content and a pH between 6.2 and 7.2 (slightly acidic to neutral) (SINCHI Institute, 2014). The soils in their floodplains (6% of the Amazonia) are known as *várzeas* and are the only ones with moderate to high fertility due to a high cation-exchange capacity and phosphorus availability (Peña & Vanegas, 2010). In contrast, many of the non-Andean or Amazonian plain tributaries have dark brown or green waters, medium to high transparency, low suspended solids content, and a pH between 4 and 7 that depends on the concentration of dissolved humic acids (Peña & Vanegas, 2010; Ríos-Villamizar, 2014). If these acids are abundant, both the water and the soils of the flood areas, also known as *igapós*, have low fertility (Ríos-Villamizar, 2014).

In general, the region has high drainage density, mainly due to the nature of the geological materials predominant in the area, but this is accelerated by precipitation, which causes processes of erosion and accumulation in the riverbeds. About 50% of the micro-watersheds have high drainage density. The drainage pattern is dendritic, characterized by small, short, and irregular courses, arranged in different directions, and reaching the main rivers at any angle (SINCHI Institute, 2014).

The Igara-Paraná and Cara-Paraná rivers are linked to the origin stories of the indigenous peoples. The Igara-Paraná acts as an articulator of the territory of La Chorrera and as a major communication route, including the network of streams and canals such as Fuemaní, Ikuye, Izie, Edimonue, Raiciye, Taife, Inille, Mue, Mazille, Jae, Menaje, Bakiye, Jifikue, Emaiye, Totumo, Mataco, Tagua, Humari, Carguero, and Jitomaye. This river, the core of the Murui (Uitoto), Bora, Okaina, and Muinane peoples' mythology, sees its course interrupted in the vicinity of La Chorrera by the Nofiko stream, a rapid that prevents the continuity of navigation and marks the difference in the type of fish upstream and downstream (AZICATCH Life Plan, AZICATCH, 2006).

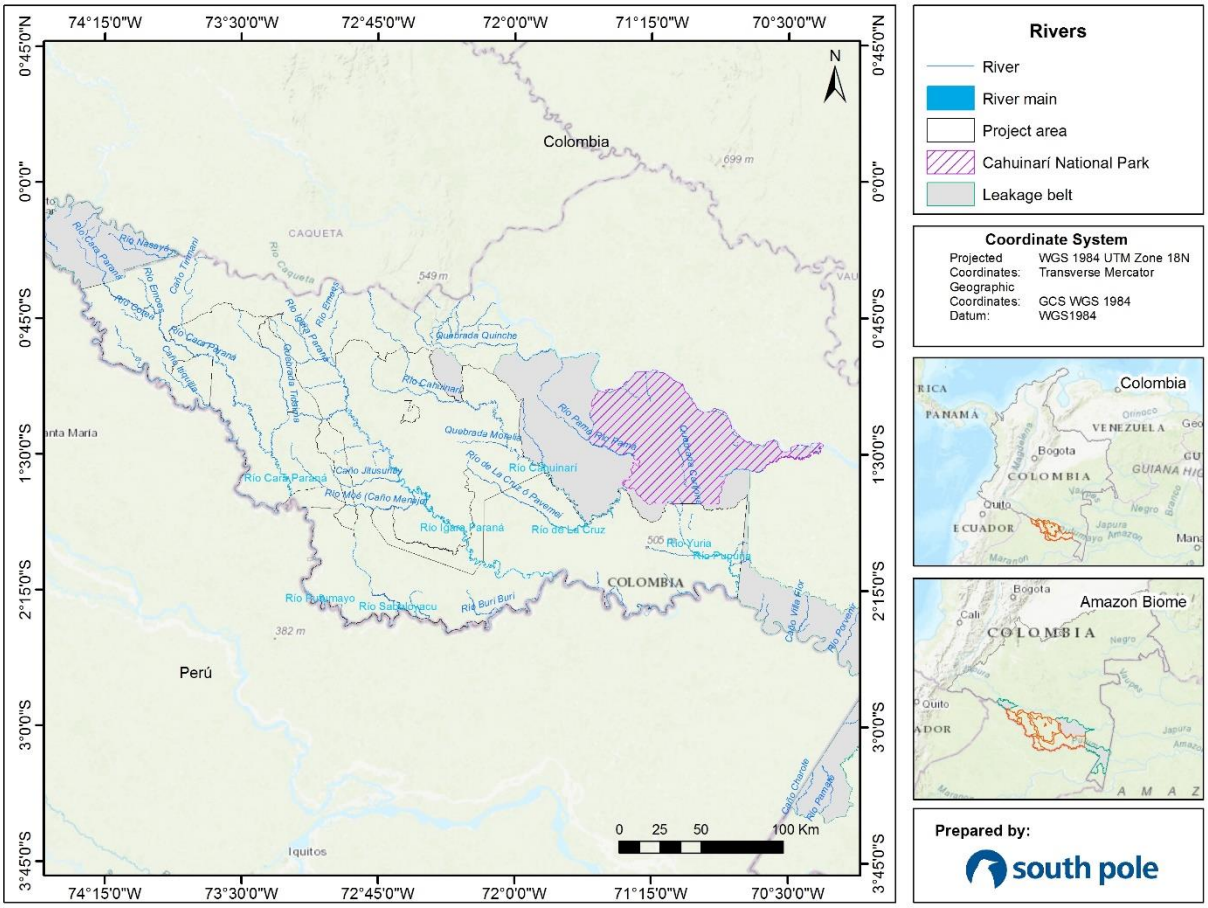


Figure 6. Map of rivers and streams in the REDD+ Project management area.

Source: prepared by South Pole (2021).

1.13.3 Physiography, relief, and soils

The Colombian Amazonia is a natural region where elevations are infrequent as it is 98% flat rainforest. It is made up of terrace systems; the scarce terrain undulations influence the general direction of the hydrographic network that favors flooding during the rainy season (Mejía Valenzuela, 1983).

There are six types of landscapes in the department of Amazonas: high plateau, body of water, range of hills, alluvial plain, alluvial valley, and urban zone. These landscapes are subdivided into different types of relief such as tablelands, hills, valleys, floodplains, and terraces, classified mainly under a warm humid climate (Instituto Geográfico Agustín Codazzi (IGAC) [Agustín Codazzi Geographic Institute], 2019).

In general terms, the soils of the Colombian Amazonia are chemically very poor and physically very susceptible to deterioration. The organic layer is a thin layer of leaf litter and plant residues in varying degrees of decomposition. According to reference information from the Territorial Environmental

Information System of the Colombian Amazonia (SIAT-AC, as per its acronym in Spanish), four important physiographic and relief/soil formations can be identified in the project area (Figure 7):

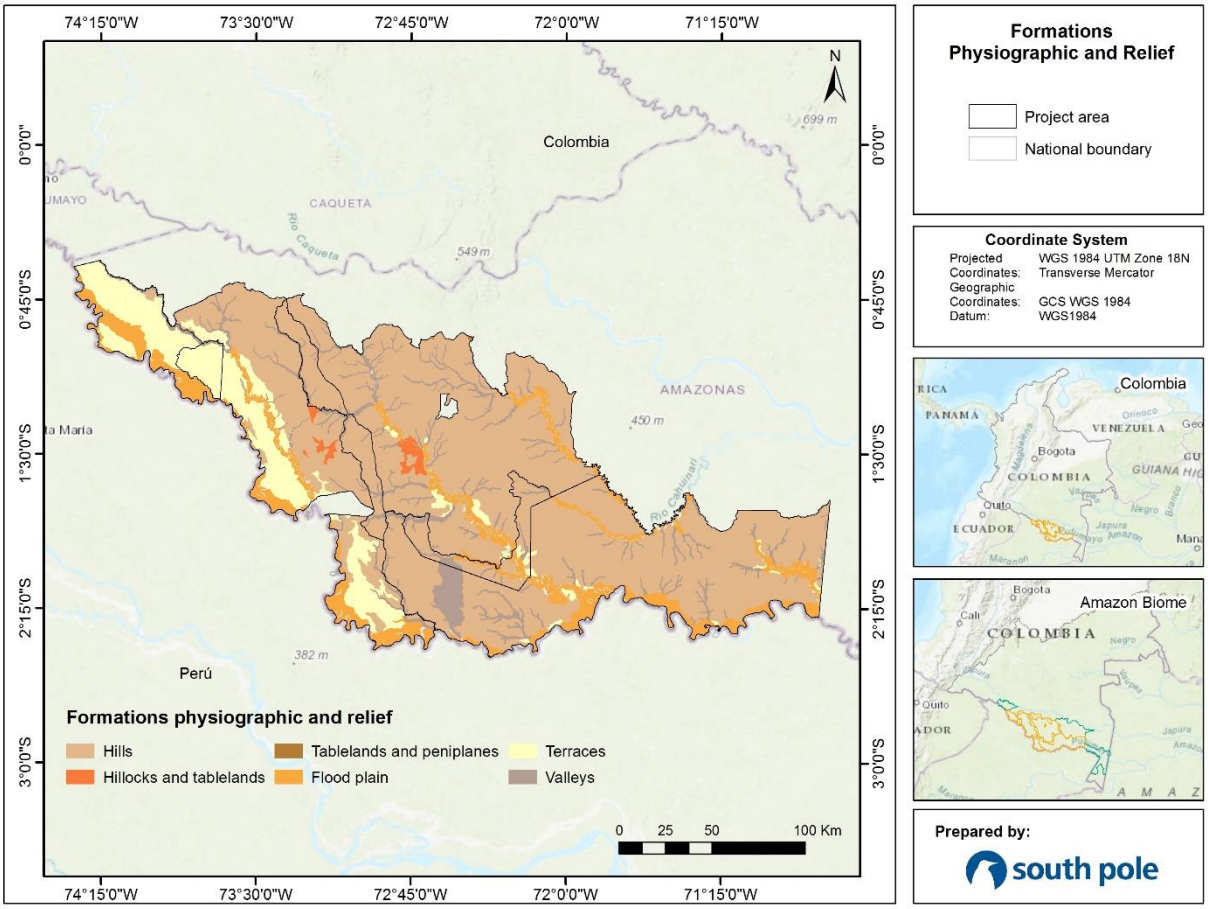


Figure 7. Map of physiographic formations and relief in the REDD+ Project management area.

Source: prepared by South Pole (2021).

Amazonian plains of sedimentary origin: They are the most representative formations of the project area; they are made up of flat to slightly flat, undulating, and strongly undulating surfaces resulting from the dissection of an ancient fluvial-marine plain. The materials are Tertiary sediments from the Mio-Pliocene, in different depositional environments, the most common being clay, clay-sandy, and sandy-clay. The slopes can be of 1-3%, 7%, and 3-12%; those with undulating reliefs reach slopes of 3-7-12% and 25%. The soils have sandy or clay loam and very fine clay textures; drainage can be poor to moderate; fertility is low to very low; and Entisols, Inceptisols, Ultisols, and some Oxisols predominate.

Alluvial plains of Andean rivers: They represent about 10% of the project area. They have a flat to slightly flat and concave flat relief, with slopes of 0-3%. The medium flat plains are elongated surfaces with flat relief and slopes of 0-3% and are part of the river floodplain. The high flat plains occupy the highest level of the floodplain, have flat relief with slopes of 0-3%, and experience occasional floods every three to seven years, regionally called *conejeras*. These alluvial plains are composed of the

floodplain and the low, medium, and high terraces. The soils of these landscapes have loamy to clayey textures; have poor drainage; and experience frequent flooding. They are shallow and limited by the water table and their fertility is average. Taxonomically, there is a predominance of Entisols, Inceptisols, and, in the higher elevations, Ultisols.

Alluvial plains of Amazonian rivers: They are in the flood meadows of the rivers that originate in the Amazon plain (such as the Yarí, Miritíí, Igara-Paraná, and Cahuinarí) and represent about 16% of the project area. The lowest alluvial plain has a flat to slightly flat relief, with slopes of less than 3%. They have natural levees and small terraces and experience sporadic flooding every year or every two years. These plains are composed of the floodplain; low, medium, and high terraces; and valleys or depressions. The soils originate from highly weathered sediments, with predominance of quartz sands and very acid kaolinitic clays and have sandy loam to clay textures. They experience sporadic flooding; their drainage is moderate to poor; and their fertility is low. They are classified as Entisols and Ultisols.

Rock structures of metamorphic origin: occupy between 5% and 10% of the project area. They are complex structures derived from granite and quartzite; they present an undulating to broken relief with slopes between 7-12-25% and greater, affected by light to moderate erosion, according to the slope. The soils are superficial, limited by the bedrock and gravel, with sandy loam textures. With good drainage, fertility is low to very low; they are classified mainly as Entisols.

1.13.4 Land covers

The delimitation of land cover in the expansion area of the project (Predio Putumayo Reserve) was based on the Land Cover Map of the Colombian Amazonia for 2016 at a scale of 1:100.00, version 1 (SINCHI Institute, 2020).[6] The minimum categories are defined according to the categories proposed by the Colombian adaptation of the Corine Land Cover (CLC) methodology. The definitions of each of the land covers identified in the project area are presented in detail in the National Land Cover Legend (IDEAM, 2010).

A total of 23 land covers were identified (Table 8). High dense forests distributed throughout the territory and covering 86.6% of the area is the predominant cover; the second most important cover is floodable forests, which account for 10.01% of the project management area; palm forests account for 1%; and rivers, most of which correspond to the Putumayo River, account for 0.40%.

The project area also contains land covered by fragmented forests (0.64%) and secondary vegetation (0.66%), which corresponds to vegetation cover resulting from the natural succession process that

[6] Land cover layer in the Amazonia for the year 2016, with a scale of 1: 100,000, based on the interpretation of satellite images for the 2016 period of the Landsat 8 (OLI) program, from the Path-Row selection (4-57, 4-58, 4-59, 4-60, 4-61, 4-62, 4-63, 9-59, 9-60, 7-58, 7-59, 7-60, 7-61, 5-57, 5-58, 5-59, 5-60, 5-61, 5-62, 3-57, 3-58, 3-59, 8-58, 8-59, 8-60, 6-57, 6-58, 6-59, 6-60, 6-61, 6-62) and implementation of the Corine Land Cover methodology adapted for Colombia. This land cover classification was made from the visual interpretation of the images, applying the legend of the land cover map at a scale of 1: 100,000 and the PIAO methodology, which favors the interpretation, digitization, and capture of the land cover visually, using the combination of bands 4, 5, 3, (NIR, SWIR1, R). The information was structured according to the generalization rules for the 1:100,000 scale, following the cover coding, and filling in the fields of the attributes table.

occurs after any intervention or destruction of primary vegetation. There are also some areas of dense grasslands that have not been intervened or have been selectively intervened (IDEAM, 2010).

Heterogeneous agricultural areas, which correspond to different configurations of crops, pastures, and natural spaces, represent less than 0.16% of the total area and are mainly used to harvest cassava, pineapple, peach palm fruit, and other self-consumption products such as spring onions, beans, and coconuts.

Table 8. Categories of the CLC Colombia within the REDD+ Project management area prior to the start date.[7]

Type of cover	Specification	Area	
		ha	%
Forests	High dense inland forest	3,125,137	86.56
	High dense flooding forest	361,556	10.01
	Short dense inland forest	1,752	0.05
	Short dense flooding forest	1,298	0.04
	Fragmented forest with pasture and crops	1,836	0.05
	Fragmented forest with successional vegetation	23,244	0.64
	Palms	37,542	1.04
Water bodies	Lagoons and lakes	3,243	0.09
	Rivers (50 m)	14,608	0.40
Pastures	Crops-pastures-natural spaces mosaic	5,820	0.16
	Pastures-natural spaces mosaic	687	0.02
	Weedy pastures	62	< 0.01
	Clean pastures	475	0.01
Herbaceous areas	Herbaceous vegetation with shrubs	3,944	0.11
	Flooding herbaceous vegetation	1,664	0.05
Crops	Crops-natural spaces mosaic	266	0.01
Artificial areas	Airports	61	< 0.01
	Continuous urban areas	49	< 0.01

[7] Land cover in the Colombian Amazonia for the year 2016. Scale: 1:100,000 (SINCHI Institute, 2020).

Type of cover	Specification	Area	
		ha	%
	Non-continuous urban areas	26	< 0.01
Secondary vegetation	Successional vegetation	23,837	0.66
Open areas with poor vegetation	Natural sandy areas	84	< 0.01
Wet areas	Swamps	527	0.01
Shrublands	Dense shrubland	2,680	0.07
Total		3,610,399	100

Source: Land Cover Map of the Colombian Amazonia for 2016 at a scale of 1:100.00, version 1 (SINCHI Institute, 2020).

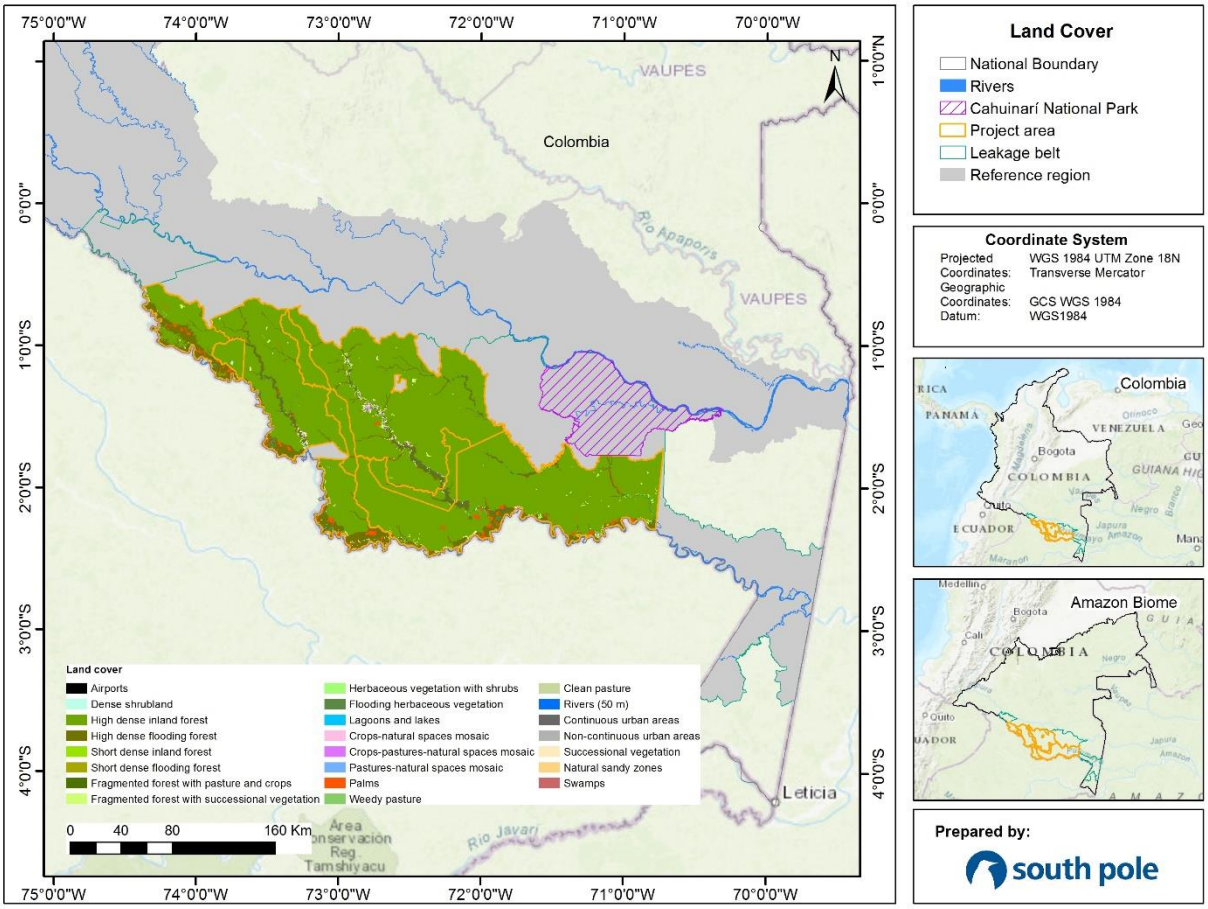


Figure 8. Map of land covers in the REDD+ Project management area.

Source: prepared by South Pole (2021).

1.13.5 Relevant socioeconomic aspects

The most relevant socioeconomic aspects that characterize the communities, prior to the start of the REDD+ Project, are presented below. More detailed information can be found in the attached supporting document *Annex4. Supporting_Document_No_1_Socio-environmental _Characterization.*

Political-administrative location

The REDD+ Project is in the department of Amazonas. This project is being developed in a sector of the Predio Putumayo Reserve, one of the reserves with the largest number of indigenous peoples in the Colombian territory. Therefore, it is home to a diversity of ethnic groups, different laws of origin, and diverse spiritual and territorial types of knowledge.

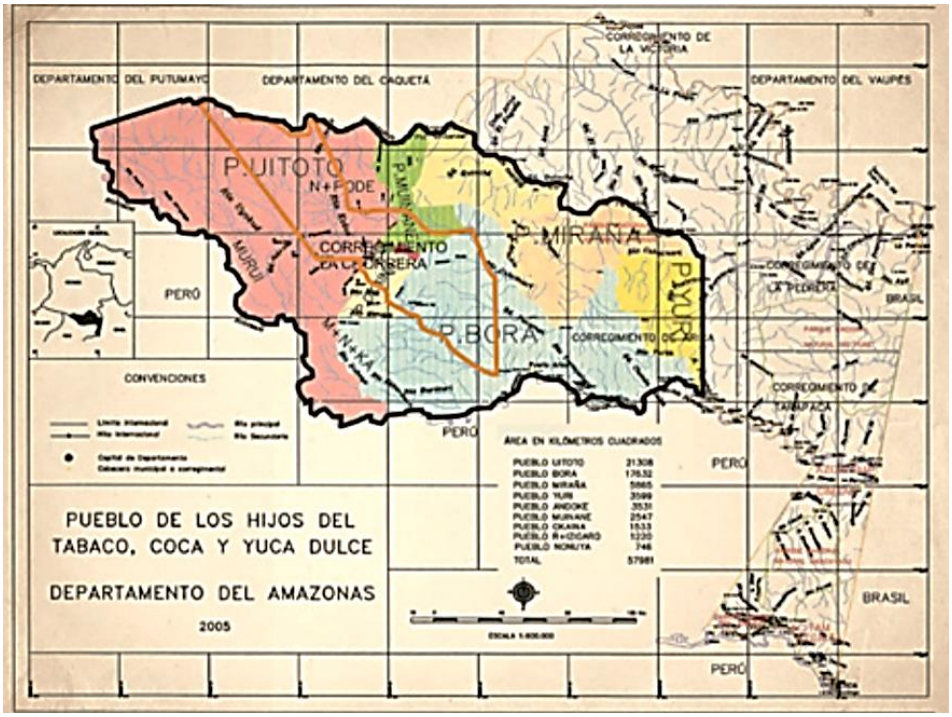


Figure 9. Location of the Predio Putumayo Reserve and its main indigenous peoples.

Source: AZICATCH. Agreement 440, 2014.[8]

Politically, this reserve is organized into AATI, which bring together the various communities and cabildos that make up the reserve. The AATI that are part of the REDD+ Project are:

1) **COINPA:** made up of the Uitoto and Inga peoples, who live in seven communities located along the banks of the Putumayo River. The communities belonging to this AATI are Inga, Itiquilla,

[8] http://www.centrodememoriahistorica.gov.co/micrositios/comunidades-etnicas/assets/pdf/sobrevivientes_victoriosos.pdf, 2021.

Martin Buinesa, Peña Blanca, Puerto Perea, Puerto Reyes, and Uitoto (Murui Muina). These represent 12.2% of the communities that are part of the REDD+ Project, with a total of 787 people distributed in 170 extended families. The population in this AATI is distributed as follows: 407 men (51.7%) and 380 women (48.3%).

2) **CIMPUM:** made up of the Murui, Inga, and Ticuna peoples, who live in 13 communities along the Putumayo and Cara-Paraná rivers. The communities belonging to this AATI are Marandúa, Puerto Belén, Puerto Calderón, Puerto Colombia, Puerto Molano, Puerto Ñeque, Puerto Tejada, Renacer, San Agustín, San José, San Rafael, Santa María, and Tercera India. These represent 22.8% of the communities that are part of the REDD+ Project. They have a total of 1,529 inhabitants distributed in 340 extended families. According to the 2019 census, the population in this AATI is distributed as follows: 821 men (53.7%) and 708 women (46.3%).

3) **AIZA:** made up of the Uitoto, Bora, and Inga peoples, who live in 12 communities along the Putumayo and Igara-Paraná rivers. The communities belonging to this AATI are Centro Arica, Consejo de Ancianos, New Wittemberg, Nueva Esmeralda, Nueva Reforma, Nueva Unión, Puerto Bora, Puerto Cabello, Puerto Cartagena, Puerto Limón, Puerto Tolima, and Sabalayaco. These represent 26.3% of the communities that are part of the REDD+ Project. According to the 2019 census information reported by the association, 206 families make up this AATI and are distributed among the 15 communities, with a total of 997 inhabitants, of which 498 are men (49.9%) and 499 are women (50.1%). Therefore, it is a very balanced population with respect to sex.

4) **AZICATCH:** made up of the Uitoto, Murui, Okaina, Muinane, and Bora peoples, who live in 22 communities along the Igara-Paraná River mainly. The communities belonging to this AATI are Asociación Nativa, Cair, Caisan, Capitanía, Centro Chorrera, Cordillera, Cris, Lago Grande, Milán, Mue, Ocim, Okaina, Petani, Providencia, Sabana, San Antonio, San Francisco, Santa María, Santa Rosa, Vegsam, Vista Hermosa, and Providencia Nueva. These represent 38.5% of the communities that are part of the REDD+ Project. There are 3,596 inhabitants, of which 1,917 are men (53.3%) and 1,679 are women (46.6%), distributed in 636 families.

Figure 10 shows the number of communities by AATI, as well as their percentage of participation, in terms of the number of communities, within the universe of communities that make up the REDD+ Project.

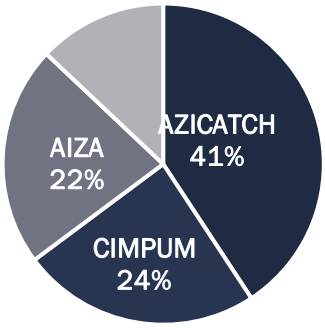


Figure 10. Percentage distribution of the number of communities participating in the REDD+ Project by AATI.

Source: prepared by South Pole (2020).

Communities that inhabit the Predio Putumayo Reserve

In the department of Amazonas, the indigenous peoples are distributed in three large culture complexes or "baskets of thought" (Echeverri et al., 2000, 179):

The first cultural complex is known as the people of the Yurupari ritual, the people who blow tobacco. The Macuna, Letuama, Tanimuca, Yucuna, Barasana, and other Eastern Tucano peoples belong to this complex. The Yuhup-Makú are also interwoven here as hunter-gatherers. These peoples reach as far as the Caquetá River, without passing to the south (AZICATCH Life Plan, AZICATCH, 2006).

The second cultural complex is called people of the center, people who suck *ambil*. The Murui (Uitoto), Bora, Miraña, Nonuya, Ocaina, Andoque, and Muinane peoples belong to this group. In this cultural complex, they have seven languages, a similar social organization, and a complementary mythology in this cultural complex. This basket of thought covers the territory from the Caquetá River to the Putumayo River, and even extends south of the Putumayo River.

The third cultural complex is called Ticuna-Yagua, made up of the Ticuna, Cocama, and Yagua peoples, located in the Amazon trapezoid region. They are the people of the word, of the coca, of the *ambil*, and of the *mambeaderos*—where they make their own decisions (AZCAITA Life Plan, AZCAITA, 2008)

To a lesser extent, the reserve is inhabited by communities of the Inga people, also known as the people of the *yagé*. They are located along the Putumayo River. These communities are mainly represented by COINPA and CIMPUM. The Inga people interact with the people of the center. Traditionally recognized for their trading vocation and their strengths in Curanderismo, the Inga people have gone beyond their area of origin in Valle del Sibundoy (Putumayo) to settle in different regions of the southwest of Colombia, in the Amazonia, and even beyond national borders.

Although they have different cultural systems or baskets of thought, they share an energy and a spiritual and territorial connection that allows them to relate and recognize each other. However, it is also important to recognize that, within these complexes, there may be groups with greater dominance than others. In the case of the people of the water located in the Amazon Trapezoid region, the Ticuna are the most dominant, either by number of members or by inhabiting the territory that belongs to them by law of origin, as opposed to the Yaguas who come from Peru and are a minority in terms of the number of members. The same happens with the Inga people, which belongs to another territory of origin and other cultural systems and, since it is a minority, it has adopted the practices and lifestyles of the people of the center. Coca, tobacco, and sweet cassava are crucial for the preserve of spirituality and government as gifts that they received in primordial times from the Creator Being or Father to take care of, protect, and heal the territory.

The ethnic structure has been organized in patrilineal clans. Each clan has been guided by a leader or elder, who has governed his clan and a traditional territory attached to this clan, which has been given

to him by the Creator Father. The elder is the one in charge of transmitting knowledge and its application; he is the depositary of the delegated word of life to be transferred and delivered to his successor. This rank of authority is inherited to the firstborn or to the one who receives and practices the knowledge. The leader is accompanied by his wife, who is the complement in the administration of the government; she is the person who harmonizes and sweetens the word. Then there are other persons who conform his administration such as the healer, the singer, and the messenger.

This social organization still survives, which is why there is a heterogeneity of governments and clans in the communities, cabildos, and associations present in Predio Putumayo. Thus, it is common to find people who work as counselors, spiritual guides, and government guides, as well as witch doctors or shamans, s*abedores* of productive activities (*chagras*, hunting, fishing, and gathering), and people who know everything necessary for the preparation of rituals and traditional dances. The social organization by clans and the family structure is based on and maintained through the existence and observance of certain principles.

In the past, several families (between 10 and 20 approximately) used to live in the same *maloca*, which might or might not belong to the same clan. All these families lived under the command of the leader of the clan, leader of the *maloca* or *Uruk+ moo*. This leader distributed functions according to the capacities of the men, who received the necessary knowledge and training to assume their positions (traditional doctor, *sabedor*, work organizer). Relationships within the *maloca* were based on family ties, which is why both decision-making and the redistribution of the products resulting from productive activities had to be done jointly and always in accordance with the rules of coexistence established by the leader. Likewise, there were rules of solidarity and distribution of functions; for example, in some workdays, the younger children were left in charge of the women. The formation of a new family within a *maloca* required prior preparation, which was guided by an *N+mairama* or traditional *sabedor*, responsible for the general organization of the *maloca* and for ensuring compliance with the rules administered by the leader of the clan.

The *maloca* also functioned as a school in which men were trained according to their abilities and the distribution of functions made by the *Uruk+ moo*. This traditional training process guaranteed, in relation to the increase in the population inside the maloca, the possibility of conformation of other *malocas*, since it was possible to count on a group of men prepared to assume the organization and the adequate functioning of a new housing unit. In this sense, when a family or clan living within a *maloca* was considered ready to form their own *maloca*, the leader of the future *maloca* and the *Uruk+ moo* talked over it and then, a dance was held to hand over the mandate. In general terms, it is stated that the importance of the traditional extended family was based on maintaining unity and spiritual and material control of the territory; preserving clans and villages; and keeping unity for work (Acosta et al., 2011).

The use, management, and control of the territory is done following a mandate by the Creator Being, whose purpose is to take care of life. Those who oversee this task are the *sabedores*, who, through dances, rituals, and daily practices, heal the territory; they do this from the *maloca*, the *chagra*, and the ceremonies and with the orientation of thought and the sweet word of coca, tobacco, and cassava.

Table 9 shows a summary of the most relevant cultural aspects of each of the indigenous peoples present in the project management area.

Table 9. Summary of cultural parameters of the indigenous peoples participating in the REDD+ Project.

People	Location	Population	Epithet	Main economic activity	Type of traditional or ceremonial housing	Authority	Production system	Language
Andoke	Araracuara Caño Aduche	820 people; 95 registered in Predio Putumayo	People of the axe	Rubber extraction	*Maloca*	Cacique or *maloquero*; elders	Farming, fishing, hunting, gathering	Andoke
Barasana	Caño Colorado, Pira Paraná River	905 people; no data for Predio Putumayo	-	Bitter cassava farming	Rectangular *maloca*	Leader of the *maloca*, *payé*, *kumu*, specialist in chants and dances, master in myth recitation	Fishing, hunting, craftwork, horticulture	Barasano - taiwano
Bora	La Chorrera, Puerto Arica, Tarapacá	1047 people; 77 registered in Predio Putumayo	People of the center	Bitter cassava farming	Octagonal *maloca*	Captain, shaman, specialist in Maguaré drums	Horticulture	Bora language family
Cocama	Puerto Nariño, Leticia, Palmeras, San José, Naranjales	3,221 people; six registered in Predio Putumayo	Ourselves	Timber, jute, fish, and rice trading	Houses on stilts near rivers	Shaman, witch doctor, *curaca* (leader)	Fishing, farming	Kokama – kokamilya, little-spoken language
Inga	Lower Putumayo	19,561 people; 52 registered in Predio Putumayo	Traveling people	Trade, folk medicine	-	*Sinchi* or *taita*, governor, elderly mayor, sheriff	Farming	Ingano, Quechua language family

People	Location	Population	Epithet	Main economic activity	Type of traditional or ceremonial housing	Authority	Production system	Language
Juhup	Apaporis River, Caño Jotabeya and La Libertad, department of Amazonas	Four people; no data for Predio Putumayo In the National Administrative Department of Statistics (DANE, as per its acronym in Spanish) database, this group was previously part of the Nukak	People	Hunting, gathering	They are part of the so-called *makú* groups of hunters and gatherers, originally of nomadic tradition. The *makú* groups are recognized as expert hunters. They exchange hunting poison for canoes with other groups. Nowadays, fishing and horticulture are their main supply activities. However, they continue to practice vegetable and insect gathering to a lesser extent.			
Letuama	Yapiyá, Popeyacá, and Icapuyá rivers in the lower Apaporis River	285 people; 16 registered in Predio Putumayo		Slash-and-burn horticulture	*Maloca*	Captain	Hunting, fishing, and gathering	Eastern Tucano language family: currently many of them speak the Tanimuca language
Makuna	Banks of the Comeña River and mouths of the Apaporis and Pira Paraná rivers	1,962 people; four registered in Predio Putumayo	People of the water	Slash-and-burn horticulture	Houses on stilts near rivers, *maloca*	Captain, shaman, *maloquero*, *kumu*	Hunting, fishing, forest resource extraction, pottery	Eastern Tucano language family

People	Location	Population	Epithet	Main economic activity	Type of traditional or ceremonial housing	Authority	Production system	Language
Miraña	Araracuara, La Pedrera The communities of San Francisco, Solarte, Puerto Remanso, and Maríapolis, along the Caquetá River	759 people; 51 registered in Predio Putumayo	People who run or people who roll	Slash-and-burn horticulture	Rounded *maloca*	Captain, elders	Hunting, fishing, forest resource extraction	Bora language family
Muinane	Caquetá River, near Araracuara and in the savannas of the upper Cahuinarí River	2,113 people; 163 registered in Predio Putumayo	Man of the river mouth	Slash-and-burn horticulture	Individual houses with materials obtained from the rainforest, around a *maloca*	Elders	Hunting, fishing, gathering	Uitoto language family
Nonuya	Villa Azul Reserve, Puerto Santander, Amazonas	258 people; 155 registered in Predio Putumayo	People of the achiote	Slash-and-burn horticulture	Houses on stilts near rivers, *maloca*	Cabildo, council of elders	Hunting, fishing, gathering	Bora language family

People	Location	Population	Epithet	Main economic activity	Type of traditional or ceremonial housing	Authority	Production system	Language
Ocaina	Banks of the Igara-Paraná River	412 people; 199 registered in Predio Putumayo		Rice, cassava, and plantain trading	Houses on stilts near rivers, *maloca*	Leader of lineage, captain	Horticulture, hunting, fishing, and wild fruit gathering	Uitoto language family
Tanimuka	Banks of the Apaporis, Guacayá, and Oiyaká-Miritíi rivers	991 people; four registered in Predio Putumayo	Ufaina, the ash people	Avocado, pineapple, papaya, lulo, and cashew nut farming	Single family homes, semi-conical *maloca*	Shaman or *yaico* (jaguar man), master of ceremonies, *maloquero*, captain	Hunting, fishing, fruit, and insect gathering	Eastern Tucano language family
Tikuna	South of the Amazonia in the Cotuhé River, Caño Ventura, Santa Lucía, Buenos Aires and in influence area of Leticia	13,842 people; 19 registered in Predio Putumayo	Yoi and Ipi's children, people of the solid land	Slash-and-burn horticulture	Houses on stilts, *maloca*	*Curaca*, clan-based social organization	Hunting, fishing, gathering of wild fruits, craftwork	Tikuna language family

People	Location	Population	Epithet	Main economic activity	Type of traditional or ceremonial housing	Authority	Production system	Language
Uitoto	Caquetá, Putumayo, Igara-Paraná, and Cara-Paraná rivers	12,029 people; 3,716 registered in Predio Putumayo	Children of the tobacco, coca, and sweet cassava	Slash-and-burn horticulture	Single family homes, *maloca*	Cacique, leader of the clan	Hunting, fishing, and gathering of wild fruits, ants, larvae, white grubs, and bee honey	Uitoto language family
Yukuna	Banks of the Miritíi-Paraná River, Caquetá River, La Pedrera, Comeyafú, Puerto Córdoba, and Villa Azul	1,582 people; four registered in Predio Putumayo	-	Slash and burn horticulture Cassava, plantain, and bushmeat trading	*Maloca*	Shaman	Gathering of wild fruits and invertebrates such as white grubs	Arawak language family

Source: prepared by South Pole (2021) based on Arango and Sánchez (2004)[9] and information from the DANE (2018, 2019).[10]

[9] https://mincultura.gov.co/areas/poblaciones/noticias/Paginas/Cumplimiento-PND.aspx

[10] Data: DANE National Population and Housing Census, 2018: https://www.dane.gov.co/files/investigaciones/boletines/grupos-etnicos/presentacion-grupos-etnicos-2019.pdf

Production system, traditional elements, and current conditions

The economic system is based on slash-and-burn agriculture, as well as on hunting and gathering of certain wild products. In general, each family clears one plot or *chagra*; they simultaneously own two or more *chagras* in various stages of production. After three years, when the cassava crop productivity begins to decline, the *chagra* is abandoned. The exploitation of fruit trees and other plants with a longer cycle continues for several years (Pineda, R. & Colombian Institute of Anthropology, 1987).

According to secondary information, the size of a *chagra* is generally one hectare. *Chagras* can be larger, especially when their production is destined for the preparation of a dance; in this case, the *chagra* can triple in size. Once the site has been selected, men work to prepare it during shifts that depend on the amount of labor involved. If the cutting down of vegetation is done through *mingas* (collective work of people belonging to different families), one hectare can be cleared in a few days. During the summer, the sites cleared are burned and the land is prepared for planting a few days before the rainy season begins (Echeverri et al., 1992). In the case of the AATI participating in the project, most of the *chagras* are between one and two hectares or less than one hectare, most of them are located less than one kilometer away from the homes, and they are family *chagras* (South Pole, 2019).

Traditionally, women are in charge of planting and harvesting crops, with the exception of coca, tobacco, and other psychotropic plants. Some plants, such as peach palms, dye plants, and fruit trees, are also grown around the houses. The main plants grown are bitter cassava, sweet cassava, yam, arrowleaf elephant ear, pepper, coca, peach palm, avocado, abiu, umari, etc. Corn is grown in some *chagras*, but the harvest is mainly used to feed chickens and other domestic animals. Bitter cassava is grown in a large part of the *chagra* and is usually associated with coca and, sometimes, with pineapple and barbasco. Yams, pepper, and arrowleaf elephant ear, or taro are grown near the fallen trunks. Plantain is grown in several areas. Tobacco and peanuts are grown in a separate small plot fertilized with ashes. In the case of peanuts, a small mound is erected and, in some cases, protected with fences (Pineda, R. & Colombian Institute of Anthropology, 1987).

In short, cassava, coca, and tobacco are the main cultigens of the indigenous peoples of the area. The first is processed as cassava bread, *fariña* (coarse flour), or tamale and is also prepared as a ritual or daily drink. The second is crushed and toasted in griddle-like pans, clay pots, or metal baskets; pulverized and sifted, the coca is mixed with trumpet tree ash and mountain grape leaf; the product is swallowed or *mambeado* (dissolved little by little in the mouth); every man has his coca container that he exchanges with his peers. Tobacco is used in a semi-liquid form as *ambil*; usually adults carry a small bottle with this content to share in meetings and conversations; consuming *ambil* in community expresses unity and solidarity; it is also used as a form of invitation for ritual ceremonies and sociability in general; its use is limited to adult men in a domestic group (Pineda, R. & Colombian Institute of Anthropology, 1987).

Hunting is a male activity. Women are not very involved in it, but, for example, they check the condition of the traps located in the *chagras* or prepare food with bushmeat prey. Children's participation in this activity is limited to the construction of *fatadas* or traps for small animals near the houses. Animals

commonly hunted include tapir, peccary, deer, black agouti, mountain paca, short-tailed cane mouse, marmoset, *picón*, scarlet macaw, parrot, trumpeter, Spix's guan, curassow, and tinamou. In the 1980s, hunting was done with shotguns and traps, taking advantage of the indigenous knowledge about the customs of the fauna. The main source of protein in the diet comes from hunting, fishing and, to a lesser extent, domestic animal husbandry (Calle, 1986).

Unlike hunting, women, children, and young people are more involved in fishing. Different fishing technologies are used: traps, barbasco, nets or meshes, hooks, harpoons, and machete fishing. Although fishing supplies are bought or exchanged in settlers' and traders' stores and boats, the knowledge applied to fishing is traditional, based on detailed native observation of the characteristics and ecology of the fish.

As for gathering, it allows indigenous peoples to obtain food of animal origin, such as Caribbean pine leaf cutting ants, white grubs and other edible larvae, and some species of frogs, as well as food of plant origin, important in the indigenous diet, such as patawa fruits, moriche palm fruits, and wild granadillas. Gathering favors the joint work of all the members of the domestic group. In addition to food from wild sources, gathering provides construction materials, household goods, personal ornaments, as well as poisons and medical supplies.

The relative importance of each of these spheres of economic activity: hunting, fishing, and wild fruit gathering, with respect to other practices, will depend on seasonal variations. There are times of the year when the work invested in horticulture is predominant, as well as the product obtained from the *chagra*; however, at other times its importance may vary, so fishing, hunting, or gathering become the main food sources (Calle, 1986).

Relationship of communities with the forest

At the territorial level, the indigenous communities have had a mixed economy typical of Amazonian societies, complementing hunting, gathering of forest products, fishing, and *chagra*-based farming practices. In this sense, the indigenous communities of Predio Putumayo use the territory for their daily sustenance and food sovereignty, in short, for their social reproduction. However, this relationship transcends the utilitarian view. The forest is classified and understood in its multiple spaces of use as a territory in which the communities and the goods offered by it converge, enriched in turn by the indigenous people's adherence to codes of reciprocity with the ancestral entities that protect these goods.

Based on research conducted over time, the Tropenbos Colombia Foundation proposes some basic principles that support the complex relationship between Amazonian indigenous communities and the natural territory (Rodríguez et al., 2007). The principles can be summarized as follows:

1) There is a limited amount of vital energy that must circulate among all beings in nature.
2) Everything in nature has its "spiritual owners" and nothing can be used without their permission.
3) The spiritual owners control the misuse of nature by means of their disease-causing weapons.

4) The territory is a multi-ethnic space in which each group has its own origin or birth, which must be maintained and well cared for.
5) Each ethnic group has its ritual tasks that must be performed to ensure harmony or balance in the territory.
6) The *maloca* or communal house is the basic unit of interaction with nature.
7) The shaman is the person in charge of establishing a balanced or harmonious relationship with nature and its spiritual owners, through symbolic and ritual payments and negotiations.
8) Each ethnic group has certain species of the forest as their spiritual ancestors, who are considered their grandparents and highly respected species. Each animal has its own place of origin and territory of occupation that must be respected.

This set of principles has significant symbolic references for the life of the indigenous peoples in the tropical forest and, in turn, serves as a basis for a more detailed and strict regulation of the relations and use of each of the resources of the forest, the natural environment of the territory, or the "world", as the macro-territory is defined in "shamanic" terms (Rodríguez et al., 2007: 57). In this sense, the ordering of the territory is also something sacred. Through this relationship, each society establishes order in its territory, distinguishing within it what is appropriate and what is not. Preserving the sacred facts and places within the environment of each indigenous people is a condition to put into practice the traditional forms of government, healing, and justice. The violation of these sacred places brings disorder and loss of moral and vital horizons. Therefore, the state is expected to contribute to the safeguarding of the sacred places as places of memory (Saade et al., 2019).

Local perception of climate change and its effects

Currently, the subsistence systems (slash-and-burn horticulture, fishing, hunting, and gathering of fruits and wild materials) of the indigenous communities that inhabit the Predio Putumayo Reserve are linked to the succession of well-established seasons. The indigenous people are aware of the complex ecological indexes that regulate the interrelationship of water, winds, and temperature cycles, as well as its effects on the reproductive cycles of fish, terrestrial fauna, and wild fruit trees and on the regulation of the ritual and productive activities of people. Although inter-annual variations of the seasonal succession are normal, the indigenous people consider that the unexpected natural signs and indexes are alarming: the seasons are occurring out of time; the pulses of flooding and lowering of rivers are not synchronized with the ripening of wild fruits; and the heat is increasing, among other facts. Rather than the impact of increased environmental temperature, the changes in precipitation and seasonality have the greatest impact on subsistence activities, mainly horticulture, fish reproduction, and human health (Echeverri, 2009).

The impacts of seasonality alteration fall on fauna and flora. The river flood cycles that do not reach the overflows or that have abrupt descents and ascents directly affect the reproduction of aquatic fauna, particularly fish, which are the most important source of protein for the Amazonian people. Another impact of climate change is derived from the alteration of cold seasons: short, weak, or unseasonal cold fronts, together with the erratic succession of dry and rainy seasons, cause that the flowering and ripening of wild fruit trees occur out-of-season or does not occur at all.

Two prominent crops that mark the peak of the dry season (the peach palm) and the cool season (the moriche palm) have shown abnormal behavior in recent years. All this, in turn, has an impact on terrestrial fauna, which feed on these fruits, and on humans, who feed on both.

Increased heat affects horticultural work and human health. High temperatures in open areas, such as productive *chagras*, cause fatigue and headaches, as the elder pointed out. From the indigenous view, higher temperature increases the circulation of disease in the world. Other effects on human health—not yet evident, but predictable—have to do with the potential decrease in food sources. Impacts on the chagras system affect both the availability of carbohydrates, since small chagras in secondary forests do not produce the amount of cassava for a family, and the diversity of other tubers and cultivated fruits, in general the chagras are less diverse. Alternative sources of protein; terrestrial fauna, avifauna, insects, and of vitamins and minerals, wild fruits, are also affected. (Echeverri, 2009).

The indigenous people have underlined the increasing occurrence of stronger and unknown types of respiratory and intestinal diseases. Vector-borne diseases, such as malaria and dengue, have apparently not increased, but the changing character of river fluctuation may create favorable conditions for vector reproduction in yet unforeseeable ways. The indigenous people recognize the seasonal recurrence of viral diseases and resort to preventive practices of both material and spiritual natures. The appearance and disappearance of recurrent diseases (influenza, diarrhea) is closely related to flood cycles, rainfall patterns, and temperature changes. The disease, according to the Caquetá-Putumayo groups' vision, is in the trees and the water; the flood and the winds of the cold fronts serve to collect all that disease from the world and drain it towards the sea when the rivers descend. When the flood is not high enough or the cold front is not strong enough, the disease accumulates in the atmosphere and the waters, causing the extension of respiratory and intestinal disorders and the emergence of new ones. Ritual specialists from the middle Caquetá region (northern rainfall regime) clearly express that the ritual practices that have served to prevent and control the adverse effects of each season are having less and less effect, due to the disorder of the seasons (Echeverri, 2009).

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

1.14.1 Legal and environmental requirements

The REDD+ Project activities are developed as part of the Comprehensive Strategy for Deforestation Control and Forest Management (EICDGB, as per its acronym in Spanish), a mechanism derived from the National Policy for the Integrated Management of Biodiversity and its Ecosystem Services (PNGIBSE, as per its acronym in Spanish). This policy represents the materialization of the international agreements and commitments subscribed by Colombia, including:

- United Nations Framework Convention on Climate Change
- Convention on Biological Diversity
- United Nations Convention to Combat Desertification
- Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat

- International Tropical Timber Agreement
- Convention on International Trade in Endangered Species of Wild Fauna and Flora
- Andean Community Decision 391
- Kyoto Protocol
- Paris Agreement

To adhere to the international agreements mentioned above and to articulate the REDD+ Project activities with the national conservation goals, the laws approving each of the international treaties mentioned above and the policy documents to implement them at the national level are taken into account:

- National Policy on Climate Change
- Colombian Low Carbon Development Strategy
- National Plan for Adaptation to Climate Change
- National Policy for the Integrated Management of Biodiversity and its Ecosystem Services
- Biodiversity Strategy and Action Plan
- Forest Policy
- National Forestry Development Plan
- National Council for Economic and Social Policies 3680 (CONPES 3680) of the National System of Protected Areas (SINAP, as per its acronym in Spanish)
- National Plan for Ecological Restoration, Rehabilitation, and Recovery of Degraded Areas
- Sustainable Land Management Policy

On the other hand, the activities associated with the REDD+ Project are carried out in accordance with existing national and regional land-use planning structures. In the case of the indigenous communities of the different organizations or AATI that are part of the project, their territory is recognized legislatively as non-municipalized areas that do not have a land use plan and, therefore, the only land use instruments are the life plans prepared by each AATI, which are taken as the guiding axis for the development of the REDD+ Project and as the basis for the formulation of its six strategic lines.

Likewise, the REDD+ Project takes into consideration special provisions regarding the main environmental determinants of the territory that guide its zoning and distribution:

- **SINAP:** part of the REDD+ Project area is located within the Cahuinarí National Natural Park, specifically in the northern part of the AIZA community in Puerto Arica. The boundaries of the Cahuinarí National Natural Park are defined in Article 1 of Agreement 0044 of 1986, which establishes land use restrictions that are considered within the REDD+ Project activities.
- **Amazon Forest Reserve (created through Law 2 of 1959):** Law 160 of 1994 establishes that, when there is an overlap between an indigenous reserve and a forest reserve, both are compatible. Therefore, the indigenous reserve is, at the same time, a forest reserve. Given that the project is an initiative of the communities inhabiting the reserve and does not involve

intervention in the territory, like infrastructure or mining projects, an environmental license or subtraction of areas from the reserve are not required for the project implementation.

- **Strategic ecosystems within the framework of Article 4, paragraph 1.4, of Decree 3600 of 2007:** wetlands are environmental determinants in accordance with the provisions of CORPOAMAZONIA and the provisions of Article 1 (sections 2 and 5) of Law 99 of 1993, Law 165 of 1994, Law 357 of 1997, and Resolutions 157 of 2004 and 196 of 2006, issued by the Colombian Ministry of Environment, Housing, and Territorial Development. Thus, this component is incorporated into the REDD+ Project to guarantee its protection and conservation.

Similarly, the REDD+ Project is integrated with the national public policy tools established by Law 1931 of 2018, which establishes the guidelines for climate change management. These tools include the provisions established by the National System for Climate Change (abbreviated SISCLIMA in Spanish) through Decree 298 of 2016 and other planning and management instruments, such as the comprehensive sectoral and territorial climate change management plans.

As a special provision, Law 1931 of 2018 also created the National System of Information on Climate Change (SNICC, as per its acronym in Spanish) as part of the SIAC. The SNICC included the RENARE, created through Article 175 of Law 1753 of 2015, as an instrument for managing information on GHG mitigation initiatives. This instrument was then regulated by the MADS through **Resolution 1447 of 2018** as part of the Monitoring, Reporting, and Verification System of GHG mitigation actions. In this sense, with the purpose of subjecting the mitigation results to national accounting, the REDD+ Project recognizes and, in all its phases (feasibility, formulation, and implementation), is governed by the guidelines of that Resolution, in addition to incorporating the assessment and monitoring of the social and environmental safeguards' commitment to REDD+ in Colombia.

At the regional level, the articulation of the REDD+ Project with forest governance structures recognizes formal organizations such as the Intersectoral Commission for the Control of Deforestation; the Integrated Management for the Permanent Indigenous Roundtable, the Amazon Regional Roundtable, and the Amazon Indigenous Environmental and Climate Change Roundtable; and the OPIAC. In this way, all phases of the REDD+ Project are oriented towards the recognition of:

- Articles 2, 13, 20, 20, 38, and 80 of the Colombian Constitution.
- Law 2 of 1959, which creates the Amazon Forest Reserve.
- Decree-Law 2811 of 1974, which establishes the National Code of Renewable Natural Resources and the Environment.
- Law 99 of 1993, which creates the Ministry of the Environment and the National Environmental System.
- National Development Plan 2018-2022: Pact for Colombia, Pact for Equity.
- Decree 1791 of 1996, Forest Harvesting Regime.
- Decree 3750 of 2011, which modifies the objectives and structure of the MADS and integrates the Administrative Sector of Environment and Sustainable Development.

- National Council for Economic and Social Policies 2834 (CONPES 2834) of 1999, which adopts the Forest Policy.
- Decree 2372 of 2010, which regulates the SINAP.
- Decree 298 of 2016, which establishes the organization and operation of the SISCLIMA and other provisions.
- Decree 1257 of 2017, which creates the Intersectoral Commission for the Control of Deforestation and Integrated Management for the Protection of Natural Forests and other determinations.
- Law 388 of 1997, which amends Law 9 of 1989 and Law 3 of 1991 and issues other provisions on land planning.
- Decree 1397 of 1996, which creates the National Commission on Indigenous Territories and the Permanent Roundtable with indigenous peoples and organizations.
- Decree 3012 of 2005, which creates the Amazon Regional Roundtable for the Indigenous Peoples of the Colombian Amazonia and establishes other provisions.
- Environmental Management Plan for the Southern Region of the Colombian Amazonia (PGAR, as per its acronym in Spanish) 2018-2038.
- COINPA Life Plan 2008.
- CIMPUM Life Plan 2008.
- AIZA Life Plan 2008.
- AZICATCH Life Plan.

It is important to mention that the REDD+ Project also considers the Colombian regulatory framework related to indigenous territories (Articles 63 and 329 of the Colombian Constitution), which recognizes the right and autonomy of indigenous territories through reserves, the special indigenous jurisdiction whose lands "are inalienable, imprescriptible, and unseizable," and collective land tenure.

Given that the mitigation activities directly affect, or might affect, the communities that are part of the AATI, the project must consider the national provisions as well as the provisions by the Colombian Ministry of the Interior on prior consultation and free and informed consent. It must also seek to ensure the participation and fair and equitable distribution of the economic benefits generated by the commercialization of mitigation results and identify the social and environmental benefits generated by the activities implemented to reduce deforestation in the forests of the reserve.

However, although Decree 1320 of 1998 establishes a procedure for the development of prior consultation, it is quite limited and does not apply correctly to this type of projects, since this decree regulated prior consultation for activities that require an environmental license and, so far, the country does not have a clear and homogeneous mechanism that guarantees such consultation nor the regulations on how to proceed with free, prior, and informed consent in mitigation projects.

Considering the above and the VCS methodological guidelines for stakeholder consultation, the REDD+ Project will lead processes to inform the four AATI about the project design and maximize stakeholder

participation, assess impacts and establish mitigation measures, and define mechanisms for ongoing communication with the communities, so they can raise their concerns about potential negative impacts during the project implementation.

Additionally, the REDD+ Project will design a **benefit distribution system** that specifies the type of benefits generated (economic, social, cultural, or ecosystem-related), the interventions to be made, the rules or mechanisms to distribute these benefits fairly and equitably among the communities involved, and the responsibilities assumed by the project parties in the management of these benefits. The benefit distribution system is currently under construction; when appropriate, it will be discussed and subsequently validated by the communities of the reserve through the traditional consultation and information spaces.

The recognition of the right and autonomy of indigenous territories and the right to free, prior, and informed consent within the REDD+ Project is related to the following regulations:

- ILO Convention 169 and the United Nations Declaration on the Rights of Indigenous Peoples.
- Articles 2, 7, 40, 63, 70, 93, 229, and 330 of the Colombian Constitution.
- Law 70 of 1993, which regulates transitory Article 55 of the Constitution and recognizes the collective property rights of the black and indigenous communities to certain portions of the national territory.

From its conception, and as an essential requirement for the certification process of reducing emissions from deforestation, the REDD+ Project takes into account and ensures that the collective territorial rights of the communities of the reserve are respected in accordance with the provisions of Law 70 of 1993 and Decree 2164 of 1995 (which partially regulates Chapter XIV of Law 160 of 1994 in relation to the provision and titling of land to indigenous communities for the establishment, restructuring, expansion, and stabilization of the indigenous reserves in the national territory). The project has also promoted the recognition of the traditional knowledge systems and the autochthonous visions on the concept of territory, especially in relation to the respect for the cultural assets and values of the communities; the participation of the different ethnic groups that inhabit the reserve; the identification and mitigation of community risks associated with the implementation of the project activities; and the knowledge and strengthening of the internal regulations and the life plan. The respect for the traditional knowledge of the communities inhabiting the reserve is framed by the following provisions:

- Article 4 of Law 397 of 1997, which defines the cultural heritage of the nation as that constituted by all the cultural assets and values that are an expression of the Colombian nationality: tradition, customs, habits.
- United Nations Declaration on the Rights of Indigenous Peoples and Law 21 of 1991, which address the constitutional rights of indigenous peoples in Colombia.
- Decree 2941 of 2009, which partially regulates Law 397 of 1997 on intangible cultural heritage.
- Court Order 004 and 005 regarding plans for the safeguarding of traditional knowledge.

1.14.2 Conformity of project activities with the land use planning

The REDD+ Project also seeks to support the consolidation of environmental and land use planning instruments provided for in national, regional, and local legislation, with a focus on the conservation and sustainable management of the forest; therefore, from the feasibility phase, the project proponent has sought to recognize and respect the guidelines (measures and instruments) of environmental and land use planning defined in Table 10. Similarly, during the discussion and consultation spaces, the project has encouraged the communities inhabiting the Predio Putumayo Reserve to obtain clear information on the articulation of this initiative with the measures and instruments mentioned, in addition to the communities' forms of land use planning of the reserve to contribute to its permanence over time.

The articulation with the main land use planning guidelines identified at the regional and local levels will be monitored during each verification to ensure periodic assessment of their compliance.

Table 10. National, regional, and local land use planning guidelines for the REDD+ Project management area.

Regulatory framework and land use planning guidelines	Description	Articulation with the REDD+ Project
Comprehensive Strategy for Deforestation Control and Forest Management - 2018	This cross-sectoral proposal of the Colombian National Government, through the MADS, seeks to comprehensively address different aspects related to the effectiveness of forest governance to reduce deforestation and improve forest management. The proposal includes five strategic lines: • Community management of the territory, livelihoods, and diversified economies based on the natural forest. • Integrated action to close the agricultural frontier and transform the forest economy. • Land use planning and environmental determinants. • Permanent monitoring and control. • Building and strengthening of legal, institutional, and financial capacities.	The specific objectives of the strategic lines of the REDD+ Project (see section 1.11.2) are consistent with the proposals mentioned in the different national and regional instances (EICDGB and PGAR), since they are oriented to the execution of actions for the adequate management of environmental resources, the promotion of sustainable development, and the conservation of the traditional values of the reserve under a pilot implementation, as part of the ENREDD+, which is developed considering a whole normative framework in terms of environment and sustainable development.
Environmental Management Plan for	The programs included in the plan were developed considering the	

Regulatory framework and land use planning guidelines	Description	Articulation with the REDD+ Project
the Southern Region of the Colombian Amazonia 2018-2038	existence of a regional group of different stakeholders and focus on: • Governance and empowerment of institutions and the community for the environmental management of the region. • Strengthening of inter- and extra-regional relations. • Information and knowledge for the environmental management of the region. • Functional land use planning for the region's preserveist development. • Governability of disaster risk and climate change management. • Environmental management of the ordered functional areas.	
Life plans of the AATI: **COINPA** **CIMPUM** **AIZA** **AZICATCH**	These documents constitute the political orientation to be followed by the communities, leaders, and authorities, as well as the institutions, so that they can support the initiatives formulated in those life plans, in compliance with their function and the obligations for which they were created as mandated by law. The main topics are: • Political organization and self-government. • Community's justice system. • Land and environment. • Health and spirituality. • Education and culture. • Economy. • Infrastructure and equipment.	With respect to the general guidelines of the life plans, the REDD+ Project is born as an initiative to advance actions regarding: <u>General objectives:</u> Strengthen governability, administrative and political autonomy, and territorial unity of the communities belonging to the COINPA, CIMPUM, AIZA, and AZICATCH associations. <u>Territory:</u> Build a model of land use and environmental planning based on traditional thinking and the development of the life plans. <u>Production and economy:</u> Promote actions for the improvement and development of productive activities that are in line with the traditional uses and customs and that strengthen traditional agriculture. Improve the living conditions of the population of the reserve through solidarity-based productive initiatives that promote the communities' social and economic well-being.

Regulatory framework and land use planning guidelines	Description	Articulation with the REDD+ Project
		Special indigenous jurisdiction: Develop and implement the AATI' internal rules and regulations. Community infrastructure: Consider the environment, manage solid waste, and produce organic fertilizers.
AATI' internal regulations	They are divided into sections that describe the characteristics of the members, rights and duties, permanence in the reserve, use of natural resources, indigenous government, and faults and penalties.	The REDD+ Project adopts the participating AATI's internal regulations regarding: • Organizational structure. • Resource management and accountability. • Respect for traditional knowledge. • Sector planning. • Mitigation of potential project risks and management of faults and penalties. • Regulation and commercialization of renewable natural resources (control and management).
Cahuinarí National Natural Park (Resolution 190 dated October 19, 1987)[11]	Considering that the area of the Cahuinarí National Natural Park overlaps with the AIZA, Article 2 of Agreement 0044 of 1986 regulates the restrictions on use as follows: "Within the area delimited in the preceding article, activities other than conservation, research, education, recreation, culture, recovery, control, and especially the allocation of wasteland, as well as those referred to in Articles 30 and 31 of Decree 0622 of 1977, are prohibited."	The REDD+ Project considers and adheres to the regulations on land use of the Cahuinarí National Natural Park by orienting the project activities towards the conservation of natural forest areas, as well as leading activities that contribute to the appropriation of the culture and education of the communities in their territorial environment. In this way, the regulated land uses in the national natural park have already been considered in the strategic lines proposed by the project and do not generate significant alterations to the environment.

Source: prepared by South Pole (2020) based on the land use planning guidelines mentioned.

[11] Environmental Determinants and Issues for Land Use Planning in the Department of Amazonas – CORPOAMAZONIA. 2014. Section: 5.1.1.3 Cahuinarí National Natural Park.

1.14.3 Project Governance Structures

During the design stage, the entities involved in this REDD+ project are the project proponents (indigenous communities) and their AATIs, who have advanced this phase of the project through collaborative efforts and consensus-building. In this stage, both the project proponents and the project developer have distributed roles among the members of their respective operating structures. In addition to the administrative and commercial units providing comprehensive support to the projects, South Pole created a team consisting of a supervisor; general coordinator; and experts in community, biodiversity, climate, and project implementation matters. Through this team, the company assumes the following roles:

- Supporting the development of the project and its activities, as well as the design of its structure, considering financial, implementation, monitoring, and maintenance aspects.
- Promoting and facilitating the implementation of the Participation, Communication, and Knowledge Appropriation Strategy (EPCAC, as per its acronym in Spanish).
- Ensuring the project's smooth operation, monitoring, and maintenance, offering support in applying methodologies for greenhouse gas reduction accounting; on-the-ground implementation of activities; drafting the Project Design Document (PDD); determining and analyzing the baseline; developing Measurement, Reporting, and Verification (MRV) plans; and in the processes of registration, verification, and issuance.
- Providing guidance in the validation and verification audit processes and certification according to a valid certification program or standard.
- Trading the carbon credits generated by the project.

For their part, the communities and their associations have contributed to the project's design in accordance with their traditional forms and structures of governance. Even though each association has its own unique governance structure, their governing bodies generally have three main hierarchical levels, each with a similar scope and set of responsibilities, although the names and compositions of these bodies may vary among associations. These levels are:

General assembly, council of elders, or traditional authorities board: The general assembly, also known as the congress, is the first level of authority within each indigenous association. It brings together representatives from all communities to make decisions regarding matters concerning the association. Decisions pertaining to the project have been taken in this space, which also serves as the annual accountability forum where updates on process difficulties and advancements are presented.

Association's land management council, executive committee, or government council: This is the associations' administrative body, which is governed by Decree 1088 of 1993. It consists of several members, chosen based on each association's bylaws, and is responsible for executing plans and programs that affect the communities. Among its main functions are:

- Legally representing the association.
- Signing the necessary agreements and contracts.
- Launching initiatives to address the needs of the associated communities.
- Defining policies and regulations pertaining to environmental, social, and economic issues.

- Establishing control and coordination mechanisms.
- Executing budgetary allocations and informing the assembly.
- Ensuring that programs and projects are formulated in accordance with the life plan, demands, and claims of indigenous peoples.
- Scheduling activities and tasks.

In addition to the legal representative, often referred to as the president or senior advisor, the vice presidents and secretaries or advisors for environment and land matters have been particularly involved in the project's development. They have acted as spokespersons for the project proponents, regularly attending follow-up meetings and addressing needs for project advancement.

Community governance: Within the framework of indigenous laws, their special jurisdiction, and international laws for indigenous peoples, a system is established at the community level to govern internal affairs in compliance with their Life Plan and traditions. This governance system is led by a governor whose appointment is made through democratic elections. Hierarchical status may also be considered in this regard, allowing certain individuals to assume authority by traditional right.

Based on the above, the formulation of the benefit distribution and management system was initiated. This system outlines an administrative structure that builds upon the existing governance structures within the communities, integrating and strengthening them in preparation for the project's implementation phase.

During the formulation of the benefit distribution system for the REDD+ Project: indigenous peoples protecting the rainforest, it was decided to include the concept of "management" as a pedagogical tool. This decision was made to highlight, through the system's name, the responsibility and commitment involved in accessing and managing benefits. Likewise, the term "administrative structure" was chosen to refer to the system necessary for project implementation. This choice was made because the term "governance" could be interpreted by communities as potentially creating alternative bodies to their existing governance structures. Henceforth, the term "administrative structure" refers to the bodies, roles, and responsibilities of the entities participating in the project's benefits.

An organization's administrative structure is a system that specifies its level of hierarchy and how it operates to accomplish the goals and objectives that drive its growth. In the operation of a REDD+ project, the administrative structure must be able to guarantee the implementation of methodologies, processes, tools, and other elements required to streamline, relax, and simplify decision-making for the organizations or community groups executing it. Various factors are also taken into account, including technology, strategy, human resources, and the environment, in order to select the most suitable governance model for the project's implementation. Since the administrative structure will ultimately be a vehicle for carrying out the project's objectives, there must be coherence between these objectives and the chosen structure.

As mentioned earlier, this administrative structure is based on the governance model that currently exists in the associations throughout the territory. It defines hierarchical levels, key decision-making bodies, and the roles of their members. In each of the project proponents, there is a governance model

that is tailored to meet the operational and administrative requirements of the REDD+ projects' implementation.

This implementation implies adapting the associations' governance structure to integrate the processes, tools, and methods needed for project implementation, as well as to streamline, relax, and simplify organizational decision-making. For the project's implementation phase and its proper operational and administrative functioning, the following three guiding aspects were considered:

- Administrative component: Responsible for managing financial resources and relationships with financial and banking instruments and for the financial reporting of the project.
- Monitoring and control component: Responsible for monitoring and evaluating the correct execution of project activities, the use of financial resources, and the achievement of project indicators.
- Operational component: Responsible for formulating and developing activities, plans, and policies during the project's implementation.

These components are compared with the governance structure of the AATIs to determine which administrative structure would best support the project's objectives and have the approval of the communities to ensure ownership and execution. Therefore, the administrative structure and its associated processes are consolidated via consultation, consensus-building, and validation in the territory.

Based on the results of such analysis, the creation of three committees for each of the associations of the REDD+ Project: indigenous peoples protecting the rainforest is proposed, which can be integrated into the existing governance structure. These committees include (i) the resource committee, responsible for the administrative component; (ii) the oversight and advisory committee, responsible for the monitoring and control component, and the (iii) operating committee, responsible for the operational component.

All decision-making bodies within the governance structure of the AATIs are maintained, such as the general assembly/congress and cabildo or community assemblies. Furthermore, there is a decentralization of authority and resources in each community's execution of project activities. Hence, community governments are included in the operational component and officially report to the operating committee, as shown in Figure 11.

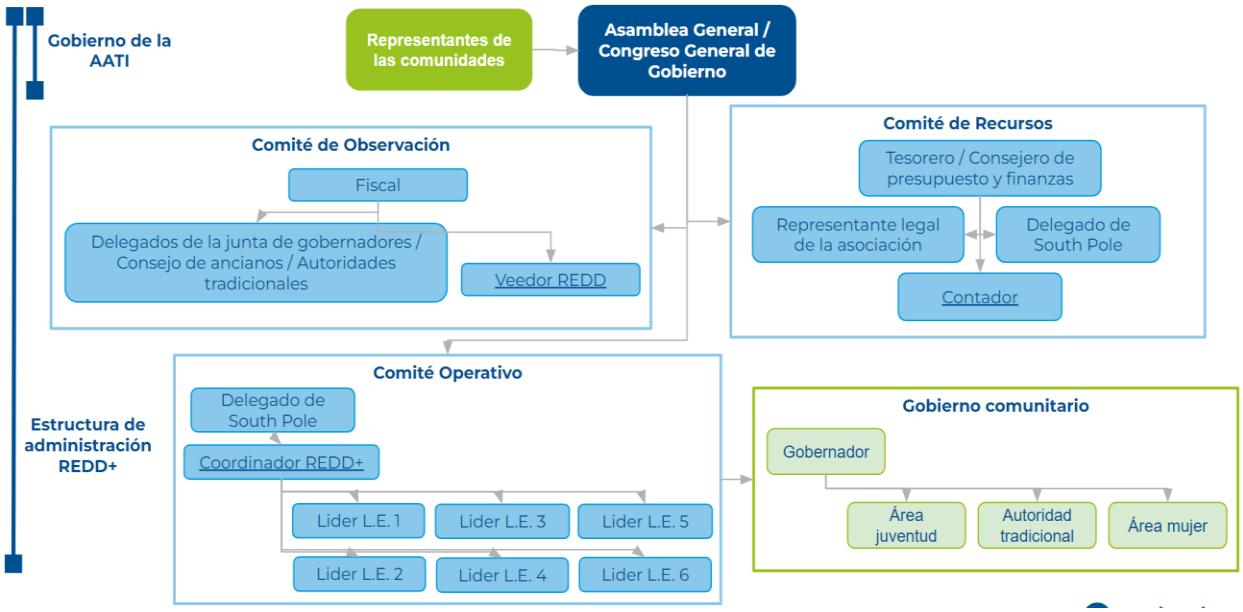


Figure 11. Administrative structure of the REDD+ Project: indigenous peoples protecting the rainforest.

Source: compiled by South Pole (2023).

The following table provides detailed information about the bodies comprising the proposed structure, which was agreed upon and validated by the project proponents during assemblies. It outlines its composition, as well as the roles and responsibilities assigned to each body. It also highlights the bodies (operating committee and resource committee) in which South Pole delegates are expected to participate, along with their duties, which include supervising resource management and financial accounting and providing technical support in carrying out project activities. Based on the identified needs, technical allies with competency and expertise in aspects related to project activities that are prioritized for execution will be considered for participation in the formulation and implementation of activities.

Table 11. Bodies, roles, and responsibilities of the proposed administrative structure.

Body	Description
General assembly/ congress	As the AATI's highest decision-making body, the general assembly or congress is involved in every phase of the REDD+ Project: indigenous peoples protecting the rainforest development. It shall function according to the guidelines and composition specified in each AATI's bylaws. Its duties include: • Deciding on the annual budget for the project's management and activity execution while taking the association's concerns and the community assembly's top priorities into account. • Determining whether technical allies should be included in project implementation when the association does not have the necessary financial, technical, human, or technology resources to execute it properly.

Body	Description
	• Selecting the members of each committee and evaluating their performance. • Deciding on penalties and warnings for committee members[12]. • Assessing executed activities and their favorable or unfavorable effects within the context of the monitoring plan. • Revising, modifying, and approving internal regulations, manuals, or guidelines for the project's proper operation. • Identifying and approving project improvement actions.
Resource committee	The resource committee is responsible for the financial management of the REDD+ project. Its members convene periodically to review and approve disbursement orders for project activity implementation. They are also in charge of providing regular financial accountability reports to the communities. Each member has specific responsibilities, as detailed below. The members of this committee are: • Legal representative of the AATI • Treasurer/Budget and finance advisor • Accountant • South Pole delegate Among their responsibilities are: • Keeping records of the project's revenue and expenses, traded and available carbon credits, and other financial records. • Preparing periodic reports on the project's budget execution. • Preparing the annual report on resource execution and available resources, as well as projected budget for presentation to the *congress or general assembly for resource prioritization and result evaluation*. • Assessing the financial viability of the annual operational plan (AOP). • Planning and overseeing cash flows. • Before authorizing and forwarding disbursement orders to the banking instrument for fund disbursement, ensuring that they comply with the authorized AOP.
Legal representative of the AATI	The legal representatives' specific project duties are based on their current roles within the AATI. Some of their main responsibilities are: • Signing disbursement orders for resources allocated to the execution of activities. • Signing contracts, agreements, and other documents required for the implementation of the REDD+ project. • Representing the project to stakeholders, including NGOs, the media, and public

[12] The general assembly may assign the oversight committee the responsibility of penalizing and admonishing committee members or other community members, provided that an internal project regulation with these considerations is already established and communicated to all community members.

Body	Description
	institutions. ● Other responsibilities associated with their role.
Treasurer/Budget and finance advisor	The treasurers'/budget and finance advisors' specific project duties are based on their current roles within the AATI. Their main responsibilities include: ● Managing and administrating the project's property and assets, in collaboration with other members of the resource committee. ● Meeting the project's monetary and economic commitments. ● Preparing reports for each committee meeting and the annual report on resource execution. ● Ensuring the project has the necessary resources for its implementation at all times. ● Being the primary point of contact between the association and the banking instrument. ● Planning and overseeing daily cash movements (inflows and outflows).
Accountant	Some of the main responsibilities of the accountant are: ● Keeping accurate and current records of the project's revenue and expenses. ● Preparing and presenting financial and accounting reports. ● Creating accounting and financial procedures. ● Ensuring compliance with tax and financial requirements.
South Pole delegate[13]	In their role as a project developer and technical ally, a position for South Pole is considered within the resource committee. The main responsibilities of South Pole delegate include: ● Providing associations with updates on the project's current status and market variables, such as VCU pricing, project emission potential, sale dates, and buyers. ● Overseeing resource disbursement. ● Signing disbursement orders for the execution of project activities. ● Helping to organize the management of banking instruments and associated protocols. ● Identifying areas for technical or procedural improvements in project operation.
Oversight and advisory committee	The oversight and advisory committee is composed of: ● Delegates from the board of governors/council of elders/traditional authorities ● Fiscal officer ● REDD+ overseer This committee serves as the project's primary control and oversight body. Some of its responsibilities are:

[13] The costs and expenses for South Pole's participation in the operating committee shall be covered by South Pole and, under no circumstances, can the resources of the community be used to pay for that.

Body	Description
	• Evaluating compliance with the results and deliverables specified for each phase of activity implementation. • Approving the project's advancement to the following stage of implementation. • Ensuring the proper operation of other committees in accordance with the associations' code of conduct and regulations, life plans, the project document, its appendices (including this annex), and other documents that are valid within the framework of the REDD+ project development • Confirming and validating that the AOP adheres to the association's bylaws, life plans, and other internal regulations, as well as to the agreements made during the result evaluation and resource prioritization assembly. • Ensuring the appropriate management of project resources and assets. • Convening an extraordinary meeting if there are serious problems with the way the project is being executed.
Delegates from the board of governors/council of elders/traditional authorities	The responsibilities of the delegates from the board of governors/councils of elders/traditional authorities in the oversight committee are based on their current roles within their respective association and the communities they represent as traditional authorities. **Level of participation:** Traditional authorities may participate fully or partially in the oversight committee depending on what is stated in the general assembly. There are three different participation levels: • **Total participation:** Should the assembly decide to include representatives from every traditional authority on the oversight committee. • **Partial participation**: Should the assembly decide to include certain traditional authorities on the oversight committee. • **Delegated participation**: Should the assembly decide to assign the participation of traditional authorities to other committee or community members. Their main responsibilities include: • Assessing and guiding committee members' and communities' performance and task completion. • Learning about irregularities or faults committed by committee members or other community members. • Validating that the AOPs are being implemented in the communities as approved. • Ensuring the appropriate management of project assets and resources and reporting to the general assembly in writing on ways to improve the project's finances, administration, necessary controls, and other measures required for the project's proper operation.
Fiscal officer	Fiscal officers' responsibilities in the REDD+ project are based on their current roles within the association. Some of their main responsibilities are: • Chairing the oversight committee. • Collecting information and evidence of faults committed by committee members or other community members. • Requesting and periodically reviewing the project's financial and accounting

Body	Description
	reports. ● Exercising control over financial operations, ensuring they are carried out in accordance with the AOPs approved by the assembly. ● Convening extraordinary meetings in case of irregularities. ● Reporting the irregularities or faults committed by committee members to the General assembly/congress for result evaluation and resource prioritization.
REDD+ overseer	This new position is created within the associations as a complement to their existing governance structure to fulfill the new responsibilities arising from the implementation of the REDD+ project. Additionally, it aims to prevent an overload of responsibilities on the existing leaders. The following are the main responsibilities of the REDD+ overseer: ● Keeping copies of the AOPs approved by the communities and the general assembly. ● Requesting, reviewing, and systematizing reports on the execution of project activities prepared by the operating committee and the executive committee/community government of each community. ● Keeping a copy and systematizing reports on project monitoring and verification, financial reports, and evidence of project activity implementation. ● Periodically requesting and assessing compliance with Measurement, Reporting, and Verification (MRV) indicators. ● Establishing communication channels with South Pole for project monitoring. ● Documenting the manuals and policies associated with the project.
Operating committee	The operating committee is composed of: ● REDD+ coordinator ● Leaders of strategic lines ● South Pole delegate ● Technical allies Among its responsibilities are: ● Leading the development of the *general assembly/congress for result evaluation and resource prioritization*. ● Formulating guidelines, work plans, schedules, and budgets for implementing project activities that have been approved in the *general assembly/congress for result evaluation and resource prioritization*. ● Making necessary adjustments to the AOP as requested by the oversight and advisory committee and the financial committee. ● Providing support to each community in formulating and implementing project activities. ● Reviewing and approving the communities' AOP. ● Requesting the necessary financial resources for implementing project activities to the resource committee in accordance with the approved AOP. ● Executing the AATI's AOP.

Body	Description
REDD+ coordinator	The purpose of this new position is to oversee the planning and execution of project activities across all strategic lines. The main responsibilities of the REDD+ coordinator are as follows: ● Chairing the operating committee. ● Coordinating the different entities to collaborate on developing and carrying out project activities within each strategy line. ● Reviewing and signing disbursement orders for implementing project activities. ● Providing an account of project activity implementation and delivering the respective evidence. ● Incorporating the considerations of the oversight and advisory committee and the resource committee in the formulation and implementation of project activities.
Leaders of strategic lines	Each strategic line will have a leader responsible for formulating and implementing project activities. Their primary responsibilities include: ● Formulating guidelines, work plans, schedules, and budgets for implementing project activities. ● Coordinating the implementation of project activities within their respective strategic line. ● Establishing communication and support channels with the secretariats/government councils for project formulation within the association. ● Preparing orders for the disbursement of financial resources by the resource committee. ● Collecting evidence of project activity execution and preparing reports for accountability. ● Providing support to each community in formulating and implementing project activities. Since these secretariats' or government councils' scope may include implementing REDD+ initiatives, the general assembly may specify the extent of their members' engagement as strategic line leaders as full or partial. There are three different participation levels: ● **Total participation:** Should the assembly decides that the secretaries/government advisors will be the leaders of the strategic lines. ● **Partial participation**: Should the assembly decides that some secretaries/government advisors will be the leaders of some strategic lines. ● **Delegated participation**: Should the assembly decides that leaders of the strategic lines will be other community members different from the secretaries/government advisors. In order to create synergies and efficiency in the execution of any project for the benefit of the association, the leaders of the strategic lines should constantly consult the secretaries/government advisors, regardless of their level of participation in the operating committee. Some of their main responsibilities are: ● Linking the implementation of the REDD project to the AATI's government programs.

Body	Description
	• Assisting in the formulation of guidelines, work plans, schedules, and budgets for the implementation of activities in each strategic line.
South Pole[14]	As a technical ally of the project, South Pole provides support in the formulation and implementation of the BDS in the following activities: • Technically reviewing compliance with the guidelines outlined in the BDS and the Theory of Change, as expressed in the work plans, schedules, and budgets formulated by the operating committee for implementing project activities. • Identifying technical, technological, and methodological improvements in the implementation of project activities. • Informing communities about the rules, protocols, and methodological considerations that must be followed to meet national government criteria, carbon standards, audits, carbon records, or other certifications and protocols associated with REDD project development. • Supporting the implementation of project activities to ensure their development in accordance with project documents, indigenous community expectations and capabilities, and national government laws, rules, and methodologies, as well as standards, audits, and carbon records.
Technical allies	Technical allies encompass all organizations, NGOs, or public and private entities that are not part of the community but are involved in the project's formulation and implementation of activities given their expertise and technical knowledge.
Community assembly	The following responsibilities are within the scope of this decision-making body: • Conducting the annual assembly for result evaluation and problem prioritization. • Assessing executed activities and their favorable or unfavorable effects within the context of the monitoring plan.
Community government	Their main responsibilities include: • Convening and conducting the community assembly for result evaluation and problem prioritization once a year. • Formulating the work plan for implementing the activities in the *Forests and Conservation* and *Sustainable Economy and Food Sovereignty* strategic lines, following the guidelines established by the operating committee. • Executing the community's AOP. • Requesting the necessary financial resources for implementing project activities to the resource committee in accordance with the approved AOP.

Source: compiled by South Pole (2023).

In accordance with the decisions made in the assembly meetings during the BDMS's validation and coordination, the administrative structure will consist of 14 members for AIZA, 15 for AZICATCH, 16 for COINPA, and 20 for CIMPUM. This diverse structure is a result of the communities' determination to

[14] The costs and expenses for South Pole's participation in the operating committee shall be covered by South Pole and, under no circumstances, can the resources of the community be used to pay for that.

assign a higher or lower number of individuals to the various roles in the oversight and advisory committee, as well as leaders of strategic lines to the operating committee.

1.14.4 Stakeholder Engagement

Within the framework of the REDD+ Project: Indigenous Peoples Protecting the Rainforest, the EPCAC has been designed and implemented in order to encourage dialogue and cooperation and to recognize traditions, ways of life, and rights of the indigenous communities that depend on these forests. These communities have decided to get involved as proponents, understand, and work jointly with South Pole in the design and formulation of the project, promoting informed and collective decision-making as defined with the REDD+ safeguards and in order to allow interpretation at the national level. The concepts outlined in this strategy are summarized as follows:

Participation. It is understood as an engine for mobilization and empowerment of stakeholders; as a right and an obligation to be informed and participate in the activities developed in the territory; and as a mechanism for the reaffirmation of autonomy, the exercise of local participation, and the reinforcement of their leadership within the framework of community initiatives with ethnic groups.

Communication. It is understood as decentralization and democratization of information for the creation of means, messages, and tools to disseminate and provide feedback on the processes from collective and proactive "cre-action." Communication acts as a bridge in the participation and appropriation of knowledge. This aspect together with participation favors compliance with safeguards, as well as transparent, accessible, and clear information.

More information is provided in section 2.2.

1.14.5 Stakeholder Participation in Decision-Making and Implementation

In the REDD+ Project: Indigenous Peoples Protecting the Rainforest, the communities are the proponents. Therefore, the project consolidation process takes up, formalizes, strengthens, and integrates local communication channels. Moreover, it is governed by the decision-making schemes and spaces that already exist in the communities according to their own governance models.

The process of communication with the communities follows a protocol order according to the traditions and communication mechanisms to ensure a clear message among the representatives of the stakeholders. First, the people in charge of the initial approach and of fostering the meeting spaces are the co-managers, who are closer (and belong) to the community and have been trained by the South Pole's technical team on the project. These co-managers, as well as the professionals of the social team in the territory, are the direct link between the project developer in the community and the local consultation processes that take place there.

In the territory, communication channels have been established among the communities, the AATIs, and the co-managers, who transmit information to the professionals in the territory and, in general, to the South Pole's team. There is also direct communication between the communities and their representatives and the professionals from South Pole. In this way, information, doubts, and suggestions are permanently sent to the social team in the territory and they, in turn, clear up any

doubts or, if necessary, transmit the information to the rest of the team. Thus, daily communication with local authorities is generally mediated by the professionals in the territory or the co-managers through the following channels:

- Virtual meetings
- In-person meetings
- General assemblies
- Community work spaces
- Information letters
- Emails
- WhatsApp messages
- Phone calls
- Digital, print, and audio newsletters
- Community bulletin boards

The relationship and communication protocol makes it possible to maintain an order that ensures clarity on the information, its legitimizers, and the agreements that are reached as the dissemination sessions are held.

The meetings and dialogs of knowledge favor the communication among stakeholders. The meetings have been held in person, in the form of assemblies with authorities and communities, dissemination sessions, and short meetings; as well as virtually due to the COVID-19 pandemic. Regarding the legitimate representation of local authorities, it should be noted that, given the organizational conditions and the governance system of the communities, it is key to recognize, convene, and integrate traditional authorities such as elders, community leaders, mayores, and presidents of the AATIs; administrative authorities such as indigenous cabildos, community governors, and community members and leaders; and spokespersons of internal groups such as women and youth, for whom emphasis should be made in the call.

In the description of the social parameters, the project proponents have completed and participated in each phase of the project, led by the community governors and AATIs and supported by the co-managers and community members selected for such task. The project has also defined the techniques, activities, and topics for collecting information on the traditional agreements between the AATIs; the management of the Predio Putumayo Reservation; the use and management of the territory; the changes over time; the stakeholders, roles, interests, demographic composition, and living conditions of the communities; among other topics and concepts that have been discussed during meetings and workshops. In these spaces, knowledge has been exchanged about what is climate change, what is a REDD+ project, what are the effects of climate change on the territory, what is the project area, what are the stakeholders, agents, and drivers of deforestation, what are the strategic lines, among other topics.

Therefore, although information exchange and training processes are continuous, legitimate and functional channels, levels, tools, and spaces for communication have been established so that community members and people in general can directly exchange knowledge.

In order to ensure the participation of all the communities in the meetings of the project, the leaders of the AATIs are summoned in advance. When it comes to a meeting aimed at a specific community, the leaders are responsible for inviting all the governors or community leaders of the reservations.

Since the first meetings, a directory has been created, and the most effective means to deliver this type of information have been identified: WhatsApp, SMSs, community bulletin boards, or phone calls. It is worth noting that the AATIs' assemblies have also been used for information, accountability, monitoring, and decision-making purposes.

For the in-person meetings, the group of co-managers, with the help of South Pole's social team, are in charge of the logistics in the meeting venues (schools, malocas, libraries, AATIs' meeting centers) and invite the communities through the channels previously described. They emphasize the importance of having the entire community (men, women, youth, and elders) present.

The project meetings are based on the dialog of knowledge, allowing the knowledge of the communities in the territories to converge with the technical knowledge of the REDD+ initiatives. The purpose is to generate knowledge leading to a successful project development. Moreover, in these meetings, there is always room for questions and for each stakeholder to answer them, as appropriate.



Figure 12. Abuelo Manuel Zafiama maloca, Centro Chorrera.

Photograph: South Pole (2021).

In terms of cultural sensitivity, the meetings are held in compliance with the communities' traditional customs and following the elders' guidelines regarding the availability of key elements of their rituals such as ypadu, tobacco, and ambil. According to indigenous cultures, these elements have medicinal and social benefits because, for instance, while the elders mambean, words are exchanged and decisions are made. The preparation of caguana and the availability of food are also coordinated depending on the duration of the meeting.

The presence of elders is critical at these gatherings because they are traditional authorities and main transmitters and guardians of the word. Attendees establish a relationship with them that extends beyond their presence in the meetings and focuses on their ancestral activities in the maloca [15].

In accordance with the conditions of the communities for which the spoken word is the main means of communication and transmission of knowledge, the project has sought to prioritize spaces for dialogue. Consequently, written communications are usually accompanied by phone calls, virtual or in-person meetings, and explanatory audios.

Due to the internal conditions of the communities, young people and women have a lower level of attendance and participation in the meetings. For this reason, meetings focused on these populations are proposed in order to strengthen the knowledge of the project and the skills and interest of these populations, so that both women and young people will be more actively integrated into the general spaces.

As already mentioned, the decision-making process takes place in the general assembly with the participation of delegates from all the communities associated with the AATIs. The delegations, according to the statutes, are composed of elders as traditional authorities, members of the board of directors of each community, women, and youth. These spaces are intended to favor the understanding of the topics by the attendees and decision makers. In addition to the interventions of the technical team and the use of tools and graphics, the interventions and explanations of the co-managers and board members of the associations are very useful.

1.14.6 Benefit Sharing Mechanisms (GL2.6)

This section provides a concise overview of the components of the project's BDMS. For a more detailed understanding of the methodological process of its formulation, please refer to the attached document entitled "Benefit Distribution and Management System." It is essential to highlight that this BSM is a system in constant construction and updating processes following the requirements and needs of the communities involved in the project. On that line and following the consultative and participatory mechanics, which are pillars in project development, this system could have some changes in the next instance of the project.

The text below delves into the criteria and objectives of the BDMS, its beneficiaries and benefits under consideration, its administrative and governance framework, as well as the stipulations for benefit allocation and its participatory formulation and dissemination process.

[15] A *maloca* is the structure in which most of the elders' social and cultural activities take place. It is a community dwelling, a meeting center, a space for rituals, and a place for food preparation. A *maloca* is the very center of the culture of these communities since its structure and location encompass knowledge of the Earth and the universe. *Malocas* are built with wooden pillars connected by vines to beams and crossbeams that support a high palm roof that keeps the interior cool and dry. *Malocas* have two doors, always in an east-west direction, following the path of the sun (Colombian Ministry of Culture, 2015, p.17).

Criteria and objectives

The project's BDMS addresses questions that arise from discussions surrounding the REDD+ mechanism: which stakeholders should be rewarded, why, under what conditions, in what proportion, and for how long (Centre for International Forestry Research, 2014). In this context, the considerations regarding benefit distribution are anchored in the principles of fairness, equity, efficiency, and effectiveness of distribution.

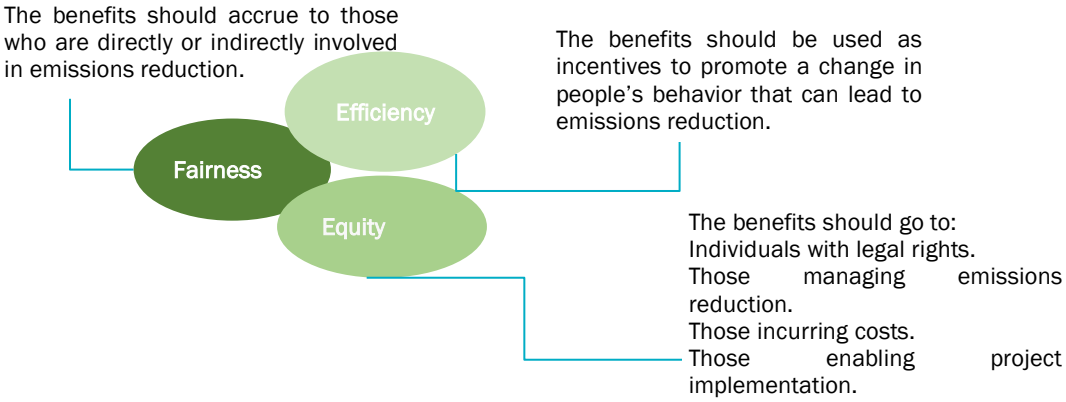


Figure 13. Criteria of the benefit distribution and management system.

These criteria serve as the foundation upon which a BDMS is formulated, aimed at achieving the following:

1. Compensating for reduction in emissions due to deforestation and forest degradation.
2. Offsetting the opportunity cost of maintaining forests.
3. Creating the necessary incentives to change people's behavior concerning deforestation and forest degradation, thereby reducing carbon emissions.
4. Enabling the attainment of the REDD+ objectives.
5. Funding the life plans of the communities.
6. Preserving the way of life of indigenous communities.

Beneficiaries

Since REDD+ projects involve performance-based payments, the criteria for determining the type of beneficiary might depend on factors such as forest management practices and the role of those enabling project implementation. To identify these beneficiaries, focus should be placed on stakeholders within the specific project area, aiming to establish common ground among them that includes social priorities and principles of equity.

In the case of indigenous communities, beneficiaries are first identified during the project preparation phase when initial interactions occur between community leaders of the indigenous associations involved in the project and project developers. These interactions are motivated by the opportunity to certify the conservation actions that these communities have traditionally undertaken for the

preservation of their territory through the REDD+ mechanism. During this phase, the territorial context, stakeholders, socio-cultural practices, and conflicts are identified. Additionally, a thorough examination of indigenous comprehensive life plans [16] and the bylaws of ethnic communities is essential to determine whether the social priorities of these communities align with the objectives of redistributive equity upon which BDMSs are based. During stakeholder mapping, groups or sectors of interest for initial engagement and the formulation of the REDD+ project are identified based on a clear diagnosis of the territorial governance structures, social order, and political framework within the context of self-governance. Other components included in this analysis are the following:

- Local stakeholders.
- Identification of legal or customary tenure/access rights or potential conflicts over these rights.
- Description of the social, economic, and cultural diversity of local stakeholders and their interrelationships.
- Significant changes in stakeholder composition over time.
- Identification of communities, local stakeholders, and their sphere of influence.

The results of stakeholder mapping are validated in the field with the communities and serve as a working roadmap for developing the necessary interrelationships for the formulation of the BDMS. Stakeholder analysis makes it possible to validate the role not only of indigenous communities but also of other stakeholders participating in REDD+ activities' implementation and should thus be considered within the BDMS.

In light of this, the indigenous communities proposing the REDD+ Project: Indigenous Peoples Protecting the rainforest are the ones controlling and managing the territory according to their customs and the ways of life outlined in their life plans, which highlight the actions needed to achieve the REDD+ objectives. Furthermore, they possess all legal rights to ownership and management of the territory, thus being the primary beneficiaries of the project.

For its part, South Pole participates in the project's BDMS as a project developer, providing the indigenous associations with the knowledge and resources needed to achieve certification and trading of generated carbon credits.

There are other stakeholders indirectly benefiting from the development of the REDD+ project, such as other ethnic groups and indigenous associations adjacent to the project area, public entities at the regional and national levels, civil society and NGOs, other private organizations directly or indirectly involved in activity implementation, as well as stakeholders from the social indigenous and academic sectors and the general community. From this list, technical allies directly involved in activity execution are considered direct beneficiaries.

Benefits

[16] An indigenous life plan is a planning tool that outlines the cultural foundations for the management and organization of the territory. It is developed through consensus and the ancestral law of each indigenous community.

This REDD+ project operates under a scheme of tangible, non-monetary benefits based on the execution of strategic lines and programs aligned with the life plans of the indigenous communities that comprise the project.

Through the implementation of the project's strategic lines, the aim is to reverse the process of degradation and deforestation of the territory while addressing the communities' priority plans by executing their life plans. This REDD+ project represents an opportunity to energize educational processes focused on territorial matters within the framework of climate change mitigation and to acknowledge the ancestral work of indigenous communities through their practices that have a minimal impact on the environment. Thus, the goal is to consolidate and value all the actions and achievements made since 2016—the project's inception date—to contribute to emissions reduction and thus mitigate climate change through forest conservation.

Each strategic line is directed towards a specific objective, which is achieved through the potential programs and projects that it encompasses. In addition, the strategic lines are rooted in the principle of indigenous autonomy, supported by tradition, education, and native languages. They reflect the indigenous purpose of living well and using and harnessing elements of their environment with a minimal impact on biodiversity and culture. Furthermore, they strengthen ancestral forest management practices that have long proven to be the foundation for effective conservation of the Amazonian forest cover and biodiversity within indigenous territories. They are also grounded in the contemporary context of indigenous peoples in a globalized world and aim to facilitate a healthy exchange of knowledge that enables beneficial interaction with the Western world to address Amazonian forest conservation issues in indigenous territories. The formulation of these strategic lines was based on the review of the indigenous life plans and the participatory work conducted in the 54 communities comprising the project, through visits by the technical team and co-managers.

Administration

The administrative structure of the benefit distribution system, was shaped based on the governance structures of the indigenous communities and their associations. Within this structure, specific bodies and roles were established to achieve the project's objectives.

In summary, the structure comprises the general assembly as the highest decision-making and accountability body and an oversight and advisory committee serving as the project's monitoring and oversight body and composed of representatives from the board of governors, the council of elders/traditional authorities, a fiscal officer, and a REDD+ overseer. The resource committee, responsible for the project's financial management, consists of the legal representative of the AATI, a treasurer/budget and finance advisor, an accountant, and South Pole delegate. Lastly, the operating committee, responsible for activity execution and the development of guidelines, work plans, schedules, and budgets, is composed of a REDD+ coordinator, strategic line leaders, South Pole delegate, and technical allies as required.

For the project's financial management, a collaborative management approach it is proposed a collaborative management scheme from a trust administration service. Fiduciary agreements are acts

of trust wherein one or more individuals, known as grantors, entrust specific assets to another person of their complete trust, known as the fiduciary. This is done with or without the transfer of ownership, with the purpose that the latter uses these assets for a particular purpose.

According to the proposal presented to the communities proponents of the project and its associations, during the consultation and validation meetings of the SDyMB, South Pole will trade the carbon credits verified by the REDD+ project. As carbon credits are traded, South Pole will deduct the profit margin defined in the ERPA with each AATI from the revenue earned. After the associations correctly invoice the carbon credits to South Pole, the net revenues will be transferred by South Pole to the trust.

The fiduciary will manage the resources entrusted in separate accounts for each AATI and in sub-accounts for the project's main provisions. The key activities within the fiduciary's scope include:

- Receiving the trust's resources from the carbon credits traded by South Pole.
- Maintaining the resources delivered to the autonomous fund in separate accounts for each AATI. Importantly, each account is independent, and no funds from sources other than those allocated for the REDD+ project can be managed in it.
- Investing the resources of the autonomous fund in collective investment funds administered by the fiduciary while they are earmarked for contractual purposes.
- Declaring, settling, and paying taxes and deductions as required.
- Submitting periodic management reports within the framework of BDMS monitoring.
- Making payments using the resources received in the autonomous fund and up to their full amount, in accordance with the instructions provided by the resource committee and based on the payment structure and benefit distribution system agreed upon between the AATIs and South Pole.

The AATIs, for their part, are obliged to fulfill several obligations under the fiduciary agreement, including:

- When carbon credits are traded, South Pole shall notify the AATIs of the quantity and price, allowing for correct invoicing. Once the credits are invoiced, the net revenues of the associations are transferred to the fiduciary.
- Through their legal representatives and South Pole delegate, each AATI's resource committee shall be responsible for instructing the monthly payments to the fiduciary, submitting the necessary orders and documentation for such purpose.
- As part of the allocation of benefits, a fund for expenses (reserve) for commission payments shall be established, authorizing the direct deduction from the resources allocated for administration upon submission of the corresponding invoice. This ensures the timely and agreed-upon payment of the fiduciary commission as per the contract.
- Additionally, the resource committee shall be responsible for approving or raising objections to the reports and bank statements presented by the fiduciary in the course of the fiduciary agreement.

Figure 14 below presents the proposed fiduciary scheme of the REDD+ Project: Indigenous Peoples Protecting the Rainforest, on which a work plan continues to be developed with a view to its approval in the legitimate spaces of community assemblies.

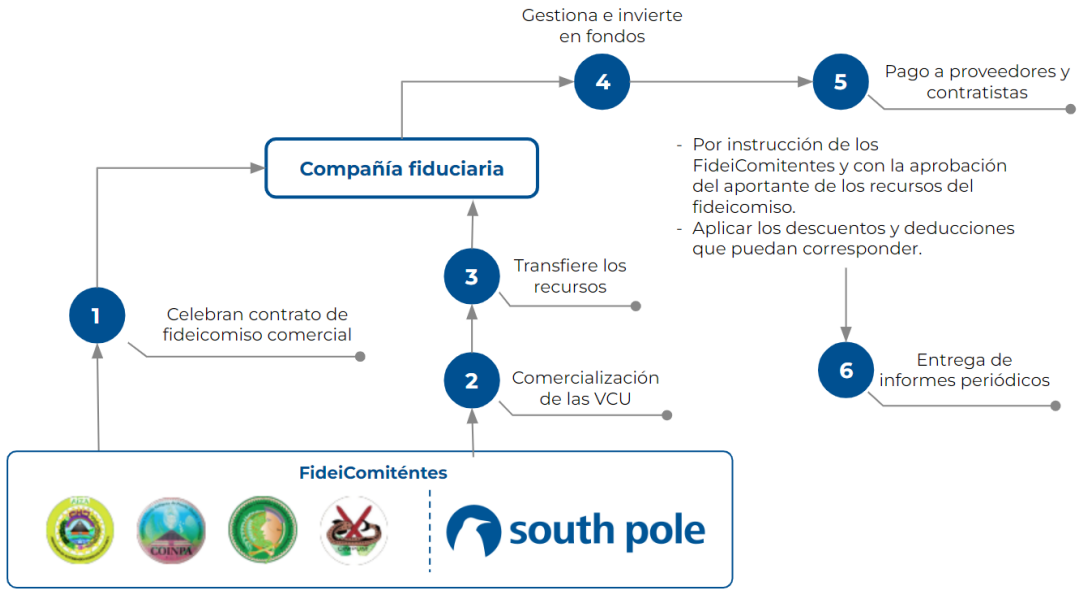


Figure 14. Financial scheme of the REDD+ project.

The following table describes how the BDMS operates, as described in the operational plan.

Table 12. Description of the operational plan of the BDMS.

Activity	Responsible Party	Description
1. Prioritizing community needs	Community government	Each of the communities that are part of the REDD+ project shall hold an annual community assembly. The objective of this assembly is to prioritize the community's problems that will be addressed within the REDD+ project in the following year. The BDMS-related topics to be covered during this assembly include: • General contextualization about REDD+ projects. • Current status of the REDD+ Project: Indigenous Peoples Protecting the Rainforest. • Project's strategic lines. • Accountability regarding the implementation of REDD+ activities. • Current benefit allocation scheme. • Prioritization of problems and solutions. An official record, including attendance lists and other necessary documents (videos, photos, minutes), shall be prepared regarding topics and agreements made throughout the assembly development.

Activity	Responsible Party	Description
2. Preparing the annual budget	Resource committee	Every year, in preparation for the general assembly/congress for result evaluation and resource prioritization, the resource committee shall prepare a report on the use of resources throughout the year. This report shall also include a balance of the resources available for the project activities. If carbon credits are available for sale, South Pole shall provide a report, based on conservative estimates, detailing the anticipated revenue from their sale, considering current market conditions such as selling price, the final market (national or international), and potential clients, if any.
3. Allocating resources	General assembly	A general assembly or congress shall be convened once a year to decide on the vertical and horizontal allocation of resources for the REDD+ project in the following year. During this event, the issues facing the association, both at the AATI level and those prioritized in each community's assembly, shall be validated. Based on this, the project activities to be executed in the following year shall be defined or approved. The assembly shall be conducted in accordance with the terms and composition established in each AATI's bylaws. In this space, the members of the committees shall also be evaluated and chosen. The BDMS-related topics to be addressed during this assembly include: General contextualization about REDD+ projects and accountability of the committees and other affiliated organizations. Current status of the REDD+ Project: Indigenous Peoples Protecting the Rainforest. Project's strategic lines. Current benefit allocation scheme. Accountability regarding the implementation of REDD+ activities. Identification of improvement actions. Validation of current issues at the association and community levels. Problem prioritization. Benefit allocation. Election of new administrators of the management scheme (committee members). The prioritized project activities must align with the project's strategic lines and meet the communities' needs, protect biodiversity, and contribute to climate change mitigation. When setting priorities, it will be necessary to consider that activity implementation will have two levels. The first one is a general or directional level and will be handled by the committee. The second one is an operational component whose execution will be the responsibility of the operating committee for activities implemented at the AATI level and by each community's government for activities

Activity	Responsible Party	Description
		developed in each specific community. All decisions shall be documented in the assembly minutes, and records of the event—including attendance lists, reports, and photos or videos—must be kept.
4. Preparing the AOP	Operating committee	Once the assembly prioritizes and approves project activities for implementation, the operating committee shall formulate the following for the prioritized activities in each of the strategic lines: • **Guidelines.** This entails defining regulations and manuals for the operation and implementation of the project, including descriptions of minor, major, and serious errors, as well as their respective penalties. It also outlines the limits and scope of the activities to be implemented, especially those to be developed by the executive committee of each community. The guidelines also seek to coordinate efforts in communities with common issues to achieve cost efficiency and the required resources. • **Work plans.** These outline the steps required to correctly implement each project activity and achieve the desired results. Such steps must be clearly defined, geared toward fulfilling specific functions, and tailored to the requirements of the personnel responsible for implementation. • **Schedule.** It corresponds to the desirable timeframe for implementing a project's activity. It is constructed based on the list of steps that make up each activity, their order, and interdependence. Its development requires considering the duration of each step and the connections between their execution. • **Budget.** It reflects the costs associated with each step involved in activity implementation. Costs should consider the quantity, quality, and availability of resources required for each activity, as well as the costs of meals, lodging, transportation, and other expenses essential for the successful completion of each step. • **Monitoring and follow-up plan.** For prioritized activities, a monitoring and follow-up plan must also be designed, outlining the mechanisms, processes, indicators, objectives, and supporting documentation needed to evaluate their correct implementation. The annual project activities schedule and budget shall be developed in phases so that overseers can establish control points to determine whether the activities are being executed correctly and stop the disbursement of resources if they are not. For each phase, specific results or deliverables shall be defined, which will be later evaluated by the oversight committee based on the following three control points: • Phase 1: 30% • Phase 2: 30% • Phase 3: 40% For such formulation, Annex 1 (Format for the Preparation of Projects' Operational and Budgetary Plan) was created. This

Activity	Responsible Party	Description
		document includes specific project development information such as dates and amounts to be disbursed, the person or organization responsible for receiving such resources, and, if applicable, the suppliers and external collaborators offering goods and services for the execution of activities and receiving payment or fees in return. For the AOP to be formulated, it is essential to identify technical allies with experience in the formulation and implementation of prioritized activities. Their hiring should be considered and included in the AOP's budget. Additionally, the operating committee must receive feedback from the communities or population groups (youth, women, elders) that will be directly impacted, positively or negatively, by the activity's implementation. Special attention shall be given to the recommendations made by elders and knowledge holders to ensure that the implementation of the activities aligns with the indigenous peoples' laws of origin. Based on the particular needs of the activity to be developed, South Pole and other organizations with technical expertise will provide technical help and support for this activity. Once the AATI's AOP has been formulated, each community shall design its own work plan for the implementation of project activities. The formulation of activities **shall adhere to the guidelines set forth by the operating committee**, as described in the previous section. Communities shall receive support from the technical committee in preparing their AOP, which must include a work plan, schedule, and budget at the community level. For community-level AOPs, it is not necessary to formulate them in phases, as this only applies to a particular AATI. Once it has been formulated, the technical committee shall conduct a final review to ensure that it complies with all the project's technical criteria.
5. Approving the AOP	Resource committee	The oversight and advisory committee will review the completed AOP before deciding whether or not it conflicts with AATI's existing bylaws, life plans, and internal regulations and with what was approved in the general assembly/congress for result evaluation and resource prioritization. If no irregularities are found, the AOP shall be sent to the resource committee, which will confirm its financial viability and grant final approval to start its execution. Otherwise, the AOP shall be sent back to the operating committee for review and adjustments.
6. Implementing the AOP	Operating committee and the executive committee of each community	Following the formulation of the AOPs, the implementation phase will start. The approval and disbursement of the resources required for activity implementation include: 1. Request for disbursement. 2. Verification and approval of disbursement. 3. Disbursement of resources. 4. Execution of resources. 5. Evaluation of the implementation phase.
7. Monitoring the execution of the	Oversight and advisory committee	Upon completion of each phase of project activity implementation, the oversight committee shall evaluate whether the outcomes and

Activity	Responsible Party	Description
AOP		deliverables outlined during the project's design have been met. Based on the criteria set forth in the AOP, the severity of any errors made shall be assessed, along with the respective corrective actions. If the oversight committee determines that everything is in order or that the errors have been corrected, the project activity can move forward to the next phase, and resources can be disbursed. Should a particularly major error occur, the oversight and advisory committee shall convene an extraordinary meeting to decide on any penalties and other necessary adjustments to ensure the project's continuity.
8. Evaluating results	Oversight committee	Within the implementation of the REDD+ project, results shall be evaluated periodically and systematically. The Monitoring section provides a detailed description of this process. The main elements that comprise it are the following: 1. **Evaluation of the activity phase.** 2. **Community assembly for result evaluation.** At the annual community assembly for result evaluation and resource prioritization held by each community, both the positive and negative impacts of project activity execution in each of the strategic lines shall be assessed. This includes activities executed by the technical committee and the community's executive committee. Within the framework of their autonomy and self-governance, communities shall take the necessary improvement actions, and the findings regarding the implementation and operation of the REDD+ project shall be brought to the assembly/congress for result evaluation. 3. **General assembly/congress for result evaluation.** At the annual assembly for result evaluation and resource prioritization held by each AATI, the positive and negative impacts of project activity execution in each of the strategic lines shall be evaluated. This includes activities carried out by the technical committee, as well as the conclusions drawn from the community assemblies for result evaluation. Additionally, comments and findings from the oversight and advisory committee and the resource committee shall be addressed. Each AATI, in accordance with its bylaws and any other applicable internal regulations, shall determine the improvement activities that are required for the proper development of the REDD+ project. Any changes to the composition and functioning of the committees, as well as to the benefit distribution mechanism, may be defined during the assembly. A list of indicators for monitoring the formulation and implementation of the BDMS is provided in the Monitoring chapter of the BDMS.

Source: compiled by South Pole (2023).

Reimbursements for carrying out the project activities start to flow during the implementation phase, which follows the AOP's approval. This is an iterative process in which the operating committee and the communities request payments for internal or external suppliers in accordance with the payment

schedule specified in the AOP. Simultaneously, the oversight and advisory committee shall supervise the project according to the monitoring and tracking plan included in the AOP and shall verify all documentation for the phase closure once it is completed. The specific activities are detailed below.

Table 13. Description of AOP's implementation.

Activity	Responsible Party	Description
1. Preparation of the disbursement order	Operating committee and the executive committee of each community	Following the formulation of the AOP, the operating committee and community governments will, in accordance with the deadlines specified in the work plan and schedule, use the document in Annex 3 (Disbursement order) to request funds for the implementation of each project activity. The disbursement order, when prepared by a community, must be approved and signed by the REDD+ coordinator, the leader of the strategic line, and the governor before being sent to the resource committee. It should include information about the resources' recipient, amount, and method of payment.
2. Disbursement	Resource committee	The resource committee shall keep a record of the net revenue from the sale of carbon credits and the disbursements made during activity execution. When the operating committee and community governments request a disbursement, the resource committee shall confirm the availability of funds and assess whether the disbursement order has been completed in accordance with the AOP. If any irregularities are found in the disbursement order, the committees will be asked to clarify or rectify any issues. Once the disbursement order has been verified, the committee shall sign it and send it to the trust administration service for disbursement. In case of insufficient funds, the committee shall notify the operating committee, community government, and oversight committee to make the necessary adjustments to the activity schedule. A trust administration service, through which the monthly payments requested by the resource committee are made, is used as the banking instrument. The associations will have independent accounting, a separate account for project resources, and even subaccounts in each AATI for resources related to the administration structure and activity implementation. This scheme is detailed in the Financial Administration section below. Once the fiduciary receives the disbursement order and confirms that it has been approved by South Pole's president and delegate on the resource committee, it shall proceed to make the payment according to their instructions (amount, recipient, date, payment type).
3. Receipt and delivery of goods and services	Resource committee and the executive committee of each community	Payments will be made for the acquisition of goods and services from internal and external suppliers. When suppliers are external, direct payments shall be made to them, and goods and services will be received by the operating committee, who will then ensure their delivery to the communities. For internal payments, the operating committee shall supervise the withdrawal of funds and be responsible for their use in activities carried out in the AATI and their delivery to community governments. The monitoring and tracking plan must be followed in order to support the delivery of products and services.

Activity	Responsible Party	Description
4. Evaluation of the implementation phase	Oversight committee	At the conclusion of each phase outlined in the AOP, the oversight and advisory committee shall review the project's progress in order to make modifications to the way activities are carried out. Also, it shall review the availability of supporting documentation and adherence to the guidelines set forth in the monitoring and tracking plan. In order to validate information, it may also consult with other committees, communities, or any other relevant parties. If irregularities are found, they shall be resolved in compliance with the guidelines set forth for the project's management, and if required, an extraordinary meeting may be convened.

Source: compiled by South Pole (2023).

Benefit allocation

In the project's vertical allocation, which guarantees the participation and operation of different stakeholders in the project and a proper mechanism administration and decision-making, the following three levels of allocation are identified:

1. Profit margin for the project proponents and South Pole—the project developer.
2. Allocation of the total carbon credits for each AATI based on the definition and evaluation of critical and performance variables.
3. Definition of key provisions for the project's administration and operation by each indigenous association.

As mentioned earlier, South Pole facilitates the trading of carbon credits in accordance with the terms agreed upon between the company and the AATIs in the ERPA. Although the REDD+ Project: Indigenous Peoples Protecting the Rainforest is a collective project, there is an independent ERPA for each association, specifying the profit margin the company and other intermediaries will have on the net income generated by VCU trading, given their political and administrative independence.

To determine the amount of carbon credits corresponding to each association, a conditionality index called the benefit allocation indicator was developed. This index considers the following three categories: (i) regional efficiency, i.e., the contribution to reducing deforestation risk in the management area of each AATI with respect to the project's regional baseline; (ii) association performance, i.e., the percentage contribution to deforestation reduction with respect to the baseline of each AATI's management area; and (iii) number of communities, i.e., the percentage of communities within each AATI with respect to the total number of communities in the project area.

For the project's operation by the AATIs, four main provisions were identified during the formulation process:

- Administration expenses: Resources necessary for the project's operation and administration. These are primarily allocated for salary payments, financing of participation in events, financial costs, and other operational expenses.

- Emergencies and calamities: This provision allows communities to address urgent social and environmental emergencies that may arise in the territory and were not considered in activity prioritization.
- Financial sustainability: Savings enabling communities to address any risks that might affect the project's continuity or carbon credit verification. If no risks materialize, saved resources can be used after two verification periods.
- Strategic lines: These resources shall be allocated to implementing the REDD+ activities contained in each strategic line.

For each of these provisions, the communities, with technical support, determined the percentage of benefits to allocate in each category during assembly discussions. Finally, the horizontal allocation of benefits considered the resources allocated by the project proponents for implementing each strategic line. To define this, a suggested percentage resulting from the technical analysis of the relationship between environmental issues causing deforestation and degradation, their level of importance according to problem theory and the Vester matrix, and the strategic lines was used as a starting point. Community analysis during assembly discussions led to the definition of the final allocation value for executing each strategic line.

Participatory formulation, validation, and dissemination of the BDMS

As demonstrated, one of the relevant elements in the development of this REDD+ project has been the inclusion of the population's collective, community, and collaborative participation to ensure transparency and clarity throughout the process. For this purpose, various strategies, approaches, and methodologies have been employed, including conducting workshops with the involved or influential stakeholders, interviews, and meetings with local leaders. This was done to identify key stakeholders for the project; establish a baseline through knowledge exchange; and identify impacts, benefits, and communication mechanisms, all framed within the EPCAC.

Although the EPCAC's participation and consultation process revealed the need to formulate a BDMS and explored certain concepts and objectives related to it, the complexity of a BDMS that ensures the fulfillment of the project objectives necessitated the design of a validation and dissemination roadmap. This roadmap included different phases and levels of complexity, gradually building capacities to ultimately reach decisions during assemblies convened for this purpose. The following were the activities conducted for the validation and dissemination of the BDMS:

Online workshop with co-managers from each AATI. In these online sessions, individuals' expectations, progress, and doubts were collected, for which the group of co-managers had engaged in discussions with communities, leaders, and representatives. The goal was to gauge the state of progress regarding existing proposals or purposes related to the BDMS. Additionally, these gatherings presented key concepts and some advancements in the proposed administration structure, which had been developed based on the review of the associations' life plans and bylaws. For the planning of the subsequent phases, a schedule was designed with the co-managers to facilitate the preparation and execution of the assemblies as the sublime moment of the validation stage. These workshops took place on November 23, 24, and 25, as well as on December 13, and was attended by the group of co-managers and professionals from the technical team.

In-person workshop with the co-managers of AZICATCH. On December 13 and 15, 2022, a theoretical and practical workshop was conducted with the group of co-managers (comprising seven members) of the AZICATCH association. The objective was to carry out a pilot test of the methodologies planned for consensus-building and the validation of the BDMS during community assemblies. As a result of this workshop, explanations, concepts, and examples were given to communicate technical concepts outlined in the BDMS in terms understandable to the communities.

Assemblies per AATI and co-managers' training. The validation stage included field stays for each of the four AATIs; this in order to conduct general assemblies with community leaders delegated by each association. The assemblies lasted between four and six days, and an additional day was dedicated to training co-managers. They took place between March 5 and April 4, 2023, and were attended by the co-managers of each association and South Pole's technical team consisting of five professionals. Thanks to this, the following objectives were achieved:

- Strengthen the understanding of the REDD+ project mechanism as a strategy for climate change mitigation.
- Validate the outcomes of the theory of change.
- Present, validate, and approve the project's BDMS.
- Provide informative materials for dissemination within the communities.
- Enhance co-managers' capacities for sharing the results of the BDMS with the communities.
- Document agreements established regarding the BDMS for formalization.

During these assemblies, the components of the BDMS were presented. Activities included workshops, discussions on environmental issues causing deforestation and degradation, and role-playing on the bodies and roles of the administration structure, which led to adjustments proposed by community leaders and delegates and, ultimately, to reach decisions. Finally, in these spaces, informative materials on the discussed topics were distributed to each of the 54 delegations to facilitate dissemination efforts by authorities, delegates, and co-managers.

Table 14. Assemblies for consensus-building and validation of the benefit distribution and management system.

Assemblies for Consensus-Building and Validation of the Benefit Distribution and Management System		
AATI	Dates	Attendees
COINPA	March 5 to 11, 2023	75
CIMPUM	March 13 to 18, 2023	102
AIZA	March 22 to 25, 2023	85
AZICATCH	March 30 to April 3, 2023	207

Source: compiled by South Pole (2023).

Outreach tours in the communities. Following the validation of the BDMS in general assemblies and co-managers' training, co-managers conducted outreach tours to share the results of the BDMS validation with each community. This further expanded the dissemination efforts undertaken by authorities and delegations. The following are the dates on which these dissemination sessions were conducted:

Table 15. Outreach tours in the communities for consensus-building and validation of the benefit distribution and management system.

AATI	Dates
COINPA	April 1 to 18, 2023
CIMPUM	March 22 to April 19, 2023
AIZA	April 11 to May 18, 2023
AZICATCH	April 12 to May 26, 2023

Source: compiled by South Pole (2023).


Proyecto REDD+
PUEBLOS INDÍGENAS RESGUARDANDO LA SELVA
Juntos cuidamos la selva que da vida: tierra que une
La chagra del REDD+
Ciclo del proyecto
Idea del proyecto
Viabilidad técnica y comercial
Financiación de la formulación y desarrollo del proyecto
Cultivar de nuevo
Compartir: beneficio colectivo
Línea base: Construcción conjunta, integral y participativa con enfoque territorial
Monitoreo y verificación
RPC
Ingreso al Registro Público de Carbono
Distribución y manejo de beneficios
BONO
Emisión y comercialización de bonos
Ejecución de actividades


Proyecto REDD+
PUEBLOS INDÍGENAS RESGUARDANDO LA SELVA
Juntos cuidamos la selva que da vida: tierra que une
Objetivos del proyecto
Evitar y reducir la deforestación y degradación no planeada de la selva amazónica, proteger la biodiversidad y los servicios ecosistémicos para la permanencia, el buen vivir y la adaptación al cambio climático de los pueblos indígenas.
1. Conservar la selva amazónica, su biodiversidad y los servicios ecosistémicos asociados a la permanencia y el buen vivir de los pueblos indígenas que la habitan.
2. Fortalecer los sistemas de gobierno propio y su capacidad de articulación interna y externa para la gobernanza del territorio, la gestión sostenible de la selva y la adaptación al cambio climático.
3. Fomento a la educación propia, como base para la comprensión del territorio ancestral, cultural e inmaterial, para el entendimiento del mundo natural y el cuidado de la biodiversidad y para la permanencia de la lengua y el ser indígena.
4. Potenciar la interacción de las comunidades con nuevas herramientas y conocimientos que permitan crear estrategias locales para la adaptación al cambio climático, el desarrollo, la comunicación y divulgación del proyecto.
5. Consolidar la participación activa de la mujer en los procesos comunitarios y la toma de decisiones a partir del fortalecimiento de capacidades y el reconocimiento de su valor como portadora de conocimiento y cuidadora de la vida.
6. Generar y establecer sistemas productivos diversificados y sostenibles que permitan generar bienes y servicios con valor ecosistémico y cultural que garanticen la abundancia y el buen vivir.
REDD


Proyecto REDD+
PUEBLOS INDÍGENAS RESGUARDANDO LA SELVA
Juntos cuidamos la selva que da vida: tierra que une
Decálogo Proyecto REDD+
Efectivo
Logra evitar y reducir las emisiones de carbono a causa de la deforestación y degradación no planeada de la selva.
Justo
La distribución y manejo de los beneficios sucede entre los actores que aportan a la reducción de la deforestación y la degradación de la selva.
Eficiente
Motiva a las personas a participar en las actividades para la reducción de las emisiones.
Equitativo
Favorece el acceso a la información, el poder y los beneficios para toda la población, incluyendo mujeres, niños, jóvenes y adultos mayores.
Funciona por sí mismo
Está compuesto por una estructura organizativa y unos procesos que cumplen con sus funciones.
Comunitario
Como propietarias del proyecto son las comunidades quienes toman decisiones, aportan ideas y ejecutan las actividades para la conservación, el cuidado y la gestión de la selva.
Participativo
Forman parte de él todos los miembros de las comunidades y los actores que se definan como aliados estratégicos.
Transparente
Cumple con los objetivos del proyecto, mediante la gestión, la ejecución transparente de los recursos, la rendición de cuentas y evaluación periódica de los resultados.
Se actualiza
Atiende las causas reales y vigentes de la deforestación y la degradación de la selva.
Mejora constantemente
Incluye acciones de monitoreo de resultados para replantear periódicamente las actividades.

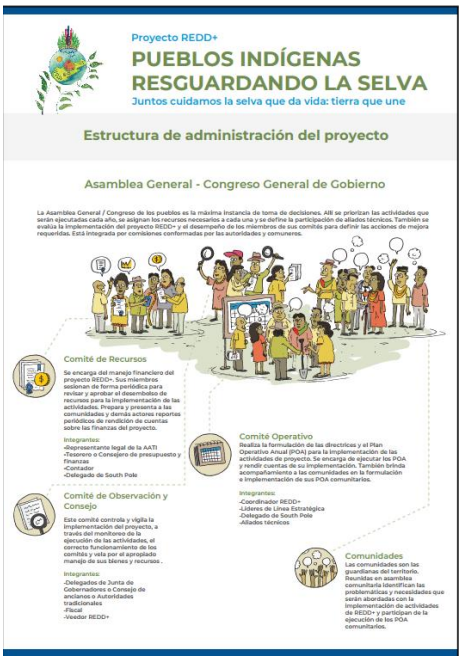

Proyecto REDD+
PUEBLOS INDÍGENAS RESGUARDANDO LA SELVA
Juntos cuidamos la selva que da vida: tierra que une
Estructura de administración del proyecto
Asamblea General - Congreso General de Gobierno
La Asamblea General / Congreso de los pueblos es la máxima instancia de toma de decisiones. Allí se priorizan las actividades que serán ejecutadas cada año, se asignan los recursos necesarios a cada una y se define la participación de aliados técnicos. También se evalúa la implementación del proyecto REDD+ y el desempeño de los miembros de sus comités para definir las acciones de mejora requeridas. Está integrada por comisiones conformadas por las autoridades y comuneros.
Comité de Recursos
Se encarga del manejo financiero del proyecto REDD+. Sus miembros sesionan de forma periódica para revisar y aprobar el desembolso de recursos para la implementación de las actividades. Prepara y presenta a las comunidades y demás actores reportes periódicos de rendición de cuentas sobre las finanzas del proyecto.
Integrantes:
-Representante legal de la AATI
-Tesorero o Consejero de presupuesto y finanzas
-Contador
-Delegado de South Pole
Comité Operativo
Realiza la formulación de las directrices y el Plan Operativo Anual (POA) para la implementación de las actividades de proyecto. Se encarga de ejecutar los POA y rendir cuentas de su implementación. También brinda acompañamiento a las comunidades en la formulación e implementación de sus POA comunitarios.
Integrantes:
-Coordinador REDD+
-Líderes de Línea Estratégica
-Delegado de South Pole
-Aliados técnicos
Comité de Observación y Consejo
Este comité controla y vigila la implementación del proyecto, a través del monitoreo de la ejecución de las actividades, el correcto funcionamiento de los comités y vela por el apropiado manejo de sus bienes y recursos.
Integrantes:
-Delegados de Junta de Gobernadores o Consejo de ancianos o Autoridades tradicionales
-Fiscal
-Veedor REDD+
Comunidades
Las comunidades son las guardianas del territorio. Reunidas en asamblea comunitaria identifican las problemáticas y necesidades que serán abordadas con la implementación de actividades de REDD+ y participan de la ejecución de los POA comunitarios.



Figure 15. Informative materials for dissemination within communities.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The REDD+ Project has not been registered and is not intended to be registered with any other GHG program.

1.15.2 Projects Rejected by Other GHG Programs

The REDD+ Project has not been rejected by any GHG program.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The territory under the administration of the four AATI linked to the REDD+ Project is located within the reference region of Vision Amazonia, a strategy of the Government of Colombia that seeks to promote a low deforestation development model in the Colombian Amazonia, as part of the national efforts to meet the UNFCCC commitments to reduce net deforestation in the Amazonia by 2020, combat climate change (GHG emission reduction), and preserve biodiversity. Vision Amazonia covers different projects, plans, and programs financed with resources from the national government and international cooperation bodies that take place within this jurisdiction, in addition to some private and local government resources leveraged by the Government of Colombia.

The REM program is among the most relevant programs of Vision Amazonia. It is an initiative based on payment for results that seeks to support the reduction of emissions from deforestation in the Colombian Amazon biome and its economic diversification. As of 2020, there were 36 projects approved under the REM program and 110 more in the evaluation process (Global Focus, 2020). In 2021, two more efforts under the REM initiative were announced: (1) rural production of latex and glue in two plants in the department of Guaviare and (2) women safeguarding the Amazonia for specific governance and conservation issues in the departments of Vaupés, Amazonas, Putumayo, Caquetá, Guainía, and Guaviare. The REM program rewards emission reductions resulting from decreasing gross

deforestation at a value of five United States dollars (USD) per ton of CO_2e. Payments under this agreement are initially based on emission reductions for the 2013-2017 period, which means a non-compatible overlap between the REDD+ Project and the REM program for the 2017 period (considering the start date indicated in section 1.8), for which the AATI expect to certify emission reductions. However, the scheme of work of the REM program proposes a broad and flexible framework, which is open to the promotion of existing activities and the development of new ones that encourage national, regional, and local REDD+ initiatives.

Considering the principles of monitoring, reporting, and verification of mitigation actions for Colombia with respect to double counting of GHG mitigation results, the MADS has offered the possibility of requesting Vision Amazonia the exclusion of the project area, if the REDD+ Project completes the feasibility and formulation phases in the RENARE.

Appealing to the "principle of maximizing the autonomy of indigenous communities or minimizing the restrictions to their autonomy" (Constitutional Court of Colombia Judgement T-601 of 2011), the four AATI will request the MADS and Vision Amazonia to exclude the limits described in section 1.12, so that they are not included in future reports of the REM program regarding emission reductions, and thus proceed independently and autonomously in the certification of emission reductions in their territory.

Considering the guidelines of Resolution 1447 of 2018 on non-compatible overlaps between mitigation initiatives, the proponents registered in the RENARE the REDD+ Project in its feasibility phase and, subsequently, requested review by the IDEAM and the change to the formulation phase. This request became effective on February 8, 2021. Now the proponents must complete the validation process to update the registration and request the change to the implementation phase. Detailed information on the REDD+ Project registration with the RENARE is presented in section 1.17.

1.16.2 Other Forms of Environmental Credit

The project has not applied for or received any other form of environmental credit related to GHGs, including renewable energy certificates.

1.17 Additional Information Relevant to the Project

1.17.1 Leakage management

The Amazonian indigenous territories possess ecological conditions and a large extension that have historically made them strategic and attractive for the development of economic activities of multiple actors, locals, settlers, companies, etc. This condition has generated negative impacts such as deforestation and degradation, which are described in detail in the territorial scenarios without and with projects. These constant impacts on land management and the care of nature are caused by both internal and external processes. From the communities, there is an increase in the population associated with an increase in the number of *chagras,* fishing, hunting and timber extraction.

One of the concerns identified so far by the community is related to the use and maintenance of the *chagras,* which, in addition to being a source of community sustenance and self-consumption, play an

important role in the transmission and production of knowledge, behaviors, traditional practices that represent the relationship with nature, animals and the ecosystem and the spiritual world of the community. As a fundamental element for the sustainability and social, cultural and ancestral reproduction of the communities, they are contemplated in the project area under the category of sustainable use, which are usually renewed every three years, based on the ecological calendar, which, although it is the guiding element of agriculture, the participants in the different spaces of participation identify the occurrence of alterations in the cycles that govern their productive activities.

The REDD+ project has considered in the framework of the vulnerability and risk assessments around the activities of the project, the complementarity and replaceability of the use spaces associated with subsistence, which were evaluated taking into account whether there are several spaces of cultural-productive use such as the *chagras* that provide benefits to the community, and if they are affected, there are others, or if there are other spaces that can replace them in case they are lost. For the first monitoring period, the indicator was Low, indicating that even prior to the start of the project, subsistence use spaces have been lost and their replacement has required access to services from external economic dynamics and monetary exchanges. The loss of these spaces is precisely one of the main underlying causes of potential leakage, which could increase under the project scenario due to the implementation of conservation measures around the REDD+ project.

Therefore, the *chagras* areas were prioritized as Leakage Management Areas (LMZ), considering the relevance of these areas for the livelihood of the communities regardless of the project scenario. Depending on the ethnic group, the *chagras* in the Colombian Amazon Region have a characteristic spatial distribution (Corpoamazonia, IAvH, SINCHI, UAESPNN, 2007) and are generally located close to the communities at a distance that varies between one and two kilometers from the settlement, so the mapping of the LMZ of the REDD+ project is limited to a buffer area of 1-2 km around the 55 communities participating in the initiative; area where the sources from which forest goods and services will be used/acquired during the first 10 years from the project start date will be concentrated. This buffer area will be validated and redefined at each verification of the REDD+ project considering that the distribution of the *chagras* has an important relationship with the demographic growth within the communities.

In this sense, it is expected that the same amount of goods and services from the forests will be extracted in the project scenario compared to the baseline scenario, based on the implementation of activities to strengthen productive activities: *chagras* and ancestral crops (recovery of seeds and native fruit species, fish farming practices with native species, breeding, and reproduction of minor species), under the strategic line of sustainable economy and food sovereignty. The plans for strengthening the *chagras* will be based on different studies and diagnoses in which the project communities have participated under the accompaniment of organizations such as SINCHI and Corpoamazonia (Acosta et al. 2011; Mendoza et al. 2017; among others).

Some of the actions that have been identified as part of that strengthening plan include:

- promoting a meeting of governors, leaders, and elders to strengthen decisions that lead to the implementation of a demonstrative *chagra* in each of the indigenous cabildos, through which

traditional practices are socialized, the diversity of species planted and the cycle of this, according to traditional principles to make a good *chagra* that guarantees eating and living well.

- including educational content on traditional practices in the academic programs of the educational institutions of the communities to support the governor of the cabildo, with the aim of covering the needs of the people in his charge, collaboration in the opening and management of the cycle of the *chagras.*
- Advancing in a process of ancestral technical training in the use and traditional management of the *chagras* cycle practices with young people and families, and the recovery of seeds of traditional species.
- creating work agreements that are analyzed and revised in accordance with the life and land use plan, after consultation and consultation with the cabildos and the AATIs.

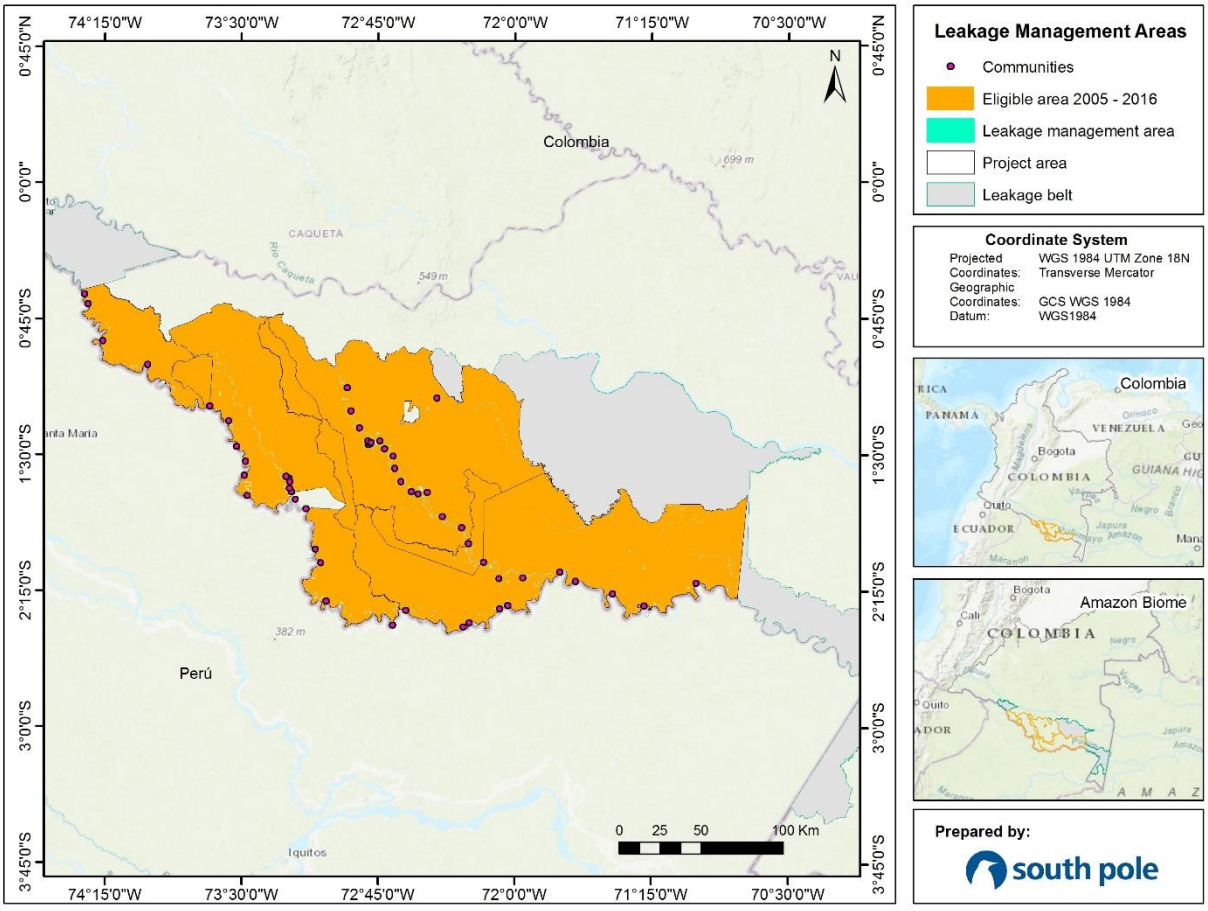


Figure 16. Leakage management areas (LMZ) associated to the first fixed baseline period.

Source: prepared by South Pole (2022).

1.17.2 Commercially sensitive information

Considering the information presented in section 1.7.2, the four Indigenous Associations (AATI) participating in the project and South Pole Carbon Asset Management S.A.S. (South Pole) signed agreements for the purchase of Emission Reductions (ER) generated by the REDD+ project within each of their territories. These documents and their content will be considered as "Commercially Sensitive Information" since the open publication of the commercial and financial information provided therein could prejudice the contractual outcome of the entities to which such information refers.

In this order, the four ERPAs will be excluded from the public version of the project description for validation, as well as the clarifications or corrective actions to be taken in the framework of the audit process with the VVB regarding these documents or their content.

1.17.3 Sustainable development

The 2030 Climate Agenda, structured in 2015 under the auspices of the United Nations, started the transformation of the Millennium Development Goals into a more holistic approach that integrates other dimensions of social development, besides health, education, food security, and gender-related matters. This new approach aims to ensure the permanence of what was achieved between 2000 and 2015, and to manage the balance between inclusive economic growth and the preserve and restoration of the integrity and ecological services of marine and terrestrial ecosystems. This must be achieved by fulfilling the Sustainable Development Goals (SDGs).

The expansion of the economic, ecological, and institutional dimension of human development in the SDGs permeated the structuring and implementation of various projects and programs in the environmental sector, with a particularly significant contribution from the forestry sector given its direct benefits in the modulation of GHGs. For the specific case of Colombia, the SDGs and the 2030 Agenda also become fundamental instruments to address economic growth during the post-conflict period, when a comprehensive and profound transformation of all rural areas is expected (Government of Colombia, 2016).

In addition, Colombia must meet the commitments set out in the Nationally Determined Contribution (NDC), because of the signing of the Paris Agreement in 2015. With the signing of this agreement, the country commits to contribute to the global efforts in terms of i) mitigation of GHGs, ii) adaptation to climate change, and iii) means of implementation as a transversal and instrumental component of the policies and actions for low-carbon, climate-adapted, and climate-resilient development (MADS, 2020).

The REDD+ Project will follow an internal protocol to identify and prioritize the SDGs and their targets and indicators, as well as to define the way they will be articulated with the monitoring plans of the project activities. This protocol consists of two phases: the first one focuses on the identification and prioritization of the SDGs based on a parallel between these, the long-term objectives, or achievements of the NDC at the country level, and the goals of the project itself; the second phase sets out a way of linking these development goals with the monitoring and implementation of the project. Both phases adhere to guiding parameters that seek effective integration between the SDGs, the NDC, and the objectives of each project. These parameters include:

- Having enough initial or baseline information to make reliable projections for each prioritized target by selected SDG.
- The activities in the project monitoring plan should provide the necessary data to calculate the indicators for each target in the future.
- The project indicators should be aligned with or equivalent to those developed by the national government.

Deforestation and forest degradation in the Predio Putumayo Indigenous Reserve are mainly caused by (1) the expansion of the agricultural frontier due to the loss of productivity in the *chagras* and climate change, (2) the uncontrolled extraction of timber and other goods from the forest for sale or self-consumption, and (3) the poor management of solid and liquid waste. Consequently, the REDD+ Project will prioritize SDGs related to the recovery and conservation of terrestrial ecosystems and inland waters (SDGs 13 and 15), food and water security (SDGs 1, 2, and 6), the consolidation of responsible production and consumption systems (SDG 12), the establishment of sustainable communities (SDG 11), and, finally, the management of partnerships to achieve long-term sustainable development (SDG 17). Likewise, the strengthening of indigenous governance and institutionality (concerning SDG 16) will be managed through the EPCAC; however, the indicators or targets will not be monitored since it is an organic tool that can be adapted to the conditions of the territory and the communities both in the present time and in future events.

This choice of SDGs is aligned with what was suggested by the Food and Agriculture Organization of the United Nations (FAO) in 2014 for linking the NDC and the seventeen SDGs under a specific focus on the agricultural sector. The entity initially prioritizes SDG 13 (Climate action), SDG 15 (Life on land), SDG 2 (Zero hunger), SDG 12 (Responsible consumption and production), and SDG 1 (No poverty); followed by SDG 6 (Clean water and sanitation), SDG 14 (Life below water), and SDG 7 (Affordable and clean energy). Similarly, the REDD+ Project covers what is proposed in terms of SDGs by the National REDD+ Strategy: "Forests, Territory of Life," which mainly considers SDGs 13 and 15.

Finally, to effectively integrate the SDGs, the NDC, and the specific goals of the REDD+ Project, the project will evaluate the literal applicability or generate the local contextualization of the national indicators related to the management of each selected SDG and its associated targets. If the SDGs' indicators or targets cannot be applied or adapted to the local context, some sections of the 2017 publication "Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development" will be used.

Table 16 provides a summary of the long-term strategic lines of the REDD+ Project and its projected contribution to the NDC priorities and SDG targets.

Table 16. Identification and prioritization of sustainable development priorities to which the REDD+ Project implementation is expected to contribute.

SDG	Does it contribute to the national sustainable development priorities? (Yes or No)	SDG-related target(s)	National indicator	Assimilation by the communities of the national indicator	Expected contribution of the project (increases, remains stable, decreases)
SDG 13: Climate action	Yes, transversal to all of them	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters	Departments with mitigation or adaptation plans	Communities with climate risk management and adaptation plans	Increases
		13.2 - Integrate climate change measures	Total GHG emission reduction	-	Increases
		13.3 - Build knowledge and capacity to respond to climate change challenges	-	Spaces for education, participatory knowledge, and strengthening of local organizational capacities on climate change	Increases
SDG 15: Life on land	Yes	15.1 - Conserve and restore terrestrial and freshwater ecosystems	Annualized loss of natural forest	-	Decreases
		15.2 - Manage, in a sustainable way, all types of forests	Forestry economic participation in the GDP	Economic valuation of timber and non-timber forest products	Increases
		15.A - Increase financial resources to conserve and sustainably use biodiversity and ecosystems	-	Number of verified carbon units (VCUs) issued for the execution of the REDD+ Project	Increases
SDG 2: Zero hunger	Yes	2.1 - Ensure universal access to safe and nutritious food	Prevalence of household food	-	Decreases

SDG	Does it contribute to the national sustainable development priorities? (Yes or No)	SDG-related target(s)	National indicator	Assimilation by the communities of the national indicator	Expected contribution of the project (increases, remains stable, decreases)
			insecurity		
		2.4 - Ensure sustainable food production and resilient agricultural practices	Agricultural production with green growth criteria	Number of production units under local adaptation and sustainability criteria	Increases
		2.5 - Maintain the genetic diversity in food production	-	Initiatives to ensure the diversification of species or varietals of traditional use, e.g., participatory workshops, exchange mechanisms	Increases
				Recognition and dissemination of culinary knowledge and practices, oral traditions, and experiences related to food production	Increases
SDG 6: Clean water and sanitation	Yes	6.B - Support local commitment to improving water and sanitation management	-	Promotion of minimum conditions for wastewater management (households and economic initiatives)	Increases
			Percentage of water quality monitoring points according to the water quality index	Number of permanent or itinerant water quality monitoring points according to the water quality index or its input variables	Increases
		6.6 - Protect and restore freshwater ecosystems	-	Number of hectares considered in community planning instruments	Remains stable or increases

SDG	Does it contribute to the national sustainable development priorities? (Yes or No)	SDG-related target(s)	National indicator	Assimilation by the communities of the national indicator	Expected contribution of the project (increases, remains stable, decreases)
SDG 1: No poverty	Yes	1.5 - Build resilience to environmental, economic, and social disasters	-	Marketing initiatives focused on the local context, e.g., fair trade, direct trade, or premium prices	Increases
				Feasibility assessment for inclusion in other scale markets	Increases
SDG 12: Responsible consumption and production	Yes	12.6 - Encourage companies to adopt sustainable practices	-	Number of hectares considered in community planning instruments related to agriculture	Remains stable or increases
SDG 11: Sustainable cities and communities	Yes	11.A - Strengthen national and regional development planning	Thousands of hectares of protected areas	Number of tools/activities promoting conservation of cultural and natural heritage	Increases
				Establishment of organizational networks for the execution of project activities	Increases
SDG 17: Partnerships for the goals		17.3 - Mobilize financial resources for developing countries	-	Money mobilized through the sale of VCUs issued thanks to the project activities	Increases

Source: prepared by South Pole (2021) based on the Colombian National Planning Department (2019).[17]

[17] https://www.ods.gov.co/en

Further information

Regional and subregional climate change scenarios

The Amazon rainforest represents 40% of the planet's tropical forests (5.3 million km^2) (Weng et al., 2018) and receives an average rainfall of 2,200 mm per year, which makes it a very important source of latent heat and moisture for the planetary atmosphere. In addition, its river discharge is estimated to reach a colossal number of 210,000 to 220,000 m^3 per second (Marengo et al., 2018). However, this biome, as a fundamental piece of the planetary water resource is at risk from increased variability and climate change. For example, since 1970, the atmospheric temperature has increased from 0.6 to 1.0 C; this number, although small compared to projections from the Intergovernmental Panel on Climate Change (IPCC) models, is enough to produce serious effects on ecosystem integrity and human health (Marengo et al., 2018; South Pole, 2020).

In terms of precipitation patterns, there is not one single unidirectional trend (Satyamurty et al., 2010; Almeida et al., 2017) in the region. However, a positive trend is observed since 1990 in the northwestern and southern extremes (Gloor et al., 2013; Rodell et al., 2018). Likewise, over the last century, megadroughts and megafloods have been reportedly intensified. Megadroughts occurred in 1925-1926, 1982-1983, 1997-1998, 2005, 2010, and 2016, and were associated with the positive phase of the El Niño-Southern Oscillation (ENSO) phenomenon (El Niño phase), except for the 2005 event that was related to abnormal North Atlantic Ocean temperatures (Zou et al., 2016; Marengo and Espinoza, 2016; Zeng et al., 2018). Megafloods were detected in 1989, 1999, 2009, 2012, and 2014, of which the first four coincided with a negative phase of the ENSO phenomenon (La Niña phase), and the last one with a neutral year (Espinoza, 2014; Marengo and Espinoza, 2016).

Some studies suggest a lengthening of the dry season, especially in southern Amazonia (Marengo et al., 2017). The reasons for this phenomenon are still unclear, but it is known that it has been extending by three to four weeks since the mid-1970s (Marengo et al., 2018). As a possible consequence, the evapotranspiration/precipitation (ET/P) ratio has been constrained to 45-60% (Salati and Vose, 1984; Nobre et al., 1991).

Regarding future scenarios and according to the Working Group I contribution to the IPCC Sixth Assessment Report, Amazonia would undergo major changes in all its climatic parameters if the scenario without mitigation (RCP8.5) continues until the end of the 21st century. According to the CMIP6 models used in this contribution, the RCP8.5 pathways would cause some areas of Amazonia to experience aridity (reduction in precipitation by 40-55%), temperature increases over 6 ºC, and more than 150 days per year with temperatures exceeding 35 ºC. If we add to this scenario the generalized phenomena of deforestation and forest degradation, the change towards a permanent savanna cover is highly probable (IPCC, 2021). This is more likely to occur in bordering areas such as the Southeast and the Andean foothills (Nobre et al., 2016; Marengo et al., 2018; Alarcón and Pabón, 2013).

Considering that, at the planetary level, we are still somewhere between the no mitigation scenario (RCP8.5) and the intermediate mitigation scenario (RCP4.5) (Schwalm et al., 2020), the Amazon biome has few safe, locally, or regionally manageable options, besides building adaptive resilience to climate

change. This would be achieved only by preserving the forest cover to at least 60-75% of what was reported before the Industrial Revolution (Sampaio et al., 2007; Zemp et al., 2017). Colombia and other countries in the Amazon biome already reached or will very soon reach this dangerous figure (Zemp et al., 2017.

Requirements of the Colombian monitoring, reporting, and verification system (Resolution 1447 of 2018)

Considering the principles of the monitoring, reporting, and verification (MRV) system of mitigation actions for Colombia defined through Resolution 1447 of 2018, the project assessed compliance with the main criteria proposed by this Resolution. Table 17 presents the sections containing the information required for the REDD+ Project.

Table 17. Compliance with the requirements of Resolution 1447 of 2018.

Resolution guideline		Required information	Compliance by the project
Title I	Article 2.	Scope of application	The project proponents, as a legal entity, intend to register the GHG mitigation initiative "REDD+ Project Pueblos Indígenas Resguardando la Selva" to demonstrate their mitigation outcomes within the framework of the national climate change goals set under the UNFCCC, because of the implementation of different activities for the conservation, use, and sustainable management of forests. Therefore, the provisions of Resolution 1447 of 2018 were considered for the formulation, registration, validation, and verification of the project. By virtue of the provisions of said article on applicability for GHG validation and verification bodies (VVBs), the project proponents will also ensure that the Resolution is considered as an important criterion within the scope of validation and verification services.
	Articles 10 and 13.	RENARE and phases of the initiative	Considering that Article 10 classifies the project as a REDD+ project, the proponent must register this initiative at the RENARE. On September 24, 2020, the project received approval from the IDEAM for registration in the feasibility phase. The registration status can be checked on the platform, as well as the initiative's information regarding: ● Basic data (name, purpose, location, etc.) ● Participants ● Emission sources ● Activities ● Competent environmental authority ● Costs and financing

Resolution guideline		Required information	Compliance by the project
			• Draft project document
Title II. Chapter 2. Section 2. REDD+ projects	Article 39.	Use of methodologies for the formulation of REDD+ projects	The REDD+ Project uses a methodology that complies with UNFCCC guidelines related to REDD+. The methodology is *VM0015 Methodology for Avoided Unplanned Deforestation, v1.1.* This methodology provides a set of guidelines for quantifying GHG emission reductions due to avoided deforestation. It also offers project proponents and developers different options for using data already available from sources such as nationally accepted forest maps to reduce monitoring costs. In addition, the project has a mechanism for quantifying the risk of leakage of GHG emission reductions, managing the risk of non-permanence of GHG emission reductions, and managing uncertainty in the quantification of the baseline and the mitigation outcomes.
	Article 40	Maximum GHG mitigation potential for REDD+ projects, object of national accounting	The MADS and the IDEAM, through the RENARE, will establish the maximum GHG mitigation potential subject to national accounting. This potential will be calculated based on the methodological reconstruction of the FREL assessed by the UNFCCC, applicable to the REDD+ Project area. Since the baseline will be validated after 2020, the maximum mitigation potential will be calculated from the methodological reconstruction of the UNFCCC-assessed FREL applicable to the project area. No baseline quote has been allocated to any project in the country since Resolution 1447 of 2018 was launched, so the Project set baseline combining methods proposed by the methodology VCS VM0015 and the carbon data published by MADS & IDEAM for the Amazon Biome (3.4.2 and 3.4.6).
	Article 41	Establishment of baselines for REDD+ projects	<u>Definition of forest according to information provided by the Colombian SMByC.</u> For the reconstruction of the FREL, the REDD+ Project used the following definition of forest: "Land mainly occupied by trees that may contain shrubs, palms, guaduas, grass, and lianas, in which tree cover is predominant with a minimum canopy density of 30%, a minimum canopy height (in situ) of five meters at the time of identification, and a minimum area of one hectare. Tree cover of

Resolution guideline		Required information	Compliance by the project
			commercial forest plantations, palm plantations, and trees planted for agricultural production are excluded." This definition is consistent with the criteria defined by the UNFCCC in its decision 11/CP.7, with the definition adopted by Colombia before the Kyoto Protocol (MAVDT, 2002), as well as with the definition of natural forest cover included in the adaptation for Colombia of the CLC methodology. Global warming potentials According to the FREL, the carbon contained in the biomass for each biome was obtained from the carbon fraction of dry matter suggested in the 2006 IPCC Guidelines: 44/12. This same fraction was used for the quantification of the REDD+ Project mitigation outcomes. Emission factors by forest type According to the proposal for a FREL from deforestation in Colombia for payment for REDD+ results under the UNFCCC (MADS & IDEAM, 2019, 2020), the emission factors in the FREL include above-ground biomass, below-ground biomass, and soil organic carbon, whose estimates were provided at the national level and for each of the biomes in Colombia. The REDD+ Project used the annual emission factors for deforestation in the Amazon biome determined in the FREL. These factors correspond to 445 tCO_2e/ha for above-ground biomass, 98 tCO_2e/ha for below-ground biomass, and 14 tCO_2e/ha for soil organic carbon. Historical deforestation data for the project area and its emission estimation method Historical deforestation data for the Amazon biome were used as a reference for the construction of the deforestation baseline, considering the existence of the REM program by Vision Amazonia and the guidelines of the methodology VCS VM0015 on reference regions. Historical deforestation data in the baseline were obtained from data generated by the SMByC (forest benchmark maps) and a projection of quantity and location of deforestation based on modeling.
	Article 42.	Establishment of mitigation goals for REDD+ projects	The mitigation goals of the REDD+ Project are articulated with the goals of the EICDGB and the other national goals regarding climate change proposed by the country before the UNFCCC. These goals correspond to: • Zero gross deforestation (205,421 ha of

Resolution guideline		Required information	Compliance by the project
			forest loss avoided in the project area, measured against the without-project scenario). • Improvement of the quality of life of the local population. • Strengthening of the territorial governance of the rural groups that live and depend on forests (strategic lines will be implemented in the crediting period of the REDD+ Project through 15 programs and 36 activities that address the central dimensions of indigenous life in their territorial autonomy to ensure forest conservation). • Reduction of 49.5 Mt of CO_2e emissions from avoided deforestation and degradation in the project area, measured against the without-project scenario). • SDGs (1, 2, 6, 11, 12, 13, 15, and 17).
	Article 43.	Additionality criteria for REDD+ projects	The assessment of the project additionality was conducted considering regulatory surplus criteria (Article 43 of Resolution 1447 of 2018) and the results obtained from the administration of the *VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry, and Other Land Use (AFOLU) Project Activities, v3.0.*[18] See section 3.5 for more details.
	Article 44.	Validation and verification criteria for REDD+ projects	The project proponents took the necessary steps to contract the VVB and to ensure that it adheres to the guidelines set out in Article 44 of the Resolution. The selected VVB was Ruby Canyon Environmental, which is authorized by the ANSI National Accreditation Board (ANAB) and, therefore, is qualified to provide auditing services for validation and verification of GHG projects in the country, in accordance with the provisions of Article 44 and Decree 446 of 2020.
	Article 45.	REDD+ project registration	Considering the guidelines of Resolution 1447 of 2018 on non-compatible overlaps between mitigation initiatives, the proponents registered the

[18] https://verra.org/methodology/vt0001-tool-for-the-demonstration-and-assessment-of-additionality-in-vcs-agriculture-forestry-and-other-land-use-afolu-project-activities-v3-0/

Resolution guideline		Required information	Compliance by the project
			REDD+ Project at the RENARE, in the feasibility phase, on September 24, 2020, and subsequently requested review by the IDEAM and the change to the formulation phase. This request became effective on February 8, 2021, and now the proponents must complete the validation process to update the registration and request the change to the implementation phase. Detailed information on the project registration at the RENARE is provided in section 1.17.
		Social and environmental safeguards	Regarding compliance with the REDD+ environmental and social safeguards, Table 33 presents the identification of the main instruments available to the REDD+ Project to enforce compliance with each of the safeguards, related to the participatory, communication, and capacity-building processes that have been developed to date by the participants of the initiative. Due to the degree of development of the safeguards topic in the country and considering the status of implementation of the MRV System and the Safeguards Information System, no specific interventions have yet been made in the territories and no specific expectations have been generated regarding monitoring procedures, indicators, or possible results with respect to compliance with safeguards. At the REDD+ Project level, the implementation of participation and communication mechanisms within the framework of the EPCAC was the strategy to demonstrate progress in complying with safeguards in the local context.
Title II. Chapter 3. REDD+ projects and programs in non-compliant status	Article 47.	Exclusion of the REDD+ Program holder from the project area	The REDD+ Project has an incompatible overlap with the 2017 REM Program by Vision Amazonia. The project proponents were interested in requesting the exclusion of the REDD+ Program holder from the area. To this end, they were expecting to complete the feasibility and formulation phases with the RENARE, in accordance with the criteria to request the exclusion from the non-compatible overlapping area provided for in Article 49 of Resolution 1447 of 2018. However, the MADS, as holder of the REDD+ Program, has informed other previous REDD+ initiatives that there are no GHG mitigation outcomes available for the Amazon biome in the 2013-2017 period and, therefore, these initiatives are invited to request, by means of an application,
	Article 49.	Completion of feasibility and formulation phases	

Resolution guideline		Required information	Compliance by the project
			the concept to participate as an executing partner of the program. The mitigation outcomes obtained by the REDD+ Project will not be traded in the country to apply to the mechanism for the exemption from the National Carbon Tax (Decree 926 of 2017) but will be used for voluntary offsets. In this regard, Verra communicated that policies may affect nested projects, but not the issuance of VCUs by these projects (for example, when the Government sets a limit on the amount of REDD+ credits that can enter a national carbon market) and that, in cases where jurisdictional policies and regulations regarding the issuance of VCUs by nested projects have not been established, Verra will allow projects to continue issuing VCUs based on the VCSs in force at the time of issuance.[19] In this way, the project will issue the mitigation outcomes for 2017, as these will not be subject to national accounting due to the market in which they will be traded.
		Notification to the REDD+ Program holder of the intention to exclude it	
		Project area in non-compatible overlap with the REDD+ program	

Source: prepared by South Pole (2021) based on Resolution 1447 of 2018 by the MADS.

Registration of the REDD+ Project at the RENARE

To avoid double counting of mitigation outcomes at the national level, particularly of credits sold as offsets in the voluntary market and those generated for trading in the Colombian domestic market (mechanism for not taxing the National Carbon Tax), the project proponents took the necessary actions to register and update the information about the initiative at the RENARE, under the guidelines of Article 54 of Resolution 1447 of 2018.

With the registration of the project at the RENARE, non-compatible overlaps with future programs or projects that intend to be developed in the same area will be avoided. Only in September 2020, the RENARE started to register initiatives and, until that date, the MADS and the IDEAM were in the first phase of the platform's entry into operation, which consisted of testing and stabilization, in addition to a process of training in the use and filling out of information on the platform, aimed at holders of GHG mitigation initiatives in the country.

[19] Disclaimer on jurisdictional nesting regulations and policies (VERRA, 2021). Available at: https://verra.org/project/jurisdictional-and-nested-redd-framework/rules-requirements/disclaimer-on-jurisdictional-nesting-regulations-and-policies/#esp

The REDD+ Project was registered in the feasibility phase on September 24, 2021, once the IDEAM authorized the proponent to access the platform. During the registration, an overlap with the REM program by Vision Amazonia (see Figure 17) was identified. Considering the guidelines of Resolution 1447 of 2018 on non-compatible overlaps between mitigation initiatives, the proponents adjusted the project start date on the platform to January 1, 2018, to avoid the overlap, and requested review by the IDEAM and the change to the formulation phase. This request became effective on February 8, 2021, and now the proponents must complete the validation process to update the registration and request the change to the implementation phase (see Figure 18).

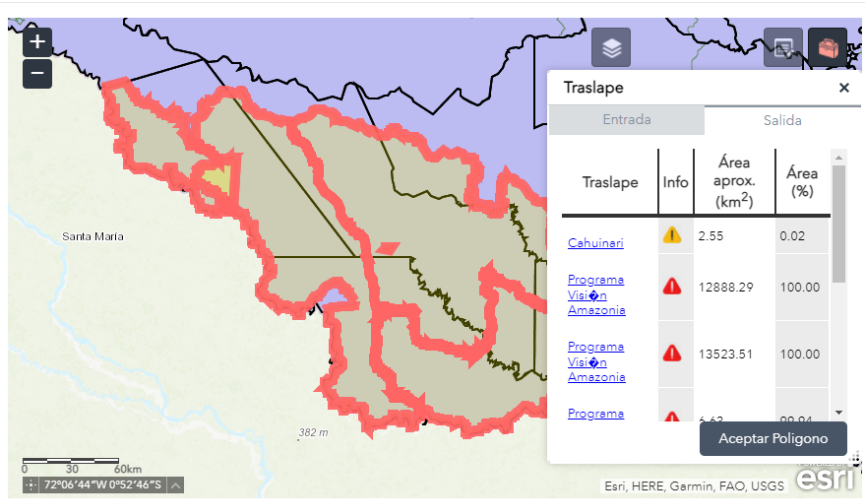


Figure 17. Identification of overlaps between mitigation initiatives on the RENARE platform.

Source: RENARE (2021).

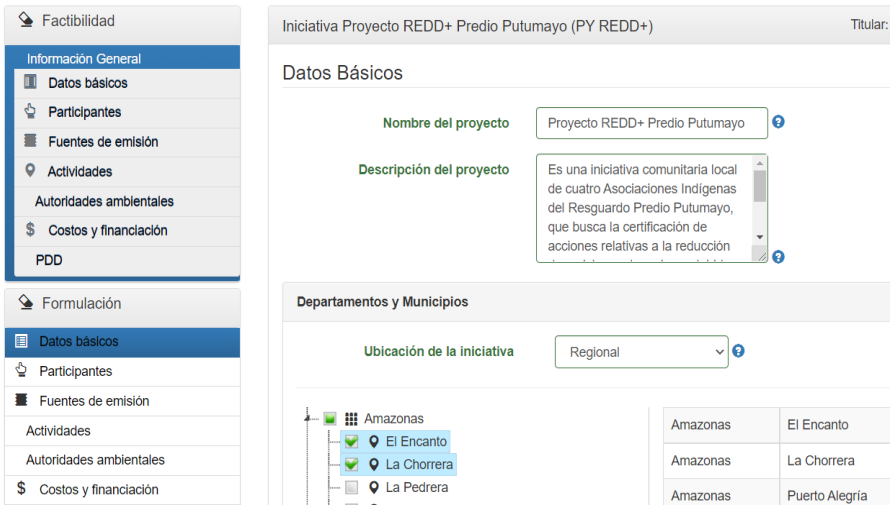


Figure 18. REDD+ Project registered on the RENARE platform in the formulation phase.

Source: RENARE (2021).

2 SAFEGUARDS

2.1 No Net Harm

The identification of socioeconomic risks in the framework of the REDD+ Project requires the analysis of the internal conditions that prevail in a territory and their interaction with the external conditions that the project and other social and natural factors bring to that territory.

2.1.1 Methodological aspects

Methodologically, the analysis is based on the integrated risk-vulnerability approach within the framework of climate change adaptation. This approach reflects on and criticizes the traditional risk-hazard approach to climate change focused on natural systems, stating that it is necessary to differentiate and understand both social or inherent vulnerability and biophysical or resulting vulnerability to determine the risk. The justification is that, by recognizing climate change as a problem, its understanding and solution concerns both social and natural systems (Lampis, 2013: 2). This approach makes it possible to identify and manage risk under probable or predicted scenarios and to include a perspective that fosters adaptation to scenarios of uncertainty (Lampis, 2013:11).

In a process of articulation, the integrated approach is proposed (see Figure 19), which combines the characteristics of the internal (social) vulnerability of a population or place with its exposure to external biophysical risk factors and correlates it to a hazard potential or hazardous situations. This potential is influenced by risks and actions and their mitigation effects, which influence territorial processes and, at the same time, result from the vulnerability existing in the territory. Likewise, the feedback arrows indicate that vulnerability and risk are understood as a process of social construction (Lampis, 2013:81).

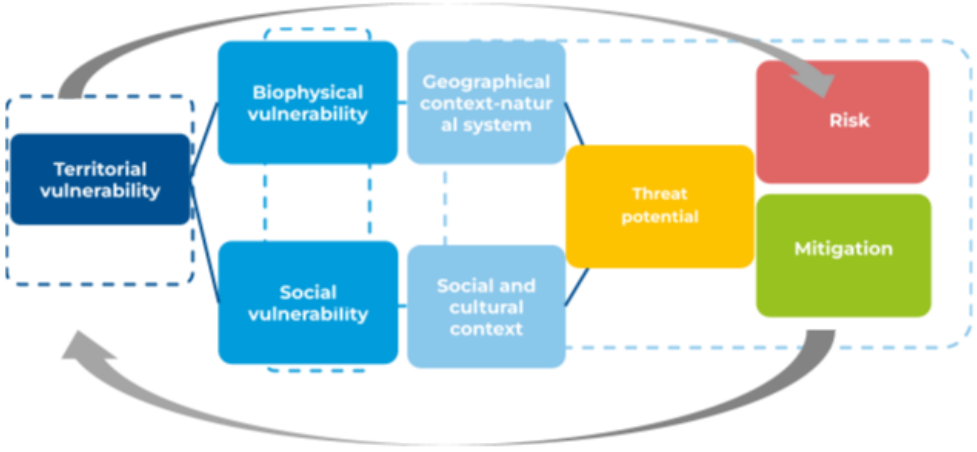


Figure 19. Adaptation of the hazard-territory model.

Source: adapted from Mapis (2013) and Cutter (2003).

To carry out the risk analysis from this approach and to be clear about its scope, results, and relevance for the REDD+ Project, the following methodological stages were consolidated:

- Socio-environmental characterization or participatory baseline (PBL) construction.
- Compilation and triangulation with various sources of the situations that are hazardous for the REDD+ projects.
- Assessment of socioeconomic risks and vulnerability based on the primary and secondary information collected.
- Review and validation with the technical development team and representatives of the community sector of the vulnerability factors, vulnerability rating, and inventory of hazardous situations.
- Risk analysis matrix.

2.1.2 Identification of hazardous situations

At the community level and for REDD+ projects, hazardous situations that may pose a risk to some stakeholders according to their level of vulnerability have been documented. These situations are related to:

1) Difficulties in implementing the measurement, reporting, and verification systems.
2) Leakage control.
3) Permanence of financial mechanisms and distribution of benefits.
4) Limitations to participation.
5) Rights of local communities (Angelsen et al., 2009; Kanninen et al., 2010).

These difficulties are defined in various studies as challenges to the REDD+ projects due to lack of multilevel governance, since this type of projects requires articulated actions at different levels: local, subnational, national, and other multiple scales, to ensure the flow and consistency of the information, as well as the management of different interests at different levels (Angelsen et al., 2013). The multilevel governance approach in the REDD+ projects shows that different stakeholders, such as policy makers, negotiators, state agencies, non-state actors, project proponents, and local organizations, need to understand that this type of governance contributes to making REDD+ more effective, efficient, and equitable by achieving vertical integration. This type of integration is only possible through broad participation processes articulated to the communication and appropriation of knowledge related to climate change mitigation as a central axis, that is, going beyond stakeholder consultation.

Additionally, the VCS standard, based on the experience in the AFOLU sector and the REDD+ projects, specifically points out that the hazardous conditions related to the project should be assessed. They include:

- Community stakeholders' participation.

- REDD+ Project design.
- REDD+ Project consultation process.
- Trade-offs in food security.
- Land loss.
- Yield losses in economic activities.
- Climate adaptation reduction.

Likewise, through the implementation of the EPCAC, from which the PBL was constructed, some of these hazardous situations that may contribute to triggering socioeconomic risks in the project scenario were identified. These hazards were assessed based on three criteria:

1) Manifestation: current (5), past (3), potential (1).
2) Frequency: regular (5), occasional (3), none (0).
3) Dynamics: increasing (5), stable (3), decreasing (1).

The hazard level rating included the following categories: very high, high, medium, low, very low. In cases where the manifestation is past or potential, the dynamics criterion is assumed not to apply and is rated at zero. Table 18 summarizes the findings.

Table 18. Summary of the hazardous situations to be assessed in the REDD+ Project.

Hazardous situation	Manifestation	Frequency	Dynamics	Hazard level	Identification source
Difficulties in implementing measurement, reporting, and verification systems	Potential	Occasional	NA	Very low	Academic literature
Difficult leakage control	Current	Regular	Increasing	Very high	Academic literature
Permanence of financial mechanisms and distribution of benefits (poorly targeted efforts and investments)	Current	Regular	Stable	High	Academic literature, PBL
Limitations in participation	Current	Occasional	Decreasing	Medium	Academic literature, VCS standard
Loss of rights by local communities: property rights (land)	None	None	NA	Very low	Academic literature, VCS standard

Hazardous situation	Manifestation	Frequency	Dynamics	Hazard level	Identification source
Difficulties in the REDD+ Project design	Current	Occasional	Decreasing	Medium	VCS standard
Difficulties in the REDD+ Project consultation process	Current	Regular	Decreasing	High	VCS standard
Loss of yields from economic activities; food security	Potential	Occasional	NA	Very low	VCS standard
Reduced climate adaptation	None	None	None	Very low	VCS standard
Lack of governability and territorial affectation due to illegal activities and development projects (drivers of deforestation)	Current	Regular	Increasing	Very high	Academic literature, PBL
Internal conflicts	Current	Regular	Stable	High	PBL
Corruption	Current	Regular	Stable	High	PBL, academic literature
High monetary expectations at the local level	Current	Regular	Stable	High	PBL

Source: prepared by South Pole (2021).

The hazard level shows us the situations that, when related to the degree of vulnerability, can pose a risk for the communities. These high-level hazards are associated with structural problems and, in most cases, with factors external to the territory, such as territorial control and surveillance and the investment of resources from public and private entities with an interest in the Amazon region. They are also related to processes that require capacity building and social and community appropriation of new knowledge, as in the case of the design of the REDD+ Project; in consequence, participation and education activities should be performed from a long-term and continuous indigenous vision. Additionally, since the REDD+ projects generate monetary resources for investment in conservation and territorial governance processes, they are very susceptible to hazardous situations already present throughout the national territory, both indigenous and non-indigenous, such as internal conflicts, corruption, and high monetary expectations. These high-level hazards, often beyond the scope of the REDD+ Project, will be addressed through mitigation measures that promote participation, communication, and transparency in information and resource allocation; all framed within the support of traditional, equitable, and sustainable governance.

Likewise, there are hazardous conditions that do not entail a risk to the community and the territory, such as the loss of territorial rights, since they are protected by the country's legislation, as well as the impact on food sovereignty and the reduced adaptation to climate change, since traditional productive activities continue to be compatible with forest conservation processes.

2.1.3 Territorial vulnerability

In the indigenous territory where the Predio Putumayo REDD+ Project is located, the **inherent conditions** (those linked to the **social system**) were analyzed, such as the socioeconomic, cultural, and political characteristics of the actors (inherent vulnerability); but also, their relationship with the **biophysical conditions and hazards** from various sources, natural and anthropogenic phenomena **(resulting vulnerability)**, where the emphasis is placed on the **impacts**. The understanding of these two dimensions or types of vulnerability leads to the analysis and integration of the territory's vulnerability, the hazard potential, and the risks, as well as to the formulation of a mitigation strategy.

Inherent vulnerability refers to the ways in which a sociocultural system or population uses, manages, and adapts to the environment or territory that it inhabits. It is closely related to the economic, social, and cultural activities and to the belief systems. Resulting vulnerability refers to biophysical conditions or characteristics, such as the incidence of natural phenomena and hazardous situations resulting from the society-nature interaction (natural and anthropic phenomena).

Table 19 shows the factors that characterize inherent and resulting vulnerability, considering social and natural factors: response capacity, assimilation capacity, and natural environment's assimilation capacity.

Table 19. Factors considered for the vulnerability assessment.

Component / Description	Indicator	Indicator rating	Vulnerability rating
Response capacity: Social, political, administrative, and territorial capacity to adapt to new conditions resulting from potential damages, take advantage of opportunities, or face consequences	**Response capacity:** Familiarity with the territory, awareness of problems and hazards, and communication strategies	**Very high:** Most of the community (elders, adults, women, and youth) is familiar with the territory, its problems, its hazards, and is clear about the permanent means of communication, not just assemblies. (Value 1)	Very low: 1
		High: The social capacity is channeled through traditional authorities, so that knowledge is shared with the entire community in collective spaces, such as assemblies several times a year. (Value 2)	Low: 2
		Medium: The social capacity is concentrated in leaders, traditional	Medium: 3

Component / Description	Indicator	Indicator rating	Vulnerability rating
		authorities, and some community leaders. Assemblies are held only once a year. The dissemination of knowledge, the communication, and the inclusion of women, youth, and older adults should be strengthened. (Value 3)	
		Low: Knowledge of the territory, its problems, and its hazards is mostly restricted to a few people with administrative leadership styles that are not always traditional. Communication is directed without reaching women and young people. (Value 4)	High: 4
		Very low: There are age or gender groups in the community that do not participate. It could be said that there is concentration of knowledge, there is no dialog of knowledge, and some members of the community are excluded and marginalized. (Value 5)	Very high: 5
Assimilation capacity: Assimilation capacity resulting from hazardous activities or situations	**Complementarity and replaceability of spaces used for subsistence:** This is evaluated by determining whether there are several spaces for cultural-productive purposes (such as the *chagras* that provide benefits to the community) and whether they can be replaced by other spaces in case of damage or loss	**Very high:** There are so many places used for subsistence that may not be used for years or for more than one year. (Value 1)	Very low: 1
		High: There are many places used for subsistence, but all of them are used at least once a year. (Value 2)	Low: 2
		Medium: There are enough places used for subsistence and they are used several times a year, but if any of them is threatened, the community may face shortages. (Value 3)	Medium: 3
		Low: Some spaces have been lost and, to replace them, the community has turned to services from external economic dynamics and monetary exchanges. (Value 4)	High: 4

Component / Description	Indicator	Indicator rating	Vulnerability rating
		Very low: Some communities within the indigenous reserve lack spaces that can be used for subsistence and have food security problems. (Value 5)	Very high: 5
Natural environment's assimilation capacity: Capacity of the natural environment to assimilate negative effects	Cover transformation percentage	Assimilation capacity Less than 10%: Very high (Value 1)	Very low: 1
		10 to 30%: High (Value 2)	Low: 2
		30 to 50%: Medium (Value 3)	Medium: 3
		50 to 80%: Low (Value 4)	High: 4
		More than 80%: Very low (Value 5)	Very high: 5

Source: adapted from the IPCC (2012) and WWF (2018).

The vulnerability factors were also rated based on the information gathered for the socio-environmental baseline and participation strategy. This rating was validated in discussions between the technical development team and the co-managers designated as representatives of each AATI (Table 20).

Table 20. Assessment of territorial vulnerability in the REDD+ Project management area.

Component	Indicator	Manifestation in the REDD+ Project management area	Indicator rating	Vulnerability rating
Response capacity	Social capacity	Much of the social capacity is concentrated in leaders, traditional authorities, and some community leaders. Assemblies are held only once a year. The dissemination of knowledge, the communication, and the inclusion of women, youth, and older adults should be strengthened.	Medium	Medium
Assimilation capacity	Complementarity and replaceability of spaces	Some spaces have been lost and, to replace them, the community has turned to services from external economic	Low	High

Component	Indicator	Manifestation in the REDD+ Project management area	Indicator rating	Vulnerability rating
		dynamics and monetary exchanges.		
Natural environment's assimilation capacity	Percentage of cover transformed	10 to 30% of native forest has been transformed.	High	Low
Total degree of vulnerability				Medium

Source: prepared by South Pole (2021).

As a result of the assessment, as detailed in the table above, there is a medium vulnerability associated with some territorial strengths, mainly in forest conservation and maintenance of cultural and natural use spaces for livelihood. This is also due to the diverse and extensive ecosystem inhabited by the different indigenous peoples. In social and political terms, the participation of all individuals (older adults, women, and young people) in decision-making and information dissemination spaces should be strengthened, so that the reflective understanding of the positive and negative aspects of the projects, the awareness of hazards and problems, as well as the solutions become collective processes and, in consequence, reinforce territorial governance and cultural identity.

2.1.4 Risk analysis and mitigation measures

The risk analysis adopts the Integrated Approach for the identification of vulnerabilities. For the identification of hazards, it relies on various sources, such as secondary information for REDD+ projects (multilevel governance and VCS standard) and contextualizes and validates them through the updated information gathered through the EPCAC, from which the socio environmental PBL was constructed and the stakeholder mapping for the REDD+ Project Pueblos Indígenas Resguardando la Selva in Predio Putumayo was carried out. This qualitative risk analysis integrates the hazards identified, whose rating was very high and high. For their correlation with the vulnerability, the various levels of vulnerability were maintained (see Table 21), even though the assessment showed an **overall medium vulnerability**. The purpose was to point out in the analysis how the level of risk is always present at high and medium levels, due to the frequent and increasing incidence of many hazards.

Table 21. Qualitative matrix for analysis of risks derived from the REDD+ Project and mitigation measures.

Hazard	Hazard level	Vulnerability level	Risk level	Mitigation measure
Difficult leakage control; lack of governability; and territorial affectation due to illegal activities and development projects (drivers of deforestation)	Very high	Very high to high	Very high	Strengthening of governability; democratization of information and leadership. Economic and technical support for better territorial control. Strategies for dialog and negotiation to improve state action for the control of illegal activities that drive deforestation.
		Medium	High	
		Low to very low	Medium	
Permanence of financial mechanisms and distribution of benefits (poorly targeted efforts and investments)	High	Very high to high	High	Participation strategy with a knowledge appropriation component focused on emission reduction and climate change mitigation as pillars.
		Medium	Medium	
		Low to very low	Medium	
Difficulties in the REDD+ Project consultation process	High	Very high to high	High	Capacity building and training with a continuous ethnic focus; consolidation of the carbon market training committee
		Medium	Medium	
		Low to very low	Medium	
Internal conflicts	High	Very high to high	High	Strengthening of collective and ancestral spaces to mediate the problems, identify the causes, produce transformative changes, and negotiate.
		Medium	Medium	
		Low to very low	Medium	
Corruption	High	Very high to high	High	Governance structure with social control through the community assembly; clear and permanent communication channels; consolidation of an oversight committee.
		Medium	Medium	
		Low to very low	Medium	
High expectations at the local level	High	Very high to high	High	Communication strategy with clear, intercultural, and continuous

Hazard	Hazard level	Vulnerability level	Risk level	Mitigation measure
		Medium	Medium	communication channels and media.
		Low to very low	Medium	

Source: prepared by South Pole (2021).

This qualitative risk analysis is constantly being updated and expanded, given that the relationship with the actors is continuous. Additionally, it is related to the determination of the actors' vulnerability levels in the area under study. The sociocultural and territorial baseline shows that, within the indigenous reserve, leadership is mainly concentrated in traditional leaders and authorities. These groups are made up of adult men; therefore, young people, older adults who are not considered wise, and women are classified as highly vulnerable.

Furthermore, one of the concerns identified so far by the community is related to the use and conservation of the *chagras*, which, besides being a source of community livelihood and self-consumption, play an important role in the transmission and production of knowledge, behaviors, and traditional practices that represent the relationship with nature, animals, the ecosystem, and the spiritual world of the community.

However, it has been made clear to the community that the *chagras*, as a fundamental element for the sustainability and the social, cultural, and ancestral reproduction of the communities, are contemplated in the project area under the sustainable use category. They are usually renewed every three years, based on the ecological calendar, which is the guiding element for agriculture, although the individuals in the different spaces for participation have identified the occurrence of alterations in the cycles that govern their productive activities. During the dissemination sessions, the participants have discussed the process to prepare the land on which *chagras* will be established and the need to avoid a greater impact on the cover that precedes the preparation of the land. In addition, clarifications have been made regarding the felling of trees for commercialization, as an activity incompatible with the project's goals if it is not done in a sustainable manner.

The *chagras*, besides containing a significant part of community and traditional life, because of the diversity of crops that they house, contribute to prevent soil erosion and to decrease exposure to pests, among other benefits (Gaia Amazonas, 2019).

2.2 Local Stakeholder Consultation

2.2.1 Briefings with communities and local stakeholders

Within the framework of the REDD+ Project Pueblos Indígenas Resguardando la Selva, the EPCAC has been designed and implemented in order to encourage dialog; cooperation; and recognition of traditions, ways of life, and rights of the indigenous communities that depend on these forests and have decide to get involved as proponents, understand, and work jointly with South Pole in the design

and formulation of the project, promoting informed and collective decision making that meets the REDD+ safeguards. The concepts outlined in this strategy are summarized as follows:

- **Participation.** It is understood as an engine for mobilization and empowerment of stakeholders; as a right and an obligation to be informed and participate in the activities developed in the territory; and as a mechanism for the reaffirmation of autonomy and the exercise of local participation.
- **Communication.** It is understood as decentralization and democratization of information for the creation of means, messages, and tools to disseminate and provide feedback on the processes from collective and proactive cre-action. Communication acts as a bridge in the participation and appropriation of knowledge.
- **Appropriation.** It is understood as the collective production of knowledge, its dissemination and disclosure, as well as the promotion of dialog and the exchange of knowledge in terms of the sustainability of the project's activities and of the actors involved. In the context of the project, appropriation takes place from the exchange of local knowledge and praxis with technical-scientific knowledge.

The EPCAC strategy consists of the following phases:



Figure 20. Phases of the EPCAC.

Source: prepared by South Pole (2020).

1) **Phase 1. Preparation.** The information needed to get to know the territory and the key stakeholders is gathered. The main activities are the preliminary stakeholder mapping and a quick reading of the socio-environmental, cultural, and governance-related context based on a review of secondary and primary information, if possible. This phase entails the participation of the communities and their representatives; spaces are created for the understanding and establishment of the ERPAs by the stakeholders; the work team is consolidated, which includes

the selection of the project facilitators or co-managers; and the technical and social feasibility of the project is verified.

2) **Phase 2. Dissemination sessions and socio-environmental characterization.** The activities proposed during this stage include the joint construction of the socio environmental PBL; the understanding of the governance, self-government, and traditional government spaces; the establishment of a dialog of knowledge and a process of knowledge appropriation; the preliminary identification of impacts; and the contribution of some initial ideas or proposals for the benefit distribution system.

   Similarly, the dissemination process with the stakeholders identified in the territory takes place in this phase, the communication channels are consolidated, and the co-managers are selected and trained from the communities or AATI to support the implementation of the EPCAC in the territory.

3) **Phase 3. Exchange of knowledge, validation, and supplementation.** The dialog and exchange of knowledge revolves around the initiative. The dissemination process makes progress with activities for the validation and supplementation of the impacts previously identified, aspects of the socio-environmental characterization, as well as the mitigation measures or strategic lines, the benefit distribution system, and the monitoring plan. At the same time, the project management area is consolidated.

4) **Phase 4. Presentation of the outcomes of the process.** It strengthens the project dissemination process and the dialog thanks to the feedback on the findings and the management strategies for the continuity of the project. This phase also makes it possible to promote alliances and identify risks and strengths for the following stages. It focuses on the presentation of results and the development of the communication strategy (delivery of written and audio reports, dissemination of videos, performance of cultural activities, and support to the communities for the auditing process).

5) **Phase 5. Implementation, follow-up, and continuity.** This process is consolidated once the incentives are received. It is developed exclusively by the proponents with the support of the stakeholders if the initiative's managers decide it so. The implementation activities that are being developed in the territories and those identified in the formulation process for certification must be executed according to a prioritization process in the short, medium, and long term. Likewise, the monitoring and follow-up plan should be executed until new verification processes are conducted. It also includes the training processes, the prioritization and execution of projects that integrate the strategic lines, and the benefit distribution system. Finally, continuity is given to the communication strategy and requests, complaints, claims, feedback, and suggestions (RCCFSs) are addressed.

The following are the spaces created for participation, information, communication, and appropriation within the framework of the REDD+ Project for the different stakeholders. The strategies developed to promote and publicize the spaces and activities to be conducted among the stakeholders are also described.

Secondary information gathering, preliminary stakeholder mapping, meetings for dialog of knowledge on agreements with proponents, and election and training of local co-managers in REDD+ knowledge

Dissemination sessions and briefings

During 2019, preliminary visits and meetings were held to talk with the different AATI (COINPA, CIMPUM, and AIZA) about their interest in grouping together to participate in a REDD+ initiative. These meetings were held between April and July 2019 in the assembly spaces. The topics discussed during these visits and assembly spaces focused on:

- Dialog of knowledge for the understanding of the REDD+ initiatives, the commitments of the proponents, and the company allied for certification. Conversation and signing of the commercial agreements between COINPA, CIMPUM, and AIZA and the company allied for certification.
- Discussion and agreement between the parties for the creation of a co-managers team made up of members of the communities democratically selected during the assemblies held. The parties also agreed on the need to start a training process for these co-managers on REDD+ issues. This group should be hired by the company allied for certification (South Pole), making it clear that the amount of these contracts could be deducted from the gross profits of the communities, once the carbon credits are generated and marketed.

Table 22. Meetings held during the field visit made between November 26 and December 7, 2019.

AATI	Community	Date (2019)	Number of attendees
COINPA	Puerto Alegría	November 28 and December 5	45
CIMPUM	San Rafael	November 29	65
AIZA	Puerto Arica	November 30	60
AZICATCH	Centro Chorrera	December 2 and 3	189

Source: prepared by South Pole (2021).

Dissemination session in Puerto Alegría	Dissemination session in San Rafael
	
Dissemination session in Centro Arica	**Dissemination session in Centro Chorrera**
	

Figure 21. Photographic record of the meetings held during the first field visit made between November 26 and December 7, 2019.

Photograph: South Pole (2019).

Co-managers training

Within the framework of the contractual agreements among the AATI for the REDD+ Project, a team of co-managers made up of members of the indigenous communities was selected and trained to support the field work to allow the proponents to provide the necessary information to the company that leads the certification process. Likewise, the co-managers have dynamized the knowledge about the REDD+ Project and the transparent, timely, and clear communication about the initiative. They are also responsible for mediating and facilitating the dialog among stakeholders and for promoting the understanding between knowledge, technical concepts of the REDD+ Project, and wisdom and languages of local communities. The co-management team is in constant interaction with the communities, listening to them, addressing their concerns, gathering their proposals and ideas to communicate and manage them with the relevant parties, and strengthening participation in educational and dissemination activities as part of the exchange of knowledge on the REDD+ initiatives, conservation, and climate change in the territory.

Between September 9 and 13, 2019, the group of 12 co-managers, plus three leaders of COINPA, CIMPUM, and AIZA, received training in REDD+ projects in the city of Medellín. At the same time, secondary information was reviewed for a preliminary context analysis of the territory.

During the same year, the technical team of South Pole, as the company allied for the certification, made a new field visit with the purpose of recognizing the socio-cultural systems that inhabit the territory, sharing with the community of the REDD+ Project the phases or activities to be developed jointly to achieve the objectives of the certification, clearing up doubts, starting the dialogs about the key concepts of the REDD+ initiatives and the use and management of forests by the communities, introducing the work team in the territory, and assessing the performance of the co-management team hired.

The work of the co-managers is generally carried out in the *malocas*, where they interact with the community elders, receive advice and guidance so that the activities are performed in an appropriate manner and in accordance with the context and the cultural practices, and ask for authorization from the elders—who are the traditional authorities of the territory—for the development of other activities.

Similarly, the co-managers carry out dissemination activities related to ERPAs, project progress, formulation of strategic lines, project cycle, community commitments to conservation, and other questions frequently asked by the communities about the REDD+ initiative. From the pedagogical and communicative component, they create community spaces to talk about climate change, REDD+ concepts, carbon market, conservation, traditional practices, among other topics. They prepare visual and informative material on the project and other topics of interest, such as community billboards and newsletters. They also develop qualitative research techniques to validate aspects such as the stakeholder mapping, project area mapping, social mapping, land use and changes, information on *chagras*, and collection of demographic information.

For more information on the co-managers training process, see the annex: *20211015__Documento soporte_Taller_Capacitacion_Cogestores.*

Dissemination and socio-environmental characterization or joint construction of the socio-environmental participatory baseline

Dissemination and information meetings

Following the dissemination and information process in the different communities, the technical team, together with the co-managers, made a second field visit in February 2020, in which the following activities were conducted:

- Dissemination of information on the progress of the REDD+ Project in an assembly with representatives of the 22 communities and local authorities of AZICATCH, to solve the doubts of the community members and complement the work plan.
- Second co-managers training session with the participation of the four representatives of the AZICATCH communities and the co-managers of the other AATI (AIZA, CIMPUM, and COINPA).

- Meeting with the AZICATCH leaders to clear up doubts about the project and to discuss and adjust the work plan.
- Discussion sessions, visits, and briefings with the community members of Caisam, Vegsam, and Santa María—belonging to AZICATCH—to explain issues related to REDD+ and resolve doubts about the project.

Table 23 shows a list of the sessions and meetings held during the second field visit between February 20 and 28, 2020.

Table 23. Sessions and meetings held during the second field visit between February 20 and 28, 2020.

Type of meeting	Date (2020)	Stakeholders invited	Place	Length	Attendees
Assembly	February 21	Community in general and AZICATCH leaders	Abuelo Manuel Zafiama *maloca*, Centro Chorrera	9	79
Co-managers training session	February 21-26	AZICATCH, AIZA, CIMPUM, COINPA, and CIMCE co-managers	AZICATCH library, Centro Chorrera	40	9
Short dissemination session	February 27	Caisam community members	Caisam community room	4	27
Short dissemination session	February 27	Santa María and Sabana community members	Santa María community room	5	ND
Short dissemination session	February 28	Vegsam community members	Vegsam community room	4	ND
Executive committee Secretariats AZICATCH	February 27	AZICATCH executive committee, secretariats, and co-managers	AZICATCH meeting room, Centro Chorrera	3	11

Source: prepared by South Pole (2021).

During this visit, and as a practical exercise of the training process, the co-managers visited some AZICATCH communities to provide information on the REDD+ initiative, the key concepts, the interrelation of cultural practices of forest conservation by the communities and the contribution to climate change, as well as to answer questions of the communities about topics of interest or about the project. The co-managers also put into practice the use of technological tools such as GPS, cameras, recorders, and computers. Figure 22 shows the photographic record of the visit and the meetings with some of the AZICATCH communities.

Assembly in Centro Chorrera	Dissemination session with Caisam community members
	
Dissemination session with Vegsan community members	Dissemination session with Santa María community members
	

Figure 22. Photographic record of the second field visit made between February 20 and 28, 2020.

Photograph: South Pole (2020).

It is worth noting that, during the two visits described above (late 2019 and February 2020), the co-managers team played a relevant role as a facilitator of the EPCAC. During the information process, the

communities already had some ideas about the project; the logistics for the meetings had advanced thanks to their coordination with the leader or governor of the community; the appropriate call made it possible to visit some AZICATCH communities that were far away from the settlements; and, finally, the inputs gathered by the co-managers together with the team of the certification partner company provided the information required to advance the writing of the project document during the first months of quarantine due to COVID-19.

Visits by the co-management team to the communities in the REDD+ Project management area

With the worsening of the pandemic and the restrictions on the organization of collective events, the work plan had to be restructured. Between August 4 and September 8, 2020, virtual meetings were held with the leaders of the AATI to discuss and agree, in a participatory way, on the new work plan for the resumption of activities by the co-management team in the territory. Once the activities of the co-management team were defined, they received virtual training from the South Pole team on key concepts for the REDD+ projects; qualitative techniques for primary data collection, validation, and complementation; technological and administrative tools; dialog of knowledge on contract agreements; climate change and its articulation with forest conservation, etc. After the training sessions, the co-managers undertook their field work, disseminating information about the project, validating, and complementing information, and collecting questions, perceptions, and primary information in the communities that are part of the project, as shown in Table 24.

Table 24. Meetings held by the co-managers in the communities of the AATI during the second half of 2020.

AATI	Community	Date (2020)	Attendees
AIZA	Centro Arica	September 13	66
	Nueva Reforma	September 16	14
	Nueva Unión	September 17	5
	Puerto Limón	September 18	8
	Nueva Esmeralda	September 24	4
AZICATCH	Santa Rosa	September 9	19
	San Antonio	September 10	10
	San Francisco	September 11	14

AATI	Community	Date (2020)	Attendees
	Lago Grande	September 21	17
	Cris	September 26	31
	Providencia Nueva	September 28	16
	Petani	September 29	12
	Bora Providencia	September 30	23
	Ocim	October 9	11
	Cordillera	October 12	27
	Okaina	October 13	14
	Milan	October 14	23
	Mue	November 10	14
CIMPUM	Santa María	October 12	15
	Puerto Colombia	October 13	10
COINPA	Perea	September 16 and 18	39
	Peña Blanca	September 18	6
	Reyes	September 19	7

Source: prepared by South Pole (2021).

It is important to mention that, although the co-managers reported to have visited around 46 communities out of 54, they could not record all their visits, given that some communities decided to take care of the activities and not to sign attendance lists or authorize photographic recording. Consequently, not all the meetings are supported by minutes, attendance lists, and photographic records. Figure 23 shows the photographic record of some of the activities performed during these visits to the territories of the four AATI.












Área del Proyecto REDD+
Predio Putumayo en Revisión
Sector AZICATCH
Amazonas Colombia
SISTEMA DE COORDENADAS





Figure 23. Photographic record of the field visits made by the co-managers team during the second half of 2020.

Photograph: South Pole (2020).

Meetings to share and assess the progress of the project and resolve doubts and questions during the AATI assemblies.

In December 2020, the AZICATCH assembly was held in Centro Chorrera. In this assembly, there was a space for dialog among communities' representatives, AATI leaders, and South Pole's professionals to present the progress of the project during 2020, address questions and comments from the communities, and define the work plan for 2021.

The meetings and assemblies of COINPA, AIZA, and CIMPUM were held in February. In these spaces, the proponents, with the support of South Pole, shared the progress of the project, ratified the agreements and signing of the project documentation, addressed doubts and questions from the communities, and reaffirmed the relevance of the co-managers as promoters of knowledge about the REDD+ Project among the communities. Three face-to-face assemblies of governors were also held, one in each AATI, with the participation of about 224 people. In addition, a meeting was held again in AZICATCH to check the progress of the commitments among the parties in December 2020.

During these meetings, the following clarifications about the REDD+ Project were given to the communities:

- It was explained that the REDD+ projects are authorized by the MADS and are therefore legal. It was also clarified that the purpose of the REDD+ projects is conservation and, consequently, they are not about selling or making transactions on the forest or the land, but about promoting actions for their preserve and care.
- It was verbally reported that the project is preliminarily registered at the RENARE.
- The progress on the construction of the project document (80%) and the need and commitment of all the communities and the AATI to provide the required information and complete the document was reported.

- It was again agreed to be diligent in obtaining the information for South Pole to make progress in the preparation of the project document.
- The commitments of the contractual agreements were ratified.
- Regarding the co-managers and their performance, the participants of the assembly suggested that the team should be expanded to include an older adult who can support and guide the project process.

Table 25 provides information on the meetings held during the assemblies of the four AATI and Iin the supporting information.[20]

Table 25. Assemblies of governors of the four AATI that are proponents of the REDD+ Project.

AATI	Participants	Date	Attendees
AZICATCH	Governors and community representatives	December 16 and 17, 2020	220
COINPA	Governors and community representatives	February 10, 2021	56
CIMPUM	Governors and community representatives	February 13, 2021	86
AIZA	Governors and community representatives	February 16, 2021	62
AZICATCH	Governors and community representatives	February 18, 2021	18

Source: prepared by South Pole (2021).

[20] The supporting minutes are available in the folder Additional Support/ Assembly Minutes 2020.

The following is a photographic record of the meetings related to the general assemblies of the AATI.

AZICATCH Assembly December 16 and 17, 2020





COINPA Assembly February 10, 2021





CIMPUM Assembly February 13, 2021





AIZA Assembly February 16, 2021





Figure 24. Photographic record of the related meetings within the framework of the AATI general assemblies.

Photograph: South Pole (2020).

Meetings with stakeholders from the institutional and educational sectors, NGOs, the academia, and indigenous organizations

Similarly, virtual dissemination sessions were held with stakeholders from the local, regional, and national institutional and educational sectors, the academia, and NGOs that have presence or develop projects in the territory of the REDD+ initiative, as well as meetings with regional, national, and international indigenous organizations and with the AATI neighboring the project. Besides informing about the project, receiving comments, and resolving doubts, these spaces helped to articulate and consolidate the communication channels among the different institutions and stakeholders, so that the information flows in a clear, truthful, and timely manner. The presentation and information provided in these meetings was the responsibility of the committees representing the AATI in this information task, the co-managers, and professionals from South Pole. The following was the agenda proposed for these meetings:

I. Climate change and REDD+ projects

Climate change: Overview and impacts on Amazonia

Policies on climate change in Colombia

II. Relevance of a REDD+ project in Amazonia

Impacts of climate change on the territory

Deforestation and forest degradation in the territory

REDD+ Project management area

III. REDD+ Project progress

Community REDD+

Certification cycle

REDD+ Project timeline

IV. Question and answer session

These meetings were attended by representatives of the AATI neighboring the REDD+ Project: the Regional Indigenous Council of the Middle Amazon in Colombia (CRIMA), the Association of Indigenous Authorities of the Miraña and Bora Peoples of the Middle Amazon (PANI), and the Association of Indigenous Cabildos of Puerto Leguízamo and Alto Predio Putumayo (ACILAPP); by representatives of OPIAC and of the COICA; by officials from governmental organizations such as the Colombian Ministry of the Interior, the Directorate of the National Authority for Prior Consultation, National Natural Parks of Colombia, the Cahuinarí National Natural Park, the Directorate of Ethnic Affairs of the Amazonas Governor's Office, the Amazonas Governor's Office, CORPOAMAZONIA, the Directorate of Climate Change of the Ministry of Environment and Sustainable Development, WWF Colombia, and the Puerto Rastrojo Foundation. The SINCHI Institute and the Gaia Amazonas Foundation were also invited but did not participate (Table 26).

Table 26. Dissemination sessions with stakeholders from the institutional and educational sectors, the academia, NGOs, and indigenous organizations.

Participants	Date (2021)	Attendees
WWF Colombia Puerto Rastrojo Foundation OPIAC - COICA	March 11	15
Colombian Ministry of the Interior, Directorate of the National Authority for Prior Consultation National Natural Parks of Colombia Cahuinarí National Natural Park Directorate of Ethnic Affairs of the Amazonas Governor's Office Amazonas Governor's Office CORPOAMAZONIA	March 12	18
MADS	April 6	6
Representatives of CRIMA, PANI, and ACILAPP	May 12	7

Source: prepared by South Pole (2021).

Exchange of knowledge, validation, and supplementation of the information on the REDD+ Project and dissemination of results prior to the validation and verification

Visits to the communities for the exchange of knowledge, validation, and supplementation of the information on the REDD+ Project

Tour of the communities for the exchange of knowledge, validation, and complementation of the REDD+ Project information.

To validate and complement the information of the REDD+ Project in its characterization and diagnosis components, a tour of the communities of the four AATI was conducted. This tour began in mid-September 2021 and ended in mid-October 2021. The strategy that made it possible to cover the territory consisted of preparing three commissions made up of South Pole professionals, co-managers, and some AATI leaders.

To carry out the activities, the work agenda was previously agreed upon with the AATI and community leaders through virtual meetings, written communications, and telephone calls. The meetings were carried out following the routes represented in the (Figure 25).

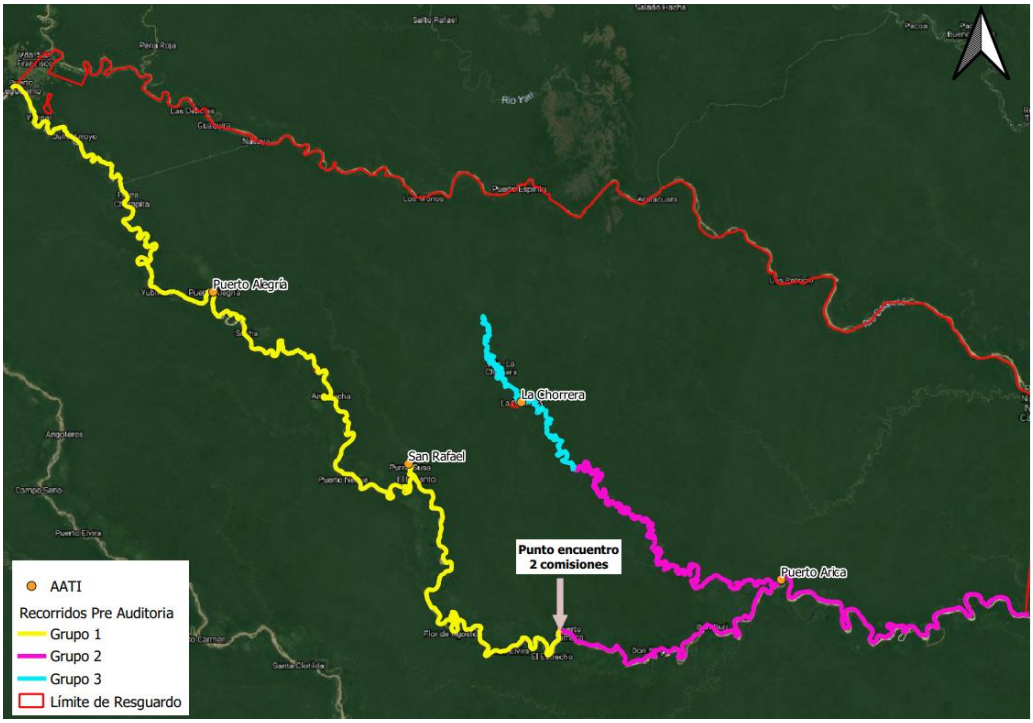


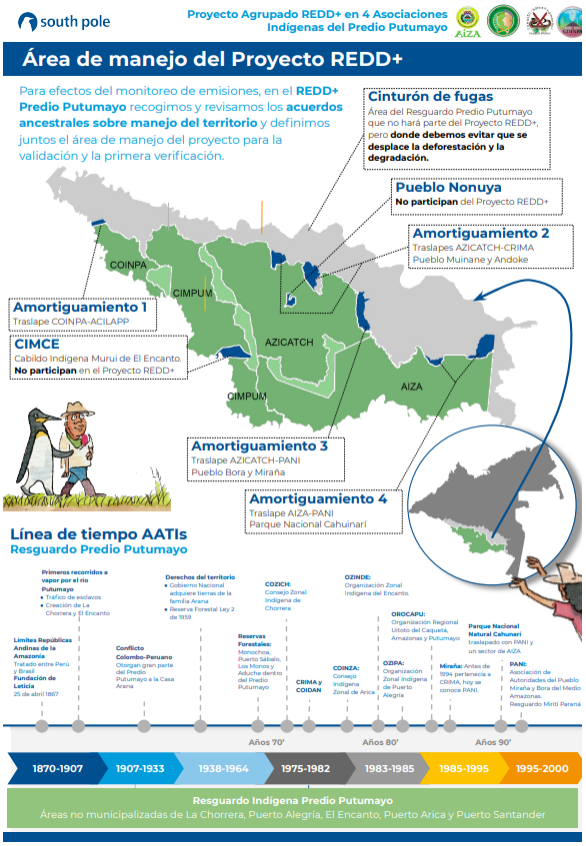
Figure 25. Visits to communities to exchange knowledge, validate and complement the information of the REDD+ Project.

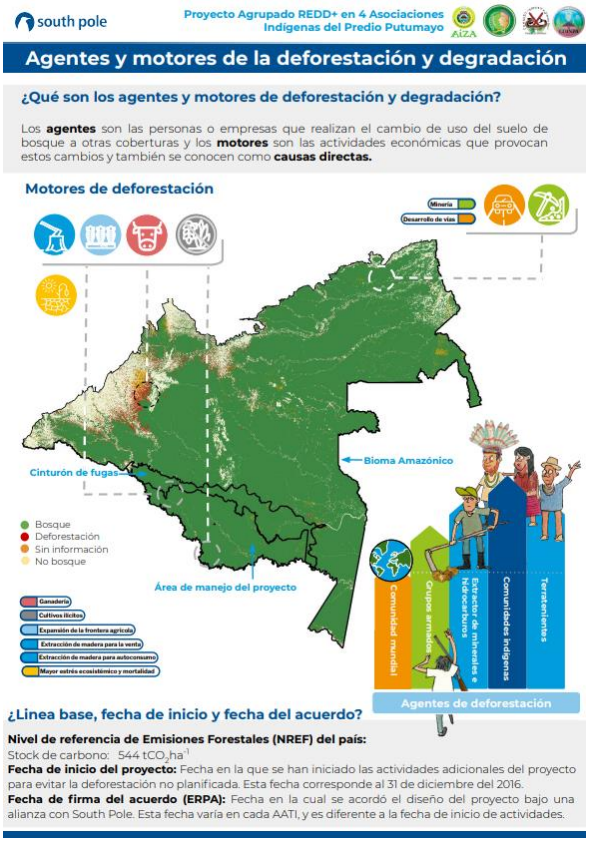
Source: prepared by South Pole (2021).

With the objective of generating spaces for the appropriation of project information and the resolution of frequently asked questions that arise in the communities, techniques and tools were designed to allow the work teams to validate and complement the causes or drivers of deforestation and degradation, effects, impacts and mitigation measures or strategic lines, as well as to collectively visualize the scenarios that make up the REDD+ initiative. The common horizon for this field work was to reach a consensus with the grassroots communities on the importance of project implementation, the context in which REDD+ initiatives arise and develop, the initial proposal of strategic lines, and to deepen the understanding of local dynamics.

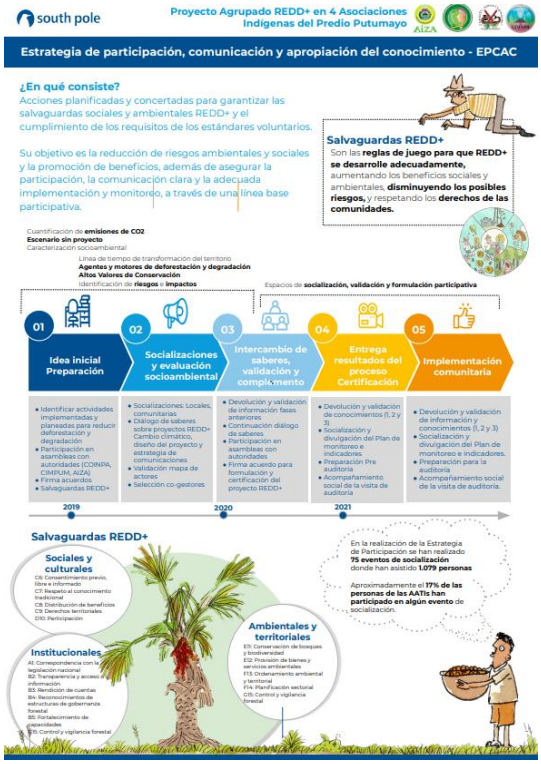
The activities consisted of daytime workshops, held in community and AATI headquarters, malocas, family homes, schools, and green areas, attended by adults (women and men), youth, children and grandparents. The profiles of the participants included teachers, artisans, students, traditional doctors, fishermen, housewives, among others. Similarly, we also participated in nocturnal spaces such as the mambeaderos where a first dialogue is held about the doubts and concerns of the elders and community members, mainly men given the masculine connotation that the mambeaderos have culturally. Traditionally, in this nocturnal space the spiritual opening and the permission to carry out the next day's activities without inconveniences is done, it is a way to harmonize previously and to solve concerns from a serene dialogue guided by the spirituality of coca, tobacco, and yucca duce.

Given the conditions in which the communities live, which limit the use of technological tools such as computers and video beam, the designs made were printed as pedagogical support; however, they were also shared with the communities through technologies and applications that allow the transfer of files off line and through WhatsApp channels, likewise, this material is currently in the hands of the co-managers and AATI with the purpose of giving continuity to the pedagogical exercise in the territory. The material used for the development of the workshops is as follows (Figure 26).





This map was updated in further discussions. Please see Figure 26



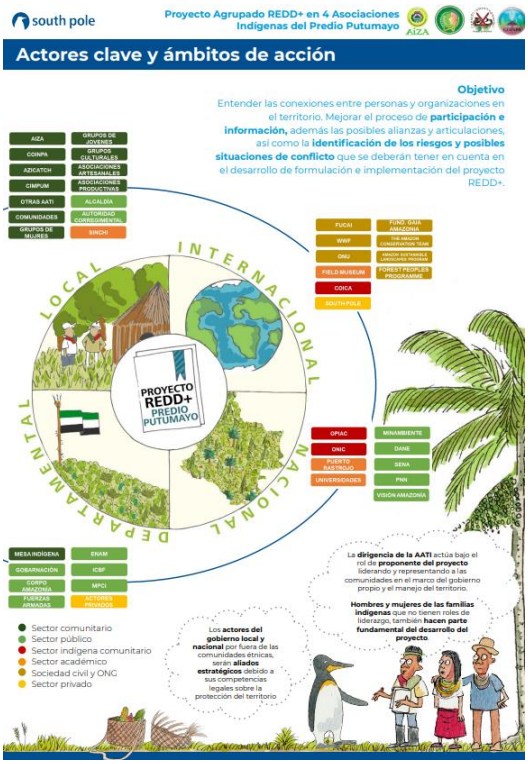




Figure 26. Tools for the development of activities.

Source: prepared by South Pole (2021).

Development of the activities and main findings

The activities carried out included an initial brainstorming session with dynamic questions:

- Have you heard what a REDD+ project is?
- What do you know about the REDD+ Project Pueblos Indígenas Resguardando la Selva?
- Have you heard and do you understand about climate change?
- How does climate change manifest itself in your territory?

Subsequently, using posters (Figure 26), the progress of the project was socialized focusing on the topics listed below. It is important to highlight that, for the presentation of the progress and results of the analysis carried out by the technical team, the elements, and narratives of the communities as they emerged in the initial activities were taken up again and with the participation of the co-managers, the activities carried out in the field, tours, mapping and focus groups were recalled as a source of information for the construction of these advances.

- Project area
- Climate Change
- EPCAC
- Poster Map Actors

- Agents and drivers of deforestation
- High Conservation Values (HCV) in Biodiversity
- What does Biodiversity have to do with REDD+?

The work previously carried out by the co-managers since 2019 allowed the identification of a series of frequently asked questions among the communities, which were taken up again in the "Canasto Preguntón" activity, in which through a collective dynamic the questions were read, and the answers were elaborated in plenary. This exercise facilitated consensus building in a participatory manner and the understanding of key concepts for understanding the project in the context of climate change and the functioning of the carbon market in which it is developed.

In some communities this objective was achieved through a game of "truth or lie" in which attendees found the opportunity to clarify their ideas about the project and the role that both AATI and the community in general play as proponents, the role of technical advisor to the South Pole company and the guarantee of their territorial and cultural rights based on compliance with national and international regulations and the country's REDD+ safeguards. In these moments, the participation of the co-managers as facilitators of the interventions by the community and in their work as interpreters or translators into the native language and narratives closer to the context was especially valuable.



Figure 27. Evidence of the development of the activities. Presentation of the REDD+ project management area (left) and dialogue on guiding questions (right).

Source: prepared by South Pole (2021).

The approach to issues related to the identification of impacts, agents and drivers of deforestation and degradation began with the question: What are the activities that we identified in the territory that cause deforestation and forest degradation? Based on this question, a dialogue was opened in which the presence of some actors and activities in the region was identified as problematic. With respect to the impacts that the communities themselves cause in their territory, population growth, the increase in the number of chagras with little diversity of cultivated species and the loss of traditional knowledge were identified as the main factors.

An important result of this activity is the pedagogical exercise about the threats that surround the territory and the people's recognition of the effects of climate change on their daily life and environment, as well as the weakening of their forests. From the collective debate, the community members were able to recognize and reaffirm that the territory is beginning to show signs of scarcity represented in some species of flora and fauna that are not as abundant as they were one or two decades ago. It is also valuable that it is the communities who recognize that some sustainable land use and management practices are not carried out following cultural guidelines and that, therefore, strengthening their own cultural system is an important area in the implementation of the project to achieve the permanence of forests and life.

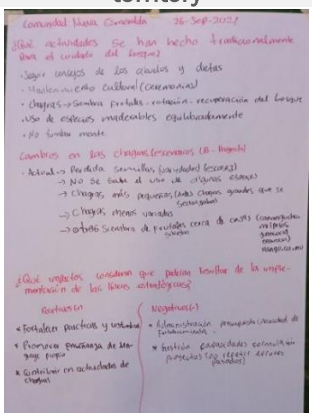
Presentation of the project's strategic lines of action by the co-managers	Activity “Canasto Preguntón”
	
Plenary discussions on the concepts of the project	Consensus around possible scenarios in the territory
	

Figure 28. Evidence of the development of the activities.

Photographs: South Pole (2021).

Around the strategic lines, initially proposed based on the life plans of the four AATI, the topic of mitigation strategies is introduced in a temporal perspective. Thus, an identification of the customs, traditions and knowledge that are part of the ways in which the communities inhabit their environment and are related to the conservation of the forest, stated by the local communities as the "care and protection of the forest", is initiated. Among the traditions mentioned are the performance of ceremonies or rites to ask permission from the creator and other beings before the opening of the chagras, the replacement of trees that are felled, the planting of a variety of plants in the chagras, and the planting of fruit trees.

For the present scenario, considerations are raised about the need to strengthen these ancestral practices and develop alternatives to face degradation and deforestation, as well as the effects of climate change on the ecological calendar. In this sense, the proposals of the strategic lines regarding forest restoration and reforestation, territorial governance, the recovery and conservation of local languages, the strengthening of chagras, sustainable productive activities and cultural customs are of great interest.

Table 27 presents the information related to the meetings, date, place, and number of attendees for each one.[21]

Table 27. Meetings to exchange knowledge, validate and complement the information gathered during the field visit between September 26 and November 9, 2021.

Community	AATI	Date (year 2021)	Location	Assistants
Nueva Esmeralda	AIZA	September 26	Rimabake traditional grandfather's maloca	12
Puerto Cabello	AIZA	September 27	Puerto Cabello Traditional maloca	9
Centro Arica	AIZA	September 30	Arica comunity room Center	42
Concejo de Ancianos	AIZA	October 1	Community maloca Council of Elders	26
Bora	AIZA	October 2	Maloca Bora	19
Puerto Tolima	AIZA	October 3	Puerto Tolima community room	15
Puerto Alfonso	AIZA	October 4	Puerto Alfonso traditional maloca	12
Nueva Unión	AIZA	October 6	Nueva Unión community room (booth)	14
Nueva Reforma	AIZA	October 7	Maloca de Nueva Reforma	24

21 Pre-audit process supports are available in the folder Additional supports/Pre-audit.

Community	AATI	Date (year 2021)	Location	Assistants
Sabaloyaco	AIZA	October 9	Sabaloyaco maloca	16
Puerto Cartagena	AIZA	October 10	Puerto Cartagena traditional grandfather's maloca	14
Ocim	AZICATCH	September 16	Ocim community room	20
Centro Chorrera	AZICATCH	September 16	Cabildo Centro Chorrera community room	27
Providencia	AZICATCH	September 17	MalocaProvidencia maloca	31
Santa María	AZICATCH	September 17	Santa María community room	28
Providencia Nueva	AZICATCH	September 18	Providencia Nueva community room	18
Sabana	AZICATCH	September 18	Governor's House	13
Petani	AZICATCH	September 19	Petani maloca	14
Capitanía	AZICATCH	September 20	Capitanía community room	32
CRIS	AZICATCH	September 21	CRIS maloca	27
VEGSAM	AZICATCH	September 21	VEGSAM community room	16
CAISAM	AZICATCH	September 22	CAISAM community room	26
Lago Grande	AZICATCH	September 23	Community room	15
Asociación Nativa	AZICATCH	September 23	Asociación Nativa community room	25

Community	AATI	Date (year 2021)	Location	Assistants
San Rosa	AZICATCH	September 25	San Rosa community room	25
San Antonio	AZICATCH	September 27	San Antonio maloca	28
San Francisco	AZICATCH	September 29	San Francisco community room	27
Cair	AZICATCH	September 30	Centro Chorrera Homestay	14
Vista Hermosa	AZICATCH	October 1	Vista Hermosa community room	13
Milan	AZICATCH	October 2	Milan maloca	28
Okaina	AZICATCH	October 4	Okaina community room	20
Cordillera	AZICATCH	October 5	Cordillera community room	31
Mue	AZICATCH	October 6	AZICATCH Governor's House	22
Renacer	CIMPUM	September 20	Renacer community	10
Puerto Calderón	CIMPUM	September 21	Puerto Calderón community room	10
Puerto Tarki	CIMPUM	September 21	Puerto Tarki cabildo community room	8
Puerto Ñeque	CIMPUM	September 22	Puerto Ñeque cabildo community room	27
Tercera India	CIMPUM	September 24	Tercera India community room	15
San Rafael	CIMPUM	September 25	San Rafael community room	44

Community	AATI	Date (year 2021)	Location	Assistants
Docentes San Rafael	CIMPUM	September 27	Teacher's lounge at the San Rafael educational center	17
Representantes AATI CIMPUM	CIMPUM	September 29	CIMPUM community room main	5
Puerto Tejada	CIMPUM	September 30	Puerto Tejada community room	14
San José	CIMPUM	October 1	San José classroom	33
Puerto Colombia	CIMPUM	October 2	Puerto Colombia classroom	18
Santa María	CIMPUM	October 3	Santa María school	11
Puerto Belen	CIMPUM	October 4	Puerto Belén maloca	29
Marandua	CIMPUM	October 5	Marandua community room	28
Puerto Molano	CIMPUM	October 5	Puerto Molano community room	8
Peñas Blancas	COINPA	September 17	Peñas Blancas community room	34
Puerto Perea	COINPA	September 16	Antonia Santos Educational Institution	26
Puerto Alegría	COINPA	September 18	Community room meetings	17
Itiquilla	COINPA	September 19	Itiquilla Community School	10

Source: prepared by South Pole (2022).

Finally, in relation to this field work, it is important to point out that the proposed objectives were achieved, the activities were developed according to the availability of time and the number of

participants in each community. There were meeting spaces for the exchange of knowledge and for the identification of local languages and meanings in relation to each of the topics addressed, concepts such as imbalance, bad air, sweetening, care, and protection were central in the participants' own elaborations.

In terms of the tools used, the printed materials were appropriate for the conditions of the communities, in addition to facilitating the presentation of the information, their installation in the community spaces allowed the members of the communities to observe them and take pictures, as well as handouts containing key concepts of the project and in relation to the carbon market, in addition to answers to frequently asked questions. This was complemented with the dissemination of videos and audios in digital format that were later shared through wireless technologies for offline file transfer such as bluetooth and ShareIt and through WhatsApp groups created for the relationship with the AATI.

The videos and brochures used in the framework of the workshops and then shared with the community members were intended to reinforce some concepts such as:

- What is REDD+ and how do REDD+ projects arise?
- What is climate change and how does it manifest itself?
- What is the logic of the carbon market and what is the role of forests and communities?
- Who is South Pole and what is its role in the project?
- Project cycle and methodology used by South Pole
- Commitments of the communities in the formulation and implementation phase.
- Strategic lines and programs.

An equally valuable result of this field work is related to the recognition of roles within the project, the attendance and participation of the communities during the spaces convened, as well as their closeness and dialogues in informal spaces, evidenced a high degree of appropriation of the project. The knowledge acquired during the previous activities with the co-managers and in accompaniment of South Pole professionals has been interpreted and appropriated in local languages and has been widely disseminated beyond the community leaders, being a challenge to achieve greater representation and more active participation among young people and women of the communities.

Dissemination of results

The project progress has been disseminated through field trip reports, statements, minutes, documents that are shared with the AATI leaders, face-to-face and virtual meetings conducted by the South Pole technical team, activities by the co-managers team with the communities located far from the settlements, and newsletters delivered via email, WhatsApp, and in printed form to communities that do not have access to digital media. These newsletters have also been placed at strategic points and community bulletin boards.

From the EPCAC, some REDD+ Project supporting documents have been prepared in a joint and concerted manner. For example, the work plan has been built jointly by the AATI leaders, the co-management team, and South Pole, and the adjustments made to it due to the COVID-19 pandemic have been discussed.

The documentation on the progress of the project has been shared via email and discussed in face-to-face and virtual meetings with the leaders of COINPA, CIMPUM, AIZA, and AZICATCH. The documents related to the contractual agreements, for example, were discussed and delivered to the AATI involved in printed and digital formats and signed by legal representatives during the first field trip made at the end of 2019. In addition, communicative pieces have been designed and delivered virtually and analogously. In the case of those communities that are farther away from the settlements, information has been displayed on community bulletin boards. These participation spaces and communication channels and tools are defined within the EPCAC, which is transversal to all the project phases.

Currently, the details of the REDD+ initiative can be found in the database of projects "under development" of the Verified Carbon Standard (VCS), at the following link: https://registry.verra.org/app/projectDetail/VCS/2297 in the feasibility phase, as well as in the initiative management platform of the National Registry for GHG Emission Reductions (RENARE). In the case of the VCS platform, efforts are being made to make this document available in Spanish so that it can be consulted by the indigenous communities involved in the REDD+ project. Once the formulation is completed and the project is in the implementation stage, Phase 5 of the EPCAC strategy, called Follow-up and Continuity, will present proposals for the execution, monitoring and follow-up of the activities proposed in the REDD+ Project, which will be developed exclusively by the project proponents.

Once the formulation is completed and the project is in the implementation stage (phase 5 of the EPCAC: follow-up and continuity), proposals will be submitted for the implementation, monitoring, and follow-up of the activities contemplated in the REDD+ Project, which will be carried out exclusively by the project proponents. Finally, thanks to these meetings and the previous activities with the communities and their representatives within the framework of the EPCAC implementation, progress was made in the process of informing the different stakeholders in the territory about the development of the REDD+ Project in a timely manner, taking into account the governance structures, and based on sectoral planning, in order to maintain transparency and continuous communication with the community and to respond to the REDD+ safeguards that ensure the sustainability of the project.

The implementation of the strategy has favored the establishment of dynamic communication channels between the project proponents and the stakeholders present in the territory or interested in forest conservation and reduction of carbon dioxide from deforestation, with the purpose of joining efforts and articulating actions to achieve these objectives. Similarly, the participation of the other AATI from the Predio Putumayo Reserve that are part of the REDD+ Project has made possible the coordination and articulation among associations around the processes and experiences in the projects that each one has been developing in their territory, which is an especially valuable aspect, given that the associations have as a common objective the preserve of their environment and their traditional ways of life.

Mechanisms for continuous communication with local stakeholders

Communication channels

Within the REDD+ Project, the process of communication with the communities follows a protocol order according to the traditions and communication mechanisms to ensure a clear message among the representatives of the stakeholders. First, the people in charge of the initial approach and of fostering the meeting spaces are the co-managers, who are closer to the community and have been trained by the South Pole's technical team on the project. These co-managers, as well as the professionals of the social team in the territory, are the direct link between the project developer in the community and the local consultation processes that take place there.

In the territory, communication channels have been established among the communities, the AATI, and the co-managers, who transmit information to the professionals in the territory and, in general, to the South Pole's team. There is also direct communication between the communities and their representatives and the professionals from South Pole. In this way, information, doubts, and suggestions are sent to the social team in the territory and they, in turn, clear up any doubts or, if necessary, transmit the information to the rest of the team. Thus, daily communication with local authorities is generally mediated by the professionals in the territory or by the co-managers. As shown in Figure 29, this relationship and communication protocol makes it possible to maintain an order that ensures clarity on the information, its legitimizers, and the agreements that are reached as the dissemination sessions are held.

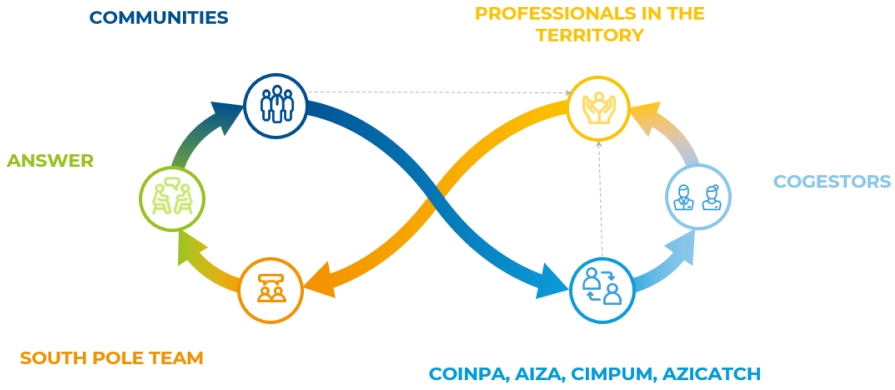


Figure 29. General communication channel established in the REDD+ Project.

Source: prepared by South Pole (2020).

The meetings and dialogs of knowledge favor the communication among stakeholders. The meetings have been held in person, in the form of assemblies with authorities and communities, dissemination sessions, and short meetings; as well as virtually due to the COVID-19 pandemic. Regarding the legitimate representation of local authorities, it should be noted that, given the organizational conditions and the governance system of the communities, it is key to recognize traditional authorities

such as older people, community leaders, *mayores*, presidents of the AATI, administrative authorities such as indigenous cabildos, community governors, community members, and other leaders.

As part of the EPCAC for the communication and consultation process of the REDD+ Project, activities have been carried out to favor an approach to the relationship system of the communities through media, narratives, and traditional forms of participation for a successful continuity of the communication processes during the project's life.

From the community dialog and meeting—base of the communities' coexistence and social organization scheme—a communications diagnosis and matrix have been developed within the framework of this project, which responds to the needs of making the project information known; informing about the process, progress, status, and stages; as well as creating feedback mechanisms to strengthen trust among the communities, regarding the formulation and implementation of the project.

Based on the construction of a communications matrix—which will also be the basis to address the RCCFSs—the project seeks to make use of various communication tools that include statements, periodic printed bulletins, digital cards, a network of community bulletin boards and/or wall newspapers, short explanatory videos with images of the territory and the communities, and short audios that represent a strategic means for remembering messages, given the oral tradition of the area.

In addition, telephone calls and direct and constant contact with key actors, through co-managers and recognized leaders, have been fundamental to keep the project in continuous communication with the communities and other local stakeholders.

Stakeholder participation in decision-making and implementation of the REDD+ Project

To ensure the participation of all the communities in the meetings of the project, the leaders of the AATI are summoned in advance. When it comes to a meeting aimed at a specific community, the leaders are responsible for inviting all the governors or community leaders of the reserves. Since the first meetings, a directory has been created, and the most effective means to deliver this type of information have been identified: WhatsApp messaging, SMS, community bulletin boards, or phone calls. It is worth noting that the locations where the AATI' assemblies are held have been used to discuss the advances of the project.

The group of co-managers, with the help of South Pole's social team, oversees the logistics in the meeting venues (schools, *malocas*, libraries, AATI' headquarters) and summons the communities through the channels previously described. They emphasize the importance of having the entire community (men, women, youth, and elders) present.

The REDD+ Project meetings are based on the dialog of knowledge, allowing the knowledge of the communities in the territories to interact with the technical knowledge of the REDD+ initiatives. The aim is to generate knowledge leading to a successful project development. Moreover, in these meetings, there is always room for questions and for each stakeholder to answer them (as appropriate).

In terms of cultural sensitivity, the meetings are held in compliance with the communities' traditional customs and following the elders' rules regarding the availability of key elements of their rituals such as ypadu, tobacco, and *ambil*. According to indigenous cultures, these elements have medicinal and social benefits because, for instance, while the elders *mambean*, words are exchanged, and decisions are made. The presence of elders is critical at these gatherings, and attendees establish a relationship with them that extends beyond their presence in the meetings, as shown in (Figure 30), which was created based on the results of some meetings held in the second semester of 2020.

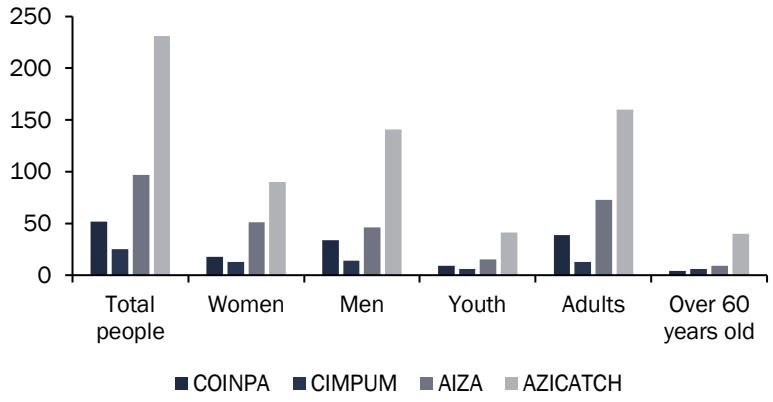


Figure 30. Community participation, by gender and age, in the informational and decision-making meetings held by the REDD+ Project in December 2020.

Source: prepared by South Pole (2021).

2.2.2 Information on risks, costs, and benefits that the project can bring to local stakeholders

As part of the topics discussed in the EPCAC strategy and with the purpose of maintaining clarity about the project's development and the parties' agreements and commitments, we have addressed the costs, commitments, benefits, and possible lines of work proposed by the communities based on their needs within the framework of the REDD+ Project. To explain these topics, several strategies have been implemented to help communities understand technical concepts. These strategies include the design of newsletters, which are distributed both physically and digitally; telephone and face-to-face meetings; communication pieces; meetings' supporting documents (minutes and recordings); and constant communication via WhatsApp. The communities' requests for information regarding costs, risks, and benefits have been mainly related to the following topics:

- Number and type of projects that communities can carry out during the implementation phase using the resources of the benefit distribution system
- Project's benefits and periodicity
- Origin of the credit resources
- Articulation with other GHG programs in the territory

Since these are some of the most recurrent topics for the communities in the territory, South Pole has defined a route of responses to these concerns based on the EPCAC strategy and in the spaces provided for it.

- **Number and type of projects that communities can carry out:** Any number of forest conservation projects can be undertaken. The idea is to be able to properly manage each of the initiatives to be developed so that service capacity is not exceeded based on the resources available for each project. The types of activities to be carried out depend on the common needs identified during the project's formulation, as well as on the communities' proposals that are in line with the REDD+ Project's goal regarding forest conservation and protection and that seek to strengthen the life plan. For this reason, promoting infrastructure projects will not be allowed, as this is only the responsibility of the Colombian government institutions and is incompatible with the main goal of forest protection.
- **Project's benefits and periodicity:** The project's periodicity depends on whether investments in the benefit distribution system are properly executed and whether the continuity of the project activities can be guaranteed. It also depends on the success of each verification and on the community's decision to establish the project's verification and monitoring periods, considering the high costs of the latter and the opportunity in the market. In other words, for incentives to be received again, the project development process must be replicated from the formulation phase (for the creation of the validation document, i.e., monitoring report) to the issuance, sale of the bonds, and implementation of activities and projects. The phases of the project develop in a cyclical pattern.
- **Origin of the credit resources:** The resources that will be received will be the result of the verified tonnes of CO_2 from the reduction of deforestation in the territory.
- **Articulation with other programs in the territory:** It seeks to give continuity to the processes that are already being executed in the territory, as is the case of the Vision Amazonia Program. The aim is to find a way to align the planned efforts with the progress made by Vision Amazonia in the territory.
- **Benefits:** Contribution to the fight against climate change and air pollution and contribution to biodiversity conservation and job creation during the project's implementation.

Emphasis has been placed on recognizing that, for some communities, this REDD+ Project represents a "project of projects," which stresses the importance of investing the benefits in activities that promote the conservation of natural resources, particularly forests. Importantly, if CO_2 emission reductions are not verified in the monitoring phase, resources cannot be obtained through a second verification, which would break the project's cyclicality.

2.2.3 Validation and verification of the VCS Program and visit of the VVB

The REDD+ Project's communication strategy in relation to the visit of the Validation and Verification Body (VVB) included a dissemination strategy with tools and messages that were close and clear. During the activities to validate and complement the information of the REDD+ Project and the presentation of progress and results, spaces were provided to inform the communities about the proximity of the visit of the Validation and Verification Body (VVB).

In addition to announcing the possible dates on which this activity would take place, it was valuable to facilitate the understanding of this stage of the project as a moment to enrich the formulation of the project, given that initially it was perceived by some communities as an evaluation in the face of which they felt uneasy, the use of the figure of the advisory elder and knowledge exchange allowed the visit of the validation and verification agency to be considered as another opportunity to strengthen the project.

Thus, with the establishment of a detailed audit schedule, the communication mechanism consisted of virtual meetings with the AATI and the preparation and dissemination of an information note on the dates and communities to be visited. Thus, when the AATI and cabildos informed the communities of the dates of the visit, there was already an understanding of the activity from the field work.

In addition to sending the communiqué and the dissemination work carried out by the AATI, in accordance with the principles of community relations in the framework of this project, the co-managers carried out a process of direct communication with their communities, which was essential to ensure a more transparent and direct relationship between the auditor and the stakeholders. This communication took place through individual calls and WhatsApp messages or in the groups created around the project or in person in the territory. As a result of this communication, the scheduling of the auditor's visit provided its own meeting spaces that are part of the traditional rituals of the communities, especially preserved by grandparents and community leaders, known as harmonizations and that mainly seek to build trust between the parties and obtain protection and accompaniment during the joint workdays planned for the audit.

Finally, the audit visit was conducted between November 3 and 15, 2021.

2.2.4 Participative definition of the project management area

During the development phase of the project document (PD), the four REDD+ project proponent associations, with the advice of South Pole, constructed a polygon proposal based on the history of the Predio Putumayo Indigenous Reserve, secondary information, agreements between the different associations and peoples, participatory work in the communities with grandparents, governors, leaders, and other community members knowledgeable about the agreements and management areas. In the REDD+ Project Zone, specifically in the COINPA, AZICATCH and AIZA management area, different sectors with possible overlaps were identified, which in terms of management and control of the territory needed to be agreed with neighboring indigenous organizations.

According to Articles 329 and 330 of Colombia's 1991 Political Constitution, the indigenous authorities are competent and independent to govern their territories and freely manage their natural resources, although their right to use and enjoy the forest resources in the territory is restricted by the obligation to comply with the ecological function of the property (Resolution 1947 of 2006); in other words, they must be in charge of protecting and preserving the renewable natural resources in accordance with the uses, customs and culture of the communities.

After the territory of the Predio Putumayo was recognized as a *Resguardo,* the indigenous peoples organized themselves administratively in indigenous councils, which later, with Decree 1088 of 1993,

would be organized in Associations of Traditional Authorities (AATI), which share the entire *Resguardo* and distribute its area based on ancestral agreements for the management and administration of the territory among the more than ten indigenous peoples that inhabit it (Witoto, Muinane, Bora, Ocaina, Andoke, Carijora, Miraña, Yucuna, Cabiyarí, Inga, Siona, Letuama, among others).

However, the four AATI proponents of the REDD+ project can only guarantee statutory, property or contractual rights to the land within the boundaries of the Predio Putumayo, but in the territory there is a lack of clarity among neighboring indigenous organizations about access/use of environmental services in relation to some kind of official boundary with respect to indigenous organizations not participating in the initiative, who also have land tenure rights under the guidelines of the Resolutions that support the ownership of the Predio Putumayo.

To avoid any type of dispute between key stakeholders with collective use rights in the project area, a meeting/socialization was held in La Chorrera, Amazonas, between the CRIMA peoples (Nonuya, Andoke, Uitoto N+pode and Muinane peoples) and the AZICATCH peoples (Uitoto M+n+ka, Bora, Okaina and Muinane peoples), Andoke, Uitoto N+pode and Muinane) and the peoples of AZICATCH (Uitoto M+n+ka, Bora, Okaina and Muinane peoples) and a virtual meeting between the counselor of the Piine Ayveju Niimu'e Iaachimu'a Association - PANI and AIZA. Also, Meetings were also held between COINPA and the Association of Traditional Authorities and Councils of the Indigenous Peoples of Leguízamo and Alto Predio Putumayo Reserve (ACILAPP). The traditional authorities of these peoples reached agreements and came closer on the territorial areas of each one and the boundary that would be used for the validation of the REDD+ project and its first verification.

As a result of this meeting, and in an autonomous manner, the peoples belonging to the organizations defined that the ancestral territory of the Nonuya people, located in AZICATCH, is excluded from the REDD+ Project Zone that AZICATCH is advancing, as confirmed in Agreement No. 3 of the general minutes of the meeting. Likewise, in the case of the Andoke people, the traditional authorities defined through an Agreement, that the sector that is still pending clarification, should not be included during the first verification of the REDD+ initiative, clarifying that in terms of management and control of the territory must be agreed between the peoples of both parties.

In this sense, through an official letter it was ratified that in the framework of the validation and first verification of the REDD+ project and in accordance with what was agreed by the peoples in the meeting, the Nonuya ancestral territory located within AZICATCH and the sector of the Andoke people that is still pending to be clarified between the peoples of both associations were completely excluded. This decision was supported and is reflected in agreements number 3 and 5 of the General Act of the Meeting between CRIMA and AZICATCH.

At the meeting, it was also agreed that the territory of the Andoke people that is pending clarification with the peoples of AZICATCH, called for purposes of the REDD+ project as an Expansion Area (Buffer Area for internal management with the communities), would not be included in other REDD+ initiatives by CRIMA, until a management agreement is reached between the parties. To this end, the polygon and visualization map indicating the areas that were excluded in this first verification of the REDD+ project, as concluded at the meeting, were presented in the non-permanence risk analysis.

During the month of June 2021, the proposed management area was reviewed with the PANI organization on behalf of the Bora Pueblo councilor, Alejandro Teteye, based on secondary information collected by South Pole and it was decided autonomously to define the overlap zone as an area pending clarification of the REDD+ Project Zone (Buffer Area for internal management purposes of the project), which is expected to be cleaned up for a second verification between AZICATCH, PANI and the Bora and Miraña peoples. This decision is supported and reflected in the overlaps ratified in different versions of maps and representations of the territory previously elaborated, such as PANI's Life Plan, territory map of the ancestral peoples in Abuelo Tabaco, territorial agreements between the Associations and other sources of information listed at the end of this communication.

Similarly, and considering that the Piine Ayveju Niimu'e Iaachimu'a - PANI Association is not part of the REDD+ project, it is expected that this area called Buffer Zone will not be included in other REDD+ initiatives until a management agreement is reached between the parties, and for this purpose the decision was ratified in writing with the Indigenous Associations involved and the polygon and visualization map where it was indicated were shared,

- The zone is located near the Arcoíris stream between the ancestral boundaries of the Bora from AZICATCH and Miraña from PANI peoples.
- The overlap zone in the buffer zone of Cahuinarí National Natural Park: The first zone begins near the southwest side of Cahuinarí National Natural Park, on one of the effluents of the right bank of the Cahuinarí river (coordinates -71°21'33.55" W - 1°45'36.76" S) until near the source of the Yuría river (-71°10'41.62" W - 1°46'57.28" S). The second begins near to the Bernardo River (-70°59'7.26" W - 1°46'22.60" S), continuing along this same river to the eastern boundary of the Resguardo Predio Putumayo (-70°43'44.31" W - 1°43'06" S).

The boundaries between COINPA and ACILAPP were discussed between the organizations during the month of July 2021. Future inspection activities were established in the territory to verify the boundary between the communities of Puerto Perea and Puerto Refugio, including the boundary between COINPA and ACILAPP. However, due to lack of resources, it was not possible to carry out these surveys, so the REDD+ project ceded a buffer area of 1 km from the initial proposed boundary and into the project management area. This zone was not considered an active project area for the first verification of the initiative but could be included in future verifications once the land management agreements are revised.

In addition, it was identify some overlapping areas with the indigenous community CRIMA. This community has a REDD+ project registered in BioCarbon Standard called “CRIMA Predio Putumayo y Andoque de Aduche REDD+ Project”[22]. Even though the communication with this neighbouring community was developed within the framework of the project, CRIMA did not report the existence of that project from their side during the discussion and consultation process. As a mitigation measurement, these areas were identified as a buffer zone in the project and were not included in the VCUs' accountability of the first verification of the project.

[22] https://biocarbonregistry.com/en/project/?id=35

New discussion meetings between the indigenous communities are expected to be developed to define an Agreement on the Boundaries. This process is aligned with the project activities proposed in the strategic line 2 Self-government and indigenous autonomy.

The results of the participatory process implied that from the project area initially considered in the REDD+ Project feasibility, the following were established:

- **Buffer areas:** areas with disputes over access/use rights or where rights overlap between proponent indigenous organizations and those not participating in the initiative. These areas will not be included in the first verification of the project but have potential to be included in future verifications under the clustered approach once access/use rights are clear and agreements between organizations are ratified. These include:
    - COINPA-ACILAPP overlap (between communities of Puerto Refugio and Puerto Perea).
    - AZICATCH-CRIMA 1 and 2 overlap.
    - CIMPUM-CRIMA overlap.
    - AZICATCH-PANI overlap (Bora and Miraña villages)

In total they correspond to 4% of the project area initially considered in the feasibility stage.

- **Excluded areas:** areas where control and management by the four proponent AATIs is totally ruled out or where the communities that manage the territory have voluntarily decided not to participate in the initiative despite having been considered in the feasibility stage. These include:
    - Cabildo Indígena Murui de El Encanto (CIMCE) with about 28,256 ha.
    - Area under the control of the Nonuya People in AZICATCH's area of influence.

After reviewing the agreements and subtracting the buffer and exclusion areas from the feasibility project area, the project management area to be validated can be considered free of risk from disputes over resource access/use rights.

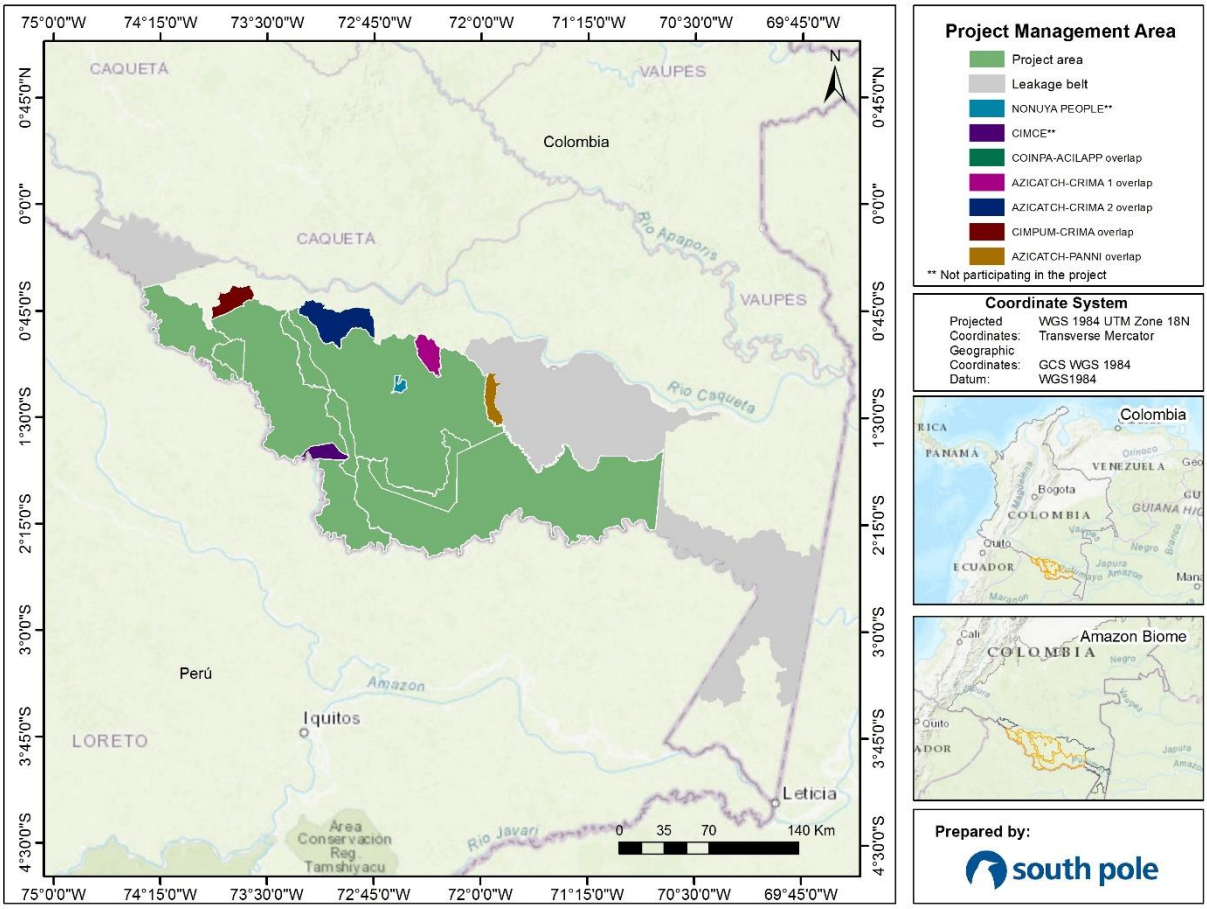


Figure 31. Project management area defined participatory.

Source: prepared by South Pole (2021).

In relation to the boundaries with the Piine Ayveju Niimu'e Iaachimu'a Association - PANI, in March 2022, after the validation and verification of the REDD+ Project, a cultural agreement meeting was held between the delegation of the territorial councils of Puerto Arica (AIZA) and PANI. In this meeting the indigenous authorities of both organizations defined and documented the following:

- **Agreement on the Boundary between the Indigenous Territories of ARICA and PANI:** this document contains the description of the boundary between the two indigenous territories and a map with the location of the described boundaries is attached (Figure 32).
- **Act 001 of March 22, 2022:** cultural agreements for the management, use and care of the shared territory between the indigenous governments of AIZA and PANI.[23] In this

[23] Acta uso y manejo territorio compartido pani aiza.pdf

meeting, the traditional indigenous authorities decided by means of Act 001 of 2022, the following provisions:

- The areas of adjacency endorsed and agreed under the Decree 632 of 2018, are defined for **use and management between both territories.**
- The territories of cultural and ancestral importance shared for care, use and management; among which are: the watershed of the Quebrada Arcoiris and the Paahí River, territory of the Meemehebamú clan, watershed between the ++r+wamyuhí (Castaño) and Daar+hi (Verano) streams, territories of the extinct Wharomú and Curumú peoples. These territories are in PANI's political-administrative territory; any **intervention by third parties will have to be agreed upon with the authorities of both governments.**
- **A Coordination Instance will be created between the authorities of AIZA and PANI** to follow up on the agreements and to solve situations/conflicts that may arise. **This instance will be conformed by the Secretariat of the Territory of ARICA, the Secretariat of Environment of PANI, and the traditional authorities of both territories.**
- **Any modification to the Act 001 of 2022, can only be made by the traditional authorities under the cultural agreements.**

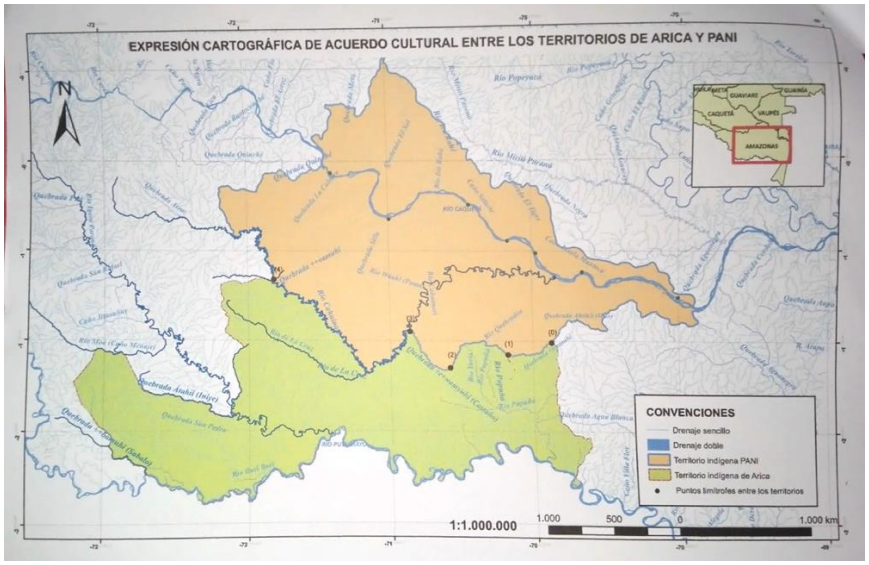


Figure 32. Map of the boundary agreement between AIZA and PANI.

Photograph: South Pole (2023).

Following the information above regarding the meeting between AIZA and PANI to achieve a boundary agreement between the territories and based on the autonomy and self-determination that the indigenous governments have, the limits defined were adopted in the project. It was also used in the shapefile of the PROYECTO REDD++ PANI (ID 3145) available on the Verra registry website[24].

Finally, considering the above, the decision of the REDD+ Project was ratified **to maintain buffer areas as potential instances of the grouped project (see section 1.4), which will only be susceptible to be included in future verifications with the prior authorization of the Coordination Instances defined in Act 001 of 2022.**

For the first verification, the REDD+ Project pueblos indígenas resguardando la selva guaranteed the exclusion of all the buffer areas presented in Figure 31 from the carbon accounting of the first monitoring period.

2.3 Environmental Impact

As part of the REDD+ project formulation, the potential environmental impacts of the generic REDD+ activity were identified to evaluate alternative approaches and to design and incorporate appropriate prevention, mitigation, management, and monitoring measures. The Environmental Impact Assessment methodology 'Guidelines for Field Projects' proposed by FAO (2012) was applied, which considers the implications from an early stage of the project planning process to avoid associated negative environmental or social impacts (Figure 33).

The methodology has three stages: 1) initial environmental assessment, 2) selection of an environmental category and 3) additional environmental and/or social analysis or impact assessment according to the project category.

[24] https://registry.verra.org/app/projectDetail/VCS/3145

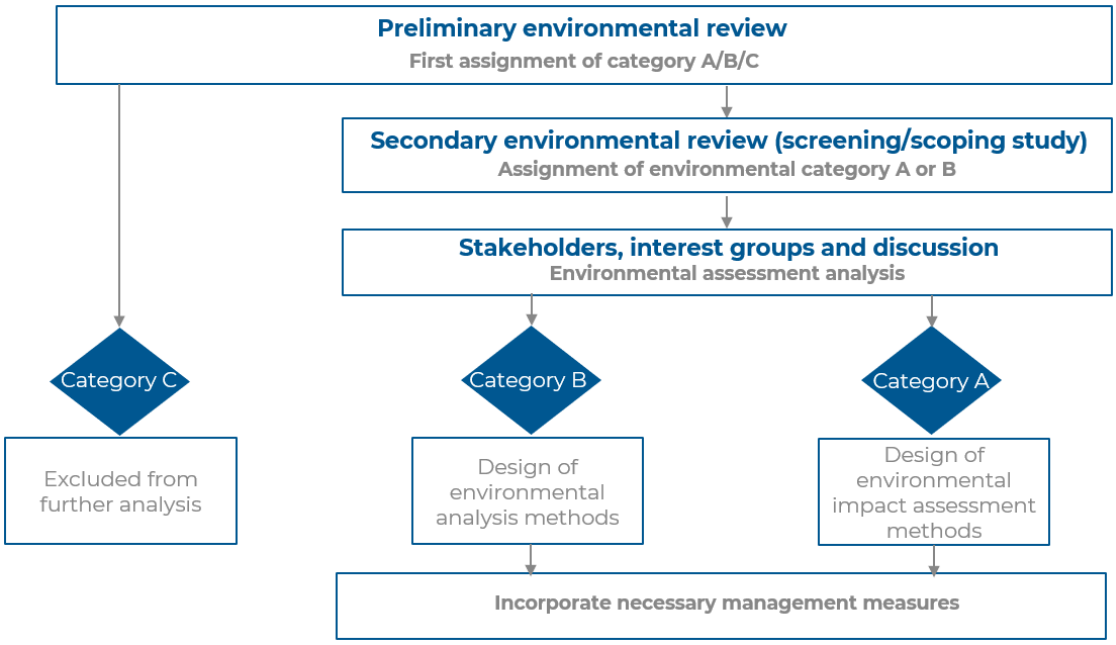


Figure 33. Overview of the environmental impact assessment process.

Source: FAO (2012).

Based on the initial environmental assessment of the project or activity, in which information is gathered to identify the broad outline of the project concept or proposal, the environmental category is selected according to the nature and severity of the potential environmental and social impacts. As shown in (Table 28), there are three environmental categories, called A, B and C. The category assigned to a project or activity will determine whether additional environmental or social analysis will be required.

Table 28. Environmental categories for projects.

Environmental category	Environmental impacts	Environmental analysis or assessment required	General characteristics
Category A	Significant adverse or adverse impacts	Environmental impact assessment required	These projects may include planned interventions that may change existing water and land uses, result in new land uses, disturb natural habitats needed to maintain biodiversity, involve significant expansion of industry, introduce water impoundment systems, promote the use of agrochemicals, or necessitate land acquisition and/or resettlement of local populations.

Environmental category	Environmental impacts	Environmental analysis or assessment required	General characteristics
			Significant negative effects may extend to social issues and beyond the project area.
Category B	Less significant adverse impacts that can be easily prevented or mitigated	**Environmental assessment** is required to identify potential negative impacts more accurately.	These projects should not have significant (or potentially irreversible) negative environmental (and associated social) impacts but may still have adverse effects that can be mitigated with appropriate preventive actions.
Category C	Minimal or no adverse impacts	No further environmental and/or social analysis or assessment is required.	These projects should have minimal or no negative environmental (and associated social) impacts, individually or cumulatively. They should be uncontroversial in terms of key stakeholder interests. If so, they will not require subsequent environmental analysis or assessment.

Source: FAO (2012).

The analysis for the REDD+ Project is presented below:

- Step 1. Initial environmental review.

As detailed in numeral 1, the REDD+ Project is a community initiative of four Indigenous Associations of the Predio Putumayo Reserve, whose objective is the certification of actions related to the reduction of carbon emissions from unplanned deforestation and degradation in about 3.7 million hectares of Amazonian Forest. The project activities aim to preserve the traditionally sustainable relationship of indigenous peoples with the forest and to limit, manage or improve other land uses, thereby reducing the impact of human activities on the natural environment, allowing its regeneration, and maintaining the structure and functionality of the forest. Similarly, other dimensions of socioeconomic development of indigenous peoples and climate change are managed, which, although not directly related to land use, have an influence on it. Based on the socio-environmental characterization and the information gathered, analyzed, and presented throughout the Project Document (PD), the environmental and social review form was completed to establish the project's environmental category (Table 29).

Table 29. REDD+ Project Environmental and Social Review Form.

If the project were to be implemented, would the following situations occur?	yes	No	Cannot be determined
Would there be significant adverse impacts on public health or safety?		X	
Would there be significant or controversial environmental effects on biophysical resources such as land, water, soil, or biodiversity?		X	
Would there be adverse impacts on unique features, such as wildlife, natural rivers, aquifers, agricultural lands, wetlands, floodplains, or ecologically significant areas?		X	
Would there be adverse impacts on traditional practices or agricultural systems in the area?		X	
Would there be potential significant environmental and social impacts with a high level of uncertainty, with unique or unknown risks?		X	
Would it set a precedent for future actions or represent a decision in principle on future actions with potentially considerable environmental and social impacts?		X	
Would it set in motion or contribute to a substantial progressive accumulation of adverse environmental and social impacts?		X	
Would there be adverse impacts (diverse or indirect) on natural habitats, such as wetlands, mangroves, tropical forests?		X	
Would there be adverse impacts on nationally or internationally important (listed or proposed) species or critical species habitats?		X	
Would there be adverse impacts on local or indigenous populations residing in interest area?		X	
Would it contribute to the introduction, continued existence, or spread of non-native invasive species or encourage the introduction, growth or spread of several non-native invasive species?		X	
Would the requirements of national, local, tribal, or indigenous people for the use of natural resources or the protection of the environment be threatened?		X	
Would unresolvedly land tenure conflicts over alternative natural resource rights or uses be triggered or exacerbated?	X		

If the project were to be implemented, would the following situations occur?	yes	No	Cannot be determined
Would there be disproportionate, significant adverse effects on low-income or disadvantaged populations?		X	
Would access to traditional or ceremonial sites be restricted or would the physical integrity of these sacred religious sites be adversely affected?		X	
Would there be adverse impacts on natural resources or properties of historical or cultural significance?		X	
Would there be significant impacts indicated by a national, district or local community group?		X	
Could the project be controversial because of disagreement among stakeholders?		X	
Would migration and other population changes be encouraged?		X	
Would the workload of local communities or subgroups within communities be increased?		X	
Could the project be contrary to the objectives or ongoing socio-economic development efforts?		X	
Would capacity building of individuals or organizations affected or involved in the project be needed? Would capacity building be needed to review and update policies, laws, regulations or to develop partnerships?	X		

Source: prepared by South (2021) based on the FAO (2012) methodological proposal.

- Step 2. Environmental screening.

Based on the environmental and social review form and the concept and/or nature of the REDD+ project, the project qualified as a Category C project. That is, the project conforms to the previously approved list of projects excluded from further environmental assessment, as it will have minimal or no adverse environmental impacts.

However, some situations were identified that in some way could be enhanced or triggered by the development of the project (Table 30), which have been identified and on which the risk analysis and mitigation measures were developed (numeral 2.1.4).

Table 30. Identification of additional threatening situations to the REDD+ Project design.

If the project were to be implemented, would the following situations occur?	yes	Description	Mitigation measures
Would unresolvedly land tenure conflicts over alternative natural resource rights or uses be triggered or exacerbated?	X	Given that the project is made up of different communities and associations, these could have different approaches that could lead to conflicts over alternative uses of natural resources. In addition, the territory has historically seen interactions with outsiders (legal and illegal) based on the indiscriminate extraction of natural resources.	Strengthening of governance, democratization of information and leadership. Economic and technical support for greater territorial control. Strategies for dialogue and consensus-building to improve state action to control illegal activities that drive deforestation. Strengthening of collective and ancestral spaces to mediate the problem, identify the cause, generate transformational change and negotiation.
Would capacity building of individuals or organizations affected or involved in the project be needed? Would capacity building be needed to review and update policies, laws, regulations or to develop partnerships?	X	One of the relevant elements in the development of the REDD+ Project has been the inclusion of the collective, community and joint participation of the population, to maintain transparency and clarity in the process.	Strategy for Participation, Communication and Social Appropriation of Knowledge. Co-managers program Capacity building and training with a continuous ethnic approach. Consolidation of the carbon market training committee.

Source: prepared by South (2021).

Finally, given that the REDD+ project was categorized as C, step 3 does not apply, and it can be concluded that no potential environmental impacts associated with the REDD+ project design were identified.

2.4 Public Comments

During the public comment period held between 08/21/2020 and 09/20/2020, the REDD+ Project received two requests for clarification or comments regarding the project design. South Pole and the participating AATI's provided responses to these comments in (Table 31).

Table 31. Comments received regarding the design of the REDD+ Project and response from the participating entities.

Comment's author	Comment received	Response from the entities participating in the REDD+ Project
Author: Not mentioned **Organization:** Indigenous Zonal Association of Cabildos and Traditional Authorities of La Chorrera (AZICATCH)	The dialogues to carry out the project and its design must be done before submitting any document to the verification program (VCS) or to the validation and verification bodies. These documents must be in Spanish and have the consent of all the governance structures of the community. In the case of AZICATH, the intermediary reported a document to the certification program that is not known to AZICATH, even though it has the signature of the organization's representative, which is not a guarantee of a broad and inclusive dialogue.	**About the Listing Representation document** The dialogues for the formulation and design of the REDD+ Project began in 2019 when the contractual agreements were socialized and signed in the territory. The signing of the REDD+ La Chorrera Emission Reduction Purchase Agreement (ERPA) took place in the framework of an Assembly of Authorities on December 3, 2019. Associated with the signing of the ERPA, the Listing Representation form was signed during 2020, under which the four AATI proponents authorized South Pole to register and publish the preliminary information of the REDD+ Project in its database and thus begin the public comment period. The document was signed by Mr. Manuel Alejandro Joinama, who at the time was the legal representative of the AZICACH organization. Although the contractual agreements mention in clause 6.6. 1 that, i) "the project proponent commits to take the necessary, acceptable and timely measures to guarantee the adequate execution and operation of the Project and for the strict and punctual compliance of the partial goals according to the PD and the generation of Verified Emission Reductions (VER) contracted", and that ii) the proponent commits to "comply with all the obligations regarding permits, licenses, waivers, consents, registrations, approvals and other authorizations from the permits, licenses, waivers, consents, registrations, approvals, approvals and other authorizations of the different entities, Following the comment sent by AZICATCH to the VCS public registry, South Pole carried out activities to socialize and resolve concerns about the Listing Representation and its implications for the issuance and trading of carbon credits, in order to maintain the principles of transparency and access to information that underpin the company's relationship with REDD+ project proponents.
	In the REDD+ Putumayo project it is not clear the mechanism of constant participation of the communities in the technical determinations, there is no capacity building that allows them to understand and determine if the ways in which the forests are measured are adequate to their activities: For	**On the application of the National FREL (MADS & IDEAM, 2019).** For the registration of the project in the pipeline of the VCS database, it is not a requirement that the draft project document (PD) presents the methodological detail the establishment of the baseline nor the accounting of GHG emission reductions. At the time the project was registered, there was a misinterpretation of Art. 41 of Resolution 1447 of 2018, which states that "the REDD+ project holder shall establish its baseline from the

Comment's author	Comment received	Response from the entities participating in the REDD+ Project
	example the project does not mention the existence of a national forest emissions reference level, it only mentions the first level of the Amazon but not the new national one, this consequently puts the communities, who in theory are authors of the project, in disregard of the technical indications of Resolution 1447 of 2018 which clearly indicates that any overlapping project should be consistent with the most updated Reference Level which in the case of Colombia covers the results for deforestation in the period 2017 - 2022.	most updated FREL that has been formally submitted by Colombia and valued by the UNFCCC". Although the FREL had been updated by MADS and IDEAM in December 2019, it had not been evaluated by the UNFCCC, so, under the interpretation of the norm, in theory this FREL should not have been applied until there was some support from the evaluation (UNFCCC technical report). Later, in different meetings with the MADS, this entity informed that regardless of the progress and evaluation status of the FREL by the UNFCCC, the National Government expected that REDD+ projects would make use of the National FREL[25] for the establishment of their baseline. With this confirmation, the REDD+ Project updated its baseline and carbon accounting considering this information. However, according to the communication issued by VERRA on its website[26], the use of a jurisdictional FREL for project baseline estimation outside the context of Verra's Jurisdictional and Nested REDD+ framework is not allowed until the revised AUDD methodologies are published.
	The wording in the document of the project actions is broad and does not allow identifying what will be done in each ATTI, in turn AZICATH said not to have knowledge of how the resources will be invested, basic questions such as how much is left in the intermediation or what projects will be financed are not known by the community. It is key to have clarity on the scope of the intermediation and the corresponding volume of resources that the community will cede from its mitigation results. The structure of agreements (possibly contracts) underpinning the project is also not known. The project reports an expected 70 million	**On agreements with proponents, REDD+ Project activities, and benefit distribution** On proponent agreements, REDD+ project activities and benefit sharing The project has gradually implemented activities to advance in the formulation of a strategic plan for technical guidance that is subdivided into six strategic lines; two of which will be formalized under VCS, three more under CCB and one more that is transversal to the VCS and CCB components of the project. This strategic plan is framed within the AATI Life Plans and the environmental management plans already formulated. The strategic lines will be implemented during the REDD+ Project credit period through 15 programs and 36 projects that address the central dimensions of indigenous life in their territorial autonomy to ensure forest conservation. Although these strategic lines are general, their scope comes from the Integral Life Plans of the four participating AATI and the Environmental Management Plans that have been formulated to date.

[25] Proposed Reference Level of Forest Emissions from deforestation in Colombia for payment for REDD+ results under the UNFCCC (MADS & IDEAM, 2019). Available at: https://redd.unfccc.int/files/02012019_FREL_colombia_v8.pdf

[26] Available at: https://verra.org/project/notice-to-new-redd-projects-and-those-considering-baseline-reassessment/

Comment's author	Comment received	Response from the entities participating in the REDD+ Project
	TCO2 in results over 30 years, equivalent to a potential cash flow of more than 20 billion pesos per year. Of which there must be full clarity on its investment mechanisms in the territory in a community detail and an investment mechanism that avoids that the resources remain in the intermediation or representation of the communities, are affected by corruption problems, or generate vulnerabilities of the leaders that support the project to illegal armed groups.	These documents have made significant progress in terms of formulation; however, information regarding the implementation of actions is limited and some are practically non-existent. To solve this problem and within the framework of the REDD+ Project formulation, the governance structure, the **Benefit Sharing System** and the schedule and implementation plan for the programs and activities prioritized by the communities themselves for the reinvestment of the financial resources derived from the commercialization of the carbon credits will be developed in a participatory manner. These components are currently under discussion with the communities in the framework of the EPCAC Phase 3 tours. With respect to the commercial structure of the contractual agreements between South Pole and the AATI, these documents were socialized in the Assemblies of Authorities held in 2019 with each AATI and the agreements were ratified in the December 2020 and January-February 2021 assemblies. Each of the AATI has a physical and digital copy of the agreements and additional rounds of review and spaces for resolving concerns regarding these agreements have been promoted with people from the community and co-managers (especially in AZICATCH).
Author: Camila Solano Ramírez **Organization:** Not mentioned	South Pole has registered with VERRA "REDD+ Project Pueblos Indígenas Resguardando la Selva, claiming that it is a local community initiative of four Indigenous Associations of the Predio Putumayo Reserve, which seeks certification of actions related to the reduction of carbon emissions from unplanned deforestation and degradation (AUDD) in some 3,893,277 hectares of Amazon Forest. The initiative includes activities in multiple instances, corresponding to the Indigenous Authorities Associations (AATI): the Indigenous Council Association of Puerto Alegria (COINPA), the Indigenous Major Council of the United Murui People (CIMPUM), the Association of Indigenous Authorities of the Puerto Arica Zone (AIZA) and the Association of Indigenous Authorities of the Puerto Arica Zone (AIZA). (AIZA) and the	**On the relationship between the communities and indigenous organizations that make up the Predio Putumayo Reserve** In the Predio Putumayo reserve there are two ways of delimiting the territory: 1) the traditional management area and 2) the socio-political administrative area. There have been some tensions in the indigenous communities of Itiquilla, which are in two of the AATI (CIMPUM and COINPA). A similar case has occurred in the communities of New Witembwg (AIZA) and Lago Grande de (AZICATCHT), in the latter case common agreements have been reached regarding the governance of the territory. However, the historical context and the population dynamics of the region make it difficult to clearly establish the territorial delimitation by community, this has represented conflicts for some actors, therefore, for the development of the project it has been made clear that this does not seek to define the territory by AATI, For this reason, and in response to the recommendations of grandparents, authorities and leaders, it was agreed to talk about the management area of the REDD+ Project to refer to the identification of the areas that are part of the initiative and that will be subject to monitoring.

Comment's author	Comment received	Response from the entities participating in the REDD+ Project
	Asociación de Cabildos y Autoridades Tradicionales de la Zona Indígena Chorrera (AZICATH); all of them present in the Predio Putumayo Indigenous Reserve in the Department of Amazonas (Colombia)." Understanding that the Predio Putumayo is legally a single territory in favor of the indigenous peoples; the above company through its project is generating divisions within our integrity, social, cultural, and territorial.	Within the framework of Phase 2 of the EPCAC, the AATI participants of the REDD+ Project reviewed and ratified agreements with neighboring indigenous organizations CRIMA; PANI and ACILAPP, and with the Cahuinarí National Natural Park regarding the management of the territory. This ratification of agreements made it possible to clarify the areas under the control of each of the AATI and to define buffer zones in which historically it has not been possible to issue a clear concept about the indigenous organization responsible or in charge of their management (a total of five areas have been defined). These buffer areas will not be included as part of the first instance of the initiative until a consensus is reached between the indigenous organizations involved in the discussion, and in the framework of the implementation of the validated REDD+ Project, the spaces for consultation on these areas will continue to be promoted in a similar manner as was done for the definition of the management area under validation. During the agreement review and ratification process, exclusion areas were also defined, which correspond to indigenous organizations that expressed their interest in not being part of the initiative, such as the Cabildo Indígenas Murui de El Encanto (CIMCE) and the territory under the control of the Nonuya people belonging to the AATI AZICATCH. The ratified and validated boundary will be updated both in the VCS registry and in the RENARE platform, making the corresponding caveat about the buffer zones that could enter the REDD+ Project as new instances in future verifications. The project management area, buffer areas and exclusion areas have been defined in consultation with the indigenous organizations of the Predio Putumayo Reserve. The AATI proponents of the REDD+ project have promoted and led the meetings with the other organizations and have been responsible for ratifying the agreements and decisions. In addition, they have the supporting information from the meetings and the participatory activities and discussions about the area.
	1). Until a general meeting is held with the indigenous peoples who own the Putumayo property, the registration shall not proceed. 2). Until the negotiation model is not clarified,	**On the registration of the REDD+ Project in the VCS database** During 2019, preliminary visits and meetings were held to dialogue with the different AATI COINPA, CIMPUM and AIZA about their interests in grouping together to participate in a REDD+ initiative, these meetings were

Comment's author	Comment received	Response from the entities participating in the REDD+ Project
	the participation of the indigenous people within the same shall not proceed. 3). The project should be registered in the name of the indigenous peoples of the area and not in the name of the company. 4). If there is no free and informed prior consultation with the consent of all the peoples settled in the Putumayo property, the project should not proceed. The non-procedure and registration of the project.	held between the months of April and July 2019 in assembly spaces. The topics discussed during these visits and assembly spaces are presented in section 2.2.1. The contractual agreements between South Pole and the four AATI proponents were socialized in the Assembly of Authorities and after socialization and approval, they were signed to begin the formulation of the REDD+ Project (see sections 1.7.2 and 2.2.1). Although the REDD+ Project is registered in the South Pole account, both in the project sheet associated with the VCS registry and in the draft project document (PD), the role of the four AATI as proponents of the REDD+ Project is clearly highlighted. Although, the legal representatives of the four AATI signed the Act of Representation for Public Listing (Listing Representation), this document does not assign the rights of the REDD+ Project to South Pole, but, on the contrary, ratifies that each of the signing AATI (among other things): 1) is a public listing representative, which in the words of the VCS standard can refer to the project proponent, any entity to which the project proponent has granted rights to emission reductions, or an entity that has been authorized by the project proponent to list the initiative in the VCS developing project database. 2) provides information that is uploaded to the database and is truthful, accurate and complete in accordance with the requirements for public listing requested by the VCS standard. 3) is jointly and severally liable for the representations, warranties and obligations that are indicated to be assumed by signing the Deed of Representation for the Public Listing. Therefore, South Pole could only have listed the REDD+ Project under the explicit authorization of the four AATI proponents. With respect to the need for prior consultation, it is important to mention that after an extensive legal review and the construction of a concept[27] on the exhaustion of the Prior Consultation mechanism, to advance REDD+ projects with Indigenous Reserves or Associations of Indigenous

[27] See attached support document Legal Concept on Participation Mechanism in REDD+ Projects.

Comment's author	Comment received	Response from the entities participating in the REDD+ Project
		Traditional Authorities, it was concluded that REDD+ projects that are implemented with the participation of the ethnic community, and with their acquiescence supported by documents that show the process of socialization and decision making by their traditional authorities, do not require the involvement of the Colombian State, so that through a Prior Consultation (as understood by the State) a legal business between private parties is validated, developed through the principle of the autonomy of the freedom of the parties. This contractual autonomy, common to all persons (legal and natural), is of greater significance in the case of ethnic communities, since other fundamental rights of equal constitutional protection are at stake, such as the autonomy and self-determination of the peoples, especially the freedom to decide their socioeconomic future and their priorities. To expect the State to act as a sort of guarantor or validator is tantamount to disregarding the freedoms and fundamental rights of the indigenous communities and, therefore, would constitute discriminatory treatment against them, and a violation of their communal right to privacy, by having to provide information regarding a legal transaction (of interest between the parties) to third parties (all State agencies participating in a prior consultation). Additionally, the existing regulations on prior consultation and FPIC in Colombia are being reviewed at the request of ethnic groups; prior consultation is not required at this time for REDD+ projects that are formulated jointly with ethnic communities, but it must ensure the participation of the communities and take minutes that allow the work agreed with them to be recorded, and for this, the REDD+ Project has been implementing its Strategy for Participation, Communication and Knowledge Appropriation (EPCAC) (see section 2.2.1).

Source: prepared by South Pole (2021).

2.5 AFOLU-Specific Safeguards

In terms of compliance with specific safeguards for AFOLU projects, the REDD+ Project gathered information and considered the following in the design of the initiative:

- **Identification of local stakeholders or stakeholder mapping**

  For REDD+ Project Pueblos Indígenas Resguardando la Selva, the key stakeholder mapping methodology was implemented as a tool to create a quick reference of the stakeholders involved in the project. It goes beyond a list of stakeholders to ask, for example, *who is pushing and why? Who is not being listened to? Who are the like-minded and who are the opposites? What is the influence capacity of certain stakeholders? Who are the most vulnerable? etc.* (Tapella, s.f. in Ortiz et al., 2016: pp. 3-4).

  The design of this methodology was based on the review of secondary information such as the life plans of the indigenous communities (AIZA, AZICATCH, CIMPUM, COINPA), diagnoses, academic documents, technical reference reports, reports of the General System of Participation, digital platforms, and websites of local, regional, and national indigenous organizations, among other documents. This information was complemented with data collected by the co-managers and subsequently systematized to feed the mapping.

  As part of the stakeholder identification and analysis process, roles, interests, and levels of action were established to understand their connections, their relationship with the participation and information process, relational levels with other stakeholders, possible alliances, and articulations, as well as the identification of risks and possible conflict situations that should be considered in the formulation and implementation of the REDD+ Project.

  Detailed information on the methodological approach to stakeholder mapping and its results can be found in the supporting document *Annex5. 20220930_Supporting_document_No_5_Mapping of relevant actors*

- **Identification of risks to stakeholders due to project implementation and definition of mitigation measures.**

  Detailed information on the qualitative matrix for identification of risks arising from the REDD+ Project and its mitigation measures is presented in section 2.1.4.

- **Plans to ensure that the project does not affect the property rights of local stakeholders without free, prior, and informed consent.**

  The parties to the UNFCCC agreed on seven safeguards as “rules of the game for REDD+” that should guide countries and ensure that the actions to be developed in the territory are carried out correctly, increasing benefits, reducing social and environmental risks, and guaranteeing respect for the rights of communities. Safeguards focus on transparency, stakeholder participation, protection of biodiversity and ecosystem services, and respect for the rights of indigenous and local communities. Also, the VCS standard document (Verra, 2017) notes that they are aligned with projects and help demonstrate compliance with the UNFCCC REDD+ safeguards in all aspects.

  Colombia interprets the Cancun Safeguards in its document Social and Environmental Safeguards for REDD+ in Colombia (Camacho, Lara, and Guerrero, 2017). The interpretation

result, initiated in 2013, aims at reviewing the regulatory framework and the vision expressed in the process of information and dialog on REDD+ in Colombia since 2010, and is reflected in 15 safeguard elements, which are listed in (Table 32).

Table 32. Elements of the national interpretation of REDD+ safeguards for Colombia.

Dimension	Safeguard element
Institutional	1. Correspondence with the national legislation. 2. Transparence and access to information. 3. Accountability. 4. Recognition of the forest governance structures. 5. Capacity building.
Social and cultural	6. Free, Prior and Informed Consent (FPIC). 7. Respect for traditional knowledge. 8. Distribution of benefits. 9. Territorial rights. 10. Participation.
Environmental and territorial	11. Conservation of forests and their biodiversity. 12. Provision of environmental goods and services. 13. Environmental and territorial planning. 14. Sector planning. 15. Forest control and surveillance to avoid displacement of emissions.

Source: Social and Environmental Safeguards for REDD+ in Colombia (Camacho, Lara, and Guerrero, 2017).

In this context, the REDD+ Project, with a community-based approach, has carried out the certification process, considering the pillars of planning, participatory development, and community implementation. Furthermore, compliance with the safeguards correlates with the implementation of clear activities with commitment and transparency on the part of the proponent indigenous associations and communities as well as the operator. They constitute the instruments, agreements, processes, and tools that will make it possible to address the measures and actions of the project itself in the best possible way, ensuring respect and guaranteeing the rights of the communities, as well as the integrity of forests and ecosystems where such actions are implemented.

As part of the implementation of the EPCAC, the REDD+ Project has carried out information, dialog, and joint construction processes. In addition, spaces for decision-making have been created in which the autonomy of the peoples in the management of their territories has been

respected, as well as their own decision-making structures. Table 33 summarizes the REDD+ Project's efforts in relation to compliance with REDD+ safeguards.

Table 33. REDD+ Project efforts in relation to compliance with the REDD+ safeguards in Colombia.

Dimension	Safeguards	Description
Institutional	1. Correspondence with the national legislation. 2. Transparence and access to Information. 3. Accountability. 4. Recognition of the forest governance structures. 5. Capacity building.	Project activities are aligned with the national climate change mitigation measures under the carbon market in accordance with Decree 926 of 2017 and Resolution 1447 of 2018. The project information has been publicly submitted to the VCS — RENARE Public Carbon Registry, as well as the progress of meetings, agreements, and joint construction of the contractual agreements. Participation in community assemblies to share the project. From the proposals and suggestions made during the EPCAC application (second field visit, February 2020), an AATI committee was created to understand how bond calculations and estimates are carried out, thus ensuring the transparency of the process. In an implementation scenario, this committee could also participate in the negotiation process and should be composed of people who understand the market dynamics of bonds. Strengthening of local capacities through the formation and training of a group of co-managers, members of the indigenous communities of the territory, to work jointly with the AATI in the project formulation and to maintain ongoing communication between the organizations and other stakeholders.
Social and cultural	6. Free, Prior, and Informed Consent (FPIC). 7. Respect for traditional knowledge. 8. Distribution of benefits. 9. Territorial rights. 10. Participation.	The development of the REDD+ Project in indigenous territories is based on ancestral knowledge, the law of origin, traditional indigenous life plans, wisdom, and the traditional management of the territory. Preliminary programs, projects, and activities proposed in section 1.11.2 are based on the communities' life plans and shall be submitted to the communities for their consideration, bearing in mind the conservation and governance of their territories. Participation in traditional assemblies. In these deliberation and decision-making spaces of the traditional authorities and the community, a space has been requested for the REDD+ Project and its impact on the territory, respecting property rights without affecting them. Implementation of the EPCAC.

Dimension	Safeguards	Description
		The REDD+ Project is led by the indigenous communities that inhabit the area, that is, the AATI, community members, and authorities. They are organized under the criteria of their own traditional government and the regulations of the Colombian State. In this respect, property rights are recognized and respected, since it is the traditional authorities themselves who wish to carry out the project. The proponent communities are interested in developing a REDD+ project in their territory, to obtain monetary resources to improve the living conditions of their communities while preserving their ancestral practices in their relationship with nature and maintaining their capacity to face the process of transformation and urbanization of the dominant economic system driven from within and outside the reserve.
Environmental and territorial	11. Conservation of forests and their biodiversity. 12. Provision of environmental goods and services. 13. Environmental and territorial planning. 14. Sector planning. 15. Forest control and surveillance to avoid displacement of emissions.	Projects and activities carried out ancestrally by each AATI and their indigenous communities are integrated into the REDD+ Project. These activities support the premise that forests do not remain for their own sake; their conservation is due to the proper management of their inhabitants. Thus, elders, adults, and young people are key actors in this REDD+ Project, as it is through their management and knowledge that forests are protected. Since REDD+ is a community-based project, it integrates the traditional management and control zones of the communities of the different indigenous ethnic groups and is linked to the pillars of the life plans. In this regard, land use planning is conducted under the cultural principles and productive proposals that communities, in their autonomy and self-government, have decided to implement.

Source: prepared by South Pole (2021).2021).

- **Processes to ensure ongoing communication and consultation with local stakeholders, including a grievance redress procedure to resolve any conflicts that may arise between the project proponent and local stakeholders.**

  Detailed information on the proposed implementation of the RCCFS Mechanism and access to this procedure can be found in section 2.2.1 under *Mechanisms for ongoing communication with local stakeholders* and in the attached supporting document *Annex8. 20220930_Supporting_Document_No_3_RCCFS_Project_Consultation_Mechanism.*

2.5.1 Feedback and Grievance Redress Procedure

The tools to document complaints and feedback for the REDD+ Project are framed under Colombian regulations, which include a RCCFS mechanism that is mainly governed by Articles 23 and 74 of the Colombian Constitution. These articles state that "every person has the right to submit respectful requests to authorities for reasons of general or particular interest and to obtain a prompt resolution (...)" (Art. 23, Colombian Constitution) and "to access public documents, except in cases established by law; professional secrecy is inviolable" (Art. 74 of Colombian Constitution).

In this project, in addition to taking the aforementioned aspects into account, according to Colombian regulations regarding RCCFS mechanisms, it has been key to understand that the requirements of the VCS and CCB standards include a procedure to receive and handle complaints, queries, or any type of feedback regarding the project. This is done based on a transparent communication process, in which various tools are used to find a solution to any requirement made by the stakeholders. The joint construction of these tools has been fundamental to ensure transparency and inclusion of the opinions of the communities during the development of the project.

As part of the National Safeguards System and the REDD+ strategy defined in Colombia, it is proposed for the operation of a permanent complaint system, the mechanisms of citizen attention as a strategy that will serve to respond to requests for information, as well as identifying corrective actions that may be required for the implementation process during the execution of the REDD+ Project. This is also in line with the principle of transparency and access to information [28].

Considering the channels and messages developed for communicating the project in its formulation and implementation phases, the proponent, with the support of South Pole, will continue to design and improve the project's consultation mechanism (RCCFSs) to receive, address, and manage complaints or questions about the REDD+ Project: Indigenous Peoples Protecting the Rainforest and its activities. In addition, this mechanism will continue to promote traditional scenarios to resolve concerns, such as malocas, mambeaderos, and assemblies.

When formulating and implementing the RCCFS mechanism, specific definitions of request, complaint, claim, feedback, and suggestion will be considered, which will provide a route to engage the stakeholders in the territory based on the development of the project and the way the information resulting from the consultation is channeled in the certification and implementation processes:

- **Request:** demand for project information or documentation made by a natural or legal person, whether public or private, using the established means and channels.
- **Complaint or claim:** expression of protest, dissatisfaction, or disagreement formulated by a person in relation to the project or to a conduct considered irregular in the context of the project (It may or may not be considered unfair).

[28] Fifth summary of information on REDD+ safeguards. Reporting period: September 2019 - October 2020. https://redd.unfccc.int/files/ris_v_-_colombia.pdf

- **Feedback:** comment, judgment, acknowledgement, or expression of appreciation, satisfaction, or congratulations related to the management of the Project.
- **Suggestion:** indication or advice to change certain aspects in order to improve the project's performance.

These mechanisms for the reception and management of RCCFSs was based on a preliminary proposal aimed at gathering and addressing the concerns of the communities about the REDD+ project. Although it builds upon the experiences and communication channels defined during the development of the project, it was discussed, complemented, and adapted by the AATIs through a validation exercise, with the purpose of consolidating a participatory and coherent mechanism with the territory in its implementation phase.

Operational structure of the RCCFS mechanism

The proposed criteria for the creation of the RCCFS committee stem from the activity carried out with nine co-managers from the four AATIs, whose purpose was to identify the regular channel applicable to the project, according to the internal structure of each AATI. As a result of this activity, the secretary of territory and environment of each association was appointed as the person in charge of communications and relationships, in cooperation with their respective president. Integrating the secretaries of communication would also be useful for this mechanism, considering its nature.

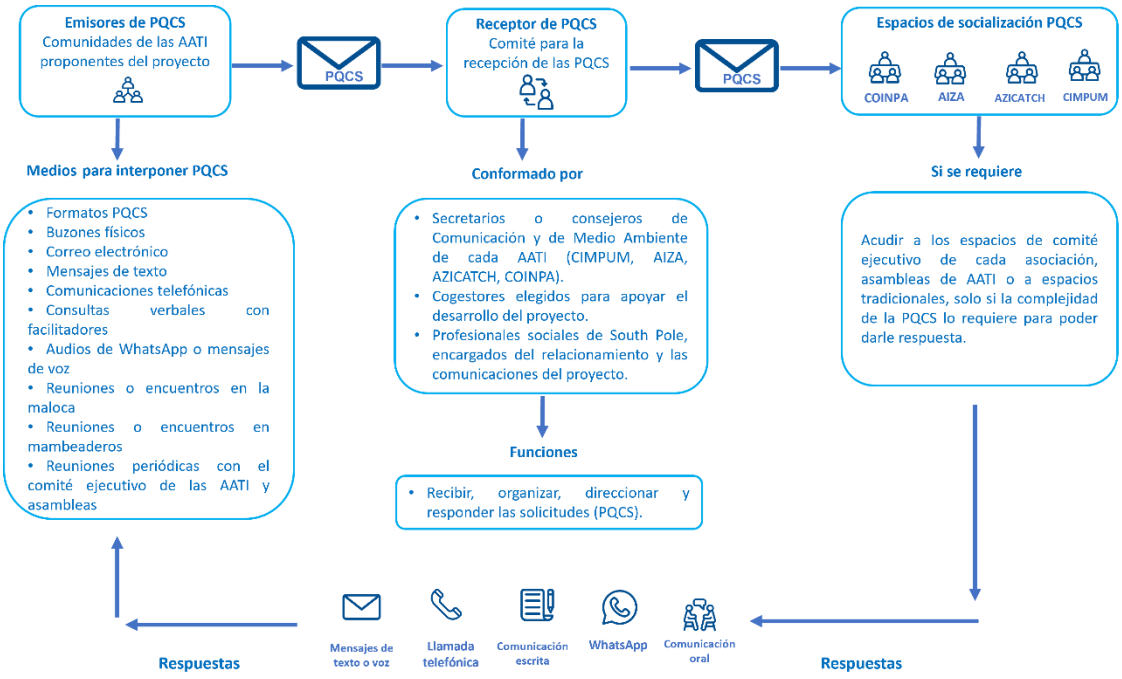


Figure 34. Scheme of the communication mechanisms of the REDD+ Project: Indigenous Peoples Protecting the Rainforest.

RCCFS reception committee

Aiming to achieve integration among the four AATIs involved in this REDD+ Project, a general RCCFS committee was created. It is composed of the communication, territory, and environment secretaries or advisors of each AATI (CIMPUM, AIZA, AZICATCH, COINPA); the co-managers selected to support the development of the project; and representatives of the South Pole team, especially the social professionals in charge of the project's relationships and communications. This committee will be in charge of receiving and processing the RCCFSs related to issues that involve all four AATIs (e.g., project area, strategic lines, or audit results).

In addition, due to their conditions in terms of organization and participation, the AATIs and their communities are encouraged to create zonal committees, chaired by the same communication, territory, and environment secretaries or advisors, but with the possibility of including other local leaders, such as the governors or the traditional authorities of each community.

Consequently, there will be two committee figures: one at the zonal level responsible for processing the RCCFSs of each AATI, and another general committee that will integrate the RCCFSs of the four AATIs involved in the project. All this with the objective of better managing the comments from the community and broadening the participation and response of the local leaders. It is important to mention that these delegates should be in constant communication with the president or senior advisor of each AATI in order to maintain the internal regular channel.

Having these two scenarios for managing and processing the RCCFSs, the zonal committee, as the first instance for each community, should classify the questions and comments and determine whether the response is the responsibility of the local facilitators, the grouped committee, South Pole, or other external institutions.

In addition to the co-managers and the communication, territory, and environment secretaries or advisors of the AATIs, the committee can request the support of other territorial stakeholders for the collection of RCCFSs in the field. For example:

- Network of allied governors.
- Health brigade members.
- Delegations of institutions that visit the communities.
- River transport companies that cover the route where the communities are located.
- Local motorists or river drivers in the area.
- Other AATI members who are visiting the territory.

Furthermore, to establish an internal communication process among the members of these committees, we proposed the creation of a WhatsApp group, an email address independent from South Pole, and Google Drive tools for simultaneously filling out the RCCFS follow-up matrix and recording the responses. However, this will continue to be a topic of discussion with the communities and the AATIs to identify the simplest ways for processing them, considering the limitations of the internet connection.

Protocol of the RCCFS mechanism

This protocol consists of a series of recommendations to guide this early implementation of the mechanism, the working route of the committee, and the process of receiving and processing the RCCFSs. It involves the following:

- Defining communication means and channels to collect the concerns of the communities and issue the respective responses in no more than one month.
- Delivering the RCCFS reception forms to the governors of each cabildo or to the community delegates to assist in the distribution of this material, when necessary.
- Centralizing and maintaining records of the RCCFSs, specifying the community from which they came and whether they were resolved.
- Escalating complex RCCFSs that require discussion in collective spaces, such as meetings of the executive committee of each association, AATI assemblies, or traditional spaces where relevant and complex issues are discussed under the guidance of traditional authorities.
- Building a network of allies with the governors of the cabildos, so that the stakeholders' RCCFSs are collected in the community assemblies and forwarded to the receiving committee. This network of allies can also collaborate in responding and processing RCCFSs.
- The members of the committees do not receive any financial compensation for their work in the management of the RCCFSs.

RCCFS form

To keep the inventory and follow-up of RCCFSs, whether received orally, in writing, or virtually, we propose to fill out a standard form to comply with the registration and systematization of supports. The purpose of this form is to collect information about the individual, the subject or type of request, and the specific information of the RCCFSs. Figure 35 shows a concise form to collect and record information through the proposed alternatives.

Registration, systematization, and follow-up of RCCFSs

The reception committee, made up of the AATIs' environment and communication secretaries or advisors, will be responsible for documenting the RCCFSs. In this way, the committee will establish strategies to facilitate the reception of requests and the delivery of responses with the support of the various stakeholders that travel throughout the territory, given that the great geographical distances make it difficult to visit frequently the population centers of each AATI. The proper management of RCCFSs will be made possible by recording and systematizing each of the requests received (see Figure 36). The committee will be in charge of recording in the matrix the information filled out in the reception form and will also include data related to the person to whom the request is addressed, the date on which it was forwarded to the person in charge, a summary of the response, the date and means by which it was processed, and the date of satisfactory closure. In the case of requests that exceed the scope of the project, the committee should refer the requester to the channels defined autonomously by the communities and the AATIs for communication with institutions or stakeholders external to the project.



PROYECTO REDD+ PUEBLOS INDÍGENAS RESGUARDANDO LA SELVA
de las AATI AIZA, AZICATCH, CIMPUM y COINPA

Formato para radicar Peticiones, Quejas, Comentarios y Sugerencias sobre el Proyecto REDD+

Fecha:	AATI:
Nombre:	Comunidad
Si desea interponer la PQCS de manera anónima marque con una X en el siguiente campo	

Marque con una X la opción elegida:

Pregunta		Queja		Comentario		Sugerencia	

Otro. ¿Cuál?_____

Espacio para la redacción:

Medio de comunicación por el cual prefiere recibir la respuesta:

- Correo electrónico: ¿Cuál? _____
- WhatsApp: ¿Cuál? _____
- Otro: ¿Cuál? _____

Figure 35. Form for submitting RCCFSs on the REDD+ Project.

Source: compiled by South Pole (2021).



PROYECTO REDD+ PUEBLOS INDÍGENAS RESGUARDANDO LA SELVA
De las AATI AIZA, AZICATCH, CIMPUM y COINPA

Matriz de registro, sistematización y seguimiento de Peticiones, Quejas, Comentarios y Sugerencias PQCS

AATI: _____

No.	Fecha y medio de recepción	Comunidad	P	Q	C	S	O	Descripción de la PQCS	Encargado de responder	Fecha y medio de respuesta	Descripción de la respuesta	Fecha de cierre a satisfacción

Figure 36. RCCFS registration, systematization, and follow-up matrix.

Source: compiled by South Pole (2021).

2.5.2 Accessibility of the Feedback and Grievance Redress Procedure

The RCCFS mechanism will be disseminated through the media strategies defined in the project formulation phase, which refer to a communication matrix constructed collectively by the co-managers and the communities for the purpose of disseminating project information (see Table 34). The proposed means and channels are information letters, SMSs, community bulletin boards, wall newspapers, videos, audios, megaphone advertising, flyers, cards, phone calls, and community and zonal spaces. These proposed means are in line with the information component of the project's communication and education plan, which aims to promote communication and popular and community relationships that foster closeness among the community.

Table 34. Communications matrix for community relationships within the REDD+ project.

Communications Matrix for Community Relationships	
Strategy	**Content**
Preparing and sending information	Communicate the progress and results of the project in a more formal way and send messages of closeness and follow-up in the process. For

Communications Matrix for Community Relationships	
Strategy	**Content**
letters	dissemination, these pieces will be printed in larger and more visible formats to be placed on the board or at a strategic point in the community. The project's WhatsApp groups will also be used.
Newsletter and informative capsules	Educational content to explain key project concepts, progress, and upcoming activities.
Community bulletin boards and wall newspaper	Content to convene assemblies and meetings within the project, provide feedback on the project and on the concerns registered through the RCCFS mechanism, promote activities planned within the project, communicate project information in various formats, such as community bulletin boards.
Videos, audios, megaphone advertising, flyers, or cards	Greetings and progress of the project, reading of information letters— because orality plays an important role in the territory— printed newsletters distributed through different channels: co-managers, WhatsApp messages, emails, megaphone advertising.
Community and zonal spaces	In order for the RCCFS mechanism to be widely disseminated, its operation can be discussed in spaces with high attendance in which all communities participate, such as soccer championships and the anniversary of the reservation.

Source: compiled by South Pole (2023).

In addition to the media and channels available to promote the RCCFS mechanism, we propose to create a network of allies made up of the governors of the cabildos and other community leaders so that they can collaborate in the dissemination of the mechanism, the reception of consultations, and the issuance of responses.

Responses to community consultations will be issued directly through the means defined in the RCCFS mechanism:

- Verbal communication (documented).
- Written communication: direct delivery to members of the committee, to the network of allies made up of governors, community leaders, institutional delegations, among others.
- Phone calls: (+57) 320 7963203, (+57) 320 7968200, (+57) 320 796 5583.
- SMSs: (+57) 320 7963203, (+57) 320 7968200, (+57) 320 796 5583.
- WhatsApp line: (+57) 320 7963203, (+57) 320 7968200, (+57) 320 796 5583.

Between February and March 2022, during the general assemblies of the AIZA, CIMPUM, and COINPA associations, a preliminary proposal for the RCCFS mechanism was presented and discussed using a presentation and informative poster. These materials were installed in the communal meeting spaces

and shared with the AATI and other leaders via USB. The proposal was positively received during these gatherings, with community members recognizing it as an opportunity to improve communication flows. Suggestions included expanding the committee, ongoing support from South Pole during subsequent stages, and addressing logistical and communication challenges in the territory during the mechanism's implementation.

In addition to the informative poster, formats for receiving, recording, systematizing, and tracking RCCFSs were provided to community representatives. These materials were intended for use as educational resources in the process of disseminating the proposal to the wider community. The formulation of the mechanism will continue with its dissemination within the project communities, an activity to be led by the co-managers and from which feedback and the final formulation of the RCCFS system will be derived.

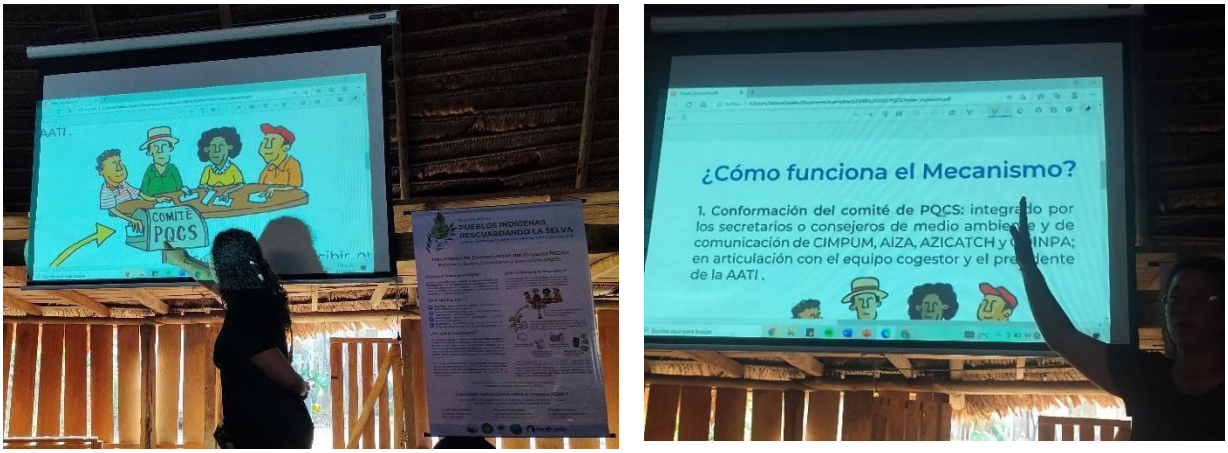


Figure 37. Presentation of the RCCFS mechanism in general assembly spaces.

Photograph: South Pole (2022).

Throughout 2022 and 2023, various validation activities of the mechanism were conducted, involving communities and co-managers in assembly spaces, field visits, and online meetings. These activities generated observations and highlighted the need to create means and messages that align better with the territory's communication reality, applying a functional and practical methodology.

The validation process had several phases. Initially, the project's co-managers underwent training on the methodological and conceptual aspects of the preliminary proposal. Topics covered in this training included:

- What is the RCCFS mechanism?
- Context explaining why the mechanism is necessary
- Definitions related to RCCFSs
- How the mechanism works
- The composition of the RCCFS receiving committee.
- Who comprises this committee?

- The committee's duties
- Formats and means for receiving and resolving RCCFSs.
- Recording, systematization, and tracking of RCCFSs.
- What is the network of collaborators?
- Scheme of the consultation mechanism
- Work plan for implementation

This online training for co-managers also served as a dissemination and validation exercise for the preliminary mechanism. Feedback and observations from the co-managers were taken into account to improve the proposal presented in this document.

The validation work led by the co-managers took place in various community spaces through visits to communities. During these visits, comments, opinions, and proposals were recorded in minutes and matrices, serving as sources of verification for this validation process. Conversations during these sessions revolved around matters such as how the RCCFS mechanism could be implemented, improvements identified for its proper operation in the territory, and how to receive and respond to RCCFSs in a simple and effective manner.

Between May and August 2022, co-managers from AIZA, AZICATCH, CIMPUM, and COINPA visited some of their communities to share project progress and address other topics, including Social and Environmental REDD+ Safeguards; the Climate, Community, and Biodiversity (CCB) standard; the RCCFS communication mechanism; and community members' concerns regarding project development. Official records were prepared for each of these meetings, documenting the progress of these events and serving as sources for verification. They included the main questions, recommendations, and comments from the communities regarding the project and the topics discussed, which would guide the project's development and subsequent stages and generate alerts regarding areas needing improvement or reinforcement.

Additionally, during the validation of the preliminary mechanism, the following general recommendations for the operation and structure of the RCCFS mechanism, particularly for the RCCFS committee, were made:

- A commission for information provision and quick solutions should be created.
- Co-managers should actively participate in RCCFS handling.
- Responses should be faster.
- Information about this mechanism should be shared with more remote communities.
- The RCCFS committee should be trained on its duties and format management.
- A budget should be allocated for the purchase of communication equipment such as radiophones and for sending envelopes or messages to communities.
- A local office should be created for the physical submission of RCCFSs.
- The RCCFS mechanism should be aligned with the project's long-term nature.
- The RCCFS mechanism should have different online and physical channels, allowing all project community members to access it.
- A mechanism that allows access for children, youth, adults, and elders should be created.
- The mechanism's operation should be evaluated on a regular basis.

- A pilot test for the mechanism should be designed to evaluate its feasibility, acceptance, practicality, and operation.
- The community should be informed of and educated about the need of this mechanism as a requirement or guideline for compliance with the standard.

Following the validation exercise and the systematization of information gathered in the aforementioned scenarios, the information from various matrices, minutes, assembly reports, and co-managers' notes was reviewed and processed to synthesize and integrate data for the improvement of the mechanism proposal shared during the formulation stage. The following sections provide descriptions of each of the components and means that define the final RCCFS mechanism proposal and its implementation roadmap within the project.

Between April and May 2023, the presentations of the RCCFS mechanism were held in the settlements of each AATI (La Chorrera, Puerto Arica, San Rafael, and Puerto Alegría). These were in-person meetings conducted on-site by South Pole team, and executive committee members of each AATI and other local leaders were invited. The proposal presented in these spaces incorporated the observations and improvements gathered during the validation work led by the co-managers.

During the RCCFS mechanism presentations, it was clarified that this was a proposal for early implementation, essentially a pilot exercise during the pre-issuance of the bonds. The goal was to train and prepare communities as project proponents to lead and fulfill this standard requirement. In these spaces, a communicative piece was distributed to each community, and the report on the RCCFS mechanism was handed over to the president of each AATI, along with the RCCFS documentation and systematization formats.



Figure 38. Updated informative poster on the RCCFS mechanism

Source: compiled by South Pole (2023).

Finally, to establish an organization scheme for the dissemination of this mechanism Figure 34 proposes a structure for consistently nurturing this tool through the collaborative efforts of the AATI participating in the project. Such structure takes into account communication diagnostics and local organizational forms to channel generated information and, most importantly, to determine how and when responses to requests, questions, or complaints about the project should be handled.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The quantification of emission reductions followed the guidelines of VCS VM0015, Methodology for Avoided Unplanned Deforestation , *version 1.1.*

This methodology also required the application of the following approved modules or tools:

VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities, v3.0 y CDM Tool for testing significance of GHG emissions in A/R CDM project activities.

3.2 Applicability of Methodology

The REDD+ Project meets with the applicability conditions for the use of the VCS VM0015 methodology as follows:

- **The methodology has no geographic restrictions**; therefore, it can be applied to any instance within the project expansion area.
- **Baseline activities may include planned or unplanned logging for timber, fuel-wood collection, charcoal production, agricultural and grazing activities as long as the category is unplanned deforestation according to the most recent VCS AFOLU requirements:** project area baseline activities include unplanned deforestation and forest cover degradation due to the development of productive activities that promote alternative uses or transformation of forest cover and the inability of institutions to control these activities. Unplanned deforestation activities in project area during reference period included subsistence farming and selective logging in legally designated areas or collective territories such as the Predio Putumayo Reserve. The main drivers of unplanned deforestarion identified include expansion of the agricultural frontier, livestock farmin, road development and waterways, timber extraction for sale and self-consumption, illicit crops, and increased ecosystem stress and mortality.
- **Project activities may include one or a combination of the eligible categories defined in the description of the scope of the methodology:** according to baseline and the proposed project activities, the project is under the category C, avoided degradation/deforestation with carbon stock decrease due to logging in the baseline and protection without logging, fuel wood collection or charcoal production for the project scenario.[29]
- **The project area can include different types of forest, such as, but not limited to, old-growth forest, degraded forest, secondary forests, planted forests and agro-forestry systems meeting the definition of "forest":** project area is dominated by tropical wet forests meeting National

[29] Avoided degradation ocurring prior to deforestation and forest carbon stocks increase will be conservatively not claimed.

Forest definition.[30] This definition is consistent with the criteria defined by the UNFCCC in its decision 11/CP.7, with the definition adopted by Colombia before the Kyoto Protocol (MAVDT, 2002), as well as with the definition of natural forest cover included in the adaptation for Colombia of the CLC methodology.

- **Project area includes only land that has qualified as forest for at least 10 years prior to the project start date** (see section 1.8) for REDD+ activities.
- **The project area can include forested wetlands (such as bottomland forests, floodplain forests, mangrove forests) as long as they do not grow on peat**: project area includes Amazonian floodplain forest but growing on non-organic soils according to methodology peat definition.

3.3 Project Boundary

3.3.1 Carbon pools

According to the methodology VCS VM0015, carbon stocks change in above-ground biomass is always significant. As a conservative approximation, only aboveground biomass, belowground biomass and soil organic carbon (SOC) carbon pools were considered for both the baseline and project scenarios.

Table 35 presents the relevant carbon pools for the REDD+ Project and the baseline scenario considered from the methodology.

Table 35. Carbon sinks included or excluded within the boundaries of the REDD+ Project area.

Carbon pools	Included?	Justification
Above-ground biomass from trees	Included	The change in carbon stocks for this sink is always significant. Mandatory according to the methodology.
Above-ground biomass from non-woody vegetation	Excluded	Conservatively excluded. The exclusion does not lead to a significant over-estimation of the net anthropogenic GHG emission reductions of the AUD project activity. Final land covers afer deforestation do not include perennial crops.
Below-ground biomass	Included	Accounts about for 20% of carbon stocks in above-ground biomass. Decay of carbon in below-ground biomass was considered.

[30] Colombian definition of forest: "Land mainly occupied by trees that may contain shrubs, palms, guaduas, grass, and lianas, in which tree cover is predominant with a minimum canopy density of 30%, a minimum canopy height (in situ) of five meters at the time of identification, and a minimum area of one hectare. Tree cover of commercial forest plantations, palm plantations, and trees planted for agricultural production are excluded."

Carbon pools	Included?	Justification
Litter	Excluded	Excluded in accordance with the VCS Methodological Requirements V.4.1
Dead wood	Excluded	Conservatively excluded. The exclusion does not lead to a significant over-estimation of the net anthropogenic GHG emission reductions of the AUD project activity
Soil organic carbon	Included	Recommended when forests are converted to cropland. Final land covers after deforestation includes mosaics of different crops, grasslands, and natural vegetation.
Harvested wood products	Excluded	Insignificant. The pool represents less than 5% of the GHG emissions attributable to the project activity (ex ante assessment using CDM tool for testing significance of GHG emissions)[31]

Source: prepared by South Pole (2023) based on the methodology VCS VM0015.

3.1.1 Sources of GHG emissions

The GHG sources included or excluded from the scope of the REDD+ Project are shown in Table 36.

Table 36. GHG sources included or excluded from the scope of the REDD+ Project.

Source		Gas	Included?	Justification
Baseline scenario	Biomass burning	CO_2	Excluded	Counted as carbon stock change
		CH_4	Excluded	Insignificant. The pool represents less than 5% of the GHG emissions attributable to the project activity (ex ante assessment using CDM tool for testing significance of GHG emissions)[32]
		N_2O	Excluded	Considered insignificant according to VCS Program Update of May 24 th, 2010

[31] The input data is presented in supporting information "20230509_Calculo_HWP_Incendios.xlsx" and "20211015_Documento_soporte_HWP_incendios.docx"

[32] The input data is presented in supporting information "20230509_Calculo_HWP_Incendios.xlsx" and "20211015_Documento_soporte_HWP_incendios.docx"

Source		Gas	Included?	Justification
		Other	NA	NA
	Livestock emissions	CO_2	Excluded	CO2 emissions from livestock are considered insignificant for the VCS VM0015 and are therefore excluded.
		CH_4	Excluded	Conservatively omitted
		N_2O	Excluded	Conservatively omitted
		Other	NA	NA
Project scenario	Biomass burning	CO_2	Excluded	Counted as carbon stock change
		CH_4	Excluded	Insignificant. The pool represents less than 5% of the GHG emissions attributable to the project activity (ex ante assessment using CDM tool for testing significance of GHG emissions)
		N_2O	Excluded	Insignificant. The pool represents less than 5% of the GHG emissions attributable to the project activity (ex ante assessment using CDM tool for testing significance of GHG emissions)
		Other	NA	NA
	Fossil fuel used during operations	CO_2	Excluded	Emissions from fossil fuel combustion are considered de minimis for the VCS VM0015 and are therefore excluded.
		CH_4	Excluded	Insignificant
		N_2O	Excluded	Insignificant
	Livestock emissions	CO_2	Excluded	CO2 emissions from livestock are considered insignificant for the VCS VM0015 and are therefore excluded.
		CH_4	Excluded	Project activities do not include livestock
		N_2O	Excluded	Project activities do not include livestock
		Other	NA	NA
Leakage belt	Biomass burning	CO_2	Excluded	Counted as carbon stock change
		CH_4	Excluded	Insignificant. The pool represents less than 5% of the GHG emissions attributable to the project activity (ex ante assessment using CDM tool for testing significance of GHG emissions)

Source		Gas	Included?	Justification
		N_2O	Excluded	Insignificant. The pool represents less than 5% of the GHG emissions attributable to the project activity (ex ante assessment using CDM tool for testing significance of GHG emissions)
		Other	NA	NA
	Livestock emissions	CO2	Excluded	CO2 emissions from livestock are considered insignificant for the VCS VM0015 and are therefore excluded.
		CH4	Excluded	Non-CO2 emissions from displaced baseline activities, which are conservatively omitted in the baseline, can be ignored, as in the worst-case scenario they would be similar to baseline emissions
		N2O	Excluded	Non-CO2 emissions from displaced baseline activities, which are conservatively omitted in the baseline, can be ignored, as in the worst-case scenario they would be similar to baseline emissions
		Other	NA	NA

Source: prepared by South Pole (2023) based on the methodology VCS VM0015.

3.4 Baseline Scenario

In the Amazon biome, to which the region reference belongs, natural resource extraction campaigns began in 1536, with the contact with the Spanish crown, and only started to decrease after the declaration of the Amazon Forest Reserve in 1959. From that date to the present, the coexistence of agriculture at different scales, illicit crops, indigenous lifestyles, the effects of global climate change, and the often illegal or deregulated extraction of forest and non-forest products have caused peaks and troughs in deforestation and land degradation rates.

For a detailed description of the baseline scenario, the methodology VCS VM0015 suggests the following step-by-step procedure:

1. Step 1. Definition of boundaries.
2. Step 2. Analysis of historical land-use and land-cover change.
3. Step 3. Analysis of agents, drivers and underlying causes of deforestation and their future development.
4. Step 4. Projection of future deforestation.
5. Step 5. Definition of the land-use and land-cover change component of the baseline.

6. Step 6. Estimation of the baseline carbon stock changes.

Each of these steps are explained below. The baseline scenario was complemented by the information presented in the following sections:

- Section 1.13 on physical-biotic factors (climate, hydrology, topography, soils, land cover) and relevant socioeconomic aspects prior to the project initiation.
- Section 1.16.1 on emission trading programs and other binding limits.
- Section 1.11.1 on the background information that influenced the project design.
- The attached supporting document *Annex4. Supporting_Document_No_1_Socio-environmental _Characterization*

3.4.1 Step 1. Definition of boundaries

Spatial boundaries

Considering the guidelines of the methodology VCS VM0015, the spatial limits of the project were defined in terms of the reference region, project area, and leakage belt for unplanned deforestation projects as follows:

Reference region (RR)

According to the methodology VCS VM0015, the reference region (RR) is the spatial delimitation of the analytic domain from which information about rates, agents, drivers, and patterns of land-use and land-cover change (LU/LC-change) will be obtained, projected into the future, and monitored.

For the REDD+ Project, a baseline was developed for a reference region of a one discrete are encompassing the project area and the leakage belt. The delimited reference region covers an area of 15,653,166 ha, which is equivalent to four times the Project Area (PA) (3,610,399 ha) and is in the western region of the Amazon biome, between the Putumayo River basins, Caquetá River, and Caguán River (Figure 39).

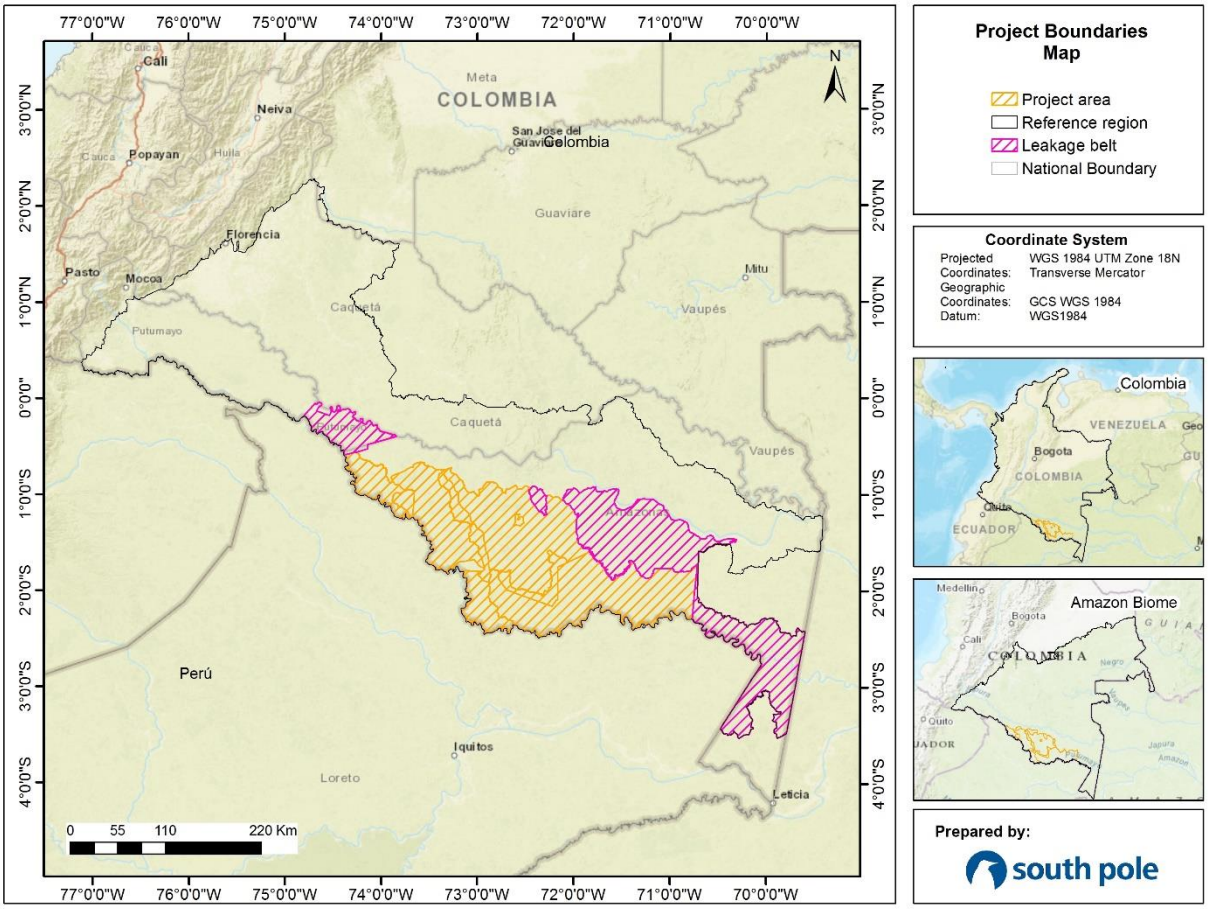


Figure 39. Location and geographic boundaries of the RR reference region for deforestation and degradation.

Source: prepared by South Pole (2023).

RR shares biogeographical and sociocultural criteria, mainly associated with the presence of Amazonian Forest, geomorphology, altitude ranges, hydrographic basins, as a unit of natural delimitation, and cultural manifestations. The defined RR follows the requirements established in the methodology VCS VM0015:

<u>Landscape configuration and ecological conditions:</u>

- **Forest/vegetation classes:** for the REDD+ project, 100% of the ecosystem type classes in the project area exist in the reference region, which corresponds to the Tropical Rainforest. Regarding the types of forest, for the reference region and for the project area, the surface is mainly covered with dense high forests. This type of forest covers 79% of the total area of the reference region and 98% of the total area of the project. Therefore, the main forest type in the reference region has a similarity of 81% with this same forest type in the PA. Additionally, these two areas share small and similar portions of different types of vegetation such as floodplain

forests, palm groves, fragmented forests, and secondary vegetation. Finally, the forest types that compose at least 5% of the PA are present in the RR and vice versa.

- **Elevation:** the Amazon corresponds to a natural region where high elevations are rare since it is 98% flat jungle. Specifically for the reference region and the project area, 91% of the reference region and 100% of the project area have surface elevations below 500 meters above sea level. They present a similarity of 96.3%.
- **Slope:** 91% of the reference region and 95% of the project area have a slight slope pf less than 15%.
- **Rainfall:** the climate in the 100% of reference region and 100% of project area is classified as Warm-Humid (WH) according to the Caldas-Lang Climate Method and in terms of Holdridge life zones, they correspond to the Tropical Humid Forest (T-hf). The average annual temperature varies between 25 and 26°C, the behavior of the precipitation is unimodal, and the estimated value of multiannual annual average precipitation varies between 2.600 – 3.200 mm and is always above the potential evapotranspiration, therefore that there is no water deficit at any time of the year in both areas.

RR fully met three of the landscape and ecological conditions to be selected according to the VCS VM0015.

It's important to highlight that the RR was delineated based on natural geographical features such as the Caqueta River basin and the sub-basin of the Putumayo-Ica River. These features not only define the boundaries but also play a crucial role in understanding access and mobility concerning deforestation agents. The rivers serve as primary routes and potential areas where deforestation may occur.

Figure 40 presents the landscape configuration, emphasizing the topological boundaries associated with the Caqueta Basin and the Putumayo River Basin, which serves as the primary hydrological source for the PA.

In Table 37 is presented that all the variables are Accomplish or Overcomplish in terms of proportion between the RR and the PA.

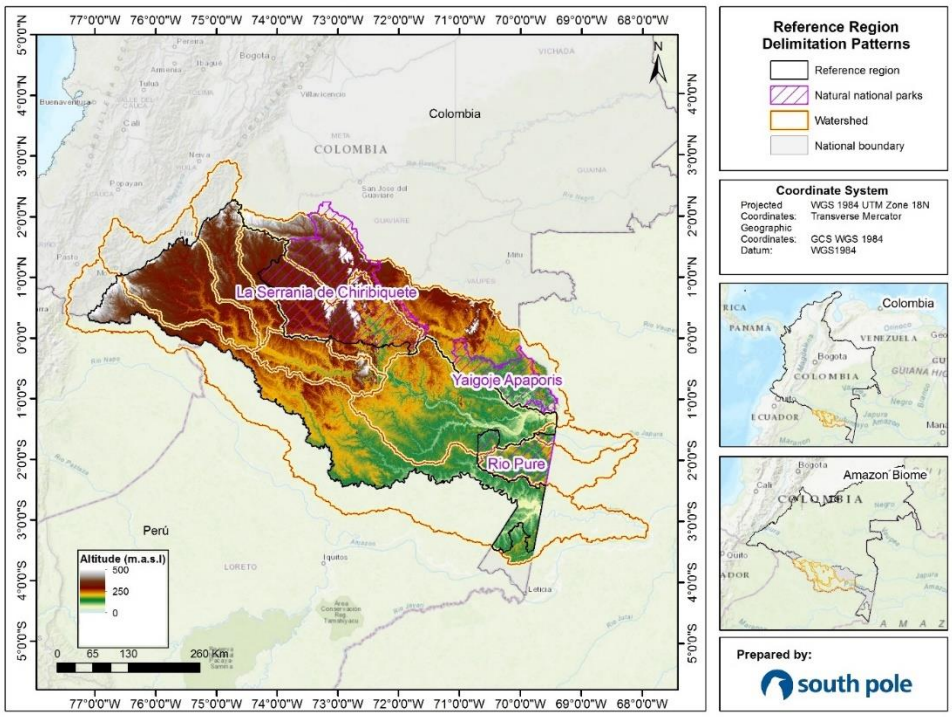


Figure 40. Landscape definition of the RR.

Source: prepared by South Pole (2023).

Table 37. Proportion of the spatial variable in the PA and RR

Variable		Project area (ha)	% Variable in PA	Number of ha required in the RR	Lower limit	Top limit	Number of ha registered in the RR	Observation
Slopes	Gentle <15%	3,424,360	1	14,846,580	11,877,264	17,815,897	14,189,994	Accomplish
	Steep >15%	186,026	0	806,532	645,225	967,838	1,408,688	Overcomplish
Elevation	<=500m	3,610,399	1	15,653,166	12,522,533	18,783,800	15,591,847	Accomplish
Precipitation	2600-3200 mm	3,610,399	1	15,653,166	12,522,533	18,783,800	13,445,629	Accomplish
Temperature	> 26.5°C	259	0	1,122	898	1,347	461,757	Overcomplish
River	Occupied area	7,124	0	30,887	24,710	37,065	274,670	Overcomplish
Communities	Density	NA	0	0	0	0	0	NA
Settlements	Density	NA	0	0	0	0	0	NA
Land cover IPCC - 2016	Cropland	266	0	1,155	924	1,386	2,138	Overcomplish
	Forest land	3,552,364	1	15,401,550	12,321,240	18,481,859	12,518,714	Accomplish
	Grassland	7,044	0	30,538	24,431	36,646	2,090,085	Overcomplish
	Non data	14	0	63	50	75	61,494	Overcomplish

Variable		Project area (ha)	% Variable in PA	Number of ha required in the RR	Lower limit	Top limit	Number of ha registered in the RR	Observation
	Other land	145	0	630	504	756	51,113	Overcomplish
	Settlements	75	0	324	259	389	5,459	Overcomplish
	Shrubland	32,125	0	139,282	111,426	167,139	688,814	Overcomplish
	Wetland	18,365	0	79,625	63,700	95,550	235,349	Overcomplish

Source: prepared by South Pole (2023).

Agents and drivers of deforestation

The predominant engine types should be the same for both the reference region and the project area. Based on primary and secondary information, remote sensing, and socioeconomic cartography available at the national and regional levels, it was possible to determine that the agents and drivers of deforestation within the project area also occur in the reference region, as is described in (Table 38). For detail information on agents, drivers and underlaying causes of deforestation see Section 3.4.3 and the file *Annex 6-Agents and drivers of deforestation-Predio Putumayo V1.1.*

Table 38. Agents and drivers, criteria for the delimitation of the reference region according to methodology VCS VM0015.

Requirement	Compliance
Agents	Deforestation in the RR, PA and LKB is driven by a complex interplay of various agent groups, including criminal organizations, agro-industrial interests, illegal timber traders, and indigenous communities. While some groups have a direct and significant impact, others contribute indirectly or to a lesser extent as follows: • Criminal Organizations and Illegal Armed Actors: Operating along the Colombian-Peruvian border, these groups have evolved post-FARC peace agreements, engaging in illegal logging, gold extraction, and other illicit activities. o Population Change: Likely increasing, subject to law enforcement efforts and demand for illegal commodities. o Deforestation Impact: High relative importance, major drivers of deforestation and degradation due to their involvement in illegal activities. • Agro-Industrial and Extractive Sector: Expanding into previously inaccessible areas post-conflict, contributing to deforestation through agriculture, minerals extraction, and infrastructure projects. o Population Change: Constant to increasing, driven by economic

Requirement	Compliance
	incentives and land availability. ○ Deforestation Impact: Medium relative importance in the reference region, low in protected areas, due to legal protections and logistical challenges. • Illegal Timber Traders and Intermediaries: Operating along borders, these intermediaries facilitate illegal logging and timber trade, exploiting regulatory gaps and weak law enforcement. ○ Population Change: Constant to unpredictable, influenced by enforcement and market dynamics. ○ Deforestation Impact: Medium relative importance in the reference region, high in indigenous reserves due to exploitation of indigenous territories and weak law enforcement. • Indigenous Communities: Depend on forests for livelihoods, some involved in illegal activities due to external pressures, but overall, their impact on deforestation is moderate. ○ Population Change: Relatively stable, impacted by socio-economic factors and external pressures. ○ Deforestation Impact: Medium relative importance in the reference region, high in protected areas due to traditional agricultural practices and encroachment by external actors. • Peasant Communities: Engaged in land clearing for agriculture, but their overall contribution to deforestation is lower compared to other groups. ○ Population Change: Constant, influenced by socio-economic factors. ○ Deforestation Impact: Low relative importance in both the reference region and protected areas. • Corrupt Government Entities: Involved in corruption, facilitating illegal activities such as timber trafficking, but their direct impact on deforestation is indirect and difficult to quantify. ○ Population Change: Constant to unpredictable, subject to efforts to combat corruption. ○ Deforestation Impact: Low relative importance due to legal protections, social cohesion, and external oversight in protected areas.
Drivers	The drivers behind deforestation, particularly in the context of market reasons, are complex and multifaceted. They involve various agents whose decisions are influenced by economic incentives, cultural practices, and socio-economic factors. The **driver variables explaining the quantity of deforestation**, particularly in the context of market reasons, underscores the intricate interplay of economic incentives, cultural practices, and socio-economic dynamics. From local market

Requirement	Compliance
	demand for natural resources to subsistence economic activities and residential use, various agent groups are influenced in their decisions to deforest or degrade forests. The drivers identified, such as market demand for timber, minerals, and agricultural products, highlight the pervasive influence of economic factors on deforestation. This demand, both at local and international levels, creates incentives for exploitation and unsustainable practices, often leading to the encroachment of forested areas. Additionally, subsistence economic activities, deeply rooted in indigenous and peasant communities, contribute to deforestation as they navigate economic pressures and cultural traditions. • Market Demand for Natural Resources: market demand for timber, minerals, and agricultural products, both domestically and internationally. factors. • Subsistence Economic Activities and Residential Use: Subsistence activities intertwined with land and forest resource use, as well as residential occupancy patterns. Agents of deforestation capitalize on market opportunities, exploit loopholes in regulations, and compete for land and resources, driving deforestation through various means. Looking ahead, the trajectory of deforestation is likely to be shaped by continued market demands, urbanization, and international trade, among other factors. The **driver variables explaining the location of deforestation** in the RR, PA, and LKB are multifaceted and interconnected, encompassing various socio-economic, political, and environmental factors. Proximity to existing infrastructure, such as roads and navigable rivers, facilitates access to forested areas (by rivers but also from previous deforested areas), enabling activities like illegal logging and land grabbing by criminal organizations, the agro-industrial sector, and illegal timber traders. Additionally, the presence of illegal industrial facilities further exacerbates deforestation, providing infrastructure for illicit activities and increasing pressure on indigenous and peasant communities. The expansion of existing settlements and the historical deforestation loops also play a significant role in deforestation, attracting people for economic opportunities and leading to increased land conversion for agriculture and urban development. Weak governance and enforcement of land management policies contribute to unchecked deforestation, despite efforts to establish protected areas and indigenous reserves.

Source: prepared by South Pole (2023).

- **Population factors and transportation infrastructure**

In the project area there is a density of navigable rivers of 1.62% and in the reference region of 2%. Therefore, there is a similarity percentage of 99.86%. In general, in the southern Amazon, the main transport infrastructure is represented by navigable rivers. Although there are airports in the reference region and in the project area, also in the northern region of the reference region a network of unplanned tertiary roads has been developing (road density of 2.17%), the navigable rivers , especially the Putumayo and Caquetá rivers, are the main road axis, and around these a complex relationship dynamic is articulated between the actors in the reference region and the project area, for which it is concluded that the proximity and/or the potential for proximity to transportation infrastructure is similar in both areas.

In general, for the reference region and the project area, the population centers are distributed along the rivers. Its distribution is in semi-urban centers with dispersed populations, and although in the northern zone there is evidence of greater development of the settlement ring, which has occurred in less than 50 years, there is a remarkable trend of active development of towns in increasingly remote areas. that become new sources of deforestation and degradation (Armenteras, Cabrera, Rodríguez, & Retana, 2013).

In the reference region and the project area, the spatial configuration of the settlements and the infrastructure linked to them have been closely related to colonization, and it is through them that most of the country's territories have been incorporated into productive activities, a phenomenon which the Colombian Amazon does not escape, especially the western Amazon where it is more evident (Aguilar N, 1992), and progressively migrating southeastward, taking advantage of the geomorphological configuration and the relief of the main hydrological basins of the Amazon, even in contrast to the location of indigenous territories in this same region.

The process of repopulation of the Amazon region since the 1930s has been characterized mainly by colonization from the Andean region, directed at one time by the State and another, spontaneously caused by migratory flows that day by day become in an irreversible process due to the disorderly and uncontrolled way in which they occur, a phenomenon that exceeds the capacity of the State for its orientation or control. Therefore, this translates into serious threats of destruction and waste of forest ecosystems (CEPAL & Patrimonio Natural, 2013).

Historically, it is from the migratory flows that the Amazon region is articulated and integrated with the general socioeconomic system of the country, this allows to conclude that the migratory process and the occupation of the region are originated from causes of a structural type, a process that in recent years, has manifested in an accelerated manner, especially downstream of the most important navigable rivers (ECLAC & Natural Heritage, 2013).

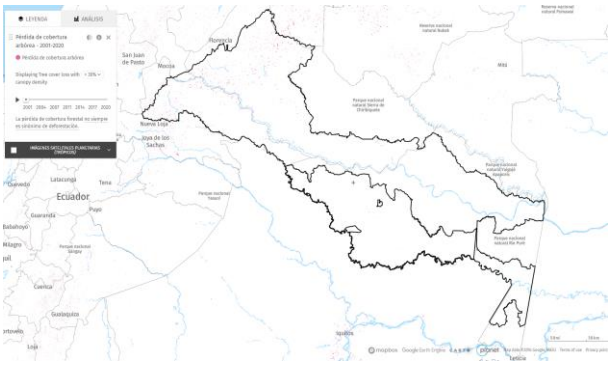
The colonization processes on the territory promote and are combined with an urbanizing pressure. The population of the region tripled in thirty years (1973-2005), with an average population growth rate for the Amazonian departments of 1.9% per year, higher than the national average (1.5%). The agglomerations and tendency to urban life in the Amazon also mean differentiated pressures on Amazonian resources and ecosystems. The region's urban settlement ring is the result of the rubber and cinchona booms, and at different times since 1973 of the exploitation of wood, oil, marijuana, and

coca. The different bonanzas have been temporary, leaving the colonist population without income and settled in the territory, for that reason the settlement of this ring has implied an increase in the demand for services for which the populated centers are not prepared in terms of infrastructure or planning. This a situation that promotes the repetitive dynamics of high dependency and demand for natural resources from the forest and the active maintenance of colonization (ECLAC & Natural Heritage, 2013).

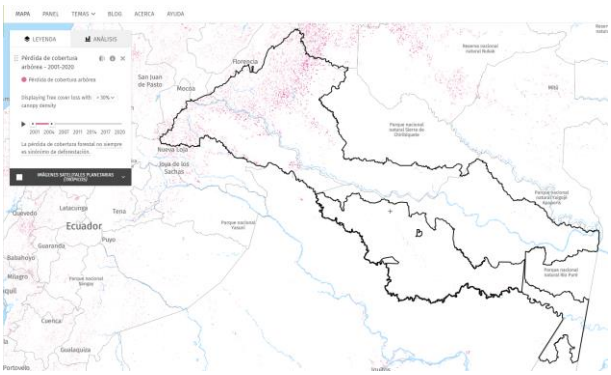
Although now, the northernmost part of the reference region is characterized by being the most active population center, the growth in the number of population centers along the rivers, identified as the main axis of colonization, is recurrent of the Amazon Forest (ECLAC & Natural Heritage, 2013). Increasingly, the trend and pressure towards the project area is evident, due to the increment in semi-urban centers of dispersed populations, generally riverside, in remote areas that become in new sources of deforestation and degradation (Armenteras, Cabrera, Rodríguez, & Retana, 2013). This is a situation that is already evident in jurisdiction of the AATI of COINPA and AZICATCH due to the accelerated growth of the populated centers of Puerto Alegría and La Chorrera, respectively.

Some of the phenomena that are observed with colonizing migration are that it is a long-term process, whose products and results we are seeing over time, where a displacement is evident (into the interior of the forest and other areas of the region) of the common colonist by the merchant or landowner once the lands have been appropriated and there is infrastructure, repeating in a certain way the experience of expulsion, increase in extractive economies and the relationship with the indigenous people based on the indiscriminate demand for natural resources from their territories, such as valuable wood, fishing, biodiversity and forest services, and the promotion of coca cultivation and the trafficking of species and wood, among others things.

Year 2001

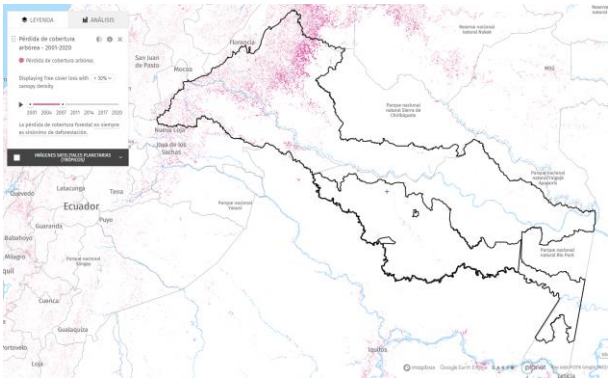


Year 2004

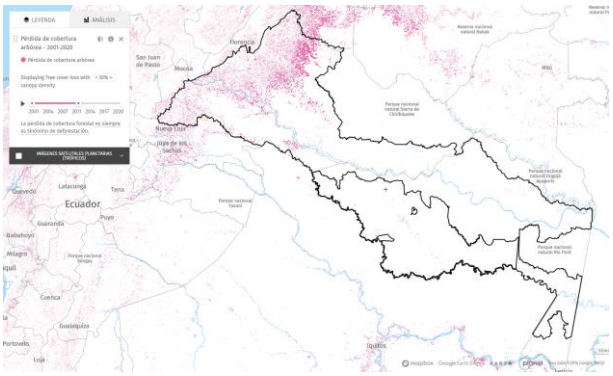


Year 2007

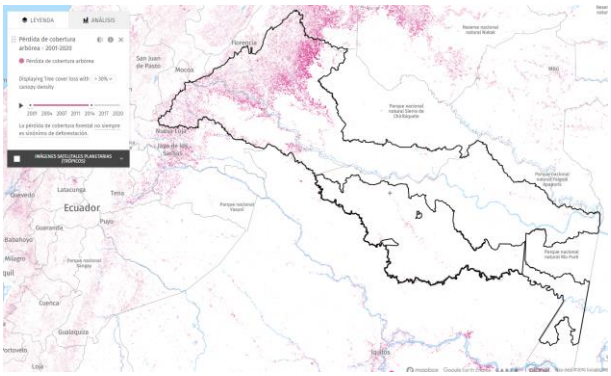
Year 2011



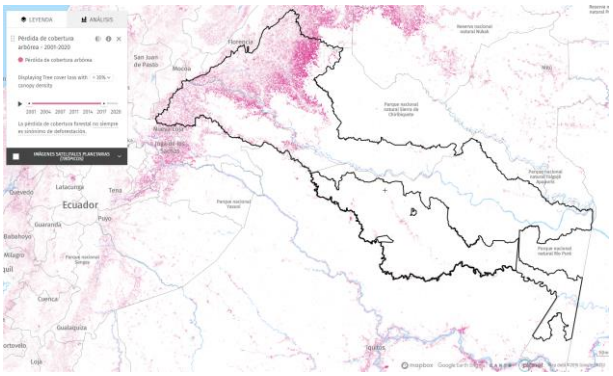
Year 2014



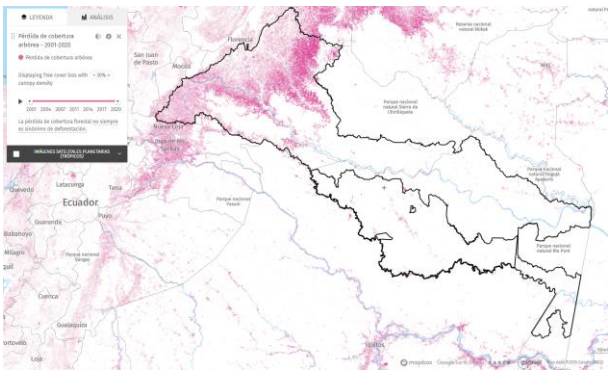
Year 2017

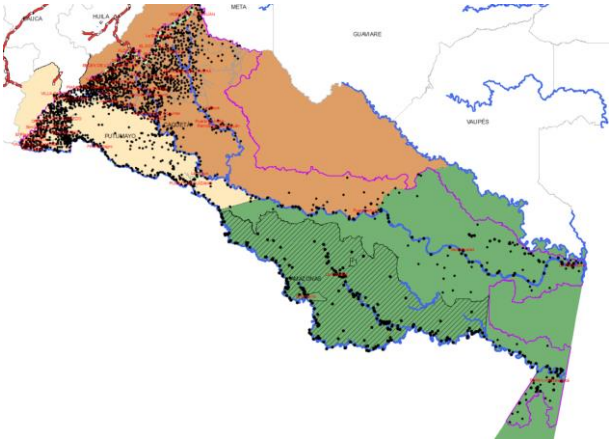


Year 2020

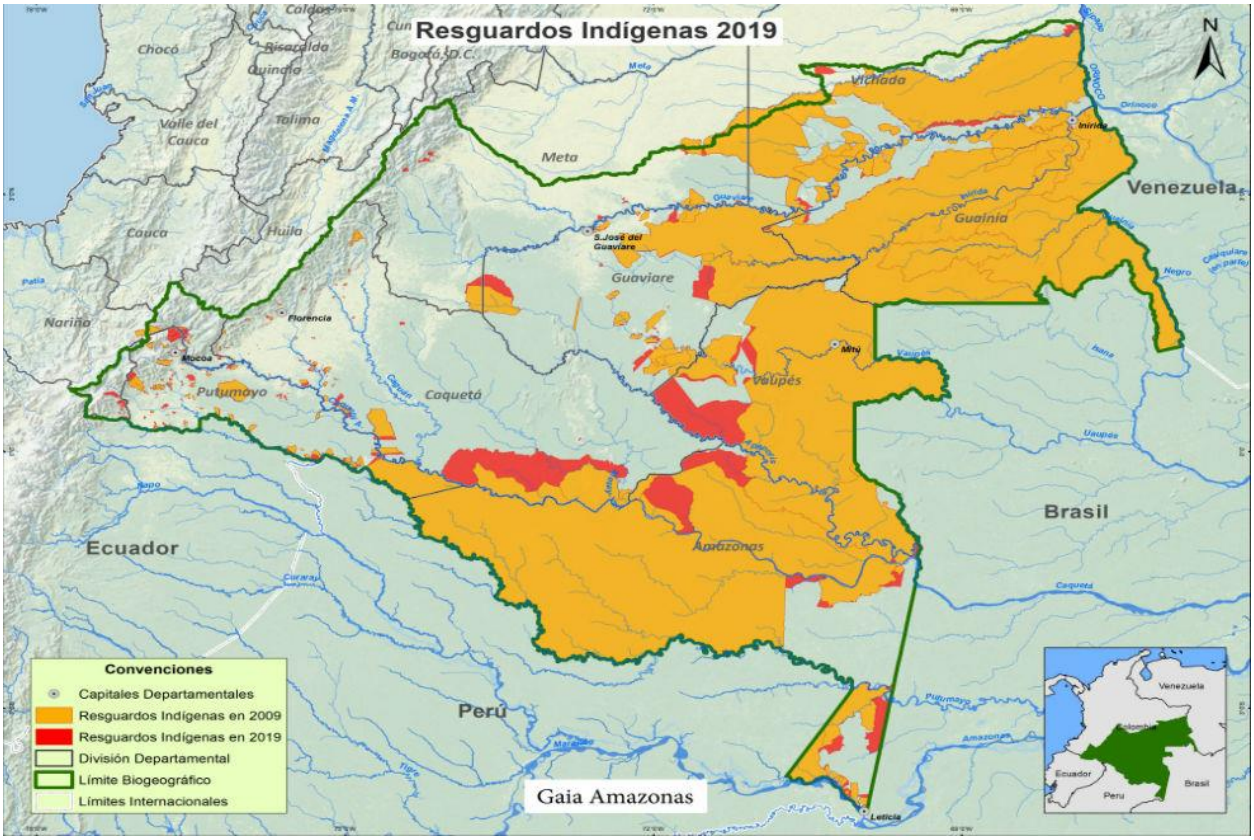


Colonization-migrations, rivers, settlement patterns





The figure illustrates the distribution of indigenous territories in the Colombian Amazon perpendicular to the direction in which the deforestation front advances, as well as the dynamics of colonization and mobility of agents along navigable rivers.



The figure illustrates that about 39% of the population that lives in the populated centers in the reference region were born in other municipalities of the Colombian territory, it is evidencing the active migratory processes towards this area of the country.

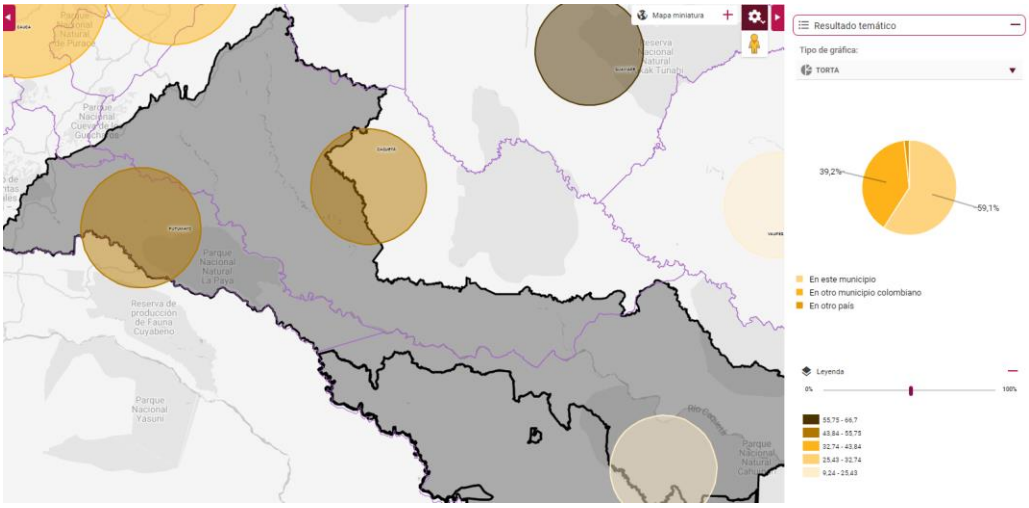


Figure 41. Graphical trend of forest loss in the reference region and project area and its relationship with colonization, migrations, rivers, and settlement patterns.

Source: Global Forest Watch (2021), DANE (2018) InfoAmazonia (2019) y South Pole (2021).

As extensively documented by the research Condemning the Forest (EIA, 2019), the phenomenon of migration - colonization - deforestation defines the model of occupation and use of the forest in the reference region and the project area, coupled with the armed conflict and its consequences. illegal economies. Figure 42 and Figure 43 present the complex socio-economic dynamics around the use of natural resources (wood extraction) in the reference region and the project area, which are closely linked.

The trend shows the sources of deforestation and degradation from the northwest to the center and southwest of the Amazon, depending on the rivers that constitute the main waterways for the transit of the different actors in the region. Although, in the reference region and the project area, there are aerodromes, air transport is not as relevant as river transport and although in the northern part of the reference region, in recent years there has been developing an important but precarious communication network of tertiary roads, not planned, but a product of the colonization process, are the navigable rivers and especially the Putumayo River, the main communication routes, this being the axis river through which establish relationships between settlers and indigenous communities.

Currently, the main points of wood extraction are Cartagena del Chaira, Milan and Puerto Leguizamo, sites such as Puerto Alegría, located in the project area, and Tarapacá, at the southern end of the reference region, are beginning to be registered. They show the pressure on the territory and the latent threat of deforestation and forest degradation (Figure 42).



Figure 42. Location of timber extraction sites in the Colombian Amazon.

Source: Environmental Investigation Agency, Inc. (2019).

Additionally, the Putumayo River, one of the main axes in the PA, is cataloged as one of the waterways where most of the timber traffic in the Amazon occurs (Figure 43).



Figure 43. The Putumayo River as the main waterway for timber traffic.

Source: Environmental Investigation Agency, Inc. (2019).

This relationship represents cultural conflicts that occur between two opposing models of link with nature, the settlers intend in their advance in the forest, to dominate and transform the environment to achieve the establishment of activities of exploitation and extraction of resources. On the other hand, the indigenous communities have ancestrally developed knowledge and practices of integration and coexistence with the forest. In this sense, stopping the advance of this colonization that is characterized by illegal activities such as the extraction of wood and by occupying the territory in a disorderly manner, represents, in addition to the preserve of ecosystems, the protection of indigenous communities and their cultural diversity of from which the practices that have made possible the conservation of the forest emerges. Based on the facts mentioned above, we can conclude that although the northern part of the reference region is closer to the center of the country, the rest of the reference region and the project area are not isolated, given that, despite the lack of land routes or affordable air transport for the inhabitants of the center of the country, the mobility of the settler population occurs along the rivers and especially the Putumayo River, which articulates a strong and complex dynamic socioeconomic and cultural, which transcends spatial limits and configures a close relationship between the entire reference region and the project area.

Socioeconomic and cultural conditions

The general social, economic, and cultural conditions are common for the PA and the RR. They are described below.

- Legal status of the land and land tenure

In Colombia, land ownership is conditioned by a series of rights and institutional rules that define access (individual or collective) and its possibilities of use (González, et al., 2018). Indigenous reserves are the main type of land tenure in the Amazon region, followed by forest reserves and national parks.

In the project area, land tenure belongs to the Putumayo Predio Indigenous Reserve, which, due to its status as a reserve, constitutes a legal and sociopolitical institution of a special nature compose of indigenous communities that have a collective property title and manage the territory in accordance with an organization of the indigenous jurisdiction, guidelines, and cultural traditions. This condition also exists in the reference region, where about 62% of the property is collective under the figure of Indigenous reserve.

In the reference region, there is also the grabbing of uncultivated land in the nation illegally by settlers, armed groups, and landowners, because of the allocation policy of uncultivated land that Colombia developed to consolidate colonization and to promote settlements and development. agricultural. A problem associated with the adjudication of vacant lots in the Amazon region is the migration of foreign families who are granted land indiscriminately in parks, indigenous reserves, forest reserves or management districts. In this way, a unique landscape is configured in which small and medium-sized farmers, large farms, groups of coca growers, and a fragile administrative or governmental branch coexist under the territorial domination of illegal forces (Botero and Rojas, 2018).

Although land ownership in the project area belongs to communities that make up the Putumayo Property Indigenous Reserve, it is highly threatened by the land conflict that has been going on for decades in the country, where property regimes of land have also been determined the dynamics of colonization in the Amazon. The deforestation and occupation of the territory are carried out with the expectation that it will be removed from the reserved category to legalize the titling and achieve a subsequent sale of the land. These appropriation processes have favored the concentration of rural property in the hands of landowners who expand their land and exacerbate the poverty conditions of medium and small producers (farmers) who enter the forest in search of new colonization areas. These people have no other option than enter the forest and generate new colonization zones (ECLAC and Natural Heritage, 2013) (see section 1.7 and Annex 20211015 Support document Analysis of motor agents).

Finally, other socioeconomic and cultural aspects that integrate the project area with the reference region are exposed.

- The historical process of the oil boom as a reference for the region (Alcaldía de Puerto Asís, Plan de Desarrollo 2020-2023).
- The consolidation of an exchange center with the South of the country due to the construction of highways that has allowed connectivity.
- The strong presence of indigenous communities in rural areas belonging to ethnic groups with a presence in the project area such as: Murui (Huitoto), Kichwa, Inga.
- The accelerated phenomenon of urbanization that begins in the northern part of the region in which 70% of the urban development of the municipalities has been generated in the last 30 years

with a spatial and temporal pattern that has been spreading towards the south of the region. There are already demonstrations in the project area.

- River transportation through the Putumayo River as the main route of colonization of the territory, mobility of the population and extraction of resources.
- The ratio of population located in urban and rural areas is similar in their capitals. Puerto Asís (60% urban and 40% rural) Leticia (70% urban and 30% rural) (Sources: Planes de Desarrollo 2020-2023).
- Demographic characteristics such as the distribution of the population by sex, the proportion between men and women and especially the migratory population registered in the DANE census (2018) is similar.
- Presence of extractive activities and illicit crops (Source: Corpoamazonia).
- Basically, agriculture is developed to supply the internal demands and needs for traditional products such as cassava, plantain, corn, and rice. In the same way, some fruit crops are important: arazá, chontaduro, and others.
- Characterization studies developed by recognized authorities such as Corpoamazonia conclude the existence of similarities that constitute the same region. In this way, the Environmental Management Plan of this corporation groups the region of the South of the Colombian Amazon (Putumayo, Caquetá, and Amazonas) and calls it "The South of the Colombian Amazon as a cohesive social, cultural, economic and politically, aware of its ethnic, biological, cultural and landscape diversity".
- Differences in regional planning and territorial ordering are due to the fragmentation and disarticulation of public entities. Even so, the existence of a single environmental authority is due to regional correlation, territorial, social, and ecological.
- In cultural terms, there are no homogeneous manifestations at a general level in the Amazon, since it is the area of the country with the most cultural diversity, therefore "The indigenous peoples of the South of the Colombian Amazon are characterized by the fact that they have their own traditional systems of authority, teaching and learning, health - traditional medicine, environmental management, among others, these particularities are recognized by Colombian laws and international agreements (Corpoamazonia). However, between cultural diversity, there are some common elements among the indigenous peoples of this region, such as the presence of ancestral laws, uses and customs, the authority and government that each of the indigenous populations. They constitute the center of community life in the Amazon region or region of the culture of yagé, tobacco, ambil and sweet yucca. In this way, cultural manifestations are identified between the communities that inhabit the region that show links and ancient human dynamics in this environment. For instance, the Siona have a language related to the Tukano family and their practices are like the Amazonian ethnic groups such as itinerant slash-and-burn horticulture, hunting, fishing, gathering, etc. (Source: Confederación de Nacionalidades Indígenas del Ecuador).
- **Land use:** current and projected classes of land-use in the project area are found elsewhere in the reference region. Current land-use classes were present in the project area in the same proportion as in the RR (±20%) at the start of the historical reference period.

Table 39. Land-use classes in PA and RR at the start of the historical reference period.

Land use IPCC 2016	Project area (PA)		Reference region (RR)	
	ha	%	ha	%
Cropland	266	0,01%	2,138	0.01%
Forest land	3.552.365	98,39%	12,518,714	79.98%
Grassland	7044	0,20%	2,090,085	13.35%
Non data	0	0,00%	61,494	0.39%
Other land	0	0,00%	51,113	0.33%
Settlements	136	0,00%	5,459	0.03%
Shrubland	32.209	0,89%	688,814	4.40%
Wetland	18.378	0,51%	235,349	1.50%
Total (ha)	**3,610,399**	100.00%	**15,653,166**	100.00%

Source: prepared by South Pole based on SMByC layers.

- **Enforced policies and regulations**

Enforced policies and regulations apply for both the project area and the reference region (see section 1.14). It is emphasized that, despite the existence of a self-government in the project area, the Colombian Political Constitution and all its statutory and organic laws apply throughout the Colombian territory, and, in principle, its rank is superior to any other law. Section 1.14 develops the entire regulatory framework that applies to the reference region and the project area.

The provided information clearly illustrates the complexity and severity of deforestation in the reference region, especially in the southern Amazon. This region has witnessed a historical pattern of deforestation originating in the Amazon foothills, encompassing the upper and upper-middle basin of the Putumayo River (departments of Putumayo and Caquetá), and extending southeastward along the banks of the Putumayo and Caquetá rivers. This expansion of deforestation has significantly affected 38 indigenous reserves, underscoring the complexity of the phenomenon and its impact on the region's indigenous communities.

It is evident that deforestation in the Amazon is not exclusive to non-indigenous territories. Even indigenous reserves, such as the Predio Putumayo, have been affected, contributing to the deforested area since 90s, considering the persistence of deforestation from the spot created historically on the banks of the Putumayo River (from the deforestation front that is dangerously close to the limits of the project area), Cara-Paraná and Igara-Paraná. This dramatic increase in deforestation prior to the

project's initiation highlights the urgency and importance of addressing this issue comprehensively and effectively.

The delineation of the reference region was based on a detailed understanding of the biogeographical, socioeconomic, and cultural factors influencing deforestation. Key agents and drivers of deforestation were identified, such as the illegal timber corridor of the Putumayo River, which highlight the complexity and interconnections of this phenomenon. The presence of indigenous communities and the influence of colonization and migration in the region underscore the need to address deforestation from a multidimensional perspective that considers both environmental and socioeconomic and cultural aspects.

- Comprehensive Analysis of Deforestation Agents: The project conducted a detailed analysis of the agents and drivers of deforestation in the Putumayo River sub-basin and the reference region. It identified socio-economic phenomena associated with the illegal timber corridor, providing insights into the dynamics of deforestation in the area.
- Biogeographical and Sociocultural Criteria: The reference region (RR) shares biogeographical and sociocultural characteristics with the Protected Area (PA), including the presence of Amazonian Forest, similar elevation, slope, and rainfall patterns. This similarity ensures that the RR is a suitable reference for assessing deforestation risk in the PA.
- Landscape Configuration and Ecological Conditions: The RR fully meets three landscape and ecological conditions outlined in the VCS VM0015 methodology. Forest/vegetation classes, elevation, slope, and rainfall patterns are comparable between the RR and the PA, ensuring that they provide a suitable basis for comparison.
- Population Factors and Transportation Infrastructure: The project area and the RR exhibit similarities in population distribution, transportation infrastructure, and settlement patterns. Both areas rely heavily on navigable rivers as primary transportation routes, facilitating the movement of populations and goods.
- Socioeconomic and Cultural Conditions: The project area and the RR share similar social, economic, and cultural conditions. Both areas experience colonization processes, urbanization trends, and cultural conflicts related to land use and resource extraction. Indigenous communities play a significant role in both areas, contributing to cultural diversity and traditional land management practices.
- Legal Status of Land and Land Tenure: The project area and the RR exhibit similar patterns of land tenure, including the presence of indigenous reserves and issues related to illegal economic activities, land conflicts and illegal land grabbing. Both areas, indigenous and non-indigenous face threats to land tenure security and encroachment by illegal actors, impacting conservation efforts and contributing to deforestation dynamics.

Furthermore, the similarity between the reference region and the project area ensures that the deforestation risk analysis is robust and accurate, providing a solid foundation for the design and implementation of conservation and management strategies.

Project area (PA)

The PA corresponded to the discrete plot(s) of land entirely covered by forest at the date of initiation of the project activity, which are under threat of deforestation and over which the project proponent has full control. Areas where there is land tenure or right of use are under disputes were excluded for validation and first verification but considered as potentital future project instances (buffer zones) under a grouped project design (See section 1.4).

Where less than 80% of the total proposed area of the project is under control at validation, new discrete units of land may be integrated into an existing project area if included in the monitoring report at the time of the first verification. For this case, the PA corresponds to the total area of forest as of December 31, 2016, within the boundaries of the territories of the four AATI in the Predio Putumayo Indigenous Reserve. The PA covers an area of 3,610,399 ha and is located between coordinates 0° 34' 12.01" S to 2° 26' 25.92" S and 70° 43' 14.23" W to 74° 25' 17.06" W. The PA does not include forests in which REDD+ Project activities will not be carried out or that were not included in the baseline assessment. The entire area is under the control of the project proponents at the time of validation (see Figure 3).

The boundary of the project area is also defined as follows:

- **Name (or names, as appropriate) of the project area:** traditional management areas of the Inidigenous Associations (AATI) of COINPA, CIMPUM; AIZA and AZICATCH in Predio Putumayo Reserve.
- **Physical boundary of each discrete area of land included in the project area (using appropriate GIS software formats):** see sections 1.3 and 1.12.
- **Description of current land-tenure and ownership, including any legal arrangement related to land ownership and the AUD project activity:** see section 1.7.1.
- **List of the project participants and brief description of their roles in the proposed AUD project activity:** see sections 1.5 and 1.6.

Leakage belt (LK)

The Methodology defines the Leakage Belt as "the land area or land areas surrounding or adjacent to the project area in which baseline activities could be displaced due to the project activities implemented in the project area". This means the areas where potential emissions could occur as a response to the implementation of the project activities.

To define the boundary of the leakage belt, two methodological options can be used:

- Opportunity cost analysis (Option I); and
- Mobility analysis (Option II).

For the project, as was mentioned in the Reference region (RR) section, the primary agents of deforestation in the Amazon correspond to the indigenous communities that have ancestrally occupied the territory, landowners who arrived with the pulse of migration, mining-energy companies established by government development policies, and armed groups promoted by the social inequality and low

institutional presence, which have found in the extraction of natural resources a source to finance their operations.

In general, the factors that trigger deforestation and forest degradation in the RR and PA are social, political, economic, and climatic. The drivers of deforestation in the territory are associated with the expansion of the agricultural frontier, cattle ranching, illegal extractive activities, the **use of the Putumayo River (navigable route) as the main corridor** for timber trafficking, illicit crops, timber extraction for sale and self-consumption, and the biological stress and mortality derived from the worsening of Climate Change (see section 3.4.3 and Annex 20211015_Documento_soporte_Analisis_agentes_motores).

In 2017, the Environmental Investigation Agency (EIA, 2017) team conducted fieldwork in municipalities and border areas in the departments of Putumayo and Amazonas, and additionally in cities such as Bogotá, Cali, and Florencia, to deepen its understanding of the dynamics of the legal and illegal timber trade occurring in the Colombian Amazon and on the border with Peru (where the project area is located). This report was the result of more than 100 interviews with officials from environmental authorities, law enforcement, loggers, local leaders, peasant and indigenous communities, former public officials, NGOs, politicians, and workers. The work involved both undercover investigations and formal interviews with multiple actors involved in timber harvesting and processing in the Amazon. Investigators followed the supply chain to identify key actors and discover how and in what manner the logging, transport, laundering, distribution, and sale of legal and illegal timber takes place.

EIA met with local and national environmental authorities and law enforcement, and reviewed the legal framework, academic reports and official documents and maps on deforestation to understand the challenges and opportunities for addressing the illegal timber trade. Through Rights of Petition, EIA obtained comprehensive information from Corpoamazonia for the 2012-2017 period on the total number of logging permits issued by the agency and the total number and type of sanctions issued, as well as copies of mobilization and remobilization permits issued.

Increasingly, the trend and pressure towards the PA are evident due to the increment of semi-urban centres of dispersed populations, generally riverside, in remote areas that become new sources of deforestation and degradation (Armenteras, Cabrera, Rodríguez, & Retana, 2013). This situation is already evident in the jurisdictions of the AATI COINPA and AZICATCH due to the accelerated growth of the populated centres of Puerto Alegría and La Chorrera, respectively.

As part of the results related to opportunity cost, some studies made in the Amazon region to understand the dynamics of the legal and illegal timber trade occurring in the Colombian Amazon and on the border with Peru (where the project area is located), highlighted the extractive process as an non-profitable economic activity for the local communities (Environmental Investigation Agency -EIA, 2017).

Many communities in the Amazon region - both indigenous and peasant - carry out subsistence activities in relative isolation, which makes them susceptible to middlemen interested in exploiting the wealth of their forests. Deforestation and illegal logging provide income for an indigenous community

that cannot afford the costs of the paperwork required to apply for the necessary legal permits, nor pay the foresters who make field visits to develop environmental management plans or invest in the other steps necessary for a logging operation, so middlemen take advantage of the opportunity to access the forest by exchanging the opportunity to log timber for simple things like a water hauling system to the village or an electric power plant.

EIA met with several communities that have worked on the activity. Some indigenous leaders in the region stated how their communities have allowed external agents access to their forests in exchange for food, supplies, school supplies, electric generators, and ACPM gasoline, given the high rates of poverty in the RR. The communities signed agreements or powers giving intermediaries the power to request forest permits and safe-conducts on behalf of the communities; however, the imbalance of knowledge and power resulted in the exploitation of the communities and unsustainable timber extraction.

Similarly, indigenous leaders may give access to the territory in different communities in exchange for a power plant or a few jobs. However, the intermediaries have extracted all the timber and did not share the limited profitability of the operation with the communities. The plants ceased to be helpful because the communities did not have enough money to buy gasoline. The result was a sense of injustice that led to community conflicts.

This phenomenon is particularly acute in indigenous territories because, when deforestation agents carry out their activities improperly - logging in unauthorized areas, harvesting unauthorized species or using the landowners' permits to launder timber from elsewhere - it is the indigenous communities who must pay the fines and assume the sanctions. The local communities perceive a low opportunity cost at having a very high risk of being sanctione and fined by local and traditional authorities.

In the proposed reference region, there is one of the waterways on which most of the timber traffic in the Colombian Amazon occurs: the Putumayo River. The Putumayo River originates in the Andes in Colombia and flows from west to east 1,800 kilometers until it reaches the Brazilian border and then the Amazon River. Along its course, the river delimits the border between Colombia and Ecuador and then between Colombia and Peru, and in the reference region it forms the east-west corridor between Tarapacá, Puerto Arica, El Encanto and Puerto Alegría (in the Department of Amazonas), a route for illegal timber extracted on both sides of the border. Upstream of the Putumayo is Puerto Leguizamo, the point at which the Putumayo River begins to become unnavigable for large cargo ships. At the end of the Putumayo River in the boundary between Colombia and Brazil (a 20-minute boat ride from Brazil), is Tarapacá, a deeply remote town and a center for illegal logging and the timber trade. This port is the point upriver through which all timber from the various Putumayo and Amazonian centers must pass (see Figures 31 and 32).

Finally, the Option I proposed by the VM0015 was considered as not applicable for Project context. The area deforested in the reference region (or some of its strata) during the historical reference period has occurred at locations where deforesting was not a profitable activity. On that line, the leakage belt was designed using Option II of the methodology VM0015, based on a “Mobility Analysis”. This approach considered the details of the accessibility and mobility capacity of deforestation agents in a joint

multicriteria, and landscape and social factors similarity analysis performed for the selection of the whole reference region.

The methodology steps proposal for Option II was followed to define the leakage belt:

a) **It used historical data and literature sources** (Environmental Investigation Agency -EIA, 2017; Armenteras, Cabrera, Rodríguez, & Retana, 2013) to define the main variable for the mobility assessment. Following the methodology process, the relevant criteria to address the mobility of the main deforestation agents identified previously were selected.

The deforestation mobility analysis is a crucial process aimed at understanding and predicting the potential shifts or expansions of deforestation in response to the implementation of carbon projects, particularly REDD+. This analysis involves the examination of various variables and factors influencing deforestation patterns, including proximity to roads, human settlements, and other relevant factors.

By leveraging tools based on Geographic Information Systems (GIS) and spatial analysis models, it becomes possible to identify vulnerable areas or those prone to future deforestation. These analyses help in delineating the leakage belt, which refers to areas where deforestation may occur because of displacement from protected areas or project sites.

The methodological flow, as outlined in Figure 44, guides the project in conducting a systematic and comprehensive analysis. This approach enables the identification of high-risk areas and facilitates the development of targeted strategies to mitigate deforestation impacts effectively.

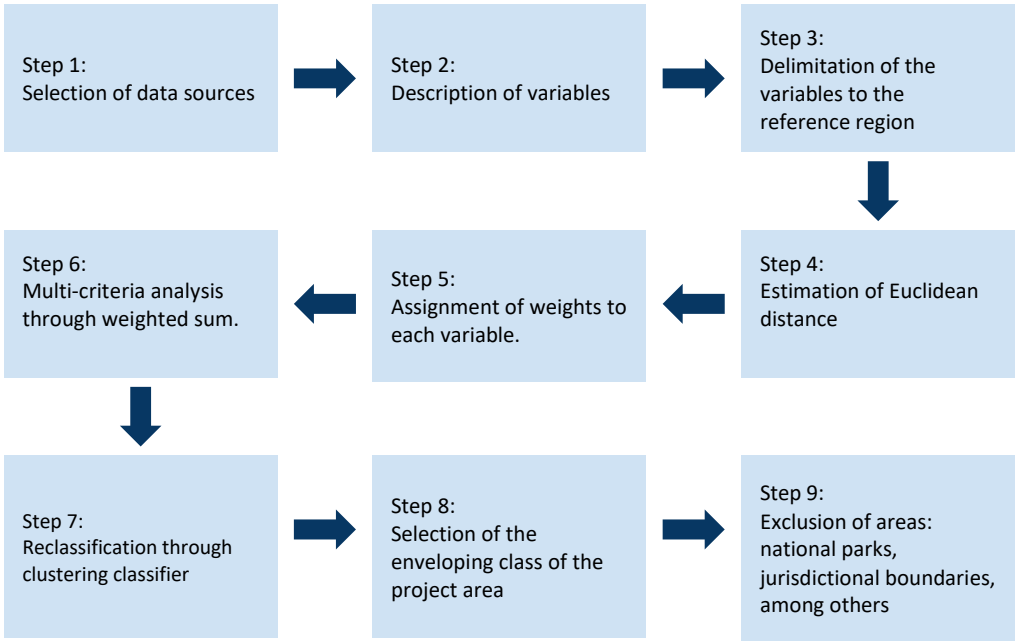


Figure 44. Steps of the methodological flow.

Source: prepared by South Pole (2024).

The layers employed as input for the multicriteria analysis come from different information sources from the IGAC base cartography at a 1:100,000 scale (Table 40).

Table 40. Layers employed in the analysis.

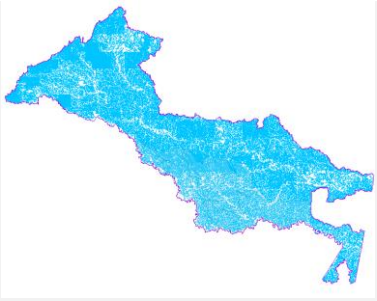
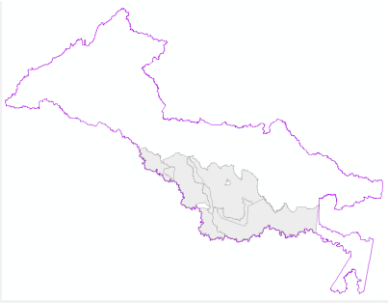
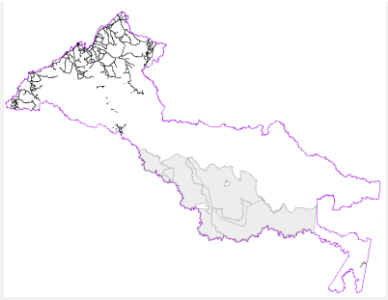
Layer	Entity	Description	Source
Double drainage	Polygon	Layer with the distribution of double drainage in the reference region	Database 1:100,000 - Instituto Geográfico Agustín Codazzi (IGAC)
Single drainage	Line	Layer with the distribution of single drainage in the reference region	Database 1:100,000 - Instituto Geográfico Agustín Codazzi (IGAC)
Cumulative deforestation	Polygon	Layer with non-forest and forest IDEAM between 2005 and 2016 near the project area	Cabrera *et al.* (2011) y Galindo *et al.* (2014)
Project area	Polygon	Project area boundary layer	Boundary delivered by the project owner
Roads	Line	Track layer (including all national categories) in the project's reference region	Database 1:100,000 - Instituto Geográfico Agustín Codazzi (IGAC)
Settlements	Points	Layer or administrative units	Database 1:100,000 - Instituto Geográfico Agustín Codazzi (IGAC)

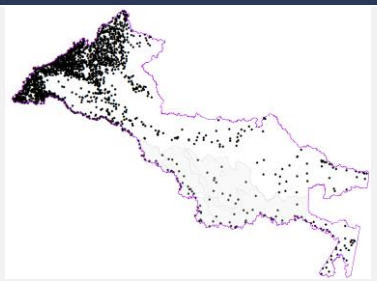
Source: prepared by South Pole (2024).

Using these layers, it was estimated the following parameters to define the leakage belt: Distance from roads, drainage systems, settlements, cumulative deforestation, and project area were measured. Next, a cartographic cut of these variables was made with the benchmark region of the REDD+ Project pueblos indígenas resguardando la selva. Immediately after, a distance analysis was performed for each of the variables using the Euclidean Distance de ArcGis tool and it's visualized in

Table 41 presented thee parameters. In a color scale: red, yellow, and green, representing the level of proximity of the theme in the reference region with the categories high, medium, and low, respectively.

Table 41. Parameter and Euclidian distance

Layer name	Variable image
Double drainage	
Single drainage	
Cumulative deforestation	
Project area	
Roads	

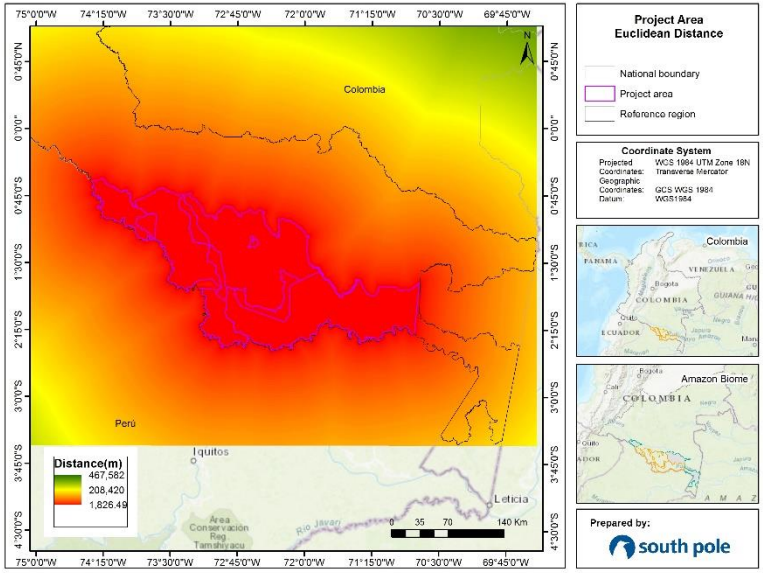
Layer name	Variable image
Settlements	

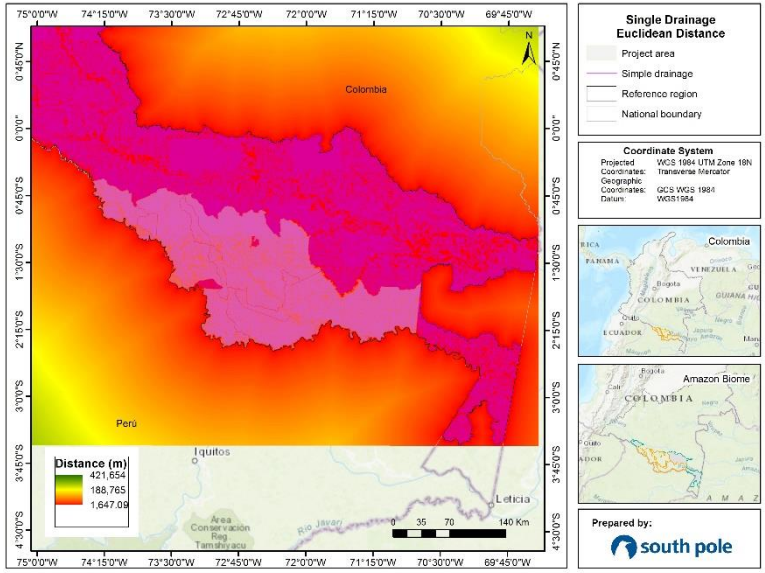
Source: prepared by South Pole (2024).

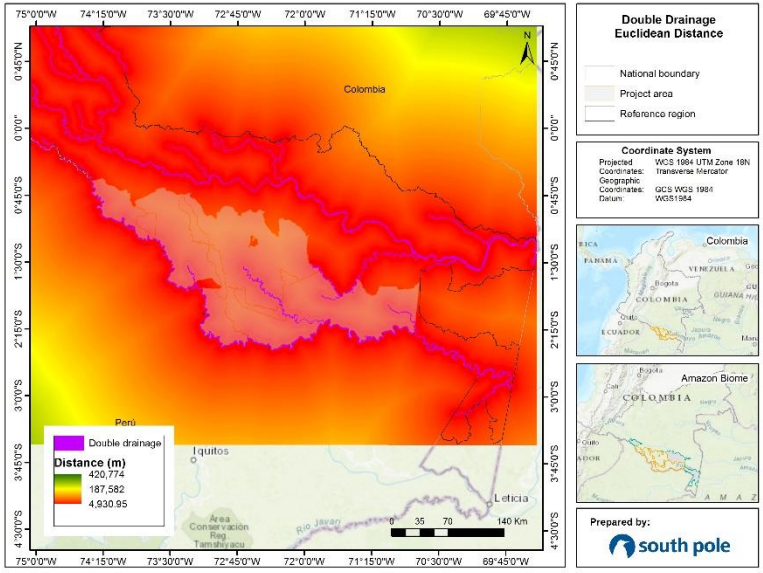
All of them were selected to include the primary access to the forest, represented by the rivers and the closeness to the settlements. In addition, the facility of the access is related to the slop and territory topography.

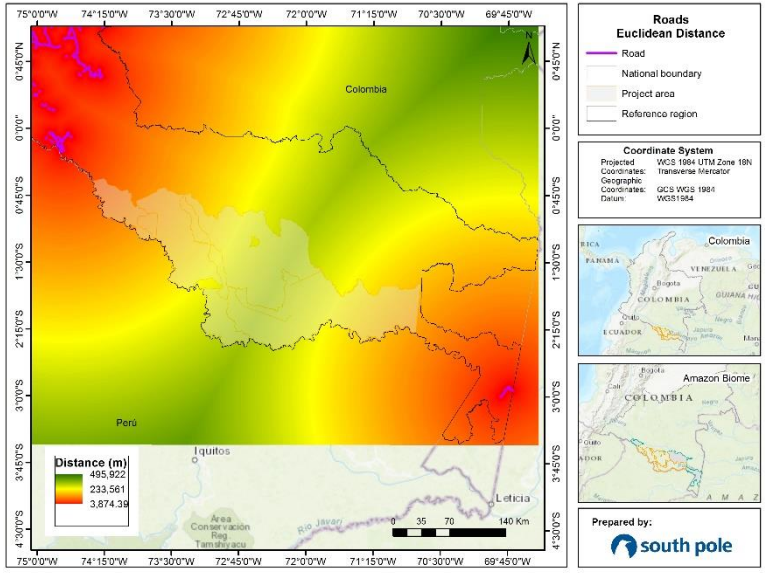
b) For each criterion, it was generated a map using a GIS.

c) Due to the relevance of the mobility variables proposed for the assessment of the potential deforestation/degradation agents, equal weighted weight was assumed between the criteria. A map algebra was performed with the Wighted Sum of ArcGIS function. This assumption for the multi-criteria analysis, response to the proportions in terms of landscape and social factors similarity between the PA and the LK, presented in Table 42. In this table, it is highlighted that all the variables are Accomplish or Overcomplish in terms of proportion between the leakage belt and the project area.


Project Area
Euclidean Distance
National boundary
Project area
Reference region
Coordinate System
Projected Coordinates: WGS 1984 UTM Zone 18N
Transverse Mercator
Geographic Coordinates: GCS WGS 1984
Datum: WGS1984
Colombia
Amazon Biome
Prepared by:
south pole
Colombia
Perú
Iquitos
Leticia
Distance(m)
467,582
208,420
1,826.49
0 35 70 140 Km


Single Drainage
Euclidean Distance
Project area
Simple drainage
Reference region
National boundary
Coordinate System
Projected Coordinates: WGS 1984 UTM Zone 18N
Transverse Mercator
Geographic Coordinates: GCS WGS 1984
Datum: WGS1984
Colombia
Amazon Biome
Prepared by:
south pole
Colombia
Perú
Iquitos
Leticia
Distance (m)
421,654
188,765
1,647.09
0 35 70 140 Km


Double Drainage
Euclidean Distance
National boundary
Project area
Reference region
Coordinate System
Projected Coordinates: WGS 1984 UTM Zone 18N
Transverse Mercator
Geographic Coordinates: GCS WGS 1984
Datum: WGS1984
Colombia
Amazon Biome
Prepared by:
south pole
Colombia
Perú
Iquitos
Leticia
Double drainage
Distance (m)
420,774
187,582
4,930.95
0 35 70 140 Km


Roads
Euclidean Distance
Road
National boundary
Project area
Reference region
Coordinate System
Projected Coordinates: WGS 1984 UTM Zone 18N
Transverse Mercator
Geographic Coordinates: GCS WGS 1984
Datum: WGS1984
Colombia
Amazon Biome
Prepared by:
south pole
Colombia
Perú
Iquitos
Leticia
Distance (m)
495,922
233,561
3,874.39
0 35 70 140 Km

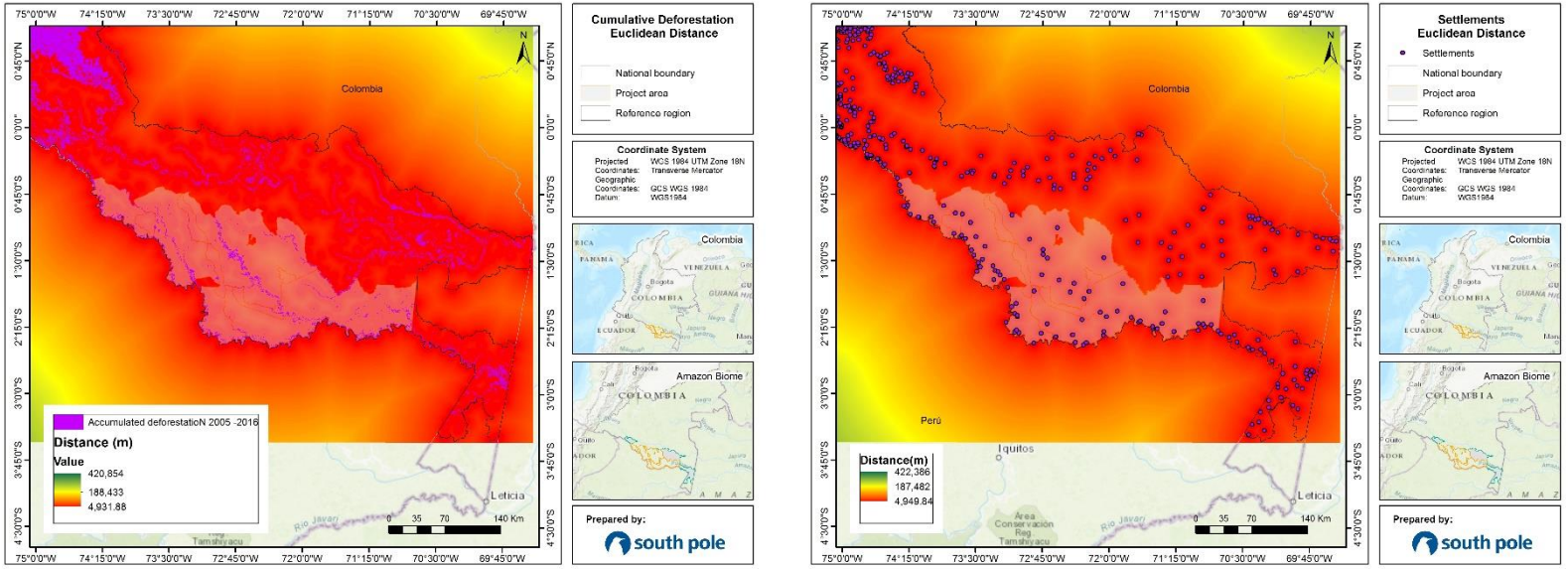


Figure 45. Euclidean distance of the variable used in the definition of the LB.

Source: prepared by South Pole (2024)

The resulting weighted analysis is grouped into 10 classes using the Natural Breaks (Jenks) classifier, and the class closest to the project area is designated as the leakage belt (Figure 46).

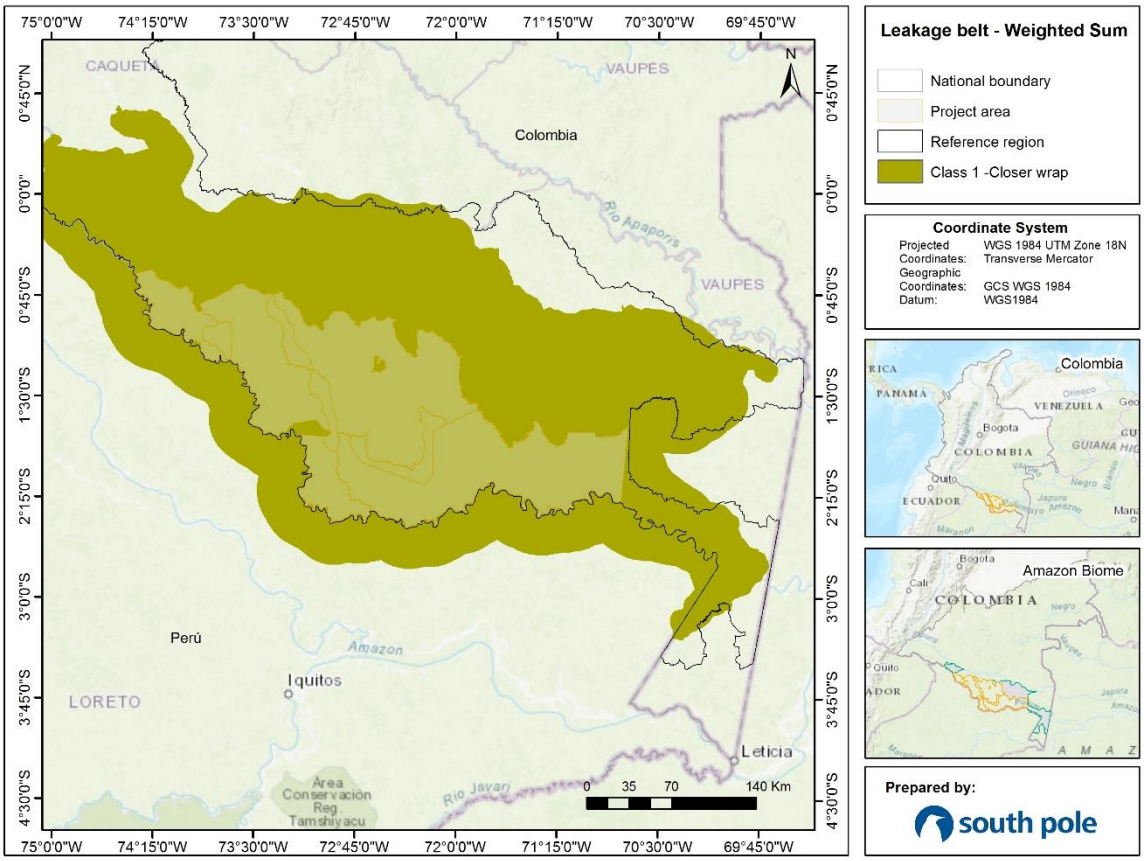


Figure 46. Leakage belt - Weighted analysis.

Source: prepared by South Pole (2024).

Table 42. Proportion of the spatial variable in the PA and LK

Variable		Project area (ha)	% Variable in PA	Number of ha required in the LK	Lower limit	Top limit	Number of ha registered in the LK	Observation
Slopes (%)	Gentle <15%	3,424,360.43	94.85%	2,905,454.44	2,324,363.55	3,486,545.33	2,821,949.31	Accomplish
	Strongly >15%	186,026.31	5.15%	157,837.06	126,269.65	189,404.47	226,980.10	Overcomplish
Elevation	<=500m	3,610,399.31	100.00%	3,063,302.16	2,450,641.73	3,675,962.59	2,900,881.59	Accomplish
Road of access	Density (m/km2)	0	0.00%	0	0	0	0.07	NA
Rivers	Density (m/km2)	850.38	0.02%	721.52	577.22	865.82	898.27	Overcomplish
Soil	Recent mixed heterometric alluviums from the eastern mountain range and the Amazonian hillock landscape	119,459.22	3.31%	101,357.12	81,085.70	121,628.54	87,206.85	Accomplish
	Recent alluviums predominantly fine, coming from the Amazonian hillock	188,849.55	5.23%	160,232.48	128,185.98	192,278.97	138,806.20	Accomplish
	Clays of the marine tertiary	1,357,261.69	37.59%	1,151,590.81	921,272.65	1,381,908.98	996,063.88	Accomplish
	Palaeozoic sandstones and clay. Araracuara Formation	29,671.14	0.82%	25,174.96	20,139.97	30,209.95	71,483.38	Overcomplish
	Sandstones, clays and conglomerates of the continental tertiary	1,083,290.93	30.00%	919,135.85	735,308.68	1,102,963.02	1,034,412.79	Accomplish
	Body of water	14,608.57	0.40%	12,394.88	9,915.90	14,873.86	29,974.17	Overcomplish
	Urban area	6.95	0.00%	5.9	4.72	7.08	46.18	Overcomplish
Indigenous Reserves	Area of any reserve	3,517,025.74	97.41%	2,984,077.83	2,387,262.26	3,580,893.39	2,611,934.38	Accomplish
Stable forest 2005-2012-2016	Forest land	3,555,160.80	98.47%	3,016,434.14	2,413,147.31	3,619,720.97	2,966,156.67	Accomplish

Source: prepared by South Pole (2024).

d) Finally, all these variables where mapped and the leakage belt of the REDD+ Project was defined to cover an area of 3,063,302 ha of Amazon rainforest and corresponding to those forest areas located within the Predio Putumayo Reserve between the Caquetá River and the northern limit of the project management area, and the remain forest areas on the edge of the Putumayo river between Puerto Leguízamo and Tarapaca, in which a displacement of deforestation or degradation due to the implementation of the REDD+ activity could occur, outside the limits of the project area. For this case, the leakage belt corresponds to the forests, as of December 2016 (project start date), that were not defined as project area, but that are like the project area forests with respect to landscape and social factors.

Buffer zones defined in the process of ratification of agreements to define the project management area are also part of the leakage belt for the first monitoring period. Buffer zones are those areas with disputes over access/use rights or where rights overlap between proponent indigenous organizations and those that do not participate in the initiative. These zones will not be included in the first verification of the project, but they have the potential to be included in future verifications under the grouped approach once the access/use rights are clear and the agreements between organizations are ratified. These include:

- COINPA-ACILAPP overlap
- AZICATCH-CRIMA 1 and 2 overlap
- CIMPUM-CRIMA overlap
- AZICATCH-PANI overlap

The initial resulting leakage belt is shown in Figure 47.

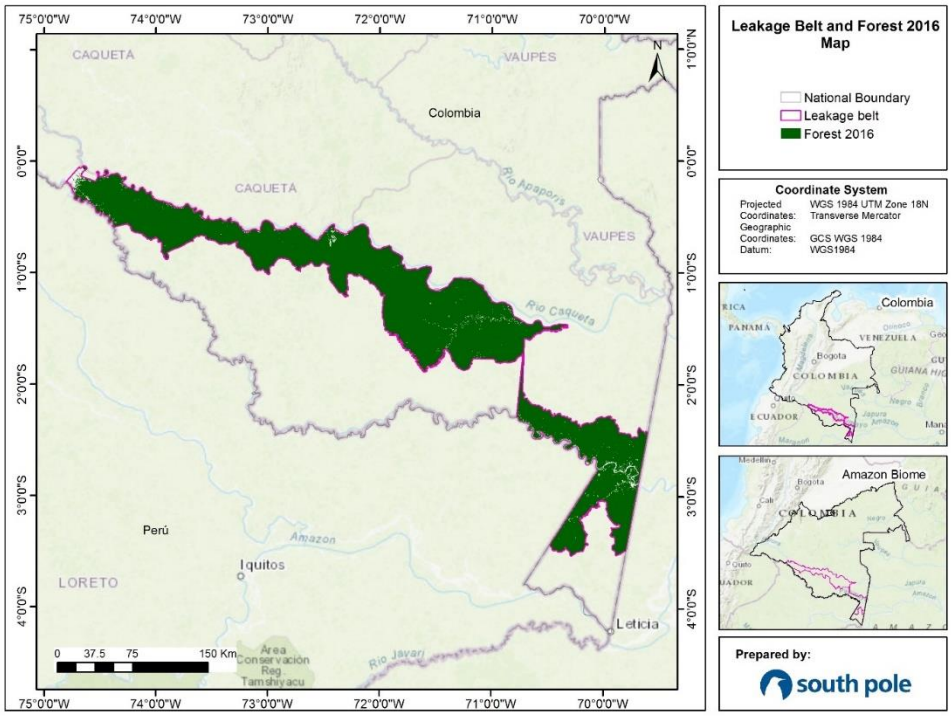


Figure 47. Leakage belt map.

Source: prepared by South Pole (2021).

Finally, following the VM0015 section 5.1.1.3 *Leakage belt, Consideration of other VCS AFOLU projects*, the Project Area (PA) of project registered under BioCarbon Standard called "CRIMA Predio Putumayo y Andoque de Aduche REDD+ Project"[33]. Was excluded from the final Leakage belt in Figure 37. Also, it was removed an overlapping area with the Leakage Belt (LK) of VCS project ID 3145, to avoid any potential boundary issue. Project Area of the VCS ID3145 was not excluded as at time of project 2297 registration request, the project 3145 had not achieved the registration status in VCS Registry. Carbon accounting considered the exclusion of the other projects boundaries, and in a future verification moment, the overlaps between leakage belt and other surroundings REDD+ projects will be checked and submitted for VVB validation (Figure 48).

[33] https://biocarbonregistry.com/en/project/?id=35

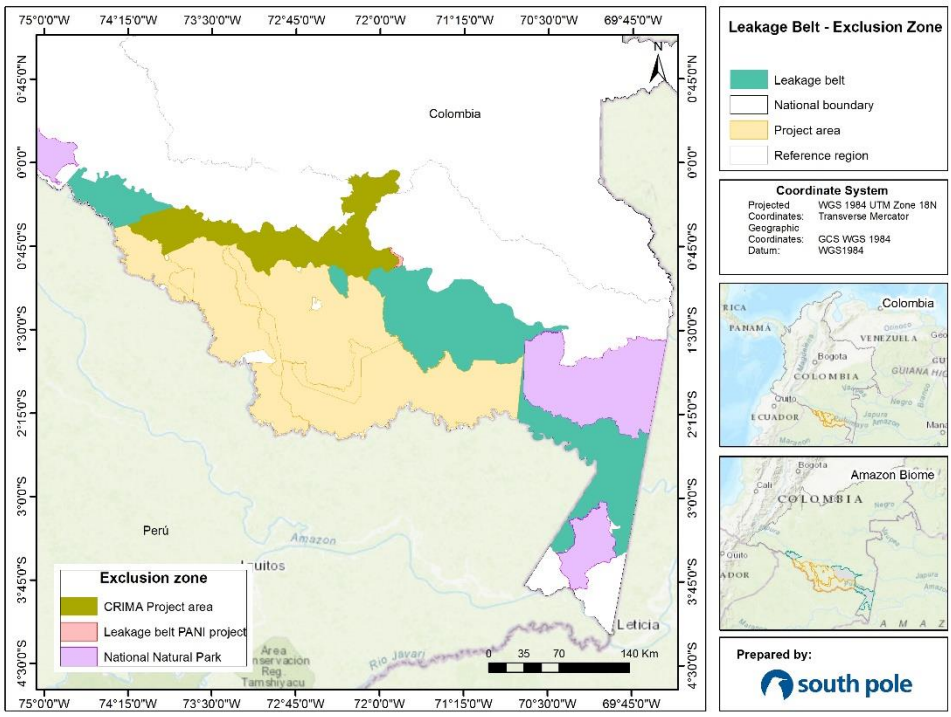


Figure 48. Final Leakage belt map with the others REDD+ projects areas and leakage belts excluded.

Source: prepared by South Pole (2024).

The final delimitation of the leakage belt for the project ID 2297 was defined to cover an area of 2,228,282 ha of Amazon rainforest and is presented in Figure 49.

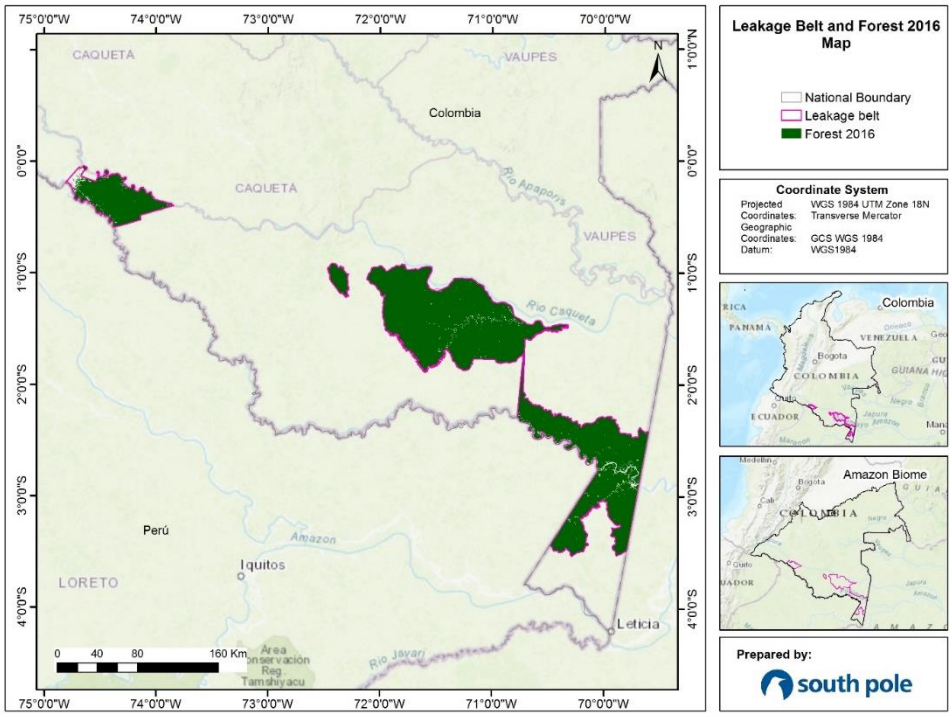


Figure 49. Leakage belt map with the subtraction of others REDD+ PA.

Source: prepared by South Pole (2024).

Forest

The boundary of forest land will be subject to periodical monitoring, verification, and reporting (MRV) is defined as follows:

- The definition of forest that will be used for measuring deforestation during the project crediting period: definition of forest submitted by Colombia to the UNFCCC for the purposes of ENREDD+ and particularly for the construction of the National Forest Reference Emission Level (FREL) (MADS & IDEAM, 2019, 2020). Initial Forest Cover Benchmark Map to report gross deforestation going forward can be found in section 1.3.
- The Minimum Mapping Unit (MMU): the MMU size of the LULC maps created using RS imagery was one hectare.

Temporal boundaries

Starting date and end date of the historical reference period

Historical reference period covered between December 31, 2005, and December 31, 2016, considering the avaialability of Forest Benchmark Maps from the National Forest & Carbon Monitoring System (SMByC).

Starting date of the project crediting period of the AUD project activity

The REDD+ Project is a retroactive initiative that began activities on December 31, 2016.

Starting date and end date of the first fixed baseline period

First fixed baseline period runs from December 31, 2016, to December 30, 2021, for a total duration of 6 years.

Monitoring period

First monitoring period covered the time between December 31, 2016, and December 31, 2020.

3.4.2 Step 2. Analysis of historical land-use and land-cover change

Collection of appropiate data sources

As a contribution of the necessary baseline information for the historical analysis of land cover changes, the REDD+ Project referred to the Proposed Forest Reference Emission Level from Deforestation in Colombia for results-based payment of REDD+, under the UNFCCC (MADS & IDEAM, 2019, 2020), hereinafter FREL Colombia. It proposes a new approach to project the trend of deforestation at national and subnational levels (natural regions), in addition to defining the principles used in its construction: transparency, completeness, consistency, and accuracy. Similarly, the FREL proposal includes the methodological information used at the time of constructing the FREL; establishes sinks, gases, and activities included in the FREL; and specifies the definition of forest for the country.

The FREL Colombia was proposed by the IDEAM and the MADS because of the decisions of the UNFCCC and the guidelines of the IPCC. According to decision 12/CP.17, it has a national scope, covering the area of the five biomes distributed in the Colombian continental territory (Amazonia, Andes, Caribbean, Orinoquia, and Pacific). These biomes are biophysically homogeneous areas and are delimited based on biogeographic criteria, mainly associated with the natural distribution of forest, geomorphology, and altitudinal ranges (Rodríguez et al., 2006; Narváez & León, 2001).

Regarding the sources of information, the construction of the FREL for gross deforestation emission reduction activity in the Colombian Amazon biome is based on information generated by the SMByC, led by the IDEAM. The biennial forest cover change maps are used to obtain activity data. These maps are the result of the biennial monitoring from 2000 to 2012 and, on an annual basis, from 2013 onwards.

The SMByC developed a protocol for digital image processing to generate information on the distribution, extent, and changes in forest cover in Colombia (Galindo et al., 2014). This protocol is implemented using images from the LANDSAT satellite program (USGS, 2014), given the historical

availability, temporal and spatial resolution for monitoring forest cover, easy access to data, and possibilities of permanence of this program.

For each reference year, the SMByC downloads the entire image collection of the Landsat satellite program (7 ETM+ and OLI 8) at the L1T level (surface reflectance) and selects all images with less than 90% cloud cover, with a time interval between January 1 and December 31 of the reference year, ensuring that all images from the last quarter of the year are downloaded and processed. Through the generation of annual temporal composites of images, all "cloud" and "cloud shadows" pixels are excluded from each image, and through the processing proposed by the SMByC, the forest area and its annual changes are identified. The characteristics of the IDEAM forest/non-forest layers are detailed in Table 1.

When Landsat data do not provide sufficient cloud-free coverage, images from CBERS, RapidEye, ASTER, and Sentinel 2 sensors are used.

As was presented in Sections 1.3.1 and 3.4.2, for the project and the baseline assessment, the information accepted by the country is presented by the IDEAM and used in the FREL[34]. This information presents the gross deforestation emission reduction activity in the Colombian Amazon biome and is based on information generated by the SMByC.

The SMByC developed a protocol for digital image processing to generate information on the distribution, extent, and changes in forest cover in Colombia (Galindo et al., 2014). This protocol is implemented using images from the LANDSAT satellite program (USGS, 2014), given the historical availability, temporal and spatial resolution for monitoring forest cover, easy access to data, and possibilities of permanence of this program[35]. With this information, the Environmental Minister of Colombia could identify actions to be more efficient against activities that threaten the conservation of forests, such as illegal logging and minerals extraction, as well as conversion for agricultural uses.

Planned deforestation was excluded in the baseline case considering that under the methodological process implemented by the IDEAM in the SMByC, the first step is the exclusion of tree cover for commercial forest plantations (conifers and/or broad-leaved), commercial palm plantations, and trees planted for agricultural production, and trees in urban parks[36]. This intends to include in the deforestation monitoring only the natural forests that accomplished the Forest definition and avoid any forest concession in the assessment.

34 https://redd.unfccc.int/media/18-08-2020_nref_colombia_v8.pdf

35 https://redd.unfccc.int/media/anexo_a_protocolo_procesamiento_digital.pdf https://archivo.minambiente.gov.co/index.php/noticias-minambiente/2125-minambiente-e-ideam-revelaran-tasa-anual-de-deforestacion

36 Please see the document MEMORIA TÉCNICA CUANTIFICACIÓN DE LA SUPERFICIE DE BOSQUE NATURAL Y DEFORESTACIÓN A NIVEL NACIONAL http://www.ideam.gov.co/documents/11769/1185637/MemoriaTecnica+Cuantificacion+de+la+superficie+de+bosque+natural+y+deforestacion+a+nivel+nacional+v2.pdf/824cd4f1-39b6-4187-b65a-83f15b58c193

According to the VM0015, planned deforestation was understood as the legally authorized conversion of forest land to non-forest land occurring on a discrete area of land. Planned deforestation includes also a wide variety of activities such as national resettlement programs from non-forested to forested regions; a component of a national land plan to reduce the forest estate and convert it to other industrial-scale production of goods such as soybeans, pulpwood plantations and oil palm plantations; and plans to convert well-managed community-owned forests to other non-forest uses; all of them not applicable within the project area and the leakage belt boundaries.

Other forms of planned deforestation may include decisions by individual owners of land legally zoned for agriculture to convert their forest to crop production. These planned deforestation activities are a component of a land planning or management document and may be readily verified. However, considering the nature of the project area and the leakage belt as indigenous territories, it did not expect this type of activities considering the following aspects:

- In Colombia, planned deforestation, defined as the legally authorized conversion of forest land to non-forest land in a specific area, is regulated by environmental legislation. In the case of the Colombian Amazon, there are regulations that establish conditions and procedures for carrying out this conversion. However, these regulations are subject to strict compliance with requirements and procedures, including environmental impact assessments and prior consultation with indigenous and local communities. Authorization for planned deforestation in the Colombian Amazon is granted in exceptional cases and under strict conditions to ensure the conservation of biodiversity and ecosystem services in the region.
- The legislation regulating planned deforestation in the Amazon and other regions of Colombia includes primarily Law 99 of 1993, which establishes the general framework for environmental management in Colombia, and Law 2 of 1959, also known as the Renewable Natural Resources and Environmental Protection Code. Additionally, Law 2.301 of 2021, which regulates the procedure for authorization of forest conversion to non-forest areas and establishes criteria for forest restoration in Colombia, is also relevant in this context. These laws establish the principles, procedures, and requirements that must be met to carry out planned deforestation legally and responsibly. Additionally, specific regulations issued by environmental authorities such as the Ministry of Environment and Sustainable Development and the Regional Autonomous Corporations (CAR) complement and detail the guidelines established in national legislation.
- Furthermore, indigenous reserves receive special protection under Colombian law. The Political Constitution of Colombia recognizes the rights of indigenous communities over their ancestral territories and establishes that these territories are inalienable, imprescriptible, and non-seizable. Additionally, Convention 169 of the ILO, ratified by Colombia, establishes that indigenous communities must be consulted prior to any measure that may affect their territories.

- According to Decree 1076 of May 26, 2015 (through which the Sole Regulatory Decree of the Environment and Sustainable Development Sector is issued), single[37] forest harvesting permits are granted by the Regional Autonomous Corporation[38] covering the respective territory, who, prior to granting the permits, must verify that the forests are located on land that, due to its suitability for use, can be destined for uses other than forestry (among other conditions). The classification of land use capacity formulated by Klingebiel and Montgomery (1961)[39] and adapted by the Agustín Codazzi Geographic Institute (IGAC), indicates that the Colombian Amazon region has a forestry vocation, so the soil must have permanent vegetation cover and low-intensity productive systems that simulate natural conditions, suggesting its use in tourism, recreational, scientific and wildlife protection activities (Peña-Vanegas and Vanegas-Cardona, 2010). [40]
- On the other hand, in the ruling STC4360 of 2018, the Supreme Court of Justice determined that the Colombian Amazon is a "subject of rights." The decision came because of an action brought by 25 Colombian plaintiffs, who claimed that increased deforestation in the Amazon and the country's rising average temperature threatened their rights to a healthy environment, life, health, food, and water. The Supreme Court agreed with the lawsuit and highlighted that the Government has not been effective in complying with its commitments regarding climate change and deforestation. Therefore, the supreme court concluded to order the Presidency of the Republic, the Ministry of Environment and Sustainable Development, and the Ministry of Agriculture and Rural Development, in coordination with the sectors of the National Environmental System, and the participation of the plaintiffs, the affected communities and the interested population in general, within four (4) months following the notification of this decision, formulate a short, medium and long term action plan to counteract the rate of deforestation in the Amazon, in order to address the effects of climate change.

In this sense, the probability of planned deforestation in the forests of the project area is legally nonexistent due to the respect for the territorial rights of these communities and the rigorous procedures established by Colombian environmental and legal regulations. Prior consultation and consent of indigenous communities are fundamental requirements for any activity that may affect the forests within their territories, contributing to the protection of these vital ecosystems and the preservation of the cultural diversity of the Amazon region.

Definition of classes of land-use and land-cover

The following criteria were used to define the LU/LC classes:

[37] A one-time authorization to harvest trees in areas where land use must be prioritized for purposes other than forestry activities or where there is a public need or interest to change land use. This type of permit involves logging activities without the obligation of subsequent forest renewal or conservation.

[38] The Corporaciones Autónomas Regionales y de Desarrollo Sostenible (Regional Autonomous and Sustainable Development Corporations) in Colombia are the primary environmental authority at the regional level.

[39] Klingebiel A.A., Montgomery P.H. (1961). Land capability classification. Agr. Handbook 210. USDA, Soil ConsService.

[40] Peña-Venegas Clara, Vanegas-Cardona Gladys. (2010). Dinámica de los suelos amazónicos: Procesos de degradación y alternativas para su recuperación. Instituto Sinchi. Bogotá, Colombia. 2010.

1) The minimum classes were “Forest Land” and “Non-Forest Land”.

2) “Non-Forest Land” was stratified in strata representing different non-forest classes. IPCC classes used for national GHG inventories were used to define such classes (Crop Land, Grass Land, Wetlands, Settlements, and Other Land).

3) The description of a LU/LC class includes criteria and thresholds that are relevant for the discrimination of that class from all other classes according to National Land-use maps (SINCHI 2016 and 2020).

4) Forest land present in the project area is affected by logging for timber, fuel wood collection or charcoal production in the baseline case, so carbon stock is affected by combining data from the Japanese Aerospace Exploration Agency’s (JAXA) Advanced Land Observing Satellite’s (ALOS) Phased Array L-band Synthetic Aperture Radar (PALSAR) (SAR of ALOS PALSAR 1 and 2).[41] In addition, an SRTM DEM (SRTMGL1 product, with a spatial resolution of approximately 30 m at the equator)[42] (Farr et al., 2007) and a global biomass layer were used (Dinerstein et al., 2017).

Changing carbon stocks in the baseline case were documented at hand of credible and verifiable sources of information, such as measurements in plots representing a chrono-sequence, published literature, and other sources, as appropriate (see section 3.4.6).

Table 43. List of all land use and land cover classes existing at the project start date within the reference region.

Class identifier		Trend in Carbon stock	Presence in	Baseline activity	Description
I1	Forest land	Decreasing	RR, LK, PA	LG, FW, CP	Tropical moist forest. The equatorial latitude, which receives a lot of rainfall (more than 2000 mm per year) and has temperatures above 24 °C throughout the year.
f1	Grassland	Increasing	RR, LK, PA	NA	Clean, wooded, and weeded pastures; mosaic of pastures, crops, and natural vegetation where pastures are the dominant land-use under the MMU.
f2	Scrubland	Increasing	RR, LK, PA	NA	Secondary or transitional vegetation and dense shrubland even with disperse trees
f3	Wetlands	Stable	RR, LK, PA	NA	Swampy areas, rivers, natural

[41] Images were downloaded for the area of inventory points containing biomass values (information available for the tropics).

[42] https://earthdata.nasa.gov/learn/articles/nasa-shuttle-radar-topography-mission-srtm-version-3-0-global-1-arc-second-data-released-over-asia-and-australia

Class identifier		Trend in Carbon stock	Presence in	Baseline activity	Description
					ponds, lakes, and swamps
f4	Settlements	Stable	RR, LK, PA	NA	Continuous urban settlements Discontinuous urban settlements Industrial or commercial zones
f5	Other land	Stable	RR, LK, PA	NA	Natural sandy areas

Source: prepared by South Pole (2023) based on SMByC layers and SINCHI (2016) maps.

1. Note if “decreasing”, “constant”, “increasing” 2. RR = Reference region, LK = Leakage belt, LM = Leakage management Areas, PA = Project area 3. LG = Logging, FW = Fuel-wood collection; CP = Charcoal Production (yes/no)

Definition of categories of land-use and land-cover change

Based on the methodology, the project proponent must identify and describe the land use and land cover (LULC) strata present in the reference region at the project start date. The sampling and stratification strategy must also follow other regional or national strategies. Therefore, the project adheres to the guidelines of the National FREL with respect to the legend and the values assigned in the reclassification of the forest/non-forest layers generated by the SMByC.

These categories or strata are as follows: 1. Stable Forest 2. Stable non-forest 3. Deforestation 4. Regeneration 5. No data (corresponds to masked data due to clouds and cloud shadows). All of them guarantee a minimum mapping unit (MMU) equal to or less than 1 ha.

For the purposes of the FREL Colombia and its application in REDD+ projects, “forest” is defined as *Land mainly occupied by trees that may contain shrubs, palms, guaduas, grass, and lianas, in which tree cover is predominant with a minimum canopy density of 30%, a minimum canopy height (in situ) of five meters at the time of identification, and a minimum area of one hectare. Tree cover of commercial forest plantations, palm plantations, and trees planted for agricultural production are excluded.*

This definition meets with the criteria established by the UNFCCC in its decision 11/CP.7, with the definition adopted by Colombia before the Kyoto Protocol (MAVDT, 2002), as well as with the definition of natural forest cover used for the estimation and reporting of the National Greenhouse Gas Inventory and the one included in the CLC methodology legend adapted for Colombia.

On the other hand, deforestation is defined as *the direct and/or induced conversion of forest cover to another type of land cover in each period of time* (DeFries et al., 2006; GOFC-GOLD, 2009).

Finally, the VCS VM0015 methodology makes it possible to classify land covers according to IPCC strata categories. LU/LC-change categories that could occur within the project area and leakage belt during the project crediting period in both, the baseline and project case start with the inial category "forest

land (l1)" and after the deforestation event the establishment is projected in one of three land uses: grasslands (f1), shrubland (f2), other land (f5).

Wetlands (f3) and settlements (f4) were not considered as "deforestation" considering the scope of the methodology.

Analysis of historical land-use and land-cover change

For the case of identifying changes in forest cover, the SMByC uses the procedure detailed in the Protocol for digital image processing for the quantification of deforestation in Colombia (Galindo et al., 2014). Figure 50 shows the flow of such processing. The use of various tools, models and algorithms designed by SMByC, some of them implemented with QGIS software, is highlighted.

The SMByC protocol includes four major phases associated with the processing of satellite data for the generation of activity data, namely: i) digital pre-processing of satellite images; ii) digital image processing; iii) data validation; and iv) activity data reporting. These phases are summarized in 12 methodological steps (Table 44).

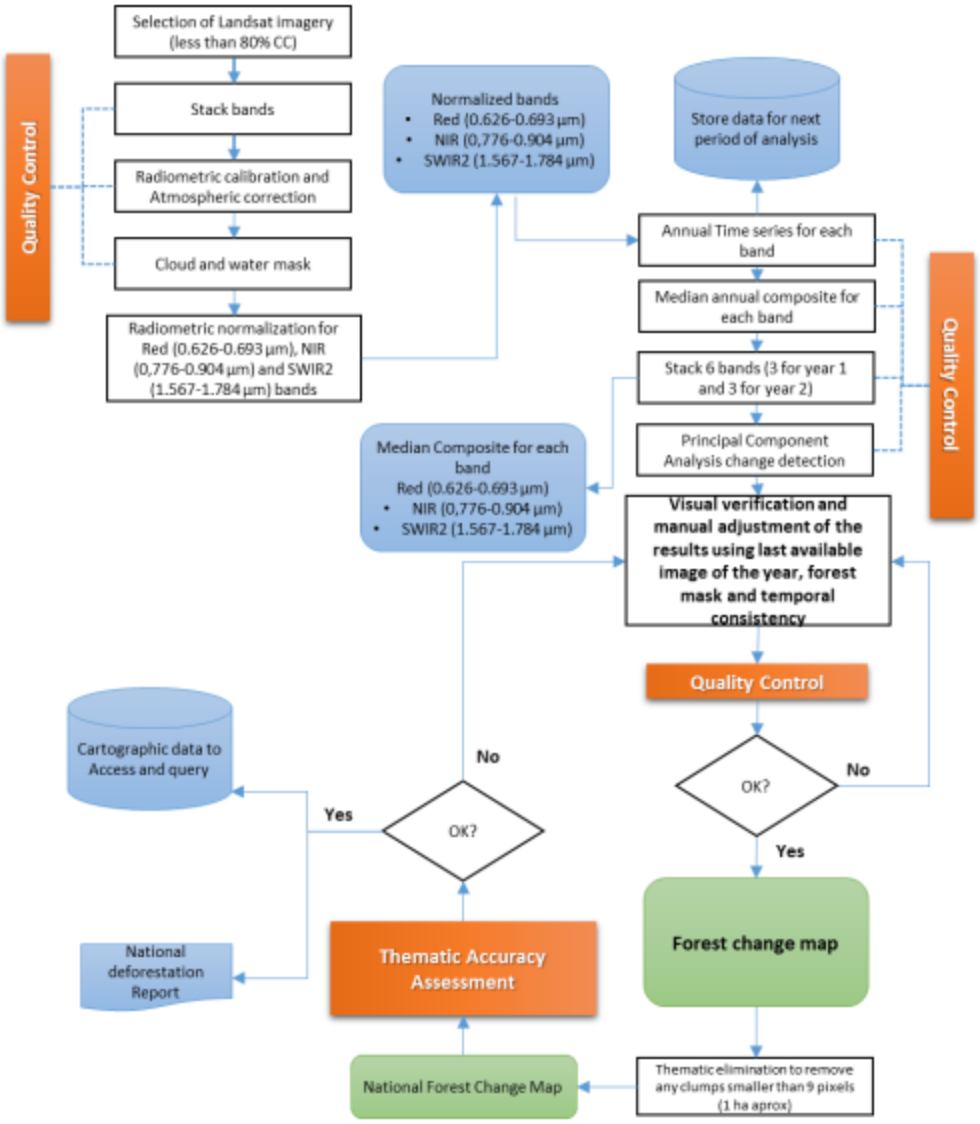


Figure 50. Methodological process applied for the estimation of the Forest Change Maps.

Source: Galindo et al. (2014).

Table 44. Methodological process for the definition of land use and land cover change strata.

Phase	Methodological steps
Phase 1 Digital preprocessing of satellite images	It covers the selection process of all Landsat images, stacking of layers between images, coregistration activities between pixels, cloud, and shadow masking, and obtaining of radiometric values for the set of images.
Phase 2 Digital processing of satellite images	Ii includes automated detection of changes in forest cover area, reflected as gain or loss. A principal component analysis (PCA) is used on the correlation matrix of the pixel values of the images and, subsequently, a reclassification of these pixels is performed. These categories or strata

Phase	Methodological steps
	are as follows: 1) Stable Forest. 2) Stable non-forest. 3) Deforestation. 4) Regeneration. 5) No data. Automated detection is supported by a visual verification by experts, where detected changes are validated, and quality control of the aforementioned activities is performed.
Phase 3 Assessment of the thematic accuracy	Reliability metrics are generated to identify and reduce process uncertainty. Visual and digital interpretation of a random sample stratified by area of each stratum type is performed to corroborate the results of the overall processing. Uncertainty of the overall estimate is calculated from the analysis of the samples. This is expressed by calculating the standard error with 95% confidence intervals for each of the map strata.
Phase 4 Calculations and reports	The deforested area during the defined periods is analyzed, as well as the temporal consistencies of the analyzed time series. This involves a process of verification of a historical period of at least 6 years. This process compares whether the pixels classified as deforestation have been previously classified as deforestation too. If this is the case, the most recent result is corrected and marked as “non-forest” (NF).

Source: South Pole, based on Galindo et al. (2014) y MADS and IDEAM (2019).

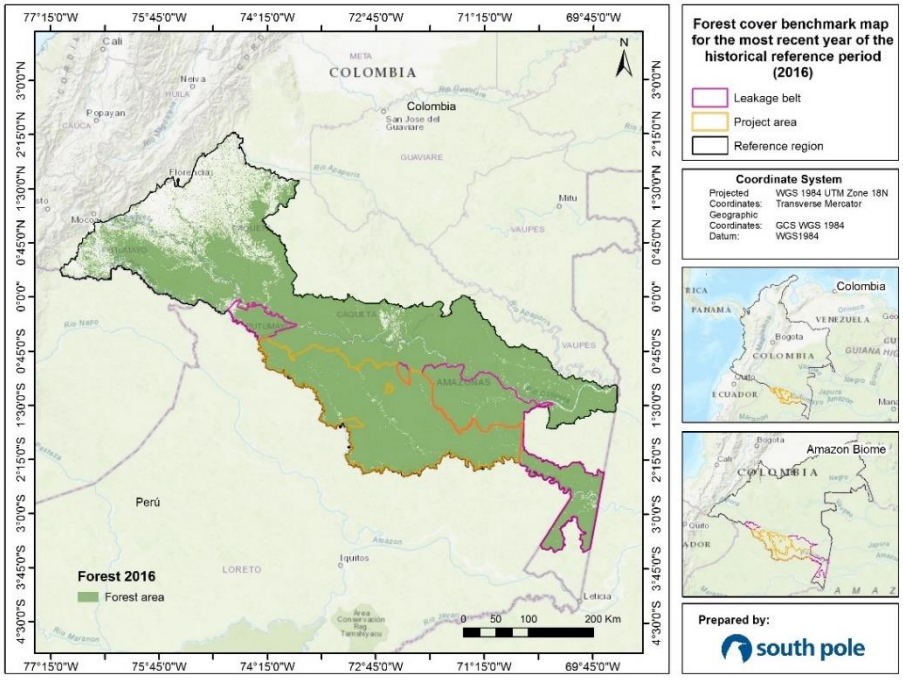


Figure 51. Forest Cover benchmark map for the most recent year of the historical reference period (2016).

Source: prepared by South Pole (2024).

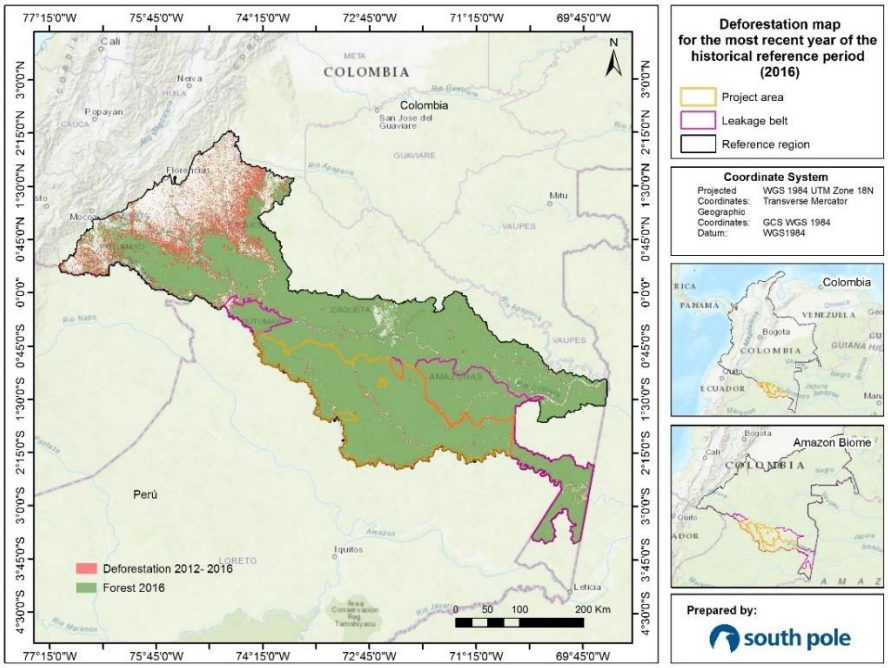


Figure 52. Deforestation map for the most recent year of the historical reference period (2016).

Source: prepared by South Pole (2024).

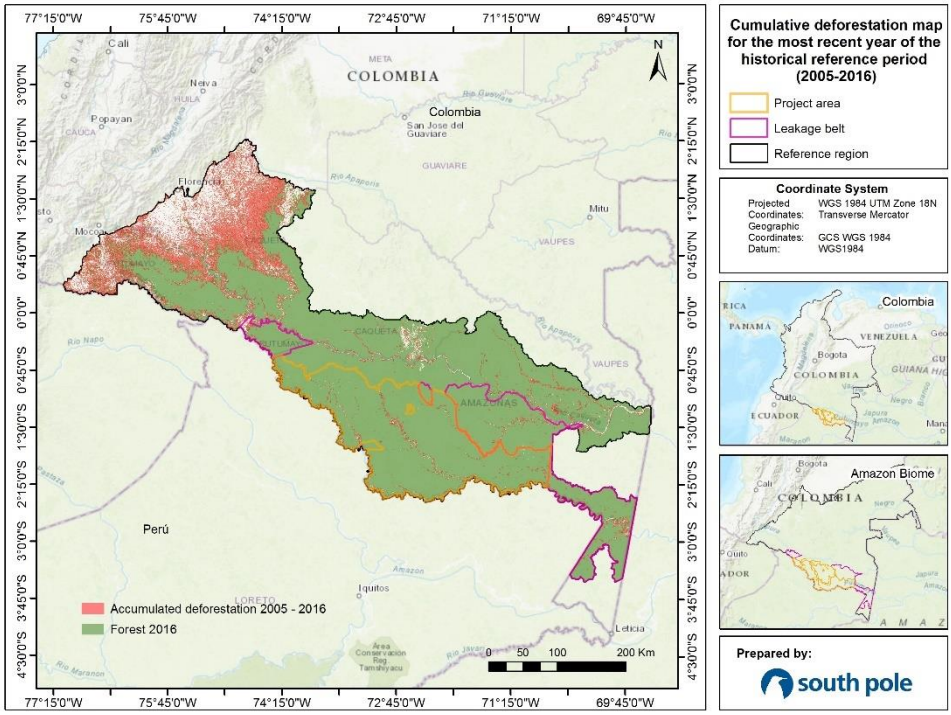


Figure 53. Cumulative deforestation map for the historical reference period (2005-2016).

Source: prepared by South Pole (2024).

3.4.3 Step 3. Analysis of agents, drivers, and underlying causes of deforestation and their likely future development

Based on primary and secondary information, remote sensing, and the socioeconomic mapping available at the national and regional levels, the relationship between the main groups of agents and drivers and the underlying causes was analyzed. Also, the chain of events that usually lead to deforestation and degradation in the Amazon biome and reference region was explained.

Detailed information on the variables herein listed are provided in the attached supporting document *Annex 6-Agents and drivers of deforestation-Predio Putumayo V1.1.*

Identification of Deforestation Agents

Deforestation in the Amazon region is driven by a complex interplay of various agent groups, including criminal organizations, agro-industrial interests, illegal timber traders, and indigenous communities. While some groups have a direct and significant impact, others contribute indirectly or to a lesser extent. Effective conservation efforts must address the root causes of deforestation, including illegal activities, economic incentives, and socio-economic pressures on local communities.

Table 45. Identification of deforestation Agents

Agent	Description	Population Change	Deforestation Impact
Criminal Organizations and Illegal Armed Actors	Operating along the Colombian-Peruvian border, these groups have evolved post-FARC peace agreements, engaging in illegal logging, gold extraction, and other illicit activities.	Likely increasing, subject to law enforcement efforts and demand for illegal commodities.	High relative importance, major drivers of deforestation and degradation due to their involvement in illegal activities.
Agro-Industrial and Extractive Sector	Expanding into previously inaccessible areas post-conflict, contributing to deforestation through agriculture, minerals extraction, and infrastructure projects.	Constant to increasing, driven by economic incentives and land availability.	Medium relative importance in the reference region, low in protected areas, due to legal protections and logistical challenges.
Illegal Timber Traders and Intermediaries	Operating along borders, these	Constant to unpredictable,	Medium relative importance in the

Agent	Description	Population Change	Deforestation Impact
	intermediaries facilitate illegal logging and timber trade, exploiting regulatory gaps and weak law enforcement.	influenced by enforcement and market dynamics.	reference region, high in indigenous reserves due to exploitation of indigenous territories and weak law enforcement.
Indigenous Communities	Depend on forests for livelihoods, some involved in illegal activities due to external pressures, but overall, their impact on deforestation is moderate.	Relatively stable, impacted by socio-economic factors and external pressures.	Medium relative importance in the reference region, high in protected areas due to traditional agricultural practices and encroachment by external actors.
Peasant Communities	Engaged in land clearing for agriculture, but their overall contribution to deforestation is lower compared to other groups.	Constant, influenced by socio-economic factors.	Low relative importance in both the reference region and protected areas.
Corrupt Government Entities	Involved in corruption, facilitating illegal activities such as timber trafficking, but their direct impact on deforestation is indirect and difficult to quantify.	Constant to unpredictable, subject to efforts to combat corruption.	Low relative importance due to legal protections, social cohesion, and external oversight in protected areas.

Source: prepared by South Pole (2024).

Identification of drivers

Driver variables explaining the quantity (hectares) of deforestation (market reasons)

The driver variables explaining the quantity of deforestation, particularly in the context of market reasons, underscores the intricate interplay of economic incentives, cultural practices, and socio-economic dynamics. From local market demand for natural resources to subsistence economic

activities and residential use, various agent groups are influenced in their decisions to deforest or degrade forests.

The drivers identified, such as market demand for timber, minerals, and agricultural products, highlight the pervasive influence of economic factors on deforestation. This demand, both at local and international levels, creates incentives for exploitation and unsustainable practices, often leading to the encroachment of forested areas. Additionally, subsistence economic activities, deeply rooted in indigenous and peasant communities, contribute to deforestation as they navigate economic pressures and cultural traditions.

Agents of deforestation capitalize on market opportunities, exploit loopholes in regulations, and compete for land and resources, driving deforestation through various means.

Looking ahead, the trajectory of deforestation is likely to be shaped by continued market demands, urbanization, and international trade, among other factors.

The drivers behind deforestation, particularly in the context of market reasons, are complex and multifaceted. They involve various agents whose decisions are influenced by economic incentives, cultural practices, and socio-economic factors. Synthesizing the information provided, the key driver variables and their impacts on different agent groups can be summarized as follows:

Table 46. Driver variables explaining the quantity (hectares) of deforestation (market reasons).

Driver	Description	Impacts on Agent Groups	Likely Future Development
Local Market Demand for Natural Resources	Market demand for timber, minerals, and agricultural products, both domestically and internationally.	• Criminal Organizations and Illegal Armed Actors: Exploit opportunities created by high demand for resources, engage in illegal logging, minerals extraction, and land grabbing to meet market demands. • Agro-Industrial and Extractive Sector: Drive expansion into forested areas for agriculture and resource extraction, prioritize short-term gains over sustainability. • Illegal Timber Traders and Corrupt Government Entities: Cater to market demand, potentially involved in transactions with illegal sources. • Indigenous Communities: Face encroachment and displacement due to increased demand for land and resources. • Peasant Communities: May adopt unsustainable practices to meet economic needs.	The rising demand for natural resources in the Amazon is expected to persist due to factors such as economic growth, urbanization, and consumer preferences. Economic expansion and urban population growth drive the need for timber, minerals, and agricultural products, leading to increased deforestation to meet market demands. Indigenous and peasant communities, whose rights and livelihoods are closely linked to natural resource use and land tenure, play a vital role in this dynamic.
Subsistence Economic Activities and Residential Use	Subsistence activities intertwined with land and forest resource use, as well as residential occupancy	• Criminal Organizations and Illegal Armed Actors: Exploit remote areas where subsistence activities occur, conceal	Continued reliance on traditional subsistence activities especially by indigenous and

Driver	Description	Impacts on Agent Groups	Likely Future Development
	patterns.	illegal operations within communities. • Agro-Industrial and Extractive Sector: Compete for land and resources with subsistence activities, may encroach into forested areas for large-scale operations. • Illegal Timber Traders and Corrupt Government Entities: Facilitate extraction and commercialization of forest resources obtained through subsistence activities. • Indigenous Communities: Face threats to traditional practices and livelihoods, suffer social and cultural erosion. • Peasant Communities: Contribute to deforestation through unsustainable practices driven by economic pressures and land conflicts.	peasant communities, alongside adaptation to external pressures and changes.

Source: prepared by South Pole (2024).

Driver variables explaining location of deforestation (predisposing factors)

The drivers of deforestation in the Colombian Amazon are multifaceted and interconnected, encompassing various socio-economic, political, and environmental factors. Proximity to existing infrastructure, such as roads and navigable rivers, facilitates access to forested areas, enabling activities like illegal logging and land grabbing by criminal organizations, the agro-industrial sector, and illegal timber traders. Additionally, the presence of illegal industrial facilities further exacerbates

deforestation, providing infrastructure for illicit activities and increasing pressure on indigenous and peasant communities.

The expansion of existing settlements also plays a significant role in deforestation, attracting people for economic opportunities and leading to increased land conversion for agriculture and urban development. Weak governance and enforcement of land management policies contribute to unchecked deforestation, despite efforts to establish protected areas and indigenous reserves.

Looking ahead, the future development of deforestation in the reference region will depend on striking a balance between conservation efforts and socio-economic development goals.

Table 47. Driver variables explaining location of deforestation (predisposing factors)

Driver	Predisposing Factors	Impact on Agent Groups	Likely Future Development
Distance to Existing Roads and Navigable Rivers	Proximity to roads and navigable rivers facilitates access to forested areas, significantly influencing the spatial distribution of deforestation and degradation. The Caquetá and Putumayo rivers act as natural transportation routes, lowering transportation costs and facilitating exploitation of forest resources.	• Criminal Organizations and Illegal Armed Actors: Easy access via roads and rivers enables penetration into remote forest areas for illegal activities such as logging and resource extraction. • Agro-industrial and Extractive Sector: Existing infrastructure allows expansion into previously inaccessible areas for agricultural and extractive activities. • Illegal Timber Traders and Intermediaries: Accessible routes streamline illegal logging and timber transportation, aiding in evasion of regulations. • Indigenous Communities: Essential for traditional activities but also exposes them to external threats. • Peasant Communities: Crucial for livelihoods but may lead to land conflicts and environmental degradation.	Continued construction of roads and expansion of navigable river routes will enhance access to remote forest areas, fostering economic activities like logging, agriculture, and transportation.
Proximity to Illegal Industrial	Presence of illegal industrial facilities facilitates various	• Criminal Organizations and Illegal Armed Actors: Facilities provide infrastructure necessary for	Illegal industrial facilities are likely to persist, driving

Driver	Predisposing Factors	Impact on Agent Groups	Likely Future Development
Facilities	illegal activities, including trafficking and laundering, contributing to deforestation and forest degradation.	illegal operations. • Agro-industrial and Extractive Sector: May engage in illegal activities in proximity to these facilities. • Illegal Timber Traders and Intermediaries: Benefit from streamlined operations and efficient trafficking routes. • Indigenous Communities and Peasant Communities: Face increased pressure and coercion due to the presence of illegal activities.	deforestation and forest degradation, exacerbating risks for local communities.
Proximity to Existing Settlements	Expansion of settlements into forested areas due to economic opportunities and weak governance.	• Criminal Organizations and Illegal Armed Actors: Exploit proximity for illegal activities. • Agro-industrial and Extractive Sector: Drawn to areas with established settlements for labor and infrastructure. • Illegal Timber Traders and Intermediaries: Exploit easier access to timber resources. • Indigenous Communities and Peasant Communities: Face threats to livelihoods and cultural rights.	Continued expansion and consolidation of settlements along rivers will attract people for economic gain, leading to further deforestation and degradation if not properly regulated.
Biomass decreasing locations due to illegal timber logging of valuable species with high appreciation in the timber market	Forest degradation in the Colombian Amazon, compounded by illegal activities such as logging and agriculture, could escalate into deforestation, exacerbating conflicts and environmental	• Criminal organizations and illegal armed actors: Illegal logging offers profitable opportunities for criminal organizations to exploit valuable timber species, leading to increased deforestation and environmental degradation. These groups may also engage in other illicit activities such as drug trafficking and gold alluvial extraction. • Agro-industrial and extractive sector: Deforestation serves as a	Weak governance and international demand for valuable timber will likely sustain illegal logging, leading to significant deforestation and degradation in regions like Caquetá,

Driver	Predisposing Factors	Impact on Agent Groups	Likely Future Development
	damage.	means for the agro-industrial and extractive sectors to access land for agricultural expansion and resource extraction. • Illegal timber traders and intermediaries: Facilitating the flow of illegally harvested timber, these actors exploit regulatory loopholes and engage in corrupt practices to evade detection. • Indigenous communities: Reliant on forest resources for their livelihoods, indigenous communities face economic and social hardships due to illegal logging. Pressure from external actors may compel them to participate in illegal activities. • Peasant communities: Displacement and loss of access to forest resources result from illegal logging, impacting traditional livelihoods and exacerbating poverty and food insecurity.	Putumayo, and Amazonas. Criminal organizations are expected to expand operations, exacerbating deforestation, while indigenous and peasant communities face ongoing challenges and displacement.
Management category of the land (e.g., national park, indigenous reserve)	Land tenure in Colombia is governed by rights and regulations, with variations in deforestation due to uneven distribution of legal designations. Despite protection efforts like establishing national parks and/or indigenous reserves, enforcement faces	• Criminal organizations and illegal armed actors: The transition from conflict to peace exposes previously inaccessible forest areas to land grabbing and deforestation. Management categories like national parks present significant challenges to these groups due to stricter surveillance and law enforcement. • Agro-industrial and extractive sector: Management categories can limit access to forested areas, particularly in conservation zones or indigenous reserves, restricting expansion	The future development of indigenous reserves in the Putumayo River Basin depends on balancing conservation with socio-economic goals, amidst threats like illegal logging and land grabbing. Active involvement of local communities,

Driver	Predisposing Factors	Impact on Agent Groups	Likely Future Development
	challenges. Weak governance allows unchecked deforestation, exacerbated by exploitation. Illegal logging persists, contributing to deforestation and carbon emissions.	opportunities for large-scale agricultural and extractive operations. • Illegal timber traders: Exploit regulatory loopholes and corruption within regulatory agencies, facilitating deforestation. Intermediaries play a crucial role in these illegal activities, exploiting communities and fostering conflicts over land and resources. • Indigenous communities: Vulnerable to exploitation within indigenous reserves, facing weak governance and power imbalances. Exploitation by intermediaries for access to land and resources perpetuates deforestation and degradation. • Peasant communities: Management categories affect them differently based on land tenure. Protected areas may restrict traditional land use practices, leading to conflicts over resource access. Weak governance and power imbalances expose them to exploitation by illegal actors, contributing to unchecked deforestation and degradation.	indigenous groups, and stakeholders is crucial for promoting sustainable land use practices and conservation efforts.
Distance to previous deforestation	Proximity to previous deforestation drives further deforestation due to easier access and established infrastructure. Criminal and agro-	• Criminal Organizations: Deforest areas near previously cleared lands to minimize effort and maximize profits from illegal logging, mining, and agriculture. • Agro-industrial Sector: Clear adjacent forest areas to expand agricultural activities, benefiting from reduced land preparation costs.	Areas near previous deforestation fronts are prone to further deforestation due to accessible rivers and existing

Driver	Predisposing Factors	Impact on Agent Groups	Likely Future Development
	industrial activities exploit these areas, accelerating deforestation. Improved access reduces costs for subsequent deforestation, making adjacent areas more attractive. Ecological studies show that edges of deforested areas are more vulnerable to degradation and further deforestation.	• Illegal Timber Traders: Utilize established paths and infrastructure in previously deforested areas, reducing logistical challenges and costs. Exploit areas with less stringent monitoring and enforcement, making illegal activities easier. Find adjacent areas economically attractive due to lower operational costs and higher profit margins after initial barriers are overcome. • Indigenous Communities: Motivated by economic incentives, subsistence needs, and external pressures to deforest areas around previously cleared zones. Deforest for new settlements and infrastructure due to population growth. Expand agricultural land for food production and commercial crops driven by internal and external demands. Seek short-term financial gains from timber sales, especially where law enforcement is weak.	communities. Navigable rivers provide efficient, cost-effective transport for goods, including illegally harvested timber, reducing logistical challenges. Established access routes along rivers make it easier for legal and illegal actors to exploit adjacent forest areas, encouraging more deforestation. This creates a feedback loop where initial deforestation improves access, leading to more clearing. Infrastructure like docks, pathways, and settlements along rivers further facilitates deforestation activities.

Source: prepared by South Pole (2024).

Identification of Underlying Causes of Deforestation

Underlying causes of deforestation in the Colombian Amazon are multifaceted and deeply interconnected. Population pressure, poor government presence and land-use control, armed conflict, poverty, and the socio-economic and environmental intersection all contribute to the alarming rate of deforestation in this region.

Rapid population growth and migration intensify the demand for land and resources, leading to the expansion of agro-industrial and extractive activities. This puts immense pressure on indigenous and peasant communities, who often resort to unsustainable practices for survival. Additionally, weak governance and corruption enable illegal activities, further exacerbating environmental degradation.

Armed conflict compounds these issues, providing opportunities for criminal organizations and illegal armed actors to exploit natural resources and perpetuate violence, while poverty traps communities in a cycle of environmental degradation and economic vulnerability.

Addressing deforestation in the reference region requires holistic approaches that tackle the root causes of the issue. Strengthening governance mechanisms, enforcing regulations, and empowering indigenous and peasant communities are crucial steps towards sustainable development and biodiversity preservation. Furthermore, addressing poverty and promoting alternative livelihoods can help break the cycle of environmental degradation and economic vulnerability.

Table 48. Identification of Underlying Causes of Deforestation

Causes	Underlying Cause	Impact on Key Agents	Likely Future Development
Population Pressure	Rapid population growth and migration to the Colombian Amazon have led to increased demand for land and resources, driving deforestation.	• Criminal Organizations and Illegal Armed Actors: Exploit vulnerable populations and weak governance to engage in illegal activities like drug trafficking and timber extraction. • Agro-industrial and Extractive Sector: Demand for land for agriculture and resource extraction fuels expansion into forested areas. • Indigenous and Peasant Communities: Face pressure on traditional	Continued population growth will intensify pressure on natural resources, driving further expansion of agro-industrial and extractive activities unless accompanied by stringent regulations and sustainable practices.

Causes	Underlying Cause	Impact on Key Agents	Likely Future Development
		land and resources, often resorting to unsustainable practices for survival. • Corrupt Government Entities: Limited resources and capacity lead to ineffective regulation and enforcement, enabling environmental degradation.	
Poor Government Presence and Land-Use Control	Weak state presence and ineffective governance contribute to illegal economic activities and environmental degradation.	• Criminal Organizations and Illegal Armed Actors: Exploit lack of enforcement to engage in illicit activities like illegal logging. • Agro-industrial and Extractive Sector: Operate with impunity due to lax regulations and oversight. • Indigenous and Peasant Communities: Vulnerable to exploitation and displacement without government protection of land rights. • Corrupt Government Entities: Corruption within regulatory agencies undermines efforts to combat illegal activities.	Without significant improvements, illegal activities and land disputes will persist, undermining environmental conservation and exacerbating social inequalities.
Armed Conflict	Decades of armed conflict have facilitated environmental degradation through illicit activities and displacement of populations.	• Criminal Organizations and Illegal Armed Actors: Exploit conflict zones for activities like illegal extractive activities and timber extraction. • Agro-industrial and Extractive Sector: Conflict disrupts operations but presents opportunities for	Power vacuums post-conflict will attract new actors, continuing competition over resources and exacerbating environmental degradation and conflicts over land.

Causes	Underlying Cause	Impact on Key Agents	Likely Future Development
		resource extraction in unstable regions. • Indigenous and Peasant Communities: Displaced and affected by violence, leading to disruptions in traditional land management. • Corrupt Government Entities: Conflict provides opportunities for collusion with illegal actors, perpetuating exploitation of natural resources.	
Poverty	Poverty serves as a fundamental underlying cause of deforestation, particularly in regions like the Colombian Amazon, where indigenous and peasant communities engage in subsistence activities and face socioeconomic challenges.	• Criminal Organizations and Illegal Armed Actors: Exploit economic vulnerabilities of communities for activities like drug trafficking and illegal extractive activities, perpetuating the cycle of poverty and environmental degradation. • Agro-Industrial and Extractive Sector: Economic vulnerabilities force communities into unsustainable practices, while companies exploit them with low wages and damaging practices. • Illegal Timber Traders and Intermediaries: Poverty drives communities into illegal logging, while lack of resources makes them susceptible to exploitation. • Indigenous and Peasant Communities: Lack of	Economic vulnerability among indigenous and peasant communities is expected to persist, exacerbating poverty and environmental degradation. Without interventions, communities will remain dependent on unsustainable activities, perpetuating deforestation.

Causes	Underlying Cause	Impact on Key Agents	Likely Future Development
		resources and opportunities push communities towards unsustainable activities, trapping them in poverty and contributing to deforestation. • Corrupt Government Entities: Poverty undermines governance mechanisms, fostering corruption and facilitating deforestation.	
Socio-Economic and Environmental Intersection	The socio-ecological diversity of the Colombian Amazon, combined with economic interests and climate change, fuels deforestation.	• Criminal Organizations and Illegal Armed Actors: Exploit diverse landscapes for illicit activities, prioritizing short-term gains over environmental conservation. • Agro-Industrial and Extractive Sector: Economic interests drive conversion of forests into pasturelands and extraction of natural resources, contributing to deforestation. • Illegal Timber Traders and Intermediaries: Exploit lax regulations and market demand for timber products, exacerbating deforestation. • Indigenous and Peasant Communities: Deep cultural ties to the land clash with inconsistent state policies, leading to conflicts over land use and management.	Economic interests and climate change will continue driving deforestation. Strengthening indigenous rights and involving communities in decision-making will be crucial for sustainable development and biodiversity preservation.

Causes	Underlying Cause	Impact on Key Agents	Likely Future Development
		• Corrupt Government Entities: Corruption undermines environmental governance, allowing illegal activities to thrive unchecked.	

Source: prepared by South Pole (2024).

Analysis of the chain of events that lead to deforestation and forest degradation.

Figure 54 shows the chain of deforestation events in the Amazon region, and Figure 55 describes the factors that have converged over time to trigger these deforestation events.

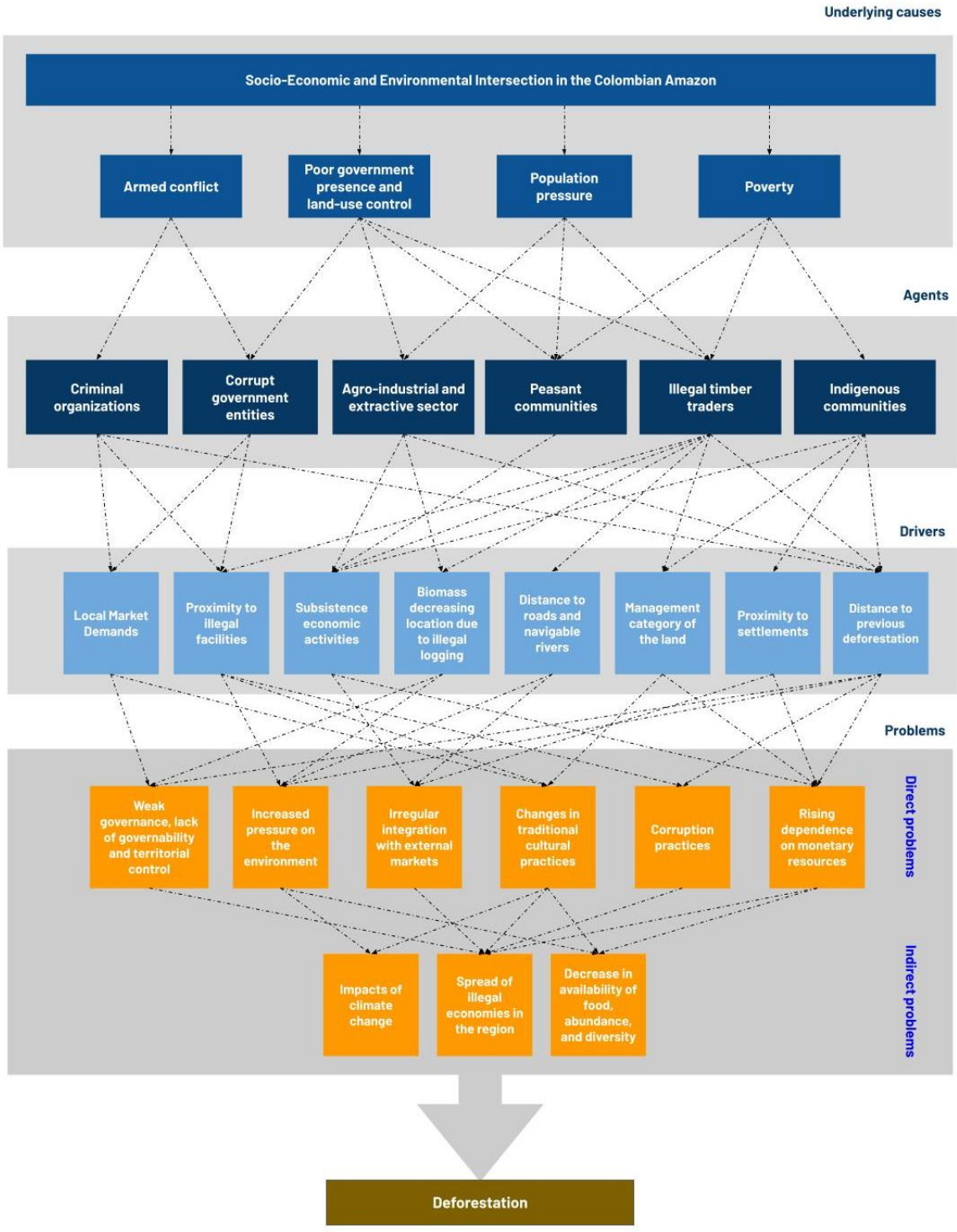


Figure 54. Analysis of the chain of events leading to deforestation and forest degradation in the reference region. Chain of events of deforestation in the RR, PA, and LKB (only the strongest relationships are shown with dotted arrows).

Source: prepared by South Pole (2024).

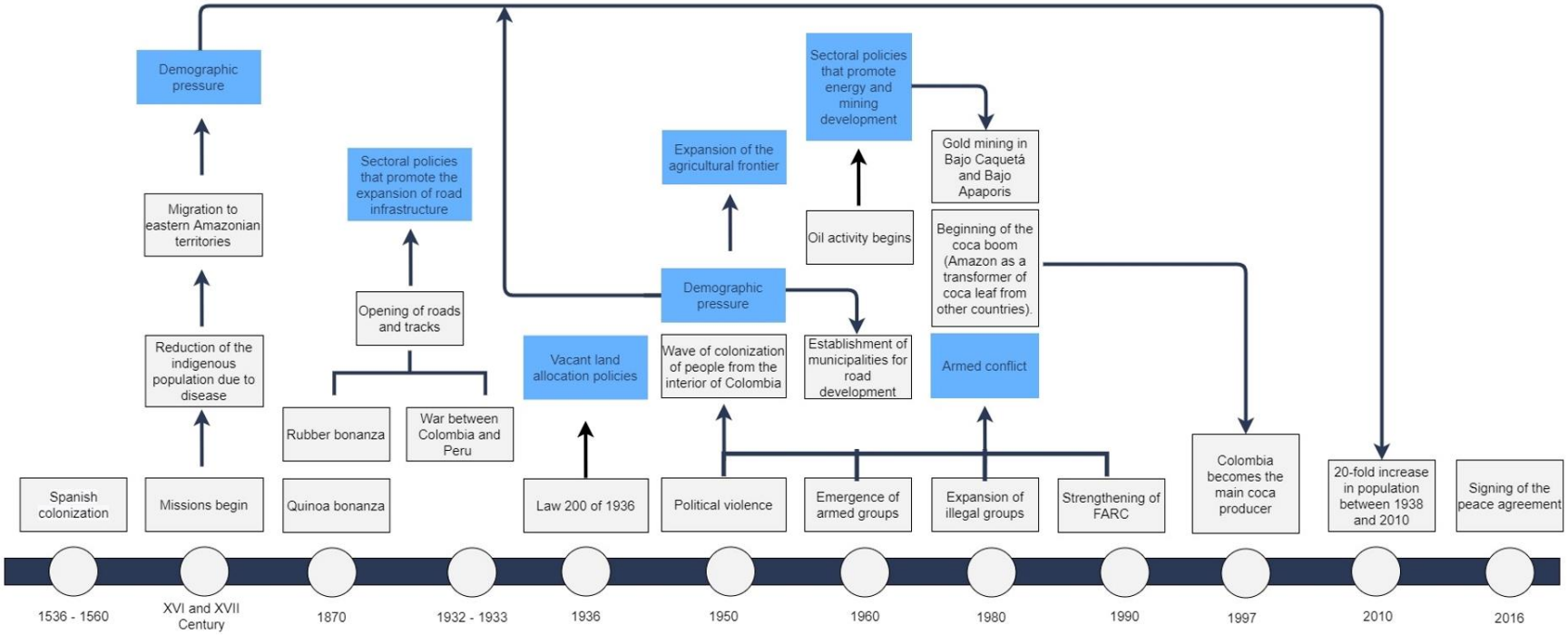


Figure 55. Historical events explaining the baseline socio-economic and environmental intersection in the Colombian Amazon and the reference region.

Source: prepared by South Pole (2024).

Conclusion

The evidence available regarding the future deforestation trend in the reference region and project area of the Colombian Amazon and the reference region suggests a conclusive direction towards continued degradation and deforestation of the forest cover. Several compelling arguments support this assertion:

- Historical Trends: Examination of historical data reveals a consistent pattern of deforestation and forest degradation in the Colombian Amazon. Over the years, the region has experienced significant loss of forest cover due to various factors such as agricultural expansion, illegal logging, extractive activities, and infrastructure development. These trends provide a strong basis for predicting continued deforestation in the future, especially considering the persistent drivers identified in the analysis (Section 3.4.2).
- Persistent Drivers: The analysis identifies a range of drivers that have consistently contributed to deforestation in the region, including population pressure, market demand for natural resources, weak governance, armed conflict, and poverty. These drivers have shown remarkable resilience over time, indicating their enduring influence on forest loss. Unless effectively addressed, these underlying factors will likely continue to fuel deforestation in the foreseeable future.
- Ongoing Challenges: Despite efforts to mitigate deforestation, the region continues to face numerous challenges that hinder conservation efforts. Weak governance, corruption, limited enforcement capacity, and socioeconomic disparities create an enabling environment for illegal activities such as logging, minerals extraction, and land grabbing. The persistence of these challenges suggests that the trajectory of deforestation is unlikely to change significantly without substantial intervention.
- Projected Developments: Future projections based on current trends and socio-economic forecasts further support the conclusion of continued deforestation in the Colombian Amazon and the reference region. Rapid population growth, urbanization, and economic expansion are expected to increase pressure on natural resources, leading to further land conversion and forest degradation. Additionally, climate change impacts such as extreme weather events and altered precipitation patterns may exacerbate deforestation by promoting land-use changes and forest disturbances.
- Limited Conservation Measures: While conservation efforts are being implemented in the region, their impact may be insufficient to reverse the trend of deforestation significantly. Despite the establishment of protected areas, indigenous reserves, and conservation initiatives, enforcement remains weak, and illegal activities persist. Moreover, conflicts over land tenure and resource access continue to undermine conservation efforts, highlighting the need for more comprehensive and effective strategies. This has promoted the formulation and implementation of a significant number of REDD+ projects throughout the Amazon since the creation of the National Carbon Tax in 2018.

In conclusion, the evidence available strongly indicates that the most likely future deforestation trend in the reference region and project area is conclusive. Historical trends, persistent drivers, ongoing challenges, projected developments, and limited conservation measures collectively point towards

continued degradation of the forest cover unless decisive action is taken to address the root causes and effectively manage natural resources in a sustainable manner.

3.4.4 Step 4. Projection of future deforestation

A projected deforestation was determined by the project proponent considering possible future changes at the level of agents, drivers, and underlying causes of deforestation, as well as the remaining forest area that is potentially available for conversion to non-forest within the reference region during the first fixed baseline period and, the project crediting period. This task was performed through the following three analytical sub-steps:

Sub-step 4.1 Selection of the baseline approach

Modeling approach was used to project potential annual deforestation within the reference region during the first fixed baseline period. With this approach, the rate of baseline deforestation was estimated using a model that expresses deforestation as a function of driver variables selected by the project proponents and considering social and economic conditions presented in section 3.4.1 to define RR boundaries and the results of the analysis of agents and drivers of deforestation in section 3.4.3.

According to the methodology, the average annual transition from forest to non-forest must be estimated for the historical reference period. The historical reference period can be broken down into two or more periods; however, the data on change in the area covered by forest in the reference region for the period 2005-2016 (annualized) constitute the activity data needed for the construction of the REDD+ Project baseline. Given the changes in the forest area for the reference region (RR), annual rates of change are estimated according to the methodology by applying the equations below, and then the average annual change between strata in the historical reference period is estimated:

$$ABSLRR_{i,t} = ARR_{i,t-1} * RBSLRR_{i,t}$$

Where:

$ABSLRR_{i,t}$ Annual area of baseline deforestation in stratum i within the reference region at year t; ha yr-1

$ARR_{i,t-1}$ Area with forest cover in stratum i within the reference region at year t-1: ha

$RBSLRR_{i,t}$ Deforestation rate applicable to stratum i within the reference region at year t; %

t 1, 2, 3 … T, a year of the proposed project crediting period; dimensionless

I 1, 2, 3 … IRR, a stratum within the reference region; dimensionless

Table 49 shows the estimated annual rate of change for the historical reference period for the reference region.

Table 49. Historical annual rate of change in forest cover in the reference region.

Year (t)	Area with forest cover $ARR_{i,t-1}$ (ha)	Deforestation rate $RBSLRR_{i,t}$ (%)	Annual area of baseline deforestation $ABSLRR_{i,t}$ (ha)
2005	13,150,475	-	-
2012	12,869,251	0.31%	40,175
2016	12,680,802	0.37%	47,112
Average (2005-2016)	-	**0.34%**	**43,644**

Source: adapted from MADS and IDEAM (2019).

Furthermore, when calculating the area deforested between two periods of analysis, the SMByC considers only the areas with information for both periods of analysis to ensure that there is certainty that the event occurred in the period of time analyzed. Forest losses detected after one or several dates without information are not included in the calculation to avoid overestimated rates in periods in which areas with no information increase due to different factors (e.g., climatic periods of high cloudiness or failures in satellite sensors).

After checking historical deforestation trend in RR, the annual area of baseline deforestation that applied at year t in stratum i within the reference region was estimated using simple regression at combining the annual area deforested ($ABSLRR_{i,t}$) as the dependent variable, and independent variable(s) like dintance to communities, distance to rivers and main streams, distance to previous deforested areas and biomass changes layers.

The modeling was carried out with the Dinamica EGO V.5.0 that allows modeling of environmental dynamics from the generation of future scenarios to understand their evolution over time. The simulation process was determined by a series of logical steps whose goal is to calibrate, execute and validate a model of change in land use and land cover, resulting from the intervention of agents or causes.

Sub-step 4.2 Projection of the location of future deforestation

Location analysis of future deforestation within reference region is required to determine the annual areas of deforestation within the project area and leakage belt. Once location analysis was completed, the portion of annual areas of baseline deforestation within the project area and leakage belt was determined using a GIS. Annex 9[43] contains the specification of modeling process, variables, simulation and validation steps, and the results to project the future deforestation within the reference region, the project area, and the leakage belt for the project crediting period 2016–2046.

[43] Annex 9_Future_deforestation_model_V2.1_clean

Table 50. Annual areas of baseline deforestation in the reference region, project area and leakage belt under the baseline scenario.

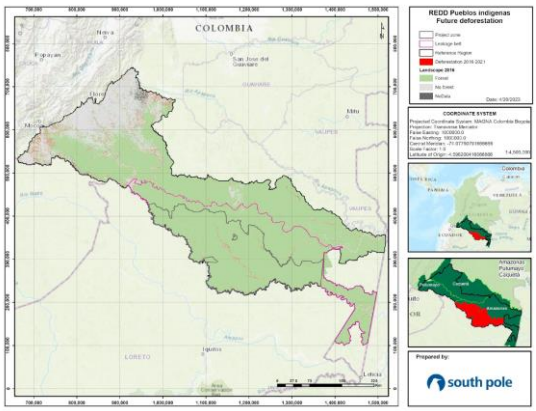
Year	Reference region (RR)		Project area (AP)		Leakage belt (LK)	
	annual ABSLRRt	cumulative ABSLRR	annual ABSLPAt	cumulative ABSLPA	annual ABSLLKt	cumulative ABSLLK
2017	41,725	41,725	4,784	4,784	3,165	3,165
2018	41,588	83,313	5,168	9,952	3,358	6,522
2019	41,451	124,764	5,443	15,395	3,576	10,098
2020	41,315	166,079	5,653	21,048	3,751	13,849
2021	41,179	207,258	6,060	27,108	3,801	17,650
2022	41,044	248,302	6,360	33,468	3,951	21,601
2023	40,909	289,211	6,362	39,830	4,125	25,727
2024	40,775	329,986	6,473	46,303	4,240	29,967
2025	40,641	370,627	6,582	52,885	4,376	34,343
2026	40,507	411,134	6,749	59,634	4,296	38,639
2027	40,374	451,508	6,670	66,304	4,582	43,222
2028	40,241	491,749	6,554	72,858	4,433	47,655
2029	40,109	531,858	6,672	79,530	4,553	52,208
2030	39,977	571,835	7,069	86,599	4,870	57,078
2031	39,846	611,681	7,010	93,609	5,048	62,125
2032	39,715	651,396	7,340	100,949	5,124	67,249
2033	39,585	690,981	7,572	108,521	5,295	72,544
2034	39,455	730,436	7,656	116,177	5,360	77,904
2035	39,325	769,761	7,358	123,535	5,447	83,351
2036	39,196	808,957	7,347	130,882	5,457	88,808
2037	39,067	848,024	7,254	138,136	5,423	94,231
2038	38,939	886,963	7,100	145,236	5,601	99,833
2039	38,811	925,774	7,146	152,382	5,599	105,431
2040	38,683	964,457	7,088	159,470	5,648	111,079
2041	38,556	1,003,013	7,244	166,714	5,624	116,704

Year	Reference region (RR)		Project area (AP)		Leakage belt (LK)	
	annual ABSLRRt	cumulative ABSLRR	annual ABSLPAt	cumulative ABSLPA	annual ABSLLKt	cumulative ABSLLK
2042	38,430	1,041,443	7,272	173,986	5,574	122,277
2043	38,303	1,079,746	7,246	181,232	5,911	128,188
2044	38,177	1,117,923	7,486	188,718	6,061	134,249
2045	38,052	1,155,975	7,651	196,369	6,204	140,453
2046	37,927	1,193,902	8,052	204,421	6,222	146,675

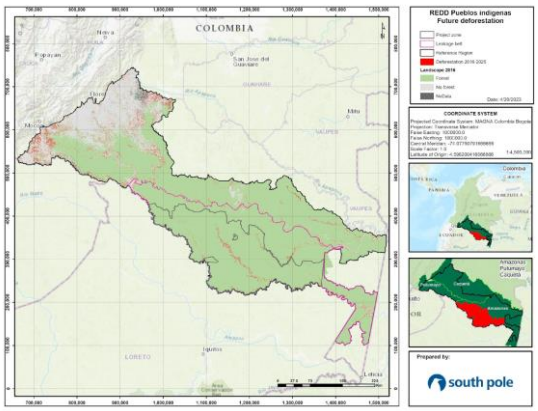
Source: prepared by South Pole (2024).

The simulation maps obtained are shown in Figure 56 and relate to the forest areas and deforestation for the period 2017 to 2046, between each pair of years.

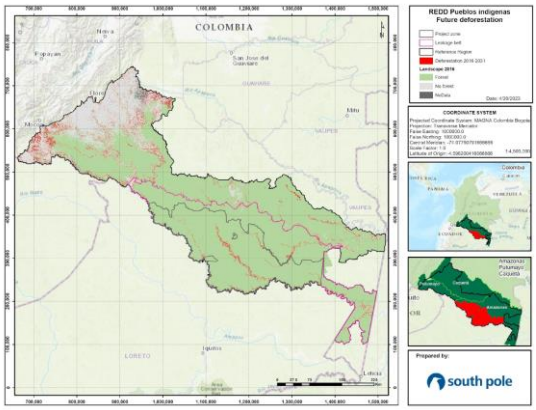
2016-2021



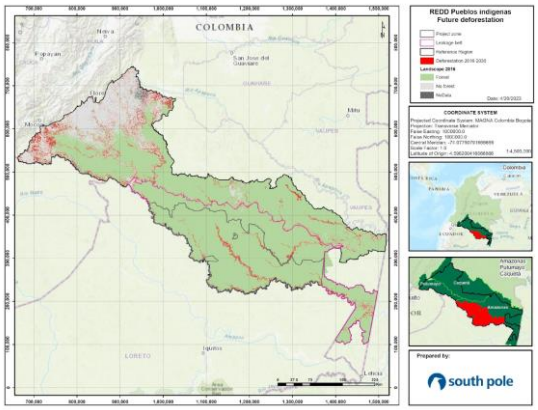
2016-2026



2016-2031



2016-2036



2016-2041 2016-2046

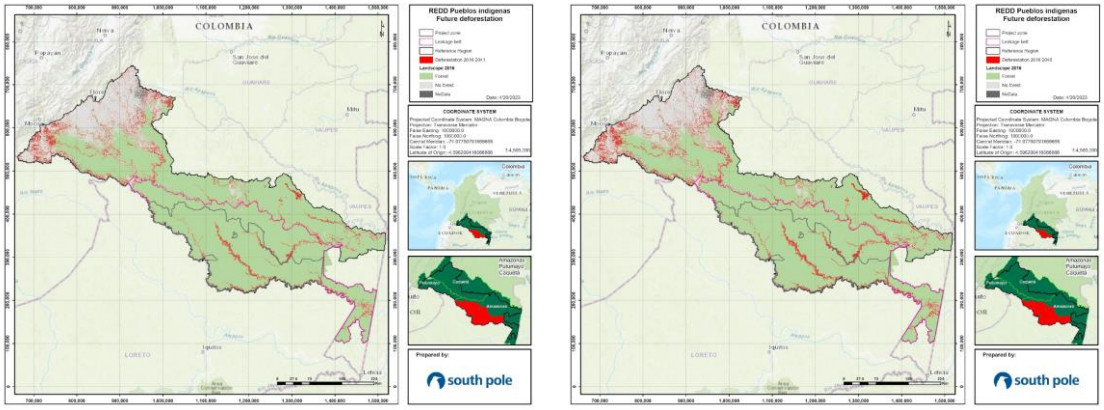


Figure 56. Deforestation for the fixed baseline period (2016-2021-2026) and the entire project crediting period (2016-2046).

Source: prepared by South Pole (2023).

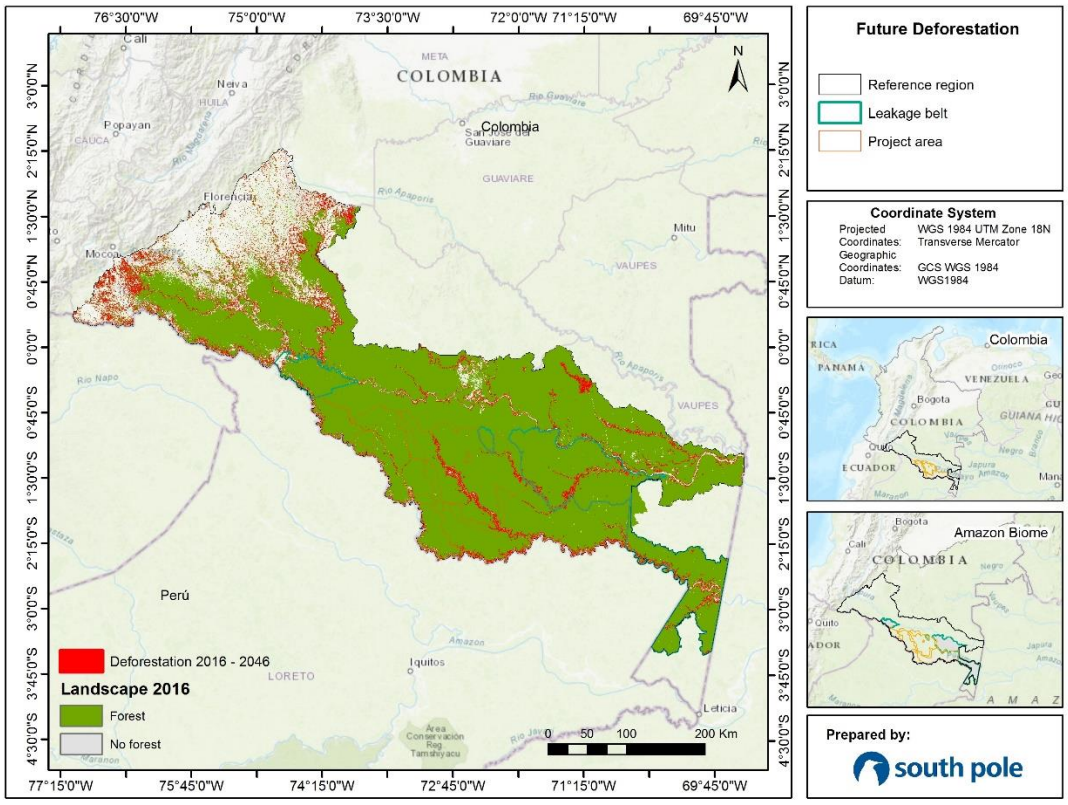


Figure 57. Future deforestation for the entire project crediting period (2016-2046).

Source: prepared by South Pole (2023).

3.4.5 Step 5: Definition of the land-use and land-cover change component of the baseline.

The goal of this step was to calculate activity data of the initial forest class (I1) that will be deforested and activity data of the post-deforestation classes (fi) that will replace them in the baseline case.

After step 4, the area and location of future deforestation were both known and pre-deforestation carbon stocks was determined by matching the predicted location of deforestation with the location of forest classes with known carbon stocks. Pre-deforestation carbon stocks shall be those existing or projected to exist at the year of the projected deforestation, so forest class carbon stock was affected by an average projection of biomass changes per hectare as a proxy of areas undergoing degradation in the baseline case. Post-deforestation carbon stocks were determined as the historical area-weighted average carbon stock.

To determine activity data, the following steps were applied:

Calculation of baseline activity data per forest class and per post-deforestation forests class

Historical LU/LC-changes were assumed to be representative for future trends in project area and leakage belt. Hence, post-deforestation land-uses were allocated to the projected areas of annual deforestation in same proportions as those observed on lands deforested during the historical reference period in the reference region. The RR was divided in three zones, each representing different combinations of possible post-deforestation land uses (zone 1, zone 2, zone 3) considering the historical location of postdeforestation LU/LC-classes and the requirements (climate, soil, economic factors) that different classes must be established within a given zone in the baseline case.

Despite the strong similarity in landscape variables throughout the reference region, the proposed zoning considered especially variations in the presence of deforestation agents in relation to the project and legal status of the territory. Zone 1 includes the area with the greatest mobility of deforestation agents that are expected to enter the project area through the Putumayo River, promoting the expansion of the agricultural frontier and connecting the processes of selective timber extraction with transportation infrastructure. Zone 2, where the project area is located, in which the proponents have traditional rights of use and management of natural resources within the boundaries that enclose the Predio Putumayo Reserve, and finally, Zone 3, which regardless of the legal status of the territory and the mobility of the agents of deforestation and forest degradation, these areas are part of the buffer zones of the Cahunari National Park, so it is expected that the exploitation and use of natural resources would be regulated.

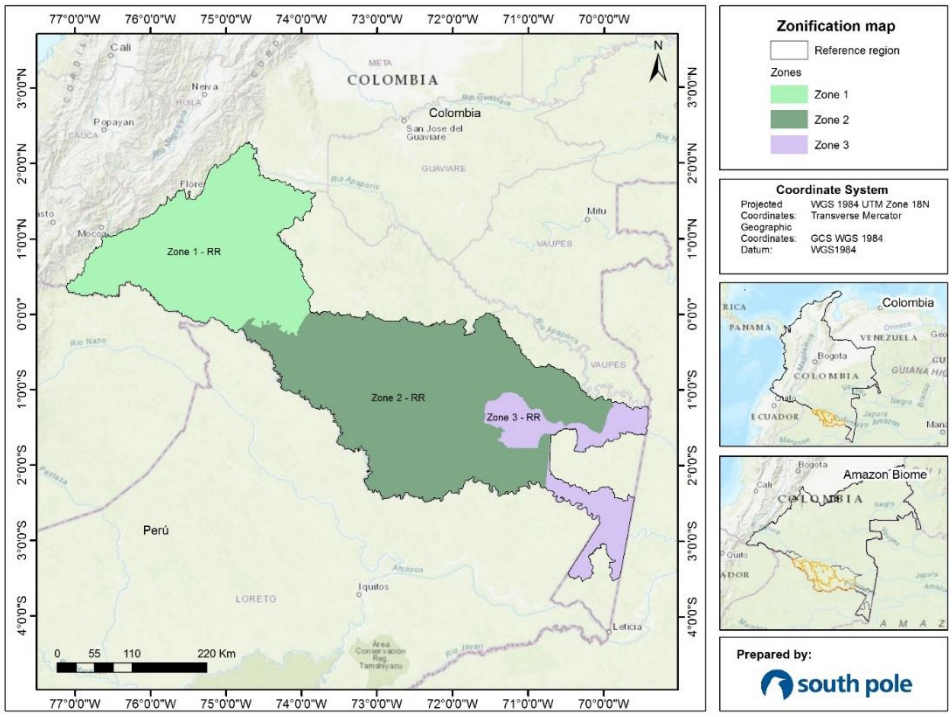


Figure 58. Zones of the reference region encompassing different combinations of potential post-deforestation LU/LC classes.

Source: prepared by South Pole (2023).

Land Cover and Land Use Change Matrix in the Reference Region

The results of the baseline deforestation were reported by creating ex ante tables of activity data per initial forest class icl and per category of land-use change ct based on IPCC land-use categories of LU/LC change (Cropland, Grassland, Shrubland, Wetlands, Settlements, Other land). Forest class changes to Wetlands and Settlements were not considered as 'Deforestation'. See IPCC 2006 GL AFOLU Chapter 3, Section 3.2, p. 3.5 for a description of these classes. Category is the term used in IPCC reports to refer to specific sources of emissions or removals of greenhouse gases. Under the AFOLU sector, "categories" are land-use / land-cover (LU/LC) transitions:

(a) Forest Land to Forest Land (degradation and regeneration of forest land remaining forest land)

(b) Forest Land to Crop Land (deforestation followed by agriculture)

(c) Forest Land to Grass Land (deforestation followed by pasture)

(d) Forest Land to Settlements (excluded due to the scope of the VCS VM0015)

(e) Forest Land to Wetlands (excluded because of the high fluvial dynamics in project area)

(f) Forest Land to Other Land (deforestation followed by other land)

This ex-ante change matrix of LU/LC was determined for the project using two main inputs the information. The first one corresponds to the cumulate deforestation detected for the historical period of reference in the baseline. This data was obtained from the previous assessment of forest- no forest. The second data set included land cover data from the Amazonian Institute of Scientific Research SINCHI[44], which provides information for the entire Amazon biome in Colombia. This information categorizes land cover using the Corine Land Cover system at a 1:100,000 scale, but as was indicated before, a standardized to the IPCC categories must be done to achieve the final classes of Grassland, Other land, Settlements, Shrubland, Wetland, and Non-data. This homologation process between Corine Land Cover and IPCC categories is presented in supporting information[45]. It is essential to highlight that the categories of flooded forests were categorized as Wetlands, and to be conservative any land cover change detected in these areas was not included in the assessment due to the variability presented in these ecosystems due to the natural dynamic of the rives and the ecosystems themselves.

Combinations of possible post-deforestation land uses considering the historical location of post deforestation LU/LC-classes were obtained to adjust the projection of future deforestation in reference region and estimate area projected to be deforested within project area and leakage belt for the fixed baseline period and, for the entire project crediting period.

For the categories of dense forest defined by the SINCHI, the post-deforestation categories corresponded to grasslands to reduce any potential confusion with initial secondary succession or grassland areas. This scenario implies a conservative approach to the LU/LC definition. On the other hand, the SINCHI classification includes some land covered with mosaics with forest and grassland or forest and shrubland. For these categories, the post-deforestation class homologated was defined according to the matrix presented in each case:

- Fragmented forest with pastures was assigned the LU/LC of grasslands.
- Fragmented forest with secondary vegetation was assigned the LU/LC of Shrubland.

Once the historical deforestation was classified into each of the IPCC categories, this map was intercepted with the layer containing the three zones identified for the zoning of the project area and the definition of the land-use and land-cover change component of the baseline. The area of land-use/land-cover (LU/LC) transitions per zone and their percentage contribution to the total deforestation of each zone was calculated. These contributions per land-use / land-cover (LU/LC) transitions were averaged to have the final expected LU/LC transitions under the baseline scenario.

[44] Download link for SICHI land cover information (https://datos.siatac.co/pages/coberturas)

[45] Supporting information Excel file 20231204_PA_LKB_Putumayo_REDD_Stratified deforestation_2016_2020_LC2020_SINCHI

Table 51. Average contribution per LU/LC transition under the baseline scenario.

Cumulative historical deforestation RR 2005 - 2016							Average contribution	
LULC 2016 IPCC	Area Zone 1 (ha)	% of Zone	Area Zone 2 (ha)	% of Zone	Area Zone 3 (ha)	% of Zone	ha	%
Cropland	181	0%	35	0%	0	0%	72	0%
Grassland	345,959	81%	12,194	37%	3,690	38%	120,614	77%
Other land	7,780	2%	219	1%	10	0%	2,669	2%
Settlements	13	0%	1	0%	0	0%	5	0%
Shrubland	63,086	15%	12,529	38%	2,292	24%	25,969	17%
Wetland	9.632	2%	8.240	25%	3.746	38%	7.206	5%
Non data	13	0%	44	0%	10	0%	22	0%
Total (ha)	426.663	100%	33.262	100%	9.747	100%	156.558	100%

Table 52. Annual areas deforested in each zone within the reference region in the baseline case (baseline activity data per zone).

Year	Baseline deforestation in RR (hectares) ABSLRRt			
	Total forest land changes	Forest land to grassland	Forest land to shrubland	Forest land to other land
2017	41,725	32,146	6,921	711
2018	41,588	32,040	6,898	709
2019	41,451	31,934	6,876	707
2020	41,315	31,830	6,853	704
2021	41,179	31,725	6,831	702
2022	41,044	31,621	6,808	700
2023	40,909	31,517	6,786	698
2024	40,775	31,414	6,764	695
2025	40,641	31,310	6,741	693
2026	40,507	31,207	6,719	691
2027	40,374	31,105	6,697	688
2028	40,241	31,002	6,675	686
2029	40,109	30,901	6,653	684
2030	39,977	30,799	6,631	682
2031	39,846	30,698	6,609	679
2032	39,715	30,597	6,588	677
2033	39,585	30,497	6,566	675
2034	39,455	30,397	6,545	673
2035	39,325	30,297	6,523	671

Year	Baseline deforestation in RR (hectares) ABSLRRt			
	Total forest land changes	Forest land to grassland	Forest land to shrubland	Forest land to other land
2036	39,196	30,197	6,502	668
2037	39,067	30,098	6,480	666
2038	38,939	29,999	6,459	664
2039	38,811	29,901	6,438	662
2040	38,683	29,802	6,417	660
2041	38,556	29,704	6,395	657
2042	38,430	29,607	6,375	655
2043	38,303	29,509	6,354	653
2044	38,177	29,412	6,333	651
2045	38,052	29,316	6,312	649
2046	37,927	29,219	6,291	647

Source: prepared by South Pole (2023).

Table 53. Annual areas deforested in each zone within the project area and the leakage belt in the baseline case (baseline activity data per zone).

Year	Baseline deforestation in PA (hectares) ABSLPAt				Baseline deforestation in LK (hectares) ABSLLKt			
	Total forest land changes	Forest land to grassland	Forest land to shrubland	Forest land to other land	Total forest land changes	Forest land to grassland	Forest land to shrubland	Forest land to other land
2017	4,784	3,686	794	82	3.165	2.438	525	54
2018	5,168	3,982	857	88	3.358	2.587	557	57
2019	5,443	4,193	903	93	3.576	2.755	593	61
2020	5,653	4,355	938	96	3.751	2.890	622	64
2021	6,060	4,669	1,005	103	3.801	2.928	630	65
2022	6,360	4,900	1,055	108	3.951	3.044	655	67
2023	6,362	4,901	1,055	108	4.125	3.178	684	70
2024	6,473	4,987	1,074	110	4.240	3.267	703	72
2025	6,582	5,071	1,092	112	4.376	3.372	726	75
2026	6,749	5,200	1,119	115	4.296	3.310	713	73
2027	6,670	5,139	1,106	114	4.582	3.530	760	78
2028	6,554	5,049	1,087	112	4.433	3.415	735	76

Year	Baseline deforestation in PA (hectares) ABSLPAt				Baseline deforestation in LK (hectares) ABSLLKt			
	Total forest land changes	Forest land to grassland	Forest land to shrubland	Forest land to other land	Total forest land changes	Forest land to grassland	Forest land to shrubland	Forest land to other land
2029	6,672	5,140	1,107	114	4.553	3.508	755	78
2030	7,069	5,446	1,173	121	4.870	3.752	808	83
2031	7,010	5,401	1,163	120	5.048	3.889	837	86
2032	7,340	5,655	1,218	125	5.124	3.948	850	87
2033	7,572	5,834	1,256	129	5.295	4.079	878	90
2034	7,656	5,898	1,270	131	5.360	4.129	889	91
2035	7,358	5,669	1,221	125	5.447	4.197	904	93
2036	7,347	5,660	1,219	125	5.457	4.204	905	93
2037	7,254	5,589	1,203	124	5.423	4.178	900	92
2038	7,100	5,470	1,178	121	5.601	4.315	929	96
2039	7,146	5,505	1,185	122	5.599	4.313	929	95
2040	7,088	5,461	1,176	121	5.648	4.351	937	96
2041	7,244	5,581	1,202	124	5.624	4.333	933	96
2042	7,272	5,602	1,206	124	5.574	4.294	925	95
2043	7,246	5,582	1,202	124	5.911	4.554	980	101
2044	7,486	5,767	1,242	128	6.061	4.670	1.005	103
2045	7,651	5,894	1,269	130	6.204	4.779	1.029	106
2046	8,052	6,203	1,336	137	6.222	4.794	1.032	106

Source: prepared by South Pole (2024).

Map Accuracy Assessment and confusion matrix.

The Land Use and Land Cover Change (LULCC) matrix in the reference region of the REDD+ was validated using satellite images from the year 2016 (the project's starting date). This validation involved selecting points from both established forest and deforested areas between the years 2005 and 2016. These points were subsequently intercepted and reclassified based on the land cover classifications provided by SINCHI for the year 2016, homologated to the IPCC system (including forest, cropland, grassland, other land, settlements, shrubland, and wetland). A set of statistics was employed to ascertain the accuracy of the generated cartographic information, focusing on a) the probability of each IPCC class relative to reality; b) ground control points; c) overall classification with minimal omission and commission errors; and d) replicability and comparability of results.

Methodologically, the precision of land cover distribution must be equal to or greater than 90%, as evaluated in 2016 following the guidelines for gross deforestation in the baseline period of 2005-2016. The definition of classes, satellite data acquisition, sampling design, the process of inspection using satellite images, and the results obtained in the confusion matrix for accuracy assessment are presented below.

- Class definition

The accuracy validation process for the year 2016 in the reference region begins with the utilization of spatial data on land cover sourced from the Colombian Amazon, specifically provided by the Amazonian Institute of Scientific Research, known as SINCHI. These datasets adhere to the criteria outlined by the Intergovernmental Panel on Climate Change (IPCC) of 2006, which standardizes the classification of land use and land cover.

Table 54 illustrates the categories utilized and those classified within the reference region, along with their reclassification into forest and non-forest areas. Following this initial classification, the land cover data from 2016 is compared against stable forest areas and deforested regions spanning the baseline period from 2005 to 2016.

This comparative analysis aims to identify areas within the reference region that require accuracy validation for the year 2016. This validation process involves the use of satellite imagery and visual inspection techniques to assess the accuracy of land cover classification.

It's important to note that areas lacking data throughout the baseline period are excluded from the accuracy validation process, ensuring that the evaluation focuses solely on regions with sufficient and consistent data availability.

Table 54. IPCC Land cover class and reclassification

IPCC Land Cover	Classified class	Forest/non-Forest
Forest	Forest (value 1)	Forest
Cropland	Cropland (value 2)	Non forest
Grassland	Grassland (value 3)	Non forest
	Scrubland (value 6)	Non forest
Other land	Other land (value 4)	Non forest
Settlements	Settlements (value 5)	Non forest
Wetland	Wetland (value 7)	Non forest

Source: South Pole (2024).

- Data acquisition

To conduct a comprehensive assessment of changes in land use and land cover (LULCC) for the year 2016, we employed multispectral images sourced from Planet. These images offer a spatial resolution of 3 meters and are provided in the Level 1C (L1C) mosaic version, ensuring precise pixel-to-pixel geometric correction.

In addition, it was used the Planet Add-in extension specifically designed for ArcGIS Pro version 3.0.0[46]. This extension facilitated the integration of Planet imagery directly into our GIS environment, streamlining the analysis process.

Table 55 contains details regarding the dates of optical images available for the entire reference region. This comprehensive dataset enabled us to conduct visual inspections and analysis without the need to download individual images, serving as an invaluable basemap for our assessment of LULCC changes in the region.

Table 55. List of Planet mosaic images

Acquisition date	Location	Type
December 2015 - May 2016	Global basemap	Mosaic
June 2016 - November 2016	Global basemap	Mosaic

Source: South Pole (2024)

The Planet images stand out for their spatial resolution of 3 meters (m) in the visible and near-infrared spectrum, providing greater spatial accuracy during the validation phase compared to the eligibility phase, which has a resolution of 30 m. Additionally, the base images have an average cloud cover of less than 10% in the reference region. Figure 59 displays a composite image of the reference region for 2016 using an RGB 3-2-1 composition.

[46] Source: https://learn.planet.com/download-arcgis-pro-add-in.html

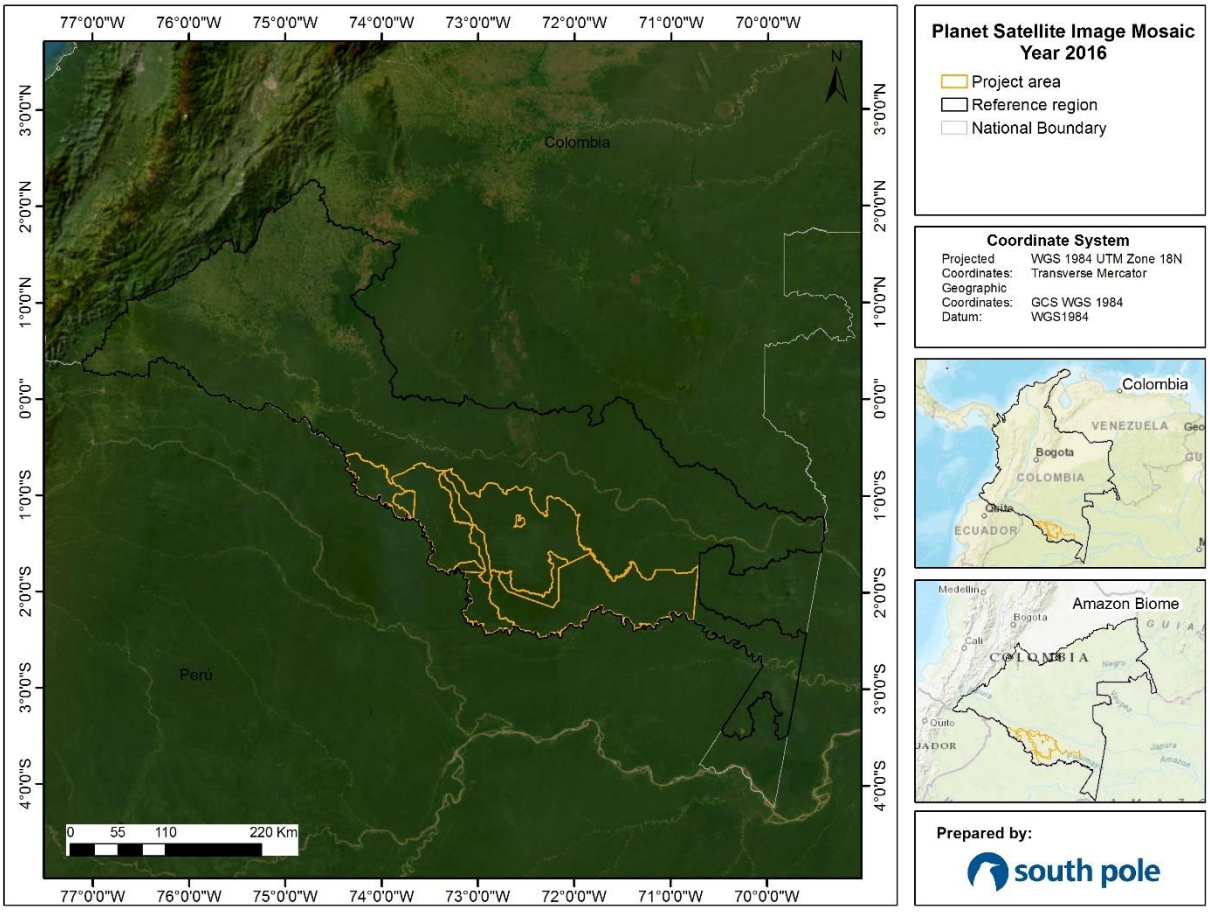


Figure 59. Mosaic year 2016 – Planet image RGB 3–2–1.

Source: prepared by South Pole (2024).

- **Sample design.**

To validate the accuracy of our land cover assessment, it was employing the "stratified random points" sampling technique within ArcGIS Pro, as illustrated in Figure 60. This method involves the random selection of points from predefined subgroups or strata of the population, which in this case, are the land cover categories according to the IPCC classification system.

By stratifying the sample, it was ensured that it is representative and captures the variability present within the population. The sample size is determined using the equation for finite populations. For the reference region, which comprises 262,419 segments distributed across 7 strata based on land cover types and considering a maximum expected margin of error of 5% with a 95% confidence level, the required sample size is calculated to be 766 points.

It's important to highlight that, given the extensive distribution of forest cover, an independent sample size is generated specifically for this stratum to ensure its representation in the validation process.

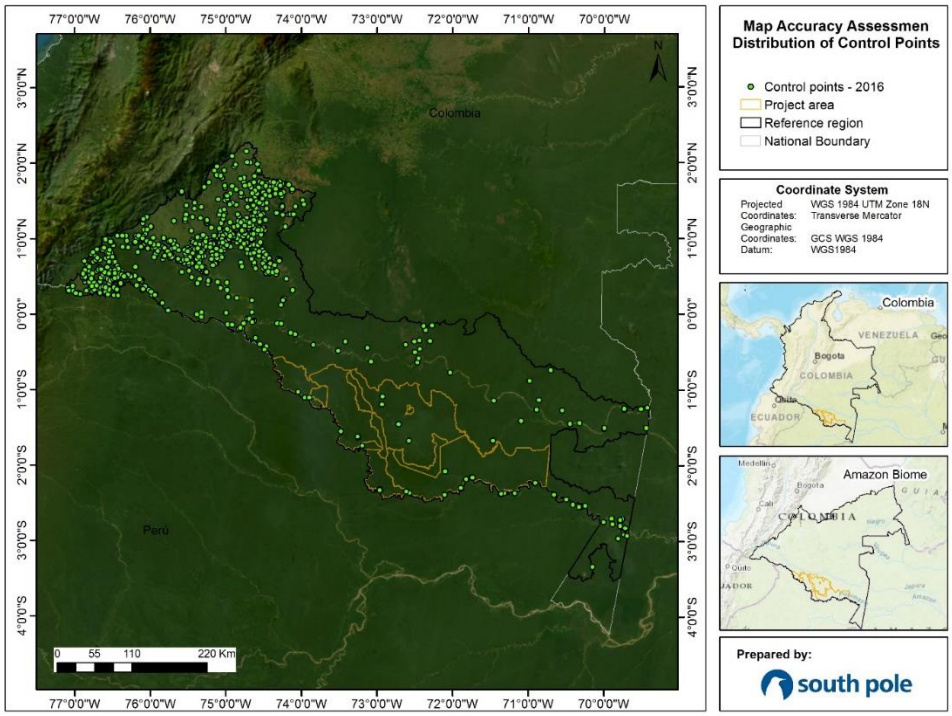


Figure 60. Control Points 2016 – Planet image RGB 3–2–1.

Source: prepared by South Pole (2024).

Table 56 summarizes the population size per stratum, the number of polygons, and the sample size. Additionally, the annex provides a detailed explanation of the methodology used to determine the sample size.

Table 56. Sample size parameters.

Class Value	Land cover stratum	Number of polygons	Sample size (units)
1	Forest	56,051	382
2	Cropland	286	384
3	Grassland	22,137	
4	Other land	2,471	
5	Settlements	89	

Class Value	Land cover stratum	Number of polygons	Sample size (units)
6	Shrubland	118,758	
7	Wetland	62,627	
Total	-	262,419	766

Source: prepared by South Pole (2024).

- **High-resolution spatial image inspection process**

The inspection process involves a point-by-point examination conducted by a remote sensing expert, who utilizes a visual scale of 1:5,000 on the Planet image. In instances where points lack information, such as due to cloud cover or shadows, complementary data from the multispectral image repository available on the Google Earth platform is used. This repository contains GeoEye image mosaics captured in the reference region between 2016 and 2017, with a spatial resolution of 1 meter, enabling detailed examination of coverage.

Figure 61 provides a snapshot of the ArcGIS Pro environment alongside the Planet extension, illustrating the evaluation process for a wetland point. This setup facilitates comprehensive assessment and validation of land cover classifications within the reference region.

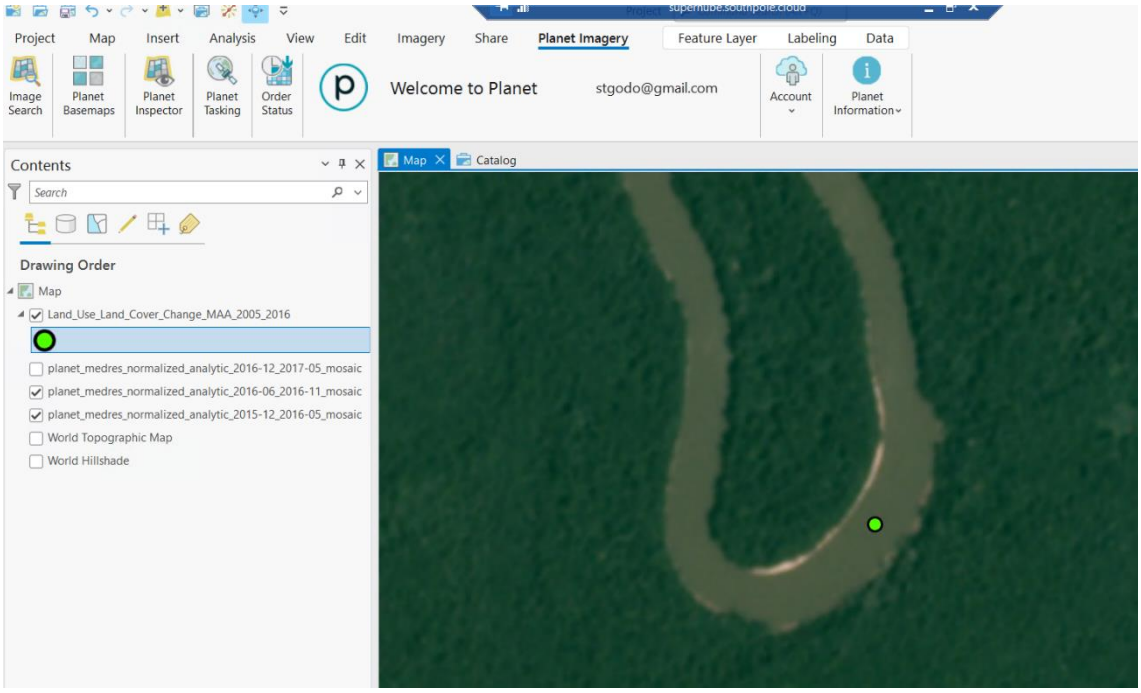


Figure 61. ArcGIS Pro environment and Planet extension for visual inspection.

Source: prepared by South Pole (2024).

The accuracy assessment of the IPCC land cover strata in the year 2016 at a scale of 1:25,000 is validated through the confusion matrix statistic, where spatial classification data are compared with control points. The ArcGIS Pro 3.0.0 Compute Confusion Matrix tool is used to perform the following calculations (ESRI, 2021):

a. The set of calculations includes total, producer and user precision, the kappa coefficient, errors of commission and omission.

b. The commission error corresponds to a false detection of the category and is associated with the accuracy of the user. User accuracy relates the pixels correctly classified in each category to the total number of pixels that were classified in that category.

c. The error of omission corresponds to a failure to detect the actual category and is associated with the accuracy of the producer. The producer's accuracy relates the number of pixels correctly classified in each category to the number of reference pixels used for that category.

d. The kappa (k) index encloses the degree of accuracy due only to the accuracy of the classification, removing that which is caused by random factors.

- **Results: Map Accuracy Assessment**

Table 57 displays the results of the Map Accuracy Assessment (MAA) for the spatial classification data of land cover changes in the year 2016, with an overall accuracy of 92.6% concerning the control points correctly assigned to IPCC land cover classes by stratum. The forest, representing the established forest in the baseline, exhibited a classification omission error of 2.9% and a visual commission error of 4.2% in forest coverages, with a success rate exceeding 90%. For other classes, depicting deforestation between the years 2005 and 2016, the average classes showed accuracies above 80%, while associated errors were distributed among non-forest classes. Furthermore, an 88.4% kappa coefficient is achieved, indicating that the classification performed discriminates classes better than unsupervised (random) classification.

Table 57. Confusion matrix – Land Cover and Land Use Change in the reference region.

Land cover	Validation points (units)										
	Forest	Cropland	Grassland	Other land	Settlements	Shrubland	Wetland	**Total**	User accuracy	Overall accuracy	Kappa
Forest	366	1	7	2	0	4	2	**382**	95.8%	-	-
Cropland	1	8	0	0	0	0	1	**10**	80.0%		
Grassland	1	3	227	1	0	11	5	**248**	91.5%		
Other land	0	0	1	7	0	1	1	**10**	70.0%		
Settlements	0	0	0	0	9	1	0	**10**	90.0%		
Shrubland	5	0	0	1	0	75	2	**83**	90.4%		
Wetland	4	1	0	0	0	1	17	**23**	73.9%		
Total	**377**	**13**	**235**	**11**	**9**	**93**	**28**	**766**		-	-
Production accuracy	97.1%	61.5%	96.6%	63.6%	100.%	80.6%	60.7%		-	-	-
Overall accuracy	-	-						-	-	92.6%	-
Kappa	--							-	-	-	88.4%

Source: South Pole (2024)

- **Formula to calculate the sample in the assessment of map accuracy.**

The finite-population calculation methodology is employed to determine the sample size when the universe is finite, i.e., countable one and the categorical variable.

First, the "N" value should be known, which is the total number of polygons or segments existing in a land cover for a specific year (for example the forest stratum). The use of the Explode Multipart Feature tool of ArcMap or ArcGis Pro is recommended to have all the possible records of the land cover and, in the case of forest, that the polygons meet the country definition.

If the population is finite, that is, we know the total population and we want to know how many locations need to be analyzed from a total area, the formula is as follows (Morillas, 2007):

$$n = \frac{N * (Z_a)^2 * p * q}{d^2 * (N-1) + (Z_a)^2 * p * q}$$

Key:

n = Number of locations of the searched sample.

N = Total population (number of polygons).

Zα= Critical Z value (statistical parameter), calculated in the tables of the area of the normal curve, depending on the confidence level. Recommended value of 1.96 (if certainty or confidence level is 95%)

p = Probability of occurrence of the event under study (recommended value is 0.5 or 50% because the probability of occurrence is unknown).

q = (1-p) = Probability that the event under study does not occur (recommended value is 0.5 or 50% because the probability that it does not occur is unknown).

d = Maximum accepted estimation error (recommended value is 0.05 or 5%).

Confidence levels

The critical Z value according to different confidence levels is shown below:

- Should Zα confidence level be 90%, the coefficient would be 1.645
- Should Zα confidence level be 95%, the coefficient would be 1.96
- Should Zα confidence level be 97.5%, the coefficient would be 2.24
- Should Zα confidence level be 99%, the coefficient would be 2.576

3.4.6 Step 6. Estimation of baseline carbon stock changes

Estimation of baseline carbon stock changes

Forest class in project area and leakage belt

Average carbon stock in forest class existing in PA and LK was retrieved from local published studies and existing forest and carbon inventories related to the Modified National Forest Reference Emissions Level (FREL) proposed by MADS & IDEAM (2020).[47] The national FREL defined the carbon content for Colombia's five biomes. For each of the five natural regions, total biomass was calculated by adding up the above-ground biomass and below-ground biomass per hectare. Subsequently, for each natural region, the carbon content of the total biomass was determined as the product of the total biomass and the carbon fraction of dry matter suggested in the 2006 IPCC guidelines (0.47).

The emission factors were estimated using data from 303 sampling points established in the National Forest Inventory (NFI) for the 2015–2018 period. According to FREL, carbon content in Amazon biome forest is 121,19 ± 2,55 tC/ha in above-ground biomass and 26,78 ± 0,54 tC/ha in below-ground biomass. Carbon stock in soil organic carbon was estimated as 73,76 ± 4,43 tC/ha.

When defaults were used, the lowest value of the range given in the literature source was used for the forest classes.

As in the baseline case the forest within the project area and leakage belt are projecting to be degrading and loosing carbon stocks, carbon stock in forest class was affected estimating the projected annual emissions due to biomass changes in reference region.

Biomass field data came from the data grid (*Selected reference data*) available from Avitabile et al. (2016). It was constructed with information from plots that collected high-quality parameters in the tropics between 2000 and 2013 and contains above-ground biomass compiled from 14,477 pixels at 1 km, of which 11,469 pixels were used and filtered by the ALOS PALSAR band quality parameter.[48] The ALOS PALSAR 1 and 2 data used operate in the L-Band (wavelength of approximately 23.6)[49], which makes it possible to capture information on forest structure and biomass (Yu & Saatchi, 2016; Tebaldini et al., 2019) even in tropical regions where the ability to penetrate into and through the canopy in dense forests has been recently proven (Pardini et al., 2018). Even though previous work has

[47] Retrieved from: https://redd.unfccc.int/files/18-08-2020_nref_colombia_v8.pdf.

[48] Pan-Tropical Biomass Map -Reference Data (Avitabile et al., 2016). Accessible at: https://www.wur.nl/en/Research-Results/Chair-groups/Environmental-Sciences/Laboratory-of-Geo-information-Science-and-Remote-Sensing/Research/Integrated-land-monitoring/Forest_Biomass.htm or http://lucid.wur.nl/.

[49] This source is considered to penetrate the forest canopy the most for this period globally. Another option is to use the P-band; however, it was not available for this analysis. In the future, to complement the analysis or have a validation source, it might be possible to use the information from the European Space Agency (ESA) BIOMASS project, which is expected to be launched at the end of 2022 and includes the P-band (the longest wavelength). The available biomass products with the highest scientific acceptance for the years of each verification will be assessed.

mentioned signal saturation due to the sensitivity of the L-band (Yu & Saatchi, 2016). For sites with biomass information from Avitabile et al. (2016), backscatter information (filtering by quality band), SRTM elevation, and biome, according to Dinerstein et al. (2017), were obtained to fit a model from a total of 11,469 records.

The proposed methodology for the biomass changes component relies on the estimation of multi-temporal biomass maps in areas of stable forest (resulting from the relationship between data from field plots and sensor backscatter values). Using this methodology, it is possible to identify the areas where there has been a statistically significant loss of biomass, which means a degraded area, and then to quantify this loss for each pixel in ton DM/ha and translate it into CO_2e emissions. The main stages for the development of the methodology were as follows:

1. Biomass modeling (random forest regression)
2. Identification of pixels with significant changes (degraded area)
3. Estimation of historical annual biomass losses for a defined reference period.

Model development stages.

The main stages for the development of the model were: i) biomass modeling and ii) identification of pixels with significant changes in this parameter. For this purpose, a Python code was used that contains the detail on sections oriented to i) data download and reading (satellite images, DEM and biomass point values); ii) data preprocessing and filtering from ALOS PALSAR quality band; iii) biomass model fitting; iv) model validation; v) identification of areas with significant changes in the period; vi) annual biomass prediction; vii) calculation of biomass changes for pixels with significant p-values; viii) filtering using stable forest layer (IDEAM, 2020) to obtain degradation (biomass losses); and ix) quantification of historical and current annual biomass losses in tCO_2e/year.

Calibration and validation of regression models

The modeling was performed by means of a machine learning (ML) procedure, using a random forest (RF) regression algorithm (Breiman, 2001) programmed in Python. This algorithm is considered an ML technique/algorithm of classification and regression trees (CART) that can be used to identify the response of a variable (degraded or non-degraded pixel, pixel biomass) as a function of a set of variables (such as pixel signal or HV backscatter, altitude, and biome type). It has been used in previous research (Meyer et al., 2019) with the aim of spatially estimating the amount of above-ground biomass from satellite imagery, as it allows obtaining reliable and unbiased data of such biomass (Mascaro et al., 2014; Hethcoat et al., 2019; Meyer et al., 2019). The model is described as:

$$AGB = f(Backscatter + Elevation + Biome)$$

The data used to train the model correspond to a random selection of 75% of the available data. To evaluate its accuracy, a validation process was carried out on the 25% of the remaining data while ensuring that the 57 plots corresponding to the Colombian Amazon biome (Figure 62) were included in the validation data. The criterion used to fit the model as a loss function was the mean square error

(MSE), which together with the coefficient of determination (R^2), root-mean-square error, correlation (r), and scatterplot analysis provided an overall assessment of the model fit for biomass quantification.

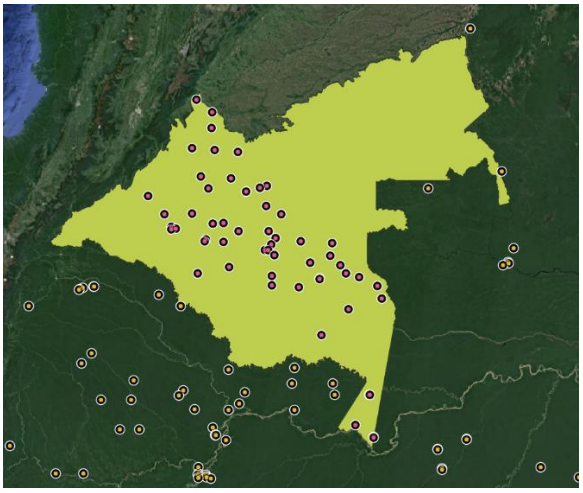


Figure 62. Sampling points used for model validation and training (pink points).

Source: prepared by South Pole (2021).

Omnibus test applied to changes.

Based on the relationship found between biomass and PALSAR data, backscatter data were correlated. Then, an Omnibus test (Nielsen, Conradsen, & Skriver, 2016) was used to identify significant changes in backscatter during the periods of interest (p-value 0.05). Due to the difficulties posed by the topographic features of the sites (e.g., slope and relief aspect) for biomass estimation from remote sensing (Lu, 2006), it is necessary to apply quality filters and use a quality band for model estimations.

The model prediction revealed some noise in the results that were related to limitations in the signal of each pixel; therefore, a trend analysis was performed for each series of each pixel through all the years of the historical period of analysis (2007-2016). Then, the points with significant changes were assessed from the Omnibus algorithm (Nielsen, Conradsen, & Skriver, 2016) for the baseline period (2007-2016) in the reference region, and for the period under monitoring (2017-2020) in the project area and the leakage belt. Finally, filtering was conducted by a stable forest layer during these periods, obtaining the sites and the amount of biomass losses for the geographic boundary. The trend analysis made it possible to establish whether the change in forest biomass was negative (decreasing in canopy occupying species and thus stored biomass), as well as to assess whether such change was statistically significant using the Omnibus test (Nielsen, Conradsen, & Skriver, 2016), applying a 5x5 pixel median filter.

Geographical boundary under analysis

The analysis excluded areas of historical deforestation by means of the multi-temporal analysis of forest and non-forest layers in Colombia reported by the SMByC for 2005, 2010, 2012, 2013, 2014,

2015, 2016, 2017, and 2018. It was carried out by superimposing the available spatial data, applying a mask with the area of stable forest in the historical reference period or baseline (2007-2016) and in the monitoring period (2007-2019). Thus, it was possible to apply the model to make a prediction of the areas in which degradation occurred and subsequently quantify the biomass values in the geographical boundaries of the REDD+ Project. This data was collected in an annual raster product for the 2007-2020 period, covering both the historical reference period for the establishment of the baseline (2007-2016) and the first monitoring period of the REDD+ Project (2017-2020). From the information in this raster format, the biomass loss that occurred in both periods was estimated with a resolution of 25 m corresponding to the minimum mapping unit.

Emissions from changes in forest biomass

The correlation was greater than 70% between observed values and values predicted by the biomass model, and the confidence level was 95% for the detection of areas with significant changes in biomass (Figure 63 and Figure 64).

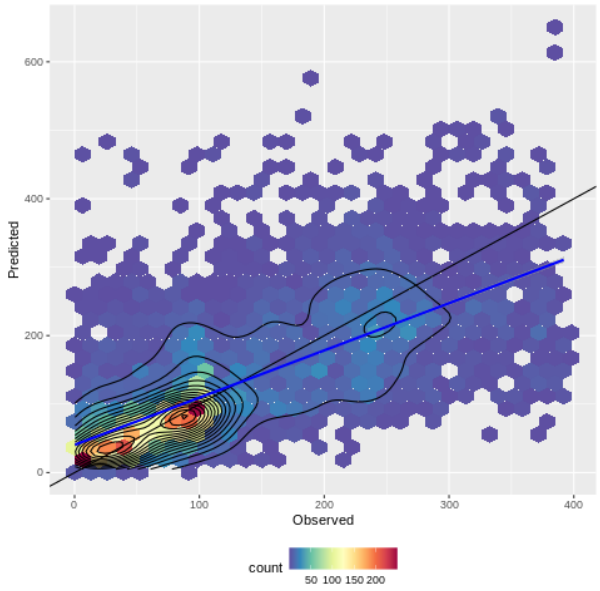


Figure 63. Biomass values ton DM/ha predicted by the model vs. observed data. The black line is the 1:1 line and the blue line is the trend line; the black outlines and bins represent point density.

Source: prepared by South Pole (2021).

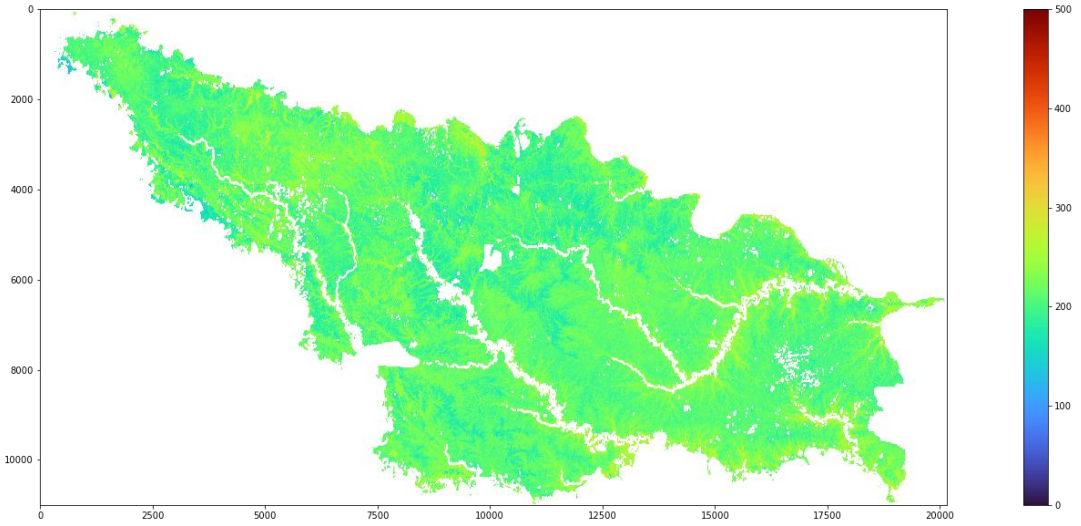


Figure 64. Average values of estimated biomass (ton DM/ha) for the stable forest area of the project and the leakage belt.

Source: prepared by South Pole (2021).

Table 58 summarizes historical changes in forest biomass in the reference region selected for the establishment of the degradation baseline for the REDD+ Project, as well as the estimate of the historical average annual rate of degradation emissions in the RR.

Table 58. Emissions from changes in forest biomass in the reference region.

Period	Changes in stable forest biomass in the RR (tCO_2e)	Annual rate of emissions from changes in biomass (tCO_2e/ha)
2007-2008	4,604,186	0.36
2008-2009	5,556,001	0.44
2009-2010	4,013,645	0.32
2015-2016	5,727,957	0.45
Promedio (2007-2016)	**4,975,447**	**0.39**

Source: prepared by South Pole (2021).

These results were obtained from a model-based inference framework for estimating biomass at a specific time considering specific years. This provides pixel-level estimates and predictions and spatially explicit information on above-ground biomass with the same or higher accuracy than conventional canopy cover and stratification methods.

This method has the advantage of obtaining time series data with backscatter values at a higher frequency, depending on the available radar images. It also supports measuring directly the volume recorded in the pixel, i.e., it takes structural information instead of an optical data signal such as

reflectance/radiance that are easily affected in a region like the Amazon by multiple challenges such as the presence of clouds and signal saturation.

Furthermore, due to the characteristics of the fitted regression models, it is not necessary to use data from biomass plots per stratum in addition to the classification by biomes, since these reflect climatic variability specifically with humidity conditions (an important variable in the use of radar data), in addition to the structural parameters analyzed. The goodness-of-fit parameters of these models and the distribution of backscatter values—and therefore of final estimate of biomass values per pixel across the region—revealed statistically significant negative changes representing loss in carbon and biomass content.

These significant negative changes in biomass associated with forest degradation are not observable at first sight through the traditional use of other images such as Landsat or MODIS, which are used to calculate change matrices and separate strata by crown densities, given the saturation in the signal observed in this type of Amazon forests. In conclusion, the described methodology made it possible to obtain results that do not negatively affect the conservative principle of GHG reductions and is therefore considered adequate since, in terms of application, it allows obtaining estimates with greater precision than what would occur if the forest degradation process could not be observed using images from optical sensors and procedures for vegetation fractionation. This methodological deviation is directly related to degradation measurement procedures and subsequent monitoring.

Post-deforestation classes carbon stocks

The carbon stock of post-deforestation classes was estimated as the long-term (20 years) average carbon stock and was determined based on different studies compiled by IDEAM (Yepes et al. 2011) for the presentation of the National Greenhouse Gas (GHG) Inventory reports (Fisher et al. 1994, Noordwijk et al. 2002, Quiñonez 2002, IPCC 2003, IPCC – AFOLU 2006, Leblanch et al. 2002, Rincón & Ligarreto 2007, Arce et al. 2008, Anaya et al. 2009, Phillips et al., IDEAM 2011).

The initial collection of this information was financed by the Gordon and Betty Moore Foundation, under the project "Technical and Scientific Institutional Capacity to Support Reducing Emissions from Deforestation and Degradation -REDD- Projects in Colombia".

Table 59. Average carbon stocks per hectare of post-deforestation LU/LC classes present in the reference region.

Post-deforestation land use	Land-use description according to IDEAM studies	Carbon stock in above-ground biomass (tC/ha)	Source
Grassland	Grassland (Pastos)	6,4 ± 7,8	Retrieved from Yepes, et al., IDEAM (2011). Carbon contents taken from other studies (Fisher et al. 1994, Noordwijk et al. 2002, Quiñonez 2002, IPCC
Schrubland	Secondary or transitional vegetation	19,6 ± 4,2	

Post-deforestation land use	Land-use description according to IDEAM studies	Carbon stock in above-ground biomass (tC/ha)	Source
Other land	Other land (otras áreas sin vegetación o zonas quemadas)	0,0	2003, IPCC - AFOLU 2006, Leblanch et al. 2002, Rincón & Ligarreto 2007, Arce et al. 2008, Anaya et al. 2009, Phillips et al., IDEAM 2011). Below ground biomass was estimated using ecuation proposed by Cairns et al. (1997) and MADS & IDEAM (2020).

Source: prepared by South Pole (2021).

As defaults were selected, the highest value of the range given in the literature source was used for non-forest classes.

For SOC under grasslands and shrublands, the estimation method was based on changes in soil organic C stocks over a finite period (20-years) following changes in management that impact soil organic C. Soil organic C stocks (SOC) were estimated for the post-deforestation non-forest classes using default reference carbon stock of the initial forest class (SOCref) and default stock change factors (FLU, FMG) coming from IPCC (2006). Input factors (FI) only applied for improved grasslands.

For other land, the SOC emissions were estimated using the emission factor proposed by MADS & IDEAM (2020). A gross emission was assumed where the forest soil carbon content (SOC) was emitted in equal proportions for 20 years once the deforestation event occurred. Under this assumption, the annual rate of soil carbon emitted in 20 years (COS20years) was calculated by dividing the SOC of the initial forest class by 20.

Table 60. Default SOC stock change factors (FLU, FMG), IPCC (2006).

Post-deforestation land use	Description	IPCC defaults
Land use (FLU)	All permanent grassland is assigned a land-use factor of 1.	1,0
Management (FMG)	Represents overgrazed or moderately degraded grassland, with somewhat reduced productivity (relative to the native or nominally managed grassland) and receiving no management inputs.	0,97

Source: IPCC (2006).

Calculation of carbon stock change factors

Under the methodology VCS VM0015, default linear functions are applied to account for the decay of carbon stock in initial forest classes (icl) and increase in carbon stock in post-deforestation classes. This was done as follows:

a) Above-ground biomass:

   i) Initial forest classes (icl): immediate release of 100% of the carbon stock was assumed to happen at the end of year t = t* (= year in which deforestation occurs).

   ii) Post-deforestation classes (fcl): linear increase from 0 tCO_2e/ha in year t = t* to 100% of the average carbon stock in year t = t*+9 was assumed to happen in the 10-years period following deforestation (i.e., 1/10th of the final carbon stock was accumulated each year).

b) Below-ground biomass:

   i) Initial forest classes (icl): an annual release of 1/10th of the initial carbon stock wass assumed to happen each year between t = t* and t = t*+9.

   ii) Post-deforestation classes (fcl): linear increase from 0 tCO_2e/ha in year t = t* to 100% of the average carbon stock in year t = t*+9 was assumed to happen in the 10 years period following deforestation (i.e., 1/10th of the final carbon stock wass accumulated each year).

c) Soil organic carbon: It was assumed that in a 20-years period the carbon stock changes from the level estimated for the initial forest classes (icl) to the level estimated for the post-deforestation class fcl. The change occured linearly.

Table 61. Carbon stocks per hectare of initial forest class existing in the project area and leakage belt, and carbon stock change factors for land-use change categories.

Year	Initial forest class l1		Carbon stock changes							
	Average carbon stock per hectare		Forest to grassland		Forest to shrubland		ΔCsoc	Forest to other land		ΔCsoc
	Cab	Cbb	ΔCab_t	ΔCbb_t	ΔCab_t	ΔCbb_t		ΔCab_t	ΔCbb_t	
	C stock (tCO_2e)	C stock (tCO_2e)	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e
2017	434.62	93.46	429.42	7.90	425.90	7.60	0.38	434.62	9.35	12.71
2018	434.23	93.38	423.82	7.89	416.78	7.59	0.38	434.23	9.34	12.71
2019	433.84	93.31	418.22	7.89	407.66	7.59	0.38	433.84	9.33	12.71

Year	Initial forest class l1		Carbon stock changes							
	Average carbon stock per hectare		Forest to grassland		Forest to shrubland		ΔCsoc	Forest to other land		ΔCsoc
	Cab	Cbb	ΔCab_t	ΔCbb_t	ΔCab_t	ΔCbb_t		ΔCab_t	ΔCbb_t	
	C stock (tCO_2e)	C stock (tCO_2e)	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e
2020	433.45	93.23	412.63	7.88	398.55	7.58	0,38	433.45	9.32	12.71
2021	433.06	93.15	407.03	7.87	389.43	7.57	0,38	433.06	9.31	12.71
2022	432.67	93.07	401.43	7.86	380.31	7.56	0,38	432.67	9.31	12.71
2023	432.28	92.99	395.84	7.86	371.20	7.55	0,38	432.28	9.30	12.71
2024	431.89	92.92	390.24	7.85	362.08	7.55	0,38	431.89	9.29	12.71
2025	431.50	92.84	384.64	7.84	352.96	7.54	0,38	431.50	9.28	12.71
2026	431.11	92.76	379.05	7.83	343.85	7.53	0,38	431.11	9.28	12.71
2027	430.72	92.68	378.66	7.82	343.46	7.52	0,38	430.72	9.27	12.71
2028	430.33	92.61	378.27	7.82	343.07	7.52	0,38	430.33	9.26	12.71
2029	429.94	92.53	377.88	7.81	342.68	7.51	0,38	429.94	9.25	12.71
2030	429.55	92.45	377.49	7.80	342.29	7.50	0,38	429.55	9.25	12.71
2031	429.16	92.37	377.10	7.79	341.90	7.49	0,38	429.16	9.24	12.71
2032	428.77	92.30	376.71	7.79	341.51	7.48	0,38	428.77	9.23	12.71
2033	428.38	92.22	376.32	7.78	341.12	7.48	0,38	428.38	9.22	12.71
2034	427.99	92.14	375.93	7.77	340.73	7.47	0,38	427.99	9.21	12.71
2035	427.60	92.06	375.54	7.76	340.34	7.46	0,38	427.60	9.21	12.71
2036	427.21	91.98	375.15	7.75	339.95	7.45	0,38	427.21	9.20	12.71
2037	426.82	91.91	374.76	7.75	339.56	7.45	0,38	426.82	9.19	12.71
2038	426.43	91.83	374.37	7.74	339.17	7.44	0,38	426.43	9.18	12.71
2039	426.04	91.75	373.98	7.73	338.78	7.43	0,38	426.04	9.18	12.71
2040	425.65	91.67	373.59	7.72	338.39	7.42	0,38	425.65	9.17	12.71

Year	Initial forest class l1		Carbon stock changes							
	Average carbon stock per hectare		Forest to grassland		Forest to shrubland		ΔCsoc	Forest to other land		ΔCsoc
	Cab	Cbb	ΔCab_t	ΔCbb_t	ΔCab_t	ΔCbb_t		ΔCab_t	ΔCbb_t	
	C stock (tCO_2e)	C stock (tCO_2e)	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e	tCO_2e
2041	425.26	91.60	373.20	7.72	338.00	7.41	0,38	425.26	9.16	12.71
2042	424.87	91.52	372.81	7.71	337.61	7.41	0,38	424.87	9.15	12.71
2043	424.48	91.44	372.42	7.70	337.22	7.40	0,38	424.48	9.14	12.71
2044	424.09	91.36	372.03	7.69	336.83	7.39	0,38	424.09	9.14	12.71
2045	423.70	91.28	371.64	7.68	336.44	7.38	0,38	423.70	9.13	12.71
2046	423.31	91.21	371.25	7.68	336.05	7.38	0,38	423.31	9.12	12.71

Source: prepared by South Pole (2023) based on IPCC (2006) and MADS & IDEAM (2020).

Calculation of baseline carbon stock changes

The total baseline carbon stock change in the project area at year t was calculated using the equation 10 of the methodology VCS VM0015. Baseline carbon stock change in the carbon pools in the project area are presented in Table 62.

Table 62. Baseline carbon stock changes in the carbon pools in the project area for land-use change categories.

Year	Baseline carbon stock changes land-use change categories (tCO_2e)								
	Forest to grassland			Forest to shrubland			Forest to other land		
	$\Delta Cab_{f1,t}$	$\Delta Cbb_{f1,t}$	$\Delta Csoc_{f1,t}$	$\Delta Cab_{f2,t}$	$\Delta Cbb_{f2,t}$	$\Delta Csoc_{f2,t}$	$\Delta Cab_{f5,t}$	$\Delta Cbb_{f5,t}$	$\Delta Csoc_{f5,t}$
2017	1,582,684	29,124	1,405	337,968	6,032	303	35,453	762	1,037
2018	1,687,439	60,525	2,924	357,281	12,534	629	38,264	1,585	2,157
2019	1,753,763	93,536	4,523	368,061	19,370	974	40,264	2,449	3,336
2020	1,797,052	127,757	6,183	373,713	26,455	1,331	41,780	3,346	4,562
2021	1,900,305	164,377	7,964	391,455	34,037	1,715	44,748	4,306	5,875
2022	1,966,957	202,743	9,832	401,217	41,980	2,117	46,921	5,311	7,253

Year	Baseline carbon stock changes land-use change categories (tCO_2e)								
	Forest to grassland			Forest to shrubland			Forest to other land		
	$\Delta Cab_{f1,t}$	$\Delta Cbb_{f1,t}$	$\Delta Csoc_{f1,t}$	$\Delta Cab_{f2,t}$	$\Delta Cbb_{f2,t}$	$\Delta Csoc_{f2,t}$	$\Delta Cab_{f5,t}$	$\Delta Cbb_{f5,t}$	$\Delta Csoc_{f5,t}$
2023	1,940,144	241,044	11,701	391,722	49,909	2,519	46,893	6,316	8,632
2024	1,946,084	279,941	13,602	388,768	57,960	2,929	47,668	7,336	10,035
2025	1,950,475	319,418	15,536	385,361	66,131	3,345	48,427	8,372	11,462
2026	1,970,863	359,824	17,519	384,932	74,493	3,772	49,611	9,432	12,924
2027	1,945,789	370,836	19,478	379,995	76,770	4,194	48,986	9,722	14,370
2028	1,909,980	378,814	21,404	372,963	78,418	4,608	48,091	9,933	15,790
2029	1,942,363	385,831	23,364	379,246	79,868	5,030	48,912	10,119	17,236
2030	2,055,814	393,957	25,440	401,355	81,547	5,477	51,775	10,333	18,768
2031	2,036,549	399,269	27,500	397,551	82,643	5,921	51,297	10,474	20,288
2032	2,130,216	404,748	29,656	415,791	83,774	6,385	53,663	10,620	21,878
2033	2,195,272	411,595	31,880	428,444	85,187	6,864	55,308	10,801	23,519
2034	2,217,325	418,265	34,129	432,701	86,564	7,348	55,871	10,978	25,179
2035	2,128,807	422,487	36,291	415,383	87,435	7,814	53,647	11,090	26,773
2036	2,123,417	425,637	38,449	414,287	88,083	8,278	53,518	11,175	28,366
2037	2,094,359	428,695	39,175	408,573	88,712	8,435	52,793	11,257	28,901
2038	2,047,763	431,520	39,742	399,440	89,293	8,557	51,625	11,333	29,320
2039	2,058,884	433,910	40,243	401,566	89,784	8,665	51,912	11,397	29,689
2040	2,040,043	433,587	40,664	397,848	89,714	8,755	51,443	11,391	30,000
2041	2,082,766	434,541	41,012	406,136	89,907	8,830	52,527	11,418	30,256
2042	2,088,631	433,699	41,280	407,235	89,730	8,888	52,682	11,397	30,454
2043	2,078,987	431,328	41,540	405,310	89,235	8,944	52,445	11,337	30,645
2044	2,145,597	429,885	41,837	418,251	88,933	9,008	54,133	11,301	30,865
2045	2,190,590	431,185	42,151	426,974	89,198	9,075	55,275	11,337	31,097
2046	2,302,982	434,918	42,534	448,832	89,967	9,158	58,118	11,437	31,379

Source: prepared by South Pole (2023).

Table 63. Baseline carbon stock changes in the carbon pools in the project area.

Year	Baseline deforestation in PA (hectares) annual ABSLPAt	Total baseline carbon stock change within the project area at year t (tCO_2e)			
		Δ Cab i1,t	Δ Cbb i1,t	Δ Csoc i1,t	Δ CBSLPAt
2017	4,561	1,956,105	35,917	2,745	1,994,768
2018	4,927	2,082,985	74,644	5,710	2,163,339
2019	5,189	2,162,088	115,355	8,833	2,286,277
2020	5,389	2,212,545	157,558	12,076	2,382,179
2021	5,777	2,336,508	202,720	15,553	2,554,781
2022	6,063	2,415,094	250,034	19,202	2,684,330
2023	6,065	2,378,759	297,268	22,852	2,698,880
2024	6,171	2,382,521	345,236	26,566	2,754,323
2025	6,275	2,384,263	393,920	30,343	2,808,526
2026	6,434	2,405,406	443,749	34,215	2,883,371
2027	6,359	2,374,770	457,328	38,042	2,870,140
2028	6,248	2,331,033	467,165	41,802	2,840,000
2029	6,361	2,370,521	475,817	45,630	2,891,968
2030	6,739	2,508,944	485,837	49,686	3,044,467
2031	6,683	2,485,397	492,386	53,708	3,031,491
2032	6,998	2,599,670	499,142	57,919	3,156,731
2033	7,219	2,679,024	507,583	62,264	3,248,871
2034	7,299	2,705,897	515,807	66,656	3,288,361
2035	7,015	2,597,838	521,012	70,878	3,189,728
2036	7,004	2,591,223	524,894	75,093	3,191,210
2037	6,916	2,555,725	528,664	76,510	3,160,900
2038	6,769	2,498,828	532,146	77,619	3,108,593
2039	6,813	2,512,361	535,091	78,596	3,126,048
2040	6,757	2,489,334	534,691	79,419	3,103,444
2041	6,906	2,541,429	535,866	80,099	3,157,393

Year	Baseline deforestation in PA (hectares) annual ABSLPAt	Total baseline carbon stock change within the project area at year t (tCO_2e)			
		Δ Cab i1,t	Δ Cbb i1,t	Δ Csoc i1,t	Δ CBSLPAt
2042	6,933	2,548,548	534,826	80,622	3,163,996
2043	6,908	2,536,742	531,900	81,129	3,149,771
2044	7,137	2,617,980	530,119	81,710	3,229,809
2045	7,294	2,672,839	531,720	82,324	3,286,882
2046	7,676	2,809,933	536,321	83,071	3,429,325

Source: prepared by South Pole (2023).

Uncertainty assessment

The calculation of uncertainty to determine accuracy was established based on information from activity data available at the sub-national level for the Amazon. The overall process includes error analysis and checks in order not to underestimate or overestimate the detected changes in forest cover and, as far as possible, to reduce the uncertainty of the maps as much as possible.

This procedure applies estimates of overall accuracy, user accuracy (or commission error) and accuracy producer (or omission error) following the recommendations elaborated by Olofsson et al. (2014), estimated by assessing the accuracy of the forest change map.

For the Amazon biome, the SMByC reports an uncertainty of 9.0% in historical deforestation data from its spatial information and 2.1% and 2.0% for aboveground and belowground biomass, respectively.

With respect to the information for the projection of the forest carbon stock changes, the mean absolute error (MAE) of the observed biomass values was estimated in ton ms/ha and in percent (Figure 65 and Figure 66). This estimate yielded an overall MAE of 41.03 %.

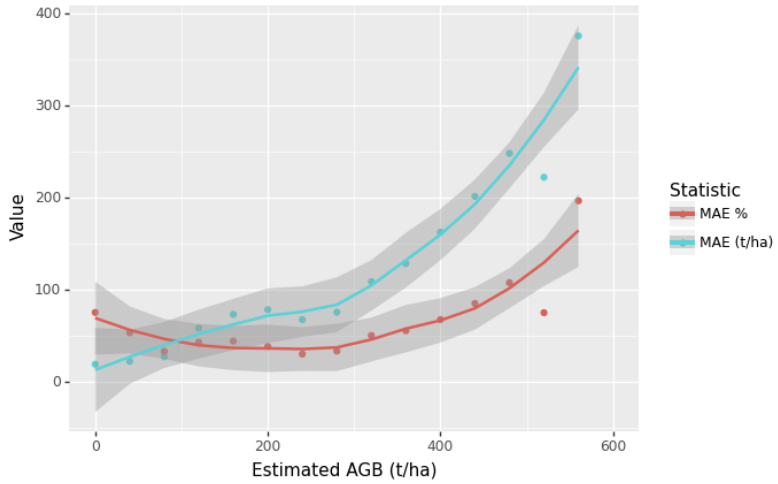


Figure 65. Average absolute error in units of ton DM/ha and percentage for each of the estimated biomass values.

Source: prepared by South Pole (2021).

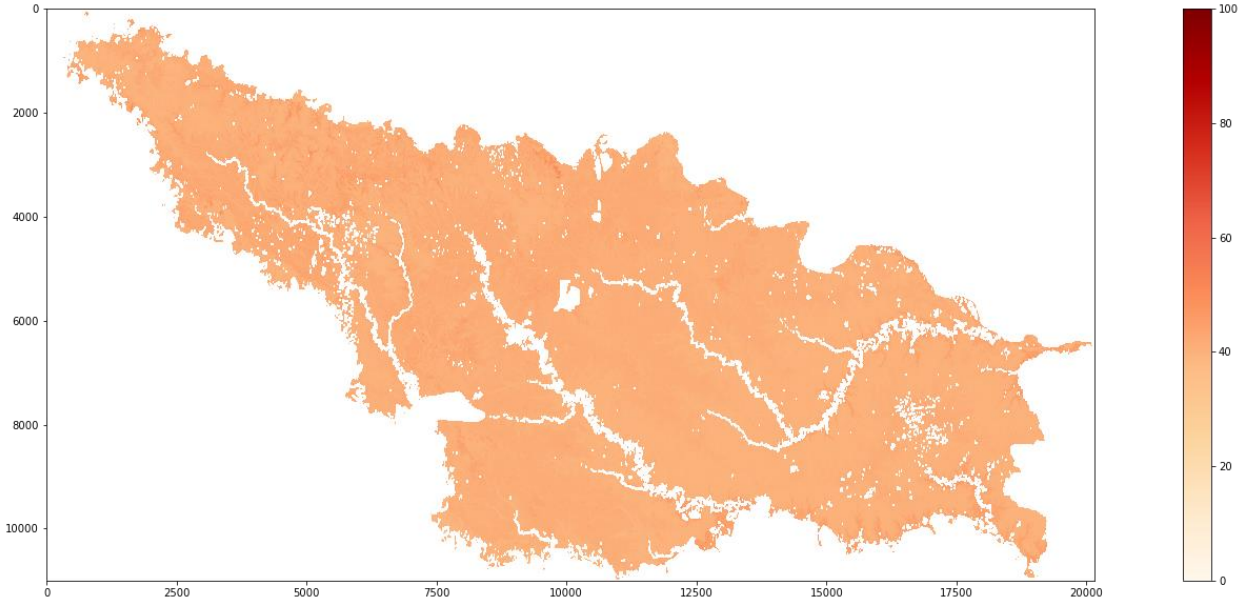


Figure 66. Average MAE values (%) for the stable forest area of the project and the leakage belt.

Source: prepared by South Pole (2021).

The uncertainty of emissions from deforestation was quantified by the SMByC under a Tier 2 process in accordance with the IPCC (2006), where the actual area estimates for Land Converted to Other Land facilitate a more transparent accounting of GHG emissions. The Tier 2 method uses, at a minimum, country-specific values, which in the case of the REDD+ Project correspond to the activity data and emission factors reported by the SMByC for the Amazon biome.

Once the uncertainties in the source categories have been determined, they can be combined to provide uncertainty estimates for the project's REDD+ activity and applicable net emission reduction discounts. MADS and IDEAM conducted a preliminary analysis for the Amazon region using the two methods and the uncertainty results were similar; however, at the national level the error propagation method has been chosen. For the REDD+ Project, the uncertainty estimation was performed by source category using the error propagation equation using the A and B rules proposed by IPCC and a simple combination of the uncertainties by source category to estimate the overall uncertainty of the baseline emissions.

Estimation of the combined uncertainty of emissions by source or pool (rule B)

The uncertainty by applicable carbon pool, aboveground biomass and belowground biomass was initially estimated using the B-rule proposed by the IPCC; when the uncertain quantities are combined by multiplication, as is the case for the calculation of emissions by multiplying the activity data by the emission factor, the equation used was:

$$U_{total} = \sqrt{U_1{}^2 + U_2{}^2 + \cdots + U_n{}^2}$$

Where:

U_{total} is the percentage uncertainty in the product of the quantities.

U_i are the percentage uncertainties associated with each of the quantities.

Estimation of the combined uncertainty of emissions from deforestation and REDD+ activities (rule A)

Following the estimation of the combined uncertainty by sources or pools, the combined uncertainty by deforestation is estimated by combining by addition, where the standard deviation of the sum (total uncertainty) is the square root of the sima of the squares of the standard deviations of the quantities to be added, with all standard deviations expressed in absolute terms. The equation for this estimate is as follows:

$$U_{total} = \frac{\sqrt{(U_1 * x_1)^2 + (U_2 * x_2)^2 + \cdots + (U_n * x_n)^2}}{x_1 + x_2 + \cdots + x_n}$$

U_{total} is the percentage uncertainty in the sum of the uncertain quantities.

X_i y U_i are the uncertain quantities and the percentage uncertainties associated with them, respectively.

Using rules A and B, the uncertainties for baseline emissions were also combined to obtain the total uncertainty of the REDD+ activity ($U_{projectREDD}$). Finally, combining both uncertainties an overall uncertainty value of 9.9% of baseline emissions was estimated. This value was used as a discount in the quantification of net emissions reductions (see section 4.4).

Table 64. Total uncertainty of baseline emissions following IPCC guidelines.

Uncertainty source	Symbol	Total uncertainty (IPCC guidelines)
Carbon pools	Uab	34,3%
	Ubb	32,5%
	Usoc	8,7%
	Up	4,2%
Deforestation data	Udef	9,0%
$U_{projectREDD}$		9,9%

Source: prepared by South Pole (2023) based on IPCC (2006).

3.5 Additionality

3.5.1 Additionality under the Colombian Regulatory Framework

According to Article 43 of Resolution 1447 of 2018, the project proponent must demonstrate a net benefit to the atmosphere in terms of reduced or removed GHG emissions and that these mitigation results did not occur in the absence of the project. This must be addressed in accordance with the criteria of the certifying program, in this case VCS, and it must be noted that the project is not in any of the following situations:

- GHG removals due to carbon dioxide sequestration by the natural forest that remains as such, and consequently are not eligible for national accounting.
- Reductions in GHG emissions or removals resulting from compensation activities of the biotic component derived from the impacts caused by projects, works, or activities as part of environmental licenses, concessions, requests for single forest use permits due to changes in land use, and requests for definitive subtractions from national and regional forest reserves.
- Reductions in GHG emissions or removals resulting from preserve and restoration activities in strategic areas and ecosystems where payments are made for environmental services for the reduction and sequestration of GHGs in accordance with the provisions of Chapter 8, Title 9, Part 2, Book 2 of Decree 1076 of 2015.

The REDD+ Project does not fall under any of the three conditions described above; therefore, it meets with the guidelines of Resolution 1447 of 2018 regarding additionality.

3.5.2 Additionality under VCS

The *Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities - VT0001*, Version 3.0, was used for the additionality analysis under the VCS standard. This tool is applicable because (i) the AFOLU activities of the project do not involve

violation of any applicable law, and (ii) it uses a baseline methodology based on a stepwise approach that justifies the determination of the baseline scenario.

According to tool VT0001, the following steps should be followed to demonstrate the additionality of the project:

Step 1. Identification of alternative land use scenarios with respect to the proposed AFOLU project activity.

Step 2. Investment analysis.

Step 3. Barrier analysis.

Step 4. Common practices analysis.

Step 1. Identification of land use scenarios alternative to the AFOLU project activity

Substep 1a. Identify credible land use scenarios alternative to the proposed VCS AFOLU project activity

Scenario 1. Continuation of local market demands for natural resources, illegal facilities and subsistence economic activities related to the use of land and forest resources and occupancy patterns for residential use.

The identification of deforestation agents in the reference region and the project area reveals a complex network of actors involved in illicit and extractive activities, as well as local communities depending on forest resources for their livelihoods (see Section 3.4.3). These agents, ranging from criminal organizations to indigenous and peasant communities, interact in an environment marked by demographic pressure, institutional weakness, and poverty. In this context, the local market demand for natural resources plays a central role in the deforestation dynamics, influencing the decisions of different groups and economic sectors. A profound understanding of these underlying factors is crucial for designing effective strategies for conservation and sustainable development in the region.

In this scenario, a dynamic interaction is observed among different deforestation agents and their economic activities, closely linked to the local market demand for natural resources. Criminal organizations and illegal armed actors have evolved post-FARC peace agreements, exploiting regulatory gaps and weak law enforcement to carry out illegal activities such as illegal logging and gold extraction. Alongside them, the agro-industrial and extractive sector has expanded its reach into previously inaccessible areas, contributing to deforestation through agriculture, minerals extraction, and infrastructure projects. In turn, illegal timber traders and intermediaries capitalize on these activities, facilitating illegal timber trade along borders.

One of the primary drivers of deforestation and forest degradation in the Putumayo River basin is the market demand for natural resources, including timber, gold, and agricultural products. This demand, originating from both domestic and international markets, creates economic incentives for various agents to exploit forest resources through illegal or unsustainable practices (Meza et al., 2018).

The market for sawn wood in Colombia, a significant component of the natural resource demand, lacks robust quality standards, allowing a portion of the supply to be sourced from illegally harvested timber from natural forests (ONF Andina, 2015). Moreover, a substantial percentage of sawn wood is allocated to low-value-added uses, contributing to wastage in applications such as wooden formwork, crates, and enclosures.

In Colombia, the construction sector represents the primary consumer of sawn wood, utilizing approximately 80% of the production, while the remaining 20% is directed towards the furniture industry (ONF Andina, 2015). The concentration of furniture manufacturing in urban centers such as Bogotá-Soacha, Medellín-Valle de Aburrá, Bucaramanga-Girón, and Cali-Yumbo highlights the spatial distribution of demand within the country.

The lack of accurate data on the timber market due to its informality poses challenges in assessing supply and demand dynamics. However, analysis conducted by ONF Andina between 2009 and 2013 reveals a significant disparity between supply and demand, suggesting the infiltration of illegal timber into the market and placing pressure on natural forests to meet the demand (ONF Andina, 2015).

Colombia's engagement in international markets has also played a significant role in shaping deforestation dynamics nationwide, potentially exacerbating forest degradation. This trend has led to the proliferation of illegal economies associated with the illegal logging and trade of valuable timber species, particularly in regions like the Amazon (Meza et al., 2018).

In the Amazon region, illegal logging is characterized by its persistence and selectivity, with a focus on timber species of higher commercial value. Despite the presence of a wide variety of valuable timber species, Corpoamazonía reports that just nine species accounted for half of the traded volume between 2012 and 2017, with species such as Tornillo or Cedrorana, Red Ucuuba, and Milk Tree emerging as primary targets (EIA, 2019).

The illegal timber trade in the Putumayo River basin poses a significant challenge for authorities due to its extensive and remote geographical reach. According to government officials, the east-west corridor between Tarapacá, Puerto Arica, El Encanto, and Puerto Alegría in the Department of Amazonas serves as a route for illegally sourced timber from both sides of the border.

Illegal practices in the timber market in this region involve various laundering methods. Some traders bring shipments of illegally sourced timber from Peru and use Colombian permits to legitimize them for transportation and commercialization within the country. Additionally, tugboats navigating the Putumayo River regularly carry timber from local farmers and indigenous communities on both sides of the border, exchanging it for goods and subsequently legitimizing it using Colombian permits obtained from local holders.

The timber mobilized along the Putumayo River is primarily unloaded at the La Esmeralda dock, located less than 6 km southeast of Puerto Asís, the first municipality along the Putumayo River connected by road to the rest of the country. Here, the timber, typically already sawn and planed, arrives for processing and subsequent commercialization.

The complexity and sophistication of these illegal operations underscore the magnitude of the problem of the illegal timber trade in the Putumayo River basin. The lack of effective regulation and corruption facilitate these illicit activities, which not only have devastating environmental consequences but also undermine the legal economy and the rule of law in the region (EIA, 2019).

In terms of subsistence economic activities, indigenous and peasant communities heavily rely on forest resources for their subsistence, exposing them to external pressures and land conflicts. Meanwhile, the presence of corrupt government entities, while indirectly related to deforestation, undermines conservation efforts by facilitating illegal activities.

Productive activities in the indigenous territories within the reference region are mainly based on the principle of complementarity. Activities such as agriculture, gathering of timber and non-timber products, fishing, and hunting are carried out according to cultural patterns and depending on the availability of resources during rainy or dry seasons. These activities are linked to the cycle of nature, in which food intake is determined by the supply or abundance of the environment available.

These forms of obtaining food, and sometimes income, are also related to the distribution of roles between men and women. "Male activities are especially devoted to logging, hunting, fishing, fruit gathering, and cultivation of ritual plants such as tobacco (*Nicotiana tabacum* L.), coca (*Erythroxylum coca* Lam.), and yagé (*Banisteriopsis caapi*). The work related to care and maintenance of the cultivation areas (*chagras)* —weeding and harvesting— is mostly carried out by indigenous women together with their minor children, so it is a social and cultural activity; they are also engaged in the processing of food derived from the cultivated species" (Sinchi, 2011, p. 23). In addition to family consumption, agricultural products such as cassava and plantain, as well as bushmeat and harvested fruits are marketed by some families who earn their basic subsistence from the sale and exchange of products (South Pole, 2021). Small-scale agriculture is the most traditional productive activity among the indigenous communities of the Colombian Amazonia.

The creation of indigenous *chagras* consists of cutting down all woody vegetation in a portion of the forest, burning the area to obtain some soil rich in nutrients (SINCHI, 2009), and then proceeding with planting. The establishment of products generally begins with the cultivation of cassava since it indicates the degree of maturity of a *chagra*. It is productive when the first cassava is harvested, which occurs between six and eight months after planting, depending on the quality of the cassava grown. A *chagra* lasts for two to three years, i.e., two to three replantings of cassava. (Corpoamazonia, IAvH, SINCHI, UAESPNN, 2007). Nevertheless, although cassava is the most important product, the crops grown are diversified to maintain a complete food supply (Table 65).

Table 65. Main crops in the chagras of the southern region of the Colombian Amazonia.

Common name	Scientific name	Common name	Scientific name
Bitter manioc	*Manhot aipi**	Amazon grape	*Pourouma cecropiifolia*

Common name	Scientific name	Common name	Scientific name
Sweet cassava	*Manihot esculenta*	Cashew tree	*Anacardium occidentale*
Yam	*Dioscorea alata*	Guacure	*Poraqueiba sericea*
Blue taro	*Xanthosoma violaceum*	Custard apple	*Rollinia mucosa*
Sweet potato	*Ipomaea batatas*	Genipa	*Genipa americana*
Plantain	*Musa paradisiaca*	Cocona	*Solanum sessiliflorum*
Pineapple	*Ananas comosus*	Araca boi	*Eugenia stipitata*
Pepper	*Capsicum spp*	Sweetcorn root	*Calathea allouia*
Coca	*Erythroxilum coca*	Amazon grape	*Pourouma cecropiifolia*
Tobacco	*Nicotiana tabacum*	Yagé (ayahuasca)	*Banisteriopsis caapi*
Guaya	*Cayaponia sp.*	Barbasco	*Lonchocarpus urucu*
Barbasco	*Several species*	Peanut	*Arachis hypogaea*
Mocambo tree	*Theobroma bicolor*	Corn	*Zea mays*
Peach palm fruit	*Bactris gasipaes*	Camu-camu	*Myrciaria dubia*
Bottle gourd	*Lagenaria vulgaris*	Banana	*Musa paradisiaca*
Calabash tree	*Crescentia cujete*	Cupuassu	*Theobroma grandiflorum*
Abiu	*Pouteria caimito*	Sugar cane	*Saccharum officinarum*
Guamo tree	*Inga spp.*	-	-

Source: CORPOAMAZONIA, IAvH, SINCHI, UAESPNN (2007) y Ministerio de Cultura (2015).

Most of the territory of the department of Amazonas is under indigenous reserves (Figure 67), which implies that food security is mainly determined by the production of the *chagras*. Besides being a method of cultivation, *chagras* are also used to collect insects and to obtain firewood and elements for rituals (Puerto Rastrojo Foundation, AZICATCH, WWF, COICA, OPIAC, 2018).

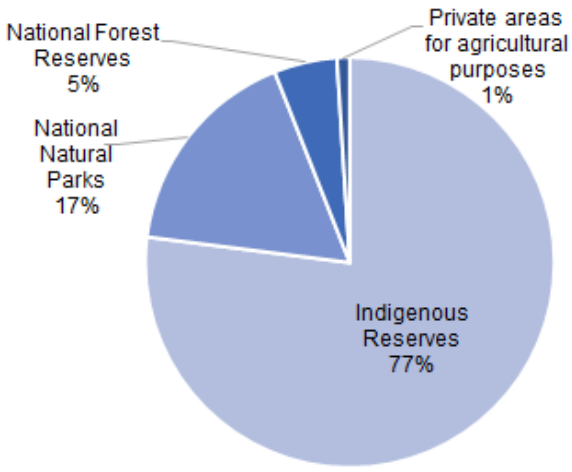


Figure 67. Legal status of the territory in the department of Amazonas.

Source: SINCHI (2009).

Depending on the ethnic group, the *chagras* in the Colombian Amazon region have a characteristic spatial distribution (CORPOAMAZONIA, IAvH, SINCHI, UAESPNN, 2007) and are generally located close to the communities, at a distance that varies between one and two kilometers from the settlement. For most ethnic groups, women are the ones who take care of and maintain them (Colombian Ministry of Culture, 2015). *Chagras* also represent the balance and harmony of the indigenous communities, as they represent the male side with the planting of products such as tobacco and barbasco and the female aspect with products such as sweet cassava and peanuts (Colombian Ministry of Culture, 2015).

Historically, *chagras* in the project area are characterized by being mostly communal (Figure 68). In terms of size, *chagras* of one to two hectares are the most common in COINPA and CIMPUM, whereas for AIZA and AZICATCH, *chagras* usually are less than one hectare. Regarding distance, for AIZA and COINPA, most of the *chagras* are located less than one kilometer from the communities; for CIMPUM, most of the *chagras* are more than one kilometer from the communities. On average, *chagras* are used during more than 5 years for AIZA and COINPA, while for CIMPUM, the most common period of use is between 2 and 5 years.

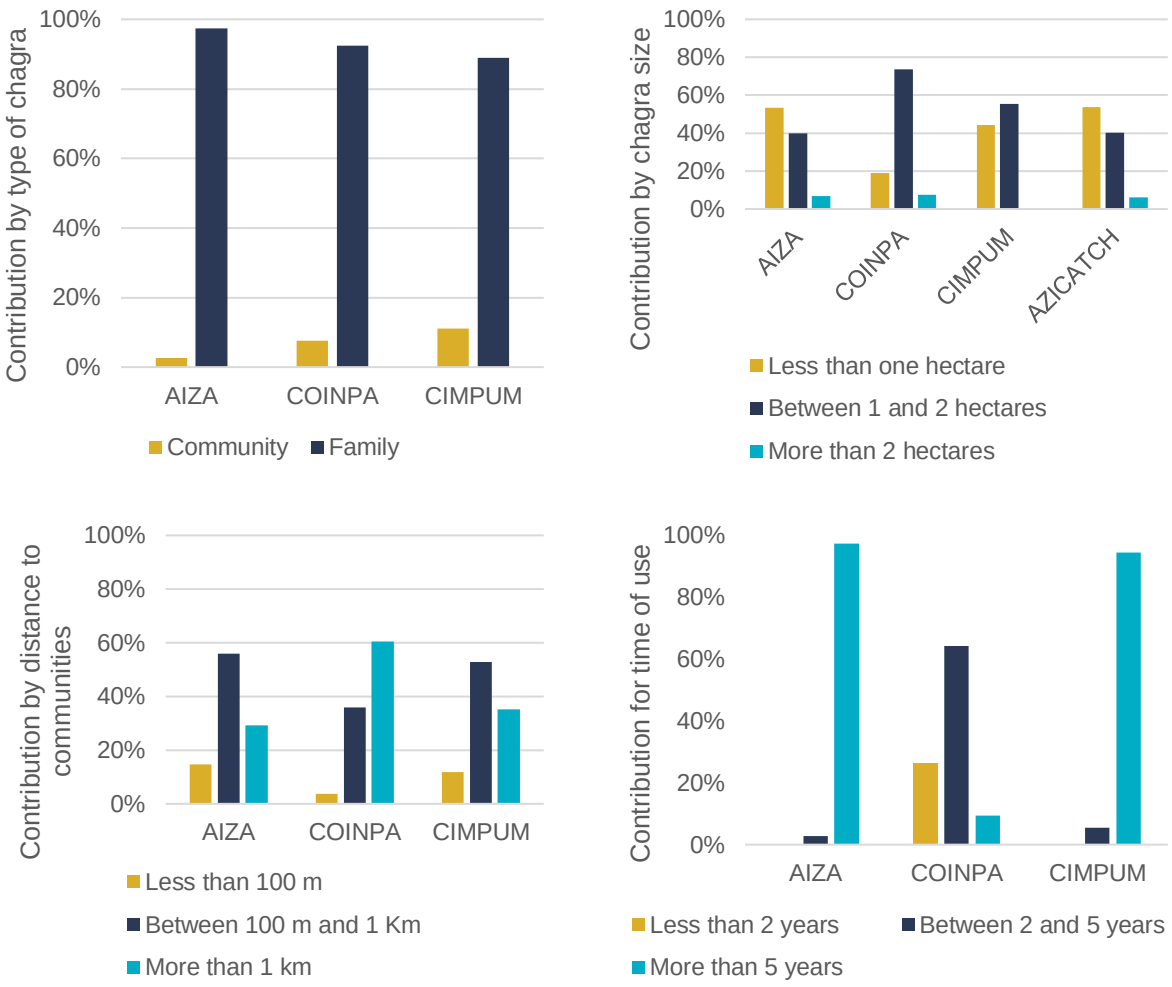


Figure 68. Main characteristics of the *chagras* in the project area. Type of *chagra* (top left); size (top right); distance from communities (bottom left); time of *chagra* use (bottom right).

Source: prepared by South Pole (2019) based on information collected in the field.

Chagras are highly diverse in terms of their floristic composition. More than 30 products are grown in each AATI, with AZICATCH being the most diverse with more than 80 different products (Figure 69). The main products grown in the *chagras* are plantain, cassava, peach palm fruit, and corn (Figure 70 and Figure 71). These products are mainly for self-consumption, but surplus production is also sold in the Peruvian communities. In AIZA, in the community of Sabaloyacu, *chagras* of more than 2 ha correspond to community *chagras*, where sugarcane is grown exclusively to produce panela, which is sold in nearby Peruvian communities (Figure 72).

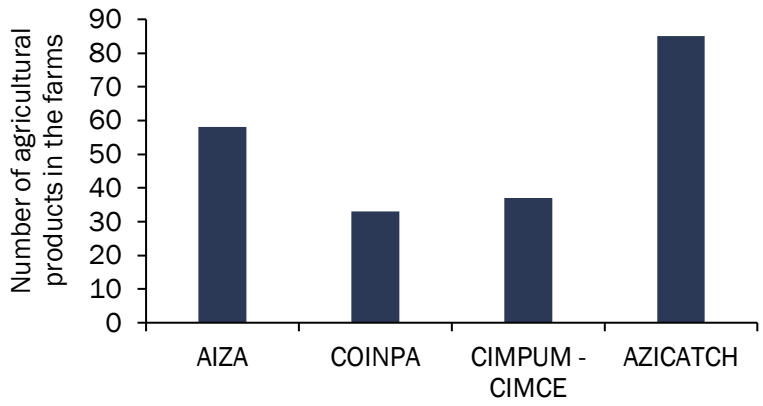


Figure 69. Number of products planted in the *chagras* of the project area.

Source: prepared by South Pole (2019) based on information from SINCHI, MADS, and AZICATCH (2011).

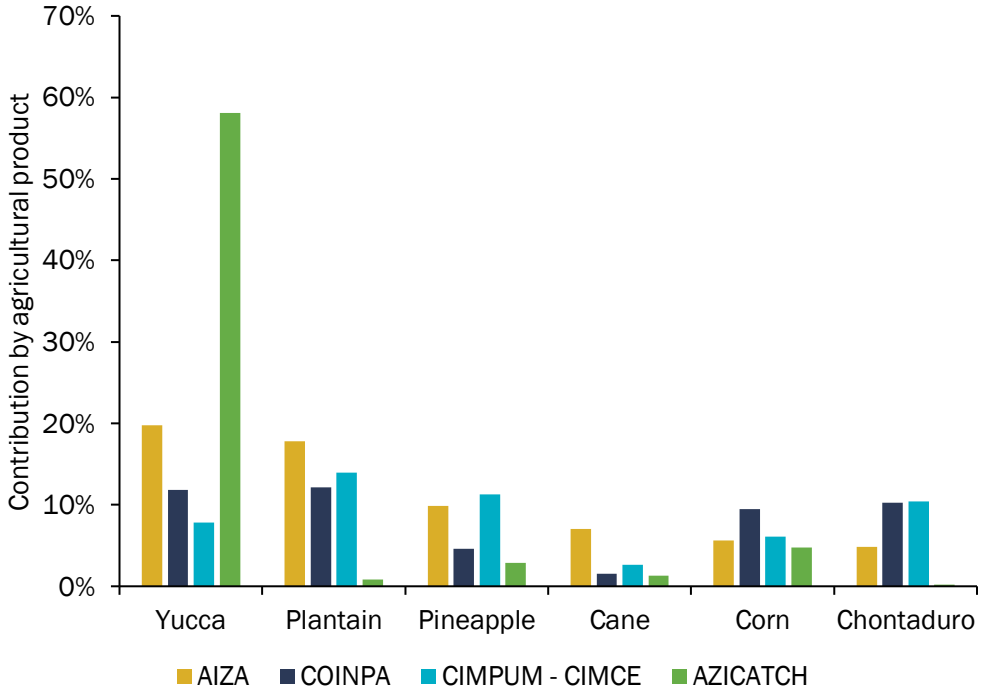


Figure 70. Main products planted in the *chagras* of the project area.

Source: prepared by South Pole (2019) based on information from SINCHI, MADS, and AZICATCH (2011).



Figure 71. Community of Sabaloyacu. Sugarcane crops (left) and sugarcane processing machine (right).

Photograph: South Pole (2019).



Figure 72. Products grown in the *chagras*. Plantain (top left); chili (top right); pineapple (bottom left); plantain and peach palm (bottom right).

Photograph: South Pole (2019).

The characterization of *chagras* carried out in the project's AATI shows that the main destination of the products harvested there is self-consumption, representing 84% of the crops; 14% are intended for both self-consumption and commercialization; the remaining percentage corresponds to one *chagra* that is intended for commercialization, and one more that is cultivated for the purpose of supplying products for traditional dances. Among the cultivated species are cassava and plantain. Cultivation of corn is also essential and is usually planted on a separate plot of land from the *chagra*, which is used for integrated crops. In addition, sugarcane, peach palm fruit, pineapple, soursop, and medicinal plants, among others, are also grown (South Pole, 2020).

Chagras are established in different types of soils and covers to favor food production. As previously mentioned, they also have a cycle in which indigenous people manage them following their traditions (SINCHI, MADS, AZICATCH, 2011), as follows:

- **New *chagras*.** These cultivation areas are between one and three months old. They are generally opened during the dry season and are usually planted first with cassava, which serves as an indicator of the phases of the *chagras*. Products such as tobacco, onions, cucumbers, and tomatoes are also planted. At this stage, the first day of maintenance and removal of weeds is carried out.
- **Young *chagras*.** These cultivation areas are between four and six months old. During this period, cassava has reached a height between one and two meters and the second tobacco harvest is carried out. Likewise, species such as corn, peanuts, lulo, peppers, watermelon, and some varieties of early cassava are harvested, along with other introduced species such as rice, tomatoes, beans, and cucumbers.
- ***Chagras* about to be harvested.** These cultivation areas are 7 to 8 months old. It is also harvest time for species such as coca, arrowleaf elephant ear, yam, and sweetcorn root. At this stage, most of the products to be harvested from *chagras* have already been planted. During this stage, the second day of maintenance of *chagras* is carried out.
- ***Chagras* in production.** These cultivation areas are between 9 and 23 months old. During this period, the highest production and use of the cassava plants is achieved; simultaneously, the stems of the harvested cassava are replanted, and saplings are cut and replanted for a new production. It is also banana and sugar cane harvesting season.
- ***Chagras* reaching completion.** They are between 24 and 48 months old. At this stage, replanted cassava plants offer their production or are no longer used. Also, given the long period of soil use and the resulting loss of nutrients, cassava varieties do not reach optimal characteristics for family consumption. It is an indicator of the culmination of a productive cycle since maintenance practices are no longer applied in these plantations. They are allowed to be covered again with vegetation to initiate the process of natural regeneration and soil recovery. It is said that these *chagras* then become a *ríare* —fruit tree stubble— and later a *méido*, as these spaces are called when they are abandoned. When a *chagra* is in its final phase, harvest time begins for fruit trees such as pineapple, peach palm fruit, Amazon grape, and mocambo tree.
- ***Chagras* in flood zones.** These are cultivation areas established only in the floodplains of rivers and other minor tributaries; they are planted during the dry season and harvested before the beginning of the rainy season. They are the most productive *chagras*, but the least diverse.

Nonetheless, *chagras,* as productive systems, are closely linked to the succession of well-differentiated climatic seasons. The communities of the Predio Putumayo Reserve describe this seasonality as marked changes in rainfall, wind, and temperature. Seasons are occurring out of time, flood pulses and river descent are not synchronized with the ripening of wild fruits or with harvesting in *chagra*s in flood areas; short droughts do not allow burning of land to establish new *chagras*; heat is increasing to such an extent that cultivating is becoming more demanding for the body, and solid land *chagra*s are losing productivity or shelf life (Echeverri, 2009).

In addition to agricultural production in the *chagra*s, the extraction of timber and non-timber forest products is an activity carried out in the REDD+ Project communities to obtain income, especially from the sale of timber. In all the life plans of the project's indigenous organizations, one of the recent problems is the selective extraction of timber species for both subsistence and commercialization. Among the species they harvest are *nectandra*, tornillo, and cedar.

Among the non-forest products that communities extract from the forest are fibers, which are used to make items such as sifters and strainers, and wild fruits such as açaí, moriche palm, patawa, and bacaba (Puerto Rastrojo Foundation, AZICATCH, WWF, COICA, OPIAC, 2018). These products are generally obtained near the place where the communities live and some of them are marketed by Peruvian communities or in boats on the Putumayo River (Figure 73). On the other hand, commercial handicrafts include weaving, basket weaving, and wood carving. It is reported that women involved in these trades must travel greater distances into the forest to obtain the necessary bark, seeds, leaves, and resins. This indicates a high demand and, probably, an unsustainable use of this resource.

The relative importance of timber and non-timber forest product extraction in relation to other economic activities, such as fishing and *chagra* cultivation, depends on seasonality and climate in general. There are times when horticulture is predominant as well as dependence on its products; while other times, subsistence depends on fishing, hunting, and gathering forest products (Calle, 1986). Some families of the Predio Putumayo Reserve even trade or exchange fruits and bushmeat to contribute to the family economy (South Pole, 2021).

Hunting is also practiced by the communities of Predio Putumayo. There are two types of hunting: small game hunting and big game hunting. Small game hunting is frequently done in the vicinity of the habitat. This type of hunting provides small mammals and birds for family consumption. Big game hunting is practiced to a lesser extent due to the effort required and the scarcity of ammunition for shotguns. Hunters must go deep into the jungle for several hours or even days to find their prey. Part of the meat obtained is consumed and the rest is sold in nearby villages or to boat traders (Echeverri et al., 1992).

A third type of hunting involves the defense of domestic animals, the search for elements for ritual purposes, or the defense of life due to fortuitous encounters in the jungle. In this type of hunting, prey are big cats such as jaguars (*Panthera onca*) and tigrillos (*Felis spp.*). The commercialization of feline skins is very limited due to restrictions imposed since 1974 by the Colombian National Institute of Renewable Natural Resources and Environment (abbreviated INDERENA in Spanish). This year marked

the end of the *tigrilladas*, which involved the hunting of thousands of felines to sell their skins (Echeverri et al., 1992).

Fishing for consumption is a common activity carried out in all bodies of water located in the vicinity of homes. This work is practiced by all members of the family, especially men. It is the primary resource for obtaining daily protein. Choosing a fishing site requires knowledge of fish habits and weather conditions. Some villages with cold rooms and marketing possibilities offer commercial fishing for supplying the inhabitants of the area (Echeverri et al., 1992).

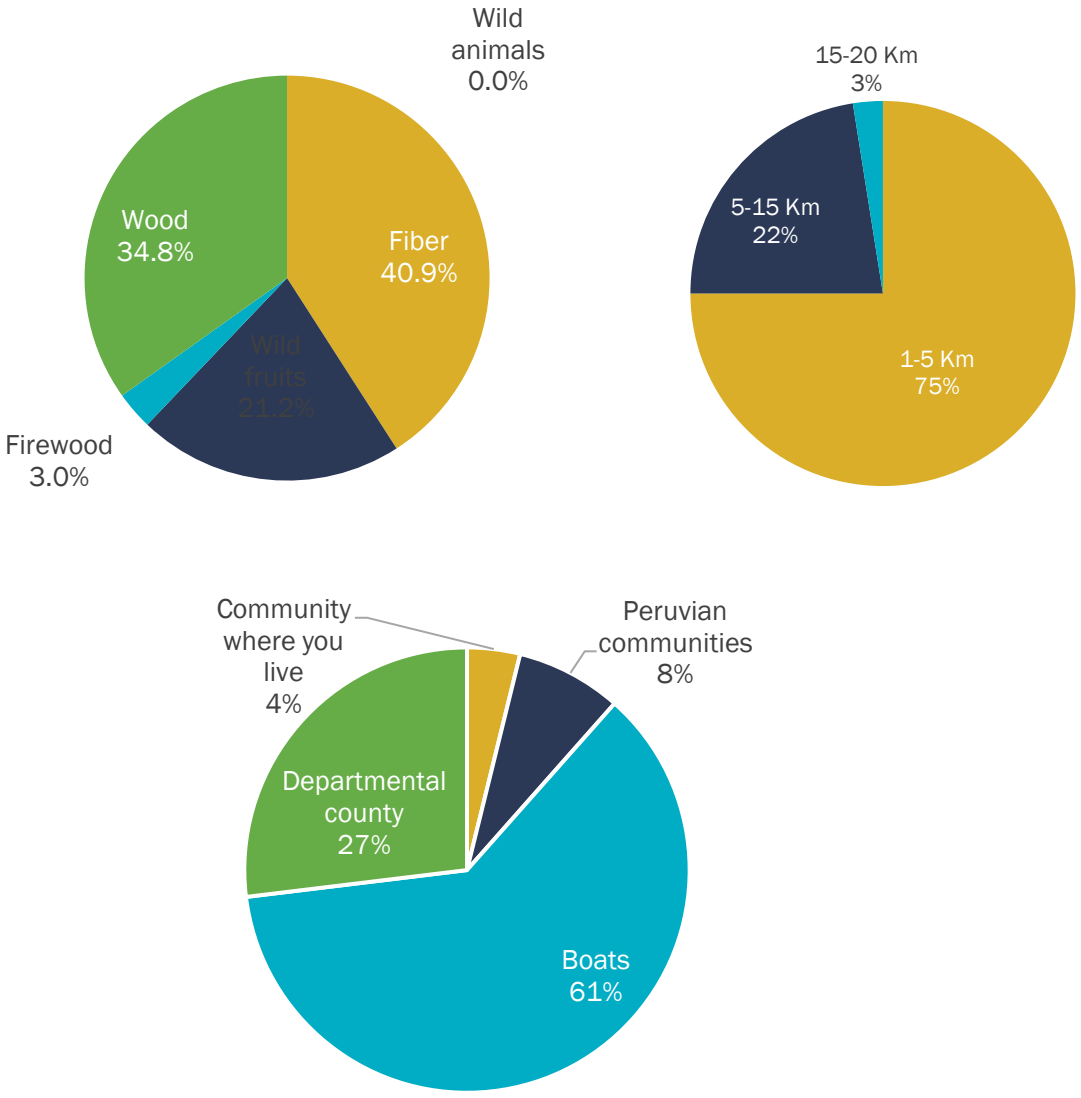


Figure 73. Main products obtained from the forest (top left); estimated distance between communities and the forest (top right); and main places where they sell forest and non-forest products (bottom).

Source: prepared by South Pole (2019) based on information collected in the field.

On the other hand, the scenario of armed conflict that has plagued the Colombian Amazon has promoted the insertion of illicit crops as an alternative productive activity to generate income in some indigenous communities in the project area. However, not all coca crops were historically related to cocaine production. For a large majority of ethnic groups in the Amazon region, such as those found in the project area (Muinane, Inga, Uitoto —Murui—, Miraña, Cocama, Ocaina, Yoriai, Bora, Tikuna, and Andoque), tobacco, coca, and sweet cassava are sacred elements in their worldview. Coca, for example, known as *Jibina* for the Uitoto people (Murui - Muina), is an element of spiritual management through which humans relate to nature. Although ypadu has a deep cultural dimension and is part of tradition, today both coca and ypadu also play an economic role, since the commercialization of ypadu is one of the economic activities that generates income for families, mainly for elders and men who are responsible for preparing ypadu for sale.

Nevertheless, since the 1980s, and due to the economic difficulties, the country was going through, specifically the poor conditions of the agricultural sector, many farmers were forced to cultivate coca on large plots of land for cocaine production (Mejía, 2016). Until 1994, Colombia produced cocaine hydrochloride with coca leaves from Peru and Bolivia. Subsequently, due to the control actions taken by the Peruvian Government, coca cultivation increased in Colombia, mainly in the departments of Guaviare, Caquetá, and Putumayo. This caused the area under coca cultivation to increase until reaching a peak of 163,000 ha in 2000 (UNODC, 2014).

The Amazon region experienced new dynamics in terms of illicit crops during the 2001-2012 period (Figure 74). For example, coca crops have been shifting and have not been registered in the same place during the entire period. At least 1,275 km^2 of coca crops were identified in the department of Amazonas between 2001 and 2012, of which less than 1% corresponded to areas of permanent coca cultivation located mainly in Puerto Alegría in the jurisdiction of COINPA (REDD+ Project area). In this period, about 3% of the department's area had intermittent coca cultivation, mostly in the banks of the Putumayo and Igará-Paraná rivers, in La Chorrera, El Encanto, Puerto Alegría, the Miritί-Paraná River, La Victoria, and on the border of La Chorrera and El Encanto, along the Igará-Paraná River (UNODC, 2014).

This crop is used in some places to extract coca paste, locally called *cocoroco*. Inputs for the implementation of this crop are provided by the merchants who own the boats. Coca cultivation for the above-mentioned purpose has quickly led to the incorporation into the daily life of Amazon communities of elements that were once alien to the region, such as power stations, tin roofing, brads, outboard motors, among others (Echeverri et al., 1992).

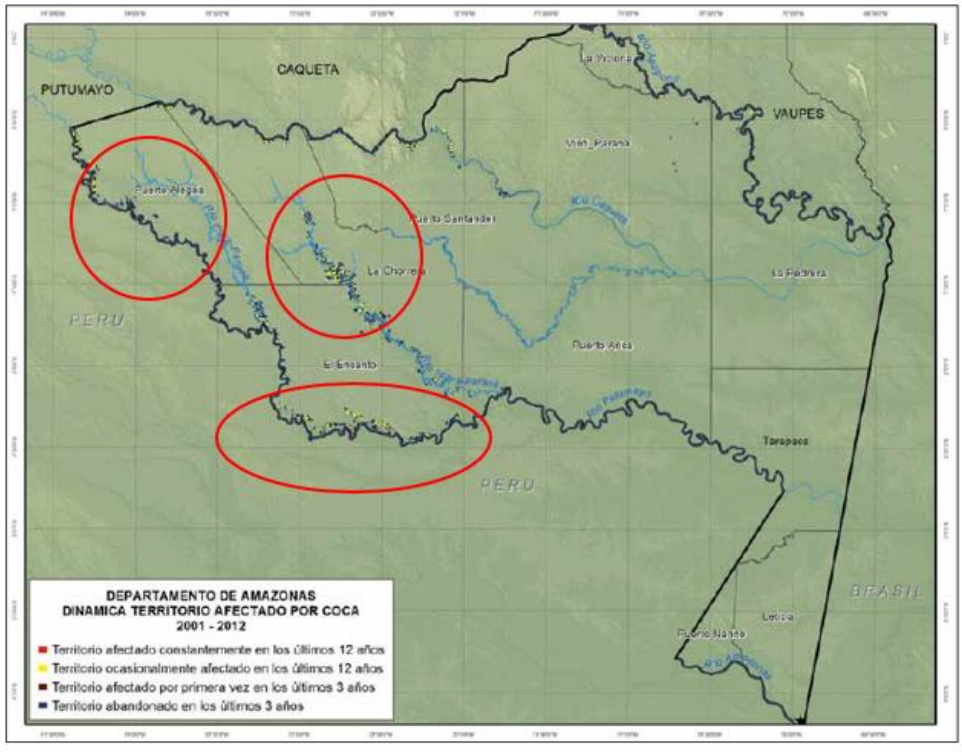


Figure 74. Coca cultivation dynamics in the department of Amazonas between 2001 and 2012. The red circles highlight the areas where there was permanent or intermittent presence of coca crops.

Source: UNODC (2014).

In the department of Amazonas, coca cultivation was also very dynamic during the 2010-2018 period. There was a peak in 2010 and, recently, it has tended to decrease (Figure 75). In the project area of the REDD+ Project, most of the illicit crops were abandoned during the 2009-2018 period (Figure 76), but there are still reports of areas affected by this type of cultigens in villages such as Peña Blanca, where the population is mixed or mostly made up of settlers.

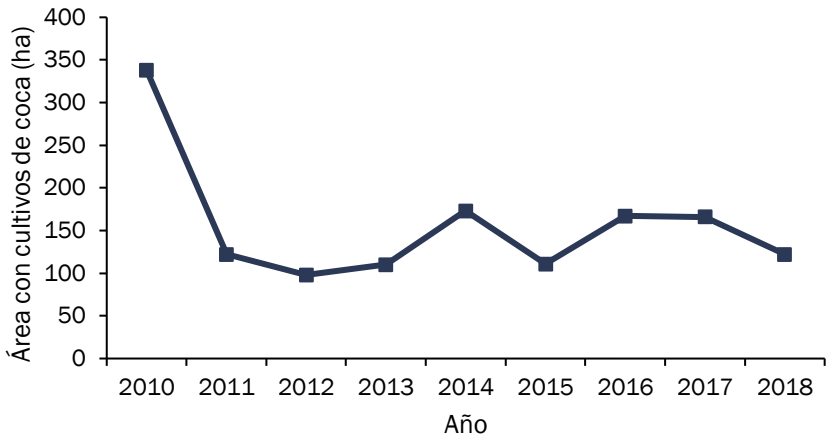


Figure 75. Coca cultivation in the department of Amazonas during 2010 and 2018.

Source: UNODC (2019).

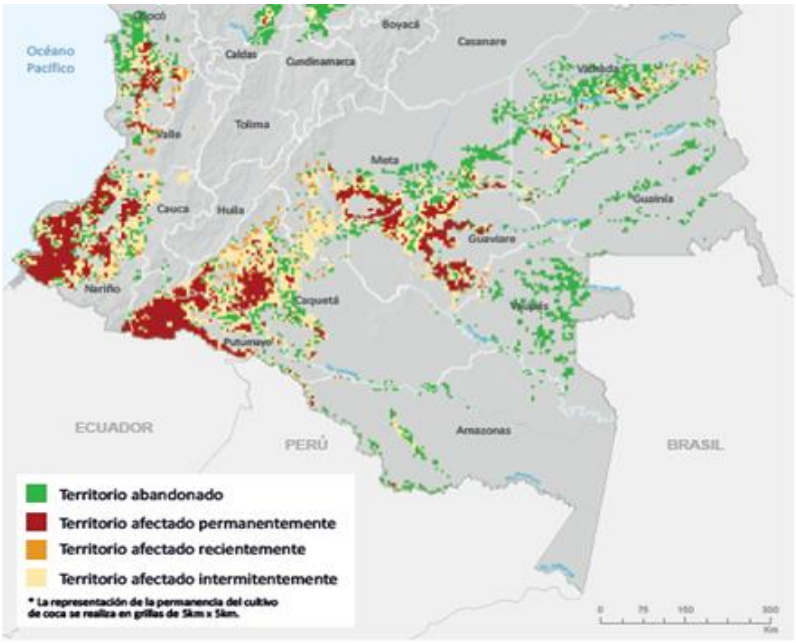


Figure 76. Distribution of coca cultivation by permanence between 2009 and 2018. Abandoned territories (green); permanently affected territories (red), recently affected territories (orange); intermittently affected territories (light yellow).

Source: UNODC (2019).

Recently, the demographic flow and permanent settlement has also been boosted in two of the project's AATI (CIMPUM and COINPA), mainly driven by informal and small-scale minerals extraction. This activity is primarily carried out along the Putumayo River, where people use small dredges and rafts to extract gold. EXtractive activities increased in 2010 in the small towns of Puerto Alegría, El Encanto, Puerto Arica, Tarapacá, La Pedrera, Puerto Santander, and La Chorrera. Even in the project area, a extraction legalization request was submitted in 2018 (SINCHI Institute, 2019).

At the regional level, illegal minerals extraction has boomed in the last three decades. The first gold bonanza was in the 1980s in the lower sectors of the Caquetá and Apaporis rivers. The second bonanza was in the early 2000s when gold explotation expanded to other sectors of the Caquetá and Puré rivers, using rafts and dredges. The third bonanza, starting in 2010, expanded the use of rafts and dredges in the Caquetá River, as well as in the Putumayo River, in the villages of Puerto Alegría, El Encanto, Puerto Arica, Tarapacá, La Pedrera, Puerto Santander and La Chorrera. The Cahuinarí, Puré River and Amacayacu National Natural Parks, within the reserves and the Amazon Forest Reserve, did not escape this bonanza either. The illegality of extractive activity involves all property regimes and the department's territorial organization, including the indigenous peoples. In the transition from the 20th to the 21st century, leaders and communities initially accepted the presence of illegal minerals extraction in their territories and progressively became involved in its activities, which offered a source of income. This triggered tensions between the youth and elders, due to the questioning of traditional authorities (Instituto Amazónico de Investigaciones - Científicas SINCHI, 2019).

The increase in population is also evident in several communities of the project, such as Puerto Alegría (COINPA), as they constantly host displaced families and people with various commercial interests (Zio-a'i Foundation, 2008). Furthermore, the CIMPUM communities located downstream the Putumayo River and close to the region known as El Estrecho, in Peru, receive massive flows of settlers from the neighboring country due to the reduction of the Putumayo River flow in that area and, therefore, the ease of transit (OIMA, Zio-a'i Foundation, 2008).

The AATI have identified problems in their territories related to continued colonization by displaced families or by foreigners with commercial interests. For example, in the community of Peña Blanca, in CIMPUM, there are conflicts over the indiscriminate logging and exploitation of resources by Peruvian nationals, who also make roads and dig in Colombian territory using techniques that are harmful to health, such as the use of poison in lagoons.

Regarding social processes inside the AATI, young people are losing interest in having a *chagra* and carrying out traditional production tasks, because parents encourage their children to study and professionalize in western educational systems. In consequence, the cultural heritage is being lost and the population profile is gradually shifting from rural to urban. According to the co-managers of the REDD+ Project, the new generations of AIZA have no interest in *chagras* and are unaware of the species and care related to them, which poses a risk to the food security of communities and the historical care of forests. Urbanization is also driven by law-and-order problems or by the desire of individuals or indigenous families to have greater access to health and education services, and even some job opportunities. The latter is already common in relation to government entities or NGOs in the communities of Puerto Alegría, Puerto Arica, Santa María, San Francisco, and Caisam.

Scenario 2. Project activities within the established area that are developed without the project being registered as a VCS AFOLU project.

Indigenous communities participating in the REDD+ Project recognize the importance of conservation and sustainable forest management as part of their identity and worldview. These activities have been traditionally carried out and are reflected in their life plans. These documents, with organizational and political validity, are also used by the communities to identify problems at the territorial level (COINPA, Zio-a'i Foundation, 2008).

Life plans include a review of the origin of each ethnic group and an analysis of the historical trends of each AATI in the specific environmental, territorial, and cultural dimensions, as well as an assessment of current conditions to address strategic lines and targets that strengthen their goals and purposes as an organizational structure.

COINPA's life plan states that there was a historically good relationship between the environment and humans, but there is currently a slight imbalance due to the exploitation of natural resources (COINPA, Zio-a'i Foundation, 2008). The projects prioritized in COINPA's life plan include the need to develop regulations for the use, exploitation, and conservation of natural resources. The main land uses in COINPA are timber extraction, agriculture, fishing, and hunting (COINPA, Zio-a'i Foundation, 2008).

Similarly, as part of its identity and beliefs, CIMPUM states that both living and non-living beings live off water and, therefore, it is necessary to take care of all the elements of nature in an orderly manner to protect the territory given by the Creator Being. Other environmental problems that they recognize include lack of recognition of their territory, overexploitation of timber as a means of economic sustainability, cultural loss among young people in their communities, and disinterest in the territory. They also state that conservation is related to both respect for the forests and the development of the *chagras* system, which serves to prevent the loss of species (OIMA, Zio-a'i Foundation, 2008).

For its part, AIZA states in its life plan that the environment is the basis of indigenous life and, therefore, the care of the territory and the protection of natural resources must be ensured. They recognize shortcomings in this regard, and their projects in the economic and environmental component are aimed at improving the human-nature relationship and preventing the depletion of natural resources (AIZA, 2009). In 2019, to improve these circumstances, they developed an environmental management plan and a regulation for environmental use, management, and control, which, to date, has not been implemented due to lack of resources.

Finally, AZICATC''s life plan considers the territory as something sacred, under the guard and protection of the Creator Being *Moo Uai*, who, since the beginning, entrusted them with the mission of caring for and respecting nature and the creatures living in it. For AZICATCH, each territory has its own protective spirit and each being that inhabits it has a protective mother. In terms of production, the AZICATCH people consider themselves as ethno-farmers, where the subsistence system is based on what their *chagras* produce for self-consumption and commercialization.

They also earn sporadic income from the sale of handicrafts. Their life plan includes as priorities the strengthening of *chagras* and fish, poultry, and pork programs, the improvement of processing techniques, the conservation of regional species, and the development of environmental management plans to preserve biodiversity (AZICATCH, 2006).

AATI's life plans and environmental management plans establish conservation as an integral part of their identity and their indigenous worldview, in which they consider themselves as millenary inhabitants of their territory and stewards of nature. However, there are major obstacles to the implementation of their projects due to the access and management of resources and the loss of cultural values, especially among the young people of these communities. This has an impact on the weakening of local governance and, consequently, on the implementation of activities aimed at forest conservation in their territory.

So far, conservation initiatives have been mostly of a traditional nature and their formalization has not been able to advance beyond priority actions in the life plans. These actions have been achieved thanks to funding received from the SGP. These resources are transferred by the national government to territorial entities (municipalities and departments) and indigenous reserves, and their usual destination is infrastructure, education, health, drinking water, and basic sanitation.

As mentioned above, results are scarce for projects or activities executed in the four AATI participating in the REDD+ Project prior to the start date. Table 5 presents the status of activities related to deforestation control that were identified in the historical reference period prior to the start of the REDD+ Project. Most of these actions have unknown follow-up processes and results, which calls into question their effectiveness in forest conservation and whether they have been able to generate any benefits for the participating indigenous communities.

Scenario 3. Presence of activities like those proposed by the project in at least part of the VCS AFOLU project area as a result of legal requirements or national conservation efforts.

In general, the Amazon region is an essential area from a cultural and environmental perspective, because of the great diversity of indigenous communities that inhabit it and the great biodiversity that it harbors. The Colombian State has a broad set of laws to ensure the protection of these natural resources and to guarantee the rights of the communities living in this region.

In Article 8 of the Colombian Constitution of 1991, the state provides that it is "the obligation of the state and of the people to protect the cultural and natural wealth of the nation." It also stipulates another series of rights related to a healthy environment and proper planning and management of natural resources. In general, all these regulations are associated with the fact that the Colombian state must ensure optimum quality conditions for the enjoyment of the environment to meet the needs of all inhabitants of the country (Rojas, Soler, & Suárez, 2016).

Regarding indigenous communities, the national government, through laws such as Decree 632 of 2018 and Decree 1953 of 2014, provides those indigenous territories shall have their own administration systems in order to guarantee autonomy, self-government, self-determination, indigenous education, and other fundamental rights, within the constitutional framework of respect and

protection of ethnic and cultural diversity. In this context, the indigenous communities participating in the project have developed their life plans, which establish several aspects, including conservation as an integral part of their cultural identity and as a requirement for maintaining the human-nature balance.

Besides the constitutional issues associated with the protection of the environment and indigenous communities, Colombia has the SINAP, which seeks to contribute to the country's conservation goals, including all protected areas under public, private, or community governance, and under national, regional, or local management. The country has a total of 1,248 protected areas covering 31.3 million ha, equivalent to 15.1% of the national territory (National Natural Parks of Colombia, 2020). The department of Amazonas has five protected areas covering 2.3 million ha (Table 66).

Table 66. Protected areas in the department of Amazonas.

Name of protected area	Area (ha)
Amacayacu National Natural Park	262,481
Cahuinarí National Natural Park	558,663
Río Puré National Natural Park	984,715
Chiribiquete National Natural Park	74.36
Yaigojé Apaporis National Natural Park	488,343
Total	**2,294,276**

Source: National Natural Parks of Colombia (2020).

In relation to the REDD+ Project management area, about 93% of the Cahuinarí National Natural Park is in the Predio Putumayo Reserve, especially in the jurisdiction of PANI and, to a lesser extent, in AIZA. It was created in 1987 by Resolution 190 of 1987 and its main uses are conservation, research, education, recreation, and culture. The park is closed to the public and includes the communities of San Francisco and Las Palmas of the Predio Putumayo Reserve and four other communities of the Mirití Paraná Reserve (National Natural Parks of Colombia, 2020).

On the other hand, the Amazon Forest Reserve, created through Law 2 of 1959, covers the departments of Amazonas, Putumayo, Nariño, Caquetá, Guainía, Guaviare, Huila, Meta, and Vaupés. Originally, it covered an area of 44 million ha, but after several subtraction processes, it was reduced to about 37.8 million ha, of which 9.8 million ha are in the department of Amazonas (around 26% of the forest reserve). This overlapping of areas implies that for this territory both protection categories apply, since they are compatible in accordance with Law 160 of 1994 (SINCHI, MADS, 2014) and, therefore, must be considered as environmental determinants in any process that is related to land use.

Moreover, in the Amazon Region, the Vision Amazonia Program is being developed to promote a new development model in the Colombian Amazonia, with a vision of sustainable development and low deforestation, which allows improving the living conditions of local populations while maintaining the natural base that sustains life and productivity in the region (MADS, 2015). The jurisdiction of Vision Amazonia corresponds to the Amazon biome, which includes the Predio Putumayo Reserve and the AATI of the REDD+ Project.

Several projects have been developed as part of the Vision Amazonia Program in the Amazon biome, the most relevant being the REM program. This program is financed by the governments of Colombia, Germany, Norway, and the United Kingdom and provides result-based financing for emission reductions during the 2013-2017 period to meet the country's goal of achieving zero net deforestation in the Amazonia by 2020. This program operates with a result-based payment for REDD+ by providing resources based on the reduction of verified emissions resulting from the decrease in gross deforestation in the Amazon biome. All funds obtained are invested in a benefit-distribution and investment scheme based on five pillars, which seek that at least 60% of the resources are invested to benefit local stakeholders in environmental governance and agro-environmental development issues (Figure 77) (KFW, GIZ, 2016).

Environmental governance with indigenous peoples is a key pillar of the Vision Amazonia Program, as more than half of the Colombian Amazonia is collectively owned by them. To facilitate the participatory construction of this pillar, REM supported the organization of 17 workshops in the Amazon Region and six in the city of Bogotá. As a result of a broad and inclusive process, in which more than 900 representatives of 60 different ethnic groups participated, there are now priority lines of work for the pillar, clear criteria for project eligibility, and a defined governance structure. However, to access funding, indigenous communities must submit their project ideas to the calls for proposals opened by the program, and funding shall depend on the prioritized scopes to be implemented by such initiative.

Program intervention has been prioritized by phases, first advancing in actions to combat deforestation in the departments of Caquetá and Guaviare in the first year. Later, work began in the departments of Putumayo, (Southern) Meta, Guainía, Amazonas, Vichada, and Vaupés. Vision Amazonia has also prioritized its actions depending on the assistance of other entities to certain regions and departments so that its investment is key or complementary to that of the national government (some regions or departments will be assisted by other government initiatives such as post-conflict, the National Comprehensive Program for the Substitution of Illicit Crops, Territory-Focused Development Plans, among others).[50]

[50] https://visionamazonia.minambiente.gov.co/departamentos-en-donde-vision-amazonia-opera/

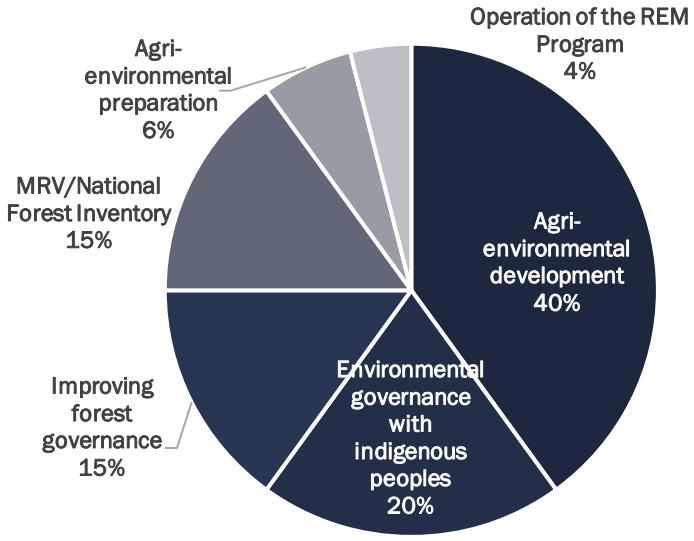


Figure 77. Benefit-distribution and investment scheme in the REM program.

Source: adapted from KFW and GIZ (2016).

Substep 1b. Describe the consistency of credible land use scenarios with enforced mandatory applicable laws and regulations.

Table 67 and Table 68 present the regulatory frameworks that address the illegal nature of illicit crops and create the mechanisms for their control under the illicit crop eradication strategy.

Table 67. Land use scenario and applicable regulatory frameworks.

Land use scenario(s)	Scenario components	Applicable regulatory framework
Scenario 1. Continuation of local market demands for natural resources, illegal facilities and subsistence economic activities related to the use of land and forest resources and occupancy patterns for residential use.	Timber logging, subsistence farming, extraction of forest and non-forest products, and residential land use and informal and small-scale minerals extraction	Indigenous territories are covered by a broad legal framework that favors their autonomy and survival in many aspects (see section 1.14). Article 286 recognizes traditional indigenous territories as territorial entities and Article 287 states that "Territorial entities are autonomous in the management of their interests within the limits of the Colombian Constitution and the law. Therefore, they shall have the following rights: *i)* To be governed by their own authorities; *ii)* To exercise their corresponding powers; *iii)* To manage resources and establish the taxes necessary to fulfill their functions, and *iv)* To participate in the national revenues." Additionally, Decree 632 of 2018 provides that indigenous communities in non-municipalized areas of the departments of Amazonas, Guainía, and Vaupés may be governed by their own authorities and define, implement,

Land use scenario(s)	Scenario components	Applicable regulatory framework
		and assess their own economic, social, environmental, and cultural policies within the framework of life plans or equivalent, in accordance with the applicable legislation (Article 5). Indigenous life plans constitute for indigenous peoples an expression of how they exercise their autonomy and their way of seeing and managing their own affairs (Office of the Comptroller General of Colombia, 2017). Finally, Decree 1953 of 2014 created a special system with the purpose of implementing indigenous territories regarding the administration of the indigenous peoples' own systems, including the environmental component. One of their functions was to define, implement, and assess their own environmental and cultural policies pursuant to their life plans, the national legislation, and the principles of coordination, concurrence, and subsidiarity. The regulatory framework for the exploitation of timber in natural forests of Colombia is complex and encompasses various laws, decrees, and regulations. In general terms, the Political Constitution of Colombia recognizes the importance of environmental protection and natural resource conservation, establishing principles of conservation and sustainability. The Forestry and Soil Conservation Law (Law 2 of 1959) is one of the fundamental pieces of the regulatory framework, laying the groundwork for sustainable forest management and the protection of forest resources. Subsequently, Law 99 of 1993 established the National Environmental System (SINA), which includes specific provisions for forest conservation and biodiversity. In the specific context of forestry exploitation, Decree 1791 of 1996 regulates the utilization of forest resources, establishing procedures and requirements for the granting of permits and authorizations. Additionally, the Ministry of Environment and Sustainable Development issues resolutions and complementary regulations to regulate specific aspects of forestry activities. The regulatory framework also includes the participation of local communities and indigenous peoples in forest management, recognizing their rights over natural resources and promoting prior consultation in projects that affect their territories. Subsistence agriculture, extraction of forest and non-forest products, and residential land use are ways of inhabiting the territory that are recognized and endorsed by the life plans of the AATI participating in the project and, therefore, comply with the legal requirements. On the other hand, informal and small-scale minerals extraction that occurs in the territory, mainly on the Putumayo River, through the installation of dredges, is,

Land use scenario(s)	Scenario components	Applicable regulatory framework
		according to the regulatory framework established by the Mining Code and the Penal Code, an illegal activity. Illegal exploitation of minerals is defined as "Illegal exploration and exploitation of mineral deposits, constituting the crime contemplated in article 244 of the Penal Code, is configured when exploration, extraction or capture of minerals of national or private property is carried out without the corresponding mining title in force or without the authorization of the owner of said property" Penal Code, in article 338. In this sense, although they are insufficient, the National Government through the national army has executed operations such as the destruction of rafts and dredges, raids, and detention of people. (Instituto Amazónico de Investigaciones - Científicas SINCHI, 2019).
	Illegal timber logging	The illegal timber market in the Putumayo River basin operates through various mechanisms, exploiting legal loopholes and engaging in illicit activities to facilitate the trade of timber. Salvoconductos, essential legal documents for timber exploitation, are manipulated and traded in the black market or reused with false information. For instance, the banned species like cedar are brought into Colombia from Peruvian national parks and falsely declared as legally harvested before the ban, exploiting legal gaps. Corpoamazonia, the regulatory body, faces challenges in enforcing regulations due to resource constraints, lack of personnel, or political will. Some permit holders collaborate with illegal loggers by using their permits to legitimize illegal timber. The timber supply chain involves operations on private, public, or collective territories, with much of the timber transported via rivers, then processed and sold in urban centers like Bogotá or exported. Intermediaries play crucial roles, financing operations, obtaining permits, and facilitating sales. The timber economy in the region traces back to half a century ago, experiencing booms driven by demand for hardwoods like cedar. However, overexploitation led to the gradual disappearance of valuable species, pushing loggers deeper into forests, even crossing borders into Peru. Intermediaries, such as "gasteros" and "apoderados," play significant roles in exploiting communities for timber extraction. Gasteros finance and facilitate operations, sometimes exploiting communities' needs, while apoderados negotiate directly with communities, securing permits and acting as representatives. However, their activities often lead to unsustainable resource use, exploitation, and internal conflicts within communities. Illicit timber trafficking mainly occurs along navigable

Land use scenario(s)	Scenario components	Applicable regulatory framework
		waterways, with limited enforcement due to few control points and inadequate resources. Lack of political will and coordination among regional authorities exacerbates the situation, allowing traffickers to evade interception by crossing borders. The regulatory framework in Colombia for the exploitation of timber in natural forests is based on a series of laws and decrees designed to prevent and combat illegal logging of forest resources. Among the most relevant regulations are Law 99 of 1993, which establishes the principles and norms for environmental management and the sustainable use of natural resources, and Law 2 of 1959, which regulates the conservation of natural resources and the preservation of the environment. Additionally, Decree 1791 of 1996 sets out the conditions and procedures for granting forest harvesting permits, while Decree 1076 of 2015 regulates the comprehensive management of renewable natural resources and the maintenance of ecological balance. These regulations establish the obligation to obtain forest harvesting permits, prohibit logging in protected areas, and impose sanctions on those who violate the regulations, including economic fines and the confiscation of equipment used in illegal activities. The objective of this regulatory framework is to promote sustainable forest management, protect biodiversity, and ensure compliance with international environmental commitments.
	Illicit crops	Coca cultivation for cocaine hydrochloride production is illegal in Colombia. A broad legal framework prohibits this activity and promotes the implementation of mechanisms for its control under the Illicit Crop Eradication Strategy (Table 68). Colombia has even made alliances with other countries to fight drug trafficking, such as Plan Colombia (UNODC, 2019).
Scenario 2. Project activities within the established area that are developed without the project being registered as a VCS AFOLU project.		<u>Colombian Constitution of 1991</u> • Article 95: duties of citizens include protecting the country's natural resources and ensuring a healthy environment. <u>Environmental duties of indigenous reserves:</u> There are different regulations that establish environmental competencies for the communities recognized in indigenous territories. As a constitutional rule, Article 330 of the Colombian Constitution states that indigenous territories must ensure the preserve of natural resources. In turn, Article 15 of Law 21 of 1991, which ratified ILO Convention 191, stipulates the right of indigenous peoples

Land use scenario(s)	Scenario components	Applicable regulatory framework
		to participate in the use, management, and conservation of the natural resources existing in their territories, which must be specially protected. In accordance with Article 67 of Law 99 of 1993, indigenous territories have the same roles and duties defined for municipalities in environmental matters. In other words, indigenous territorial entities, in the exercise of their roles, must be subject to the principles of regional harmony, normative gradation, and subsidiary rigor. Traditional conservation and sustainable forest management are part of the lines of work that the indigenous communities prioritize within their life plans. These plans, goals, and activities seek to strengthen the traditional conservation initiatives, sustainably use local biodiversity, and make efforts to protect and safeguard the cultural and natural heritage of the communities.
	Scenario 3. Presence of activities like those proposed by the project in at least part of the VCS AFOLU project area as a result of legal requirements or national conservation efforts.	<u>Colombian Constitution of 1991</u> • Article 8: the state must protect the cultural and natural wealth of the nation. • Article 79: all people have the right to enjoy a healthy environment; communities must be able to participate in all decisions that will affect them; and the state has the duty to protect the biological diversity and integrity of the environment and to conserve biologically important areas. • Article 80: the Colombian State must plan the management and use of natural resources to conserve, restore, or substitute them and thus achieve sustainable development. • Article 95: duties of citizens include protecting the country's natural resources and ensuring a healthy environment. • Article 339: the state must submit a national development plan that shall include environmental policies. <u>Decree-law 2811 of 1974. National Code for Renewable Natural Resources and Environmental Protection</u> Articles 206-210: Forest reserve areas. Articles 327-336: National Natural Parks System. Law 2 of 1974: National Forest economy and conservation of renewable natural resources. <u>Cahuinarí National Natural Park</u> It was declared as a natural park under Executive Resolution 190 dated October 19, 1987.

Land use scenario(s)	Scenario components	Applicable regulatory framework
		REDD+ programs Resolution 1447 of 2018 regulates the system for monitoring, reporting, and verification of mitigation actions at the national level referred to in Article 175 of Law 1753 of 2015, as well as other provisions.

Source: prepared by South Pole (2021) based on the regulations.

Table 68. Regulatory frameworks associated with the Illicit Crop Eradication Strategy in Colombia.

Components of the Illicit Crop Eradication Strategy	Regulations	Content
Illicit Crop Eradication Program through Aerial Spraying with Glyphosate, voluntary manual eradication, and forced manual eradication.	Resolution 1065 of 2001 (MADS)	Whereby a management plan is established, and other decisions are made.
	Resolution 1054 of 2003 (MADS)	Whereby an environmental management plan is modified, and other provisions are made.
	Resolution 0013 of 2003	Whereby Resolutions 1 of February 11, 1994, and 5 of August 11, 2000, are revoked and a new procedure for the Illicit Crop Eradication Program is adopted.
	Resolution 031 of 2003	Whereby Article 5 of Resolution 0013 of June 27, 2003, is modified and a new procedure for the Illicit Crop Eradication Program is adopted.
	Resolution 099 of 2003 (MADS)	Resolution by the Colombian Ministry of Environment modifying the Environmental Management Plan established by Resolution 1065 of 2001 submitted by the National Narcotics Directorate for the Illicit Crop Eradication Program with Glyphosate. This program is currently suspended by the National Narcotic Drugs Council (CNE, as per its acronym in Spanish) pursuant to Resolution 0006 dated May 29, 2015.
	Law 30 of 1986	Articles 8, 9, 77, and 91: Paragraph g. System for the eradication of illicit crops, competence, and procedure.

Components of the Illicit Crop Eradication Strategy	Regulations	Content
	Resolution 0013 of 2003 (CNE)	Whereby Resolutions 0001 dated February 11, 1994, and 0005 dated August 11, 2000, are revoked and a new procedure for the Illicit Crop Eradication Program is adopted.
	Resolution 015 of 2005 (CNE)	Whereby permission is granted (... to decide on aerial spraying with the glyphosate herbicide).
Prior consultation process for the eradication of illicit coca crops in indigenous territories	Decree 1320 of 1998	Whereby Law 21 of 1991 is regulated.
	Judgement SU/383 Supreme Court of Justice	Prior consultation with indigenous communities on issues related to the eradication of illicit coca crops.
	Presidential Directive 0001 of 2010	Whereby prior consultation for the eradication of illicit crops is ordered for all national minorities.

Source: adapted from the Colombian Drug Observatory (2020).

Results of step 1b.

All scenarios are plausible except for the illicit crop component under Scenario 1.

Substep 1c. Select the most plausible alternative scenario for the baseline.

The most plausible scenario for the baseline is the combination of the three scenarios described in substep 1a, which include the following:

1) Continuation of local market demands for natural resources, illegal facilities and subsistence economic activities related to the use of land and forest resources and occupancy patterns for residential use.
2) Project activities within the established area that are developed without the project being registered as a VCS AFOLU project (considering the conservation initiatives implemented by the indigenous communities, whether in association with entities outside the reserves, which have a traditional essence given the relevance of forest care for the communities, and whose formalization has not progressed beyond priority actions in the life plans).
3) Presence of activities like those proposed by the project in at least part of the VCS AFOLU project area because of legal requirements or national conservation efforts, such as the entities attached to the SINAP and activities derived from mitigation actions at the national level that are implemented as part of sectoral or REDD+ programs.

Step 2. Investment analysis

The *Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities — VT0001* requires Step 2 (investment analysis) or Step 3 (barrier analysis) to be carried out for the development of the additionality analysis. In this case, the barrier analysis was selected and is developed below.

Step 3. Barrier analysis

The following are the barriers that would prevent the implementation of the proposed project activity if it were not included in an AFOLU project registered under VCS.

Substep 3a. Identify barriers that would prevent the implementation of the type of proposed project activity.

Financial and investment barriers

Indigenous communities are highly dependent on the income that they receive from the government, which mainly comes from the SGP. These resources are allocated in accordance with the provisions of Article 356 of the Colombian Constitution and articles 2 and 83 of Law 715 of 2001, for the financing of investment projects duly formulated pursuant to the life plans or uses and customs of the indigenous peoples. The departments or municipalities manage the resources of the special allocation of the SGP for indigenous reserves by signing an administrative contract entered by the respective local authority and the authorities of the indigenous reserve (Office of the Comptroller General of Colombia, 2017).

The SGP corresponds to the resources that the nation transfers to the departments, districts, and municipalities for the financing of the services for which they are responsible and is made up of sectoral participations and special allocations, including that of indigenous reserves. Unfortunately, most of these resources are distributed by sector, while only 0.52% is allocated to Colombia's indigenous reserves (Figure 78).

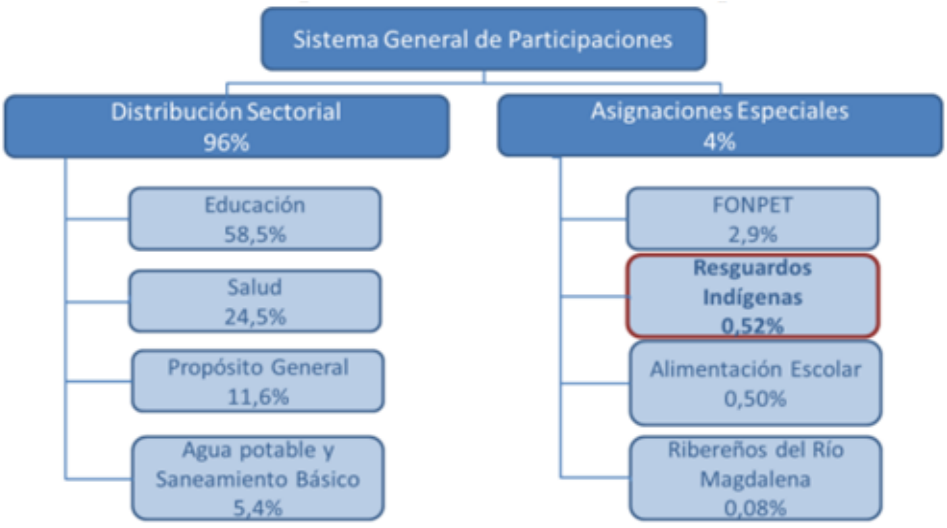


Figure 78. Composition of the SGP in Colombia.

Source: Office of the Comptroller General of Colombia (2017).

Most of the resources channeled through the SGP for indigenous communities are invested in the acquisition of goods and services for the communities and, to a lesser extent, in consumable products (food security); only about 1% is allocated to activities related to the environment. Although most of the resources are allocated to health, education, drinking water, and basic sanitation, mortality indicators show that the situation of the indigenous population is worse than that of the non-indigenous rural population and like that of other ethnic minorities that do not have a special allocation of resources. This proves that these resources have not been effective in closing the existing gaps (Office of the Comptroller General of Colombia, 2017). Other financial barriers related to the management of SGP resources are closely related to the following:

1) Budgets depend on the population size.
2) Municipalities with high percentages of indigenous population have a low degree of financial planning and low levels of revenue generation and management. This is further worsened by the not always friendly relations between the indigenous reserves and the territorial entities.
3) Investment plans of the formulated projects do not have effective investment monitoring and reporting mechanisms, cost-effectiveness principles, or operational and transparent accounting and auditing systems.

Therefore, the special allocation of SGP resources is not enough to invest in all the necessary aspects of the Putumayo Reserve, thus preventing investment in other areas such as conservation. This situation is not only exclusive to the communities of Predio Putumayo, but also applies to all indigenous communities in Colombia.

Institutional barriers

The management of SGP resources is a challenge for indigenous communities since they must have technical and administrative capacities that allow them to manage resources efficiently and achieve a positive impact on the improvement of their quality of life. In addition, communities must also harmonize ordinary jurisdiction with their own law and strengthen their special jurisdiction in the management of public resources (Office of the Comptroller General of Colombia, 2017).

At the national level, the execution of projects endorsed by the SGP was only 65% for the 2013-2016 period, and it was close to 50% for 2014 and 2016 (Office of the Comptroller General of Colombia). Therefore, it is evident that many indigenous communities in Colombia face problems in the formulation and execution of the scarce resources that they receive from the special allocation of the SGP. Besides the general shortcomings of the indigenous reserves in Colombia, municipalities, and departments, which are responsible for contracting with the reserves for the implementation of resources in the SGP, often lack administrative capacity, resources, or personnel to carry out such activities (Office of the Comptroller General of Colombia). As a result, by 2017 only 333 reserves (39%) had signed contracts with the municipalities of the country (Colombian Ministry of the Interior, 2017).

More specifically, the AATI of the REDD+ Project recognize that there are difficulties in the formulation and execution of resources within their life plans. For instance, AZICATCH, explicitly states that they are aware that they have made inadequate use of some resources that require management and that they recognize the need for an environmental management plan in each community and area for better management of their natural resources. As for AIZA, they have environmental use regulations and an environmental management plan, but they have not developed a control and surveillance system to supervise compliance with the laws of their own government.

Similarly, CIMPUM was previously known as the Indigenous Organization of the Murui People of the Colombian Amazon (OIMA, as per its acronym in Spanish), but due to problems of corruption and money mismanagement, most of the cabildos chose to separate.

Barriers related to local tradition.

Life plans were born as a strategy to build the indigenous communities' own vision of development. They were designed to meet the constitutional objectives and the goals set by indigenous organizations since the beginning of their struggles to achieve recognition and equitable inclusion in the country. However, since there must be some level of coordination between state development plans, private initiatives, and indigenous life plans, many difficulties have arisen in the formulation of the latter because there is no adequate dialog of knowledge between the parties (Vieco, 2010).

The main characteristic of the development plans promoted by the territorial entities is the promotion of income generation through increasing integration into the market. Nonetheless, these development projects often do not consider the social and community structure of the indigenous communities and local knowledge (Vieco 2010).

Life plans are based on cosmogonic and ontological principles for the care of forests and rivers and for the establishment of productive processes, but they lack modern ways of social, economic, and political relationships necessary for the integration into the market economy and the generation of income at both individual and community levels (Vieco, 2010).

Given the above and the fact that life plans are the documents that govern the management of the territory and, of course, the implementation or otherwise of conservation initiatives, indigenous communities need to integrate the languages and discourses of modernity and development into their traditional forms of association and solidarity. Otherwise, it will be very difficult for life plans to be heard, understood, and financed by state entities or NGOs, and therefore, the strong financial, institutional, and technological barriers that exist today for conservation in these territories will remain (Vieco, 2010).

Historically, forest care activities in the indigenous communities of the REDD+ Project have been carried out under the belief of the human-nature balance. However, these initiatives have not had implementation and monitoring plans defined for the medium and long term; they are isolated and are guided solely by the life plan of each AATI. These plans generally delegate to each community the responsibility for understanding the forest and designing and implementing activities for its care, which

results in a lack of cohesion and order to sustain efforts that go beyond the local level, i.e., subregional, or regional scope.

For example, although AZICATCH's traditions include the millenary work of conservation of the Amazon ecosystem, and they have established traditional management practices to ensure the care of the territory (Puerto Rastrojo Foundation, AZICATCH, WWF, COICA, OPIAC, 2018), their life plan only formally contemplates a project to improve processing techniques and conservation of regional species (AZICATCH, 2006).

Regarding the projects of the territory and environment component, CIMPUM and AIZA are interested in prioritizing projects related to the regulation of use and management of natural resources, training of environmental promoters, preparation of an environmental management plan, implementation of reforestation and forest conservation projects, and strengthening of culture through oral tradition, among others. Nevertheless, they have not been able to establish, so far, an effective mechanism to meet these goals and ensure their sustainability (OIMA, Zio-a'i Foundation, 2008). Likewise, COINPA define conservation as "maintaining and caring for the permanence of our natural resources in good condition." The territorial use, conservation, and exploitation pillar of their life plan includes projects such as the regulation of resource use and management, greater institutional and law enforcement presence, and reforestation of species mainly associated with housing construction (COINPA, Zio-a'i Foundation, 2008). Notwithstanding, these initiatives could not be formulated due to the lack of financial resources and the strong distancing of the communities.

Barriers due to social conditions

- Distance to settlements

The indigenous communities of the REDD+ Project are very far from large settlements; the closest are Leticia, in the department of Amazonas, and Puerto Leguízamo, in the department of Putumayo; and for most of the small towns, the only access is by river. The exception is La Chorrera, which has a small airport with weekly flights from San José del Guaviare (Table 69).

Table 69. Access to the departmental small towns in the REDD+ Project management area.

Small town	AATI	Way of access	Description
Puerto Alegría	COINPA	River transport	The urban area of the small town is located approximately 580 km from Leticia and is accessible by air via Leticia - Bogotá - Puerto Leguízamo and then by the Putumayo River to Puerto Alegría. The journey takes between one and four days depending on the type of boat used.

Small town	AATI	Way of access	Description
El Encanto	CIMPUM - CIMCE	River transport	The urban area of the small town is located approximately 455 km from Leticia and is accessible by air via Leticia - Bogotá - Puerto Leguízamo and then by the Putumayo River to El Encanto. The journey from Puerto Leguízamo to El Encanto takes between two and five days depending on the type of boat used.
Puerto Arica	AIZA	River transport	The urban area of the small town is located approximately 310 km from Leticia and is accessible by river via Leticia - Santo Antônio do Içá (Brazil) by the Amazon River; and Santo Antônio do Içá - Puerto Arica by the Putumayo River. This journey takes between four and eight days depending on the type of boat used. It is also accessible from Puerto Leguízamo by the Putumayo River to Puerto Alegría - El Encanto, and finally Puerto Arica. The journey takes between three and seven days depending on the type of boat.
La Chorrera	AZICATCH	River/air transport	The urban area of the small town is located approximately 450 km from Leticia. Access by river: Bogotá - Puerto Leguízamo flight, and by the Putumayo River via Puerto Leguízamo - Puerto Alegría - El Encanto - Puerto Arica and then by the Igara-Paraná River to La Chorrera. Transport by river takes between four and nine days. Access by air: Bogotá - San José del Guaviare - La Chorrera. Flights from San José del Guaviare are provided by private companies that go to the region of La Chorrera and Araracuara mainly to collect fish that is sold in the interior of the country. These flights operate weekly. It takes approximately two hours from San José del Guaviare to La Chorrera.

Source: prepared by South Pole (2020) based on visits to the territory.

The geographic isolation of the project communities and the lack of cell phone or internet coverage in most of the territory makes it more difficult and costly to develop conservation projects and creates difficulties for the establishment of productive chains related to agriculture or other alternatives to reduce the pressure on the forest.

Also, the project area borders Peru, and this proximity generates conflicts because indigenous Peruvian communities sometimes carry out activities such as timber extraction in Colombian territory and the AATI do not have the mechanisms or resources to monitor and control them.

- Armed conflict

There is a close relationship between illicit crops, armed conflict, and violence in Colombia (Meisel Roca, et al., 2013). The department of Amazonas has been the scene of problems such as corruption and drug trafficking since the 1980s, when the region became the route for coca paste entering the country from Bolivia and Peru. This situation, together with the precarious institutional framework, aroused the interest of illegal armed groups in the area (Electoral Observation Mission - MOE, 2008). For this reason, the Colombian National Government established a marine infantry river brigade in Puerto Leguízamo along with river posts in some communities in the project area, to exercise control over the armed actors in the territory (Colombian Navy, 2007).

Indigenous peoples have been one of the most affected by the armed conflict, with 1,641 members killed by armed groups between 1986 and 2006 (Meisel Roca et al., 2013). This conflict has not spared the indigenous communities in the REDD+ Project. 237 victims were reported between 2012 and 2017, and although this number has considerably decreased since 2016, it has never reached zero (Figure 79).

For instance, within COINPA there is an armed group claiming to be a breakaway faction of the Revolutionary Armed Forces of Colombia (FARC) that seeks to seize control of illicit crops. This poses a significant threat to the permanence of other productive activities in the area, as well as violent confrontations (South Pole, 2020–2021).

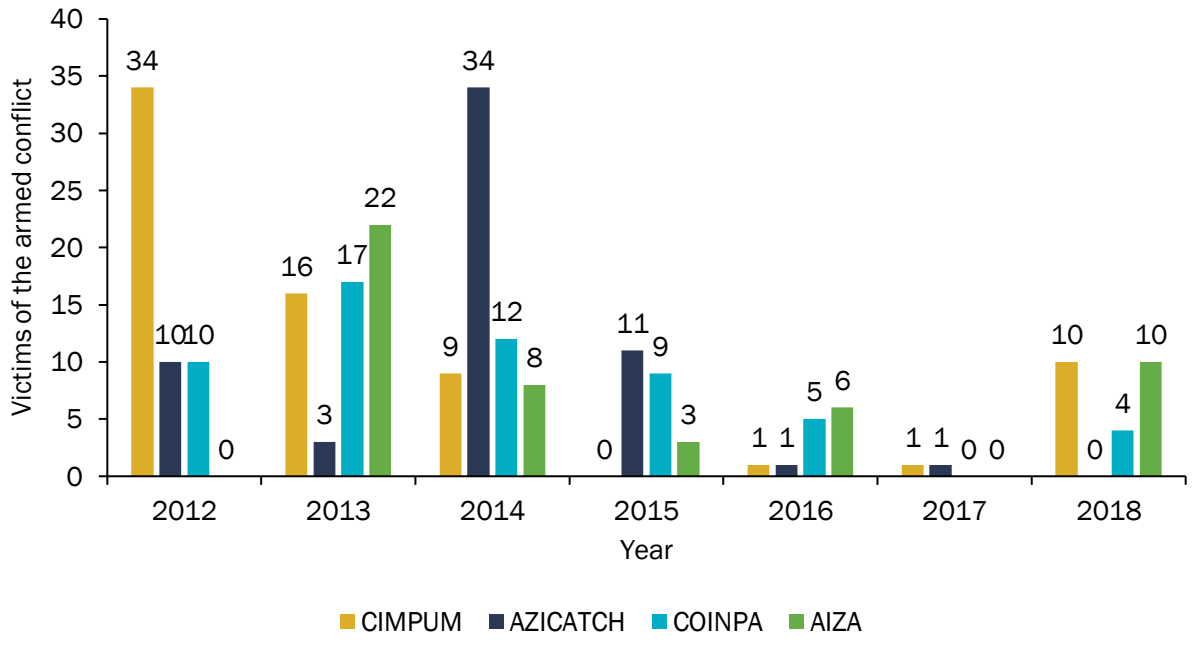


Figure 79. Victims of the armed conflict in the territory of the AATI that compose the REDD+ Project management area.

Source: Colombia's National Information Network (2020).

- Low socioeconomic development and poverty

According to the DANE, the index of unsatisfied basic needs (UBNs) in rural communities and non-municipalized areas of the REDD+ Project exceeds the departmental average (35% in 2018) (Figure 80). This reflects the high vulnerability of the indigenous peoples in the project area, who often live in severely overcrowded conditions (more than five individuals per household) or in dwellings with inadequate or non-existent public utilities (90% of these communities do not have access to residential public utilities). They are also characterized by a high level of economic dependency and lack of schooling (Ministry of Health and Social Protection, 2014).

The most notorious consequences of a high level of social vulnerability are (1) a lack of opportunities or interest in learning or in a fair intercultural exchange, (2) a lack of innovation (beyond subsistence) in agriculture and other productive activities, and (3) the loss of traditional values that could well tip the balance towards the social and economic well-being of each community.

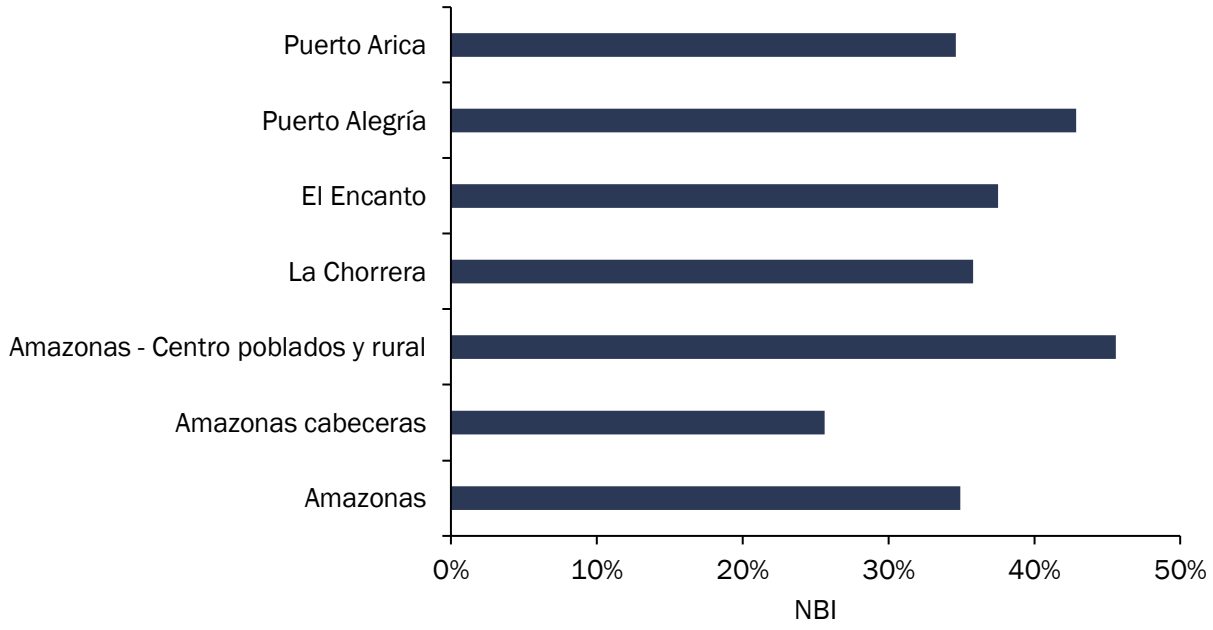


Figure 80. UBNs in the department of Amazonas and non-municipalized areas within the REDD+ Project area.

Source: DANE (2018).

- Lack of association consolidation

The indigenous communities in the REDD+ Project face challenges in strengthening their governance and forming associations. Although the government has attempted to provide guarantees for indigenous peoples to structure their own government through the AATI, most of them do not trust these guarantees because of a history of corruption. As a result, these communities have split and created new cabildos to manage their own resources without resorting to associations.

Moreover, the AATI are directly confronted with financial difficulties due to a lack of income to sustain their operating activities. They have, thus, decided to use a portion of the resources that they receive from the special allocation of the SGP. Nonetheless, using these resources to cover such expenses is prohibited by law.

Substep 3b. Show that the identified barriers would not hinder the implementation of at least one of the alternative land-use scenarios (except for the proposed project activities).

Table 70. Alternative scenarios to the REDD+ Project activity and related barriers.

Alternative scenario	Type of barrier
Scenario 1. Continuation of subsistence economic activities related to the use of land and forest resources and occupancy patterns for residential use.	None of the identified barriers. It is a common activity in indigenous territories and one of their main means to ensure food security.
Scenario 2. Project activities within the established area that are developed without the project being registered as a VCS AFOLU project.	Financial and social barriers. Although it could be considered a generalized activity in the indigenous territories given the interest from their cosmovision for the care of the forest, there is a clear lack of economic resources to carry out these activities in a formal way and there is little capacity of the AATI in the formulation of conservation projects. It is necessary to ensure the permanence of financial mechanisms and the distribution of benefits.
Scenario 3. Presence of activities similar to those proposed by the project in at least part of the VCS AFOLU project area as a result of legal obligations or national conservation efforts	Financial and social barriers Since these activities are part of initiatives resulting from legal obligations or national conservation efforts, they heavily rely on the financial resources required for their implementation (many of which come from international cooperation agreements). Additionally, they demand communities to actively participate, as well as involvement and consent processes to be adequately established to carry out the proposed activities without violating the

Alternative scenario	Type of barrier
	communities' rights.

Source: prepared by South Pole (2021).

Step 4. Common practice analysis

The Colombian Amazon comprises an area of 476,000 km^2 and occupies 41.8% of Colombia's territory. It includes the departments of Amazonas, Caquetá, Guainía, Guaviare, Putumayo, and Vaupés, with three major land distribution concepts: (1) 178 indigenous reserves covering 25 million ha, (2) 12 national natural parks covering about 8 million ha, and (3) forest reserves covering 8 million ha (Law 2 of 1959). Between these groups, there are overlapping areas (around 4 million ha) (ECLAC & Patrimonio Natural [Natural Heritage], 2013).

Over 50% of all the country's forests are found in the indigenous territories of the Amazon region. As a result of the boom in carbon markets and mitigation projects in the country, many of these indigenous peoples have begun to formalize their conservation activities to earn certified emission reductions. Considering this panorama, it is not possible to say that there are no conservation activities like those of the project in the Colombian Amazonia because all indigenous communities consider forest protection as an essential part of their daily lives.

Just as the ways how indigenous peoples in the Colombian Amazon protect the forest are somewhat similar among them, so are the barriers that were identified in the previous section. Low socioeconomic development is a widespread problem in the Amazon region, although it is particularly acute in departments such as Vaupés and Guainía, where the index of UBNs is close to 80%. Even though this index is lower in the other departments, it is still above 30.2% (national average index of UBNs in rural communities).

Most of these indigenous communities in the Colombian Amazon depend mainly on SGP resources, which are allocated and managed via two different models (Office of the Comptroller General of Colombia, 2017):

- **Territorial entities as the managers of the resources:** The funds are managed by the municipality in which the indigenous reserve is located, and for the funds to be used, the municipality must sign a management contract with the authorities of the reserve.
- **Reserves certified to manage the resources:** Indigenous reserves must demonstrate experience or good practices in resource management, depending on the amount that they intend to manage. In 2015 and 2016, 45 reserves applied to directly administer SGP resources, but only

eight of them received approval. To date, only eight reserves (none of which are in the Amazon region) have been accredited to manage these funds.

Institutional barriers are also common in the region because, due to the extensive border area that Colombia shares with Brazil and Peru, there are strong deficiencies in territorial control and surveillance. In addition to this, institutions have insufficient installed capacity to be present in such a wide area. Poorly planned projects, difficulties in coordinating activities with indigenous authorities, limited human resources, lack of operational resources, and ambiguity or non-existence in life plans are all barriers to making conservation initiatives more widespread across indigenous communities (Office of the Comptroller General of Colombia, 2017).

Resources are mostly allocated to projects that address the reserves' food security needs (such as *chagra* management, agricultural and fish farming projects, and input and food supply), as well as activities related to education (such as educational infrastructure, furniture and fixtures, provision of school supplies, uniforms, school transportation, training sessions for teachers, computer equipment, and ethno-education). Only 1% of the funds are invested directly in environmental issues (Office of the Comptroller General of Colombia, 2017).

Considering the aforementioned circumstances, the indigenous communities in the Colombian Amazon face similar challenges in developing conservation projects given their social, economic, and cultural conditions. Hence, developing projects to reduce deforestation and forest degradation in a region where 138,176 ha of natural forest were harvested in 2018 requires economic incentives such as those obtained from the REDD+ projects to strengthen governance and contribute to the implementation of environmental projects, not only in Predio Putumayo but also in many other territories of the Colombian Amazonia.

In terms of prioritizations over other initiatives in the region, the REDD+ Project has prioritized, within its formulation process, full compliance with the Social and Environmental Safeguards for REDD+ in Colombia as a plan to guarantee that the project protects the rights of local stakeholders without their free, prior, and informed consent. Since the agreements for the development of the project were signed, efforts have been made to ensure transparency and access to information for all communities, recognition of forest governance and indigenous leadership structures, strengthening of capabilities in REDD+ and climate change, respect for traditional knowledge and the various forms of self-government, and participation in all activities associated with it. The implementation of the National Safeguards System and the Monitoring, Reporting, and Verification System is a current challenge for the country. Since this is quite recent, many mitigation initiatives have started to be formulated without considering these guidelines, thus entailing greater social and institutional risks for indigenous communities.

Finally, although the project activities aimed at the conservation and sustainable use of the forest in the project area could constitute a common practice, the generalized barriers across the reference region demonstrate the strong need for incentives derived from the sale of carbon credits in the decision to proceed with the project activity and ensure its permanence.

3.6 Methodology Deviations

The REDD+ Project will consider the methodology deviations presented in Table 71 for the guidelines for monitoring and measuring emission reductions.

The REDD+ Project proposed a methodological deviation for the quantification of expected emissions from unplanned degradation based on an algorithm created based on different studies on biomass and carbon mapping and prediction (Mascaro et al. 2014, Dang et al. 2019, Meyer et al. 2019) and pilots for the estimation of emissions from degradation in the Amazon (Bullock et al. 2020; Qin 2021) and in the Colombian Pacific (Pacheco-Pascagaza 2020).

It is important to highlight that the project proponent did not develop a methodological approach or a totally new model, but on the contrary, compiled technical and scientific information from previous studies, around an algorithm that could be reproducible in the framework of the validation of the initiative and the monitoring, reporting and verification processes throughout the crediting period.

According to Section 3.1.4 of the VCS Standard V4.2, when projects apply methodologies that allow the project proponent's own choice of a model, the model must comply with the VCS Methodology requirements, and it must be demonstrated in the validation that the model is appropriate for the circumstances of the project. Considering that the algorithm used is based on previous models and studies, compliance with the applicability criteria under VCS Methodology requirements V4.1 is presented based on these studies and their publications.

Criteria	Supporting information
Models shall be publicly available, though not necessarily free of charge, from a reputable and recognized source (e.g., the model developer's website, IPCC, or government agency).	**Random Forest (RF) algorithm in Python:** https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.RandomForestRegressor.html **Alos palsar data:** https://www.eorc.jaxa.jp/ALOS/en/dataset/fnf_e.htm ó https://developers.google.com/earth-engine/datasets/catalog/JAXA_ALOS_PALSAR_YEARLY_SAR **Biomass data:** Avitabile, Valerio, Martin Herold, Gerard B. M. Heuvelink, Simon L. Lewis, Oliver L. Phillips, Gregory P. Asner, John Armston, Peter S. Ashton, Lindsay Banin, Nicolas Bayol, Nicholas J. Berry, Pascal Boeckx, Bernardus H. J. de Jong, Ben DeVries, Cecile A. J. Girardin, Elizabeth Kearsley, Jeremy A. Lindsell, Gabriela Lopez-Gonzalez, Richard Lucas, Yadvinder Malhi, Alexandra Morel, Edward T. A. Mitchard, Laszlo Nagy, Lan Qie, Marcela J. Quinones, Casey M. Ryan, Slik J. W. Ferry, Terry Sunderland, Gaia Vaglio Laurin, Roberto Cazzolla Gatti, Riccardo Valentini, Hans Verbeeck, Arief Wijaya, y Simon Willcock. 2016. An integrated pan-tropical biomass map using multiple reference datasets. Global Change Biology 22(4):1406-20.

Criteria	Supporting information
	https://doi.org/10.1111/gcb.13139 Disponibles en: http://lucid.wur.nl/datasets/high-carbon-ecosystems **Omnibus test algorithm:** https://developers.google.com/earth-engine/tutorials/community/detecting-changes-in-sentinel-1-imagery-pt-3
Model parameters shall be determined based upon studies by appropriately qualified experts that identify the parameters as important drivers of the model output variable(s).	The use of L-band radar (SAR) data for biomass estimation has been recommended by different authors, including: Kellndorfer, J., Flores-Anderson, A. I., Herndon, K. E., & Thapa, R. B. (2019). Using SAR data for mapping deforestation and forest degradation. The SAR Handbook. Comprehensive Methodologies for Forest Monitoring and Biomass Estimation; ServirGlobal: Hunstville, AL, USA, 65-79. Chapters 3, 5. https://doi.org/10.25966/68c9-gw82 https://doi.org/10.25966/hbm1-ej07 Rodríguez-Veiga, P., Barbosa-Herrera, A. P., Barreto-Silva, J. S., Bispo, P. C., Cabrera, E., Capachero, C., ... & Balzter, H. (2019). Mapping the spatial distribution of Colombia's forest aboveground biomass using SAR and optical data. The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences, 42, 57-60. https://doi.org/10.5194/isprs-archives-XLII-3-W7-57-2019 Kellndorfer, J., Flores-Anderson, A. I., Herndon, K. E., & Thapa, R. B. (2019). Using SAR data for mapping deforestation and forest degradation. The SAR Handbook. Comprehensive Methodologies for Forest Monitoring and Biomass Estimation; ServirGlobal: Hunstville, AL, USA, 65-79. Chapters 3, 5. https://doi.org/10.25966/68c9-gw82 https://doi.org/10.25966/hbm1-ej07
Models shall have been appropriately reviewed and tested (e.g., ground-truthed using empirical data or results compared against results of similar models) by a recognized, competent organization, or an appropriate peer review group.	The models were validated and adequately tested through peer review processes around the review process of the publications listed below: Use of RF for biomass estimation: Dang, A. T. N., Nandy, S., Srinet, R., Luong, N. V., Ghosh, S., & Senthil Kumar, A. (2019). Forest aboveground biomass estimation using machine learning regression algorithm in Yok Don National Park, Vietnam. Ecological. https://doi.org/10.1016/j.ecoinf.2018.12.010 Mascaro, J., Asner, G. P., Knapp, D. E., Kennedy-Bowdoin, T., Martin, R. E., Anderson, C., ... Chadwick, K. D. (2014). A Tale of Two "Forests": Random Forest Machine Learning Aids Tropical Forest Carbon Mapping. PLOS ONE, 9(1), e85993. https://doi.org/10.1371/journal.pone.0085993 Meyer, V., Saatchi, S., Ferraz, A., Xu, L., Duque, A., García, M., & Chave, J. (2019). Forest degradation and biomass loss along the Chocó region of Colombia. Carbon Balance and Management,

Criteria	Supporting information
	14(1), 1–15. https://doi.org/10.1186/s13021-019-0117-9 Rodríguez-Veiga, P., Barbosa-Herrera, A. P., Barreto-Silva, J. S., Bispo, P. C., Cabrera, E., Capachero, C., ... & Balzter, H. (2019). Mapping the spatial distribution of Colombia's forest aboveground biomass using SAR and optical data. The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences, 42, 57-60. https://doi.org/10.5194/isprs-archives-XLII-3-W7-57-2019 Nielsen, A. A., Conradsen, K., & Skriver, H. (2016). Omnibus test for change detection in a time sequence of polarimetric SAR data. In 2016 IEEE International Geoscience and Remote Sensing Symposium (IGARSS) (pp. 3398–3401). https://ieeexplore.ieee.org/document/7729878
All plausible sources of model uncertainty, such as structural uncertainty or parameter uncertainty, shall be assessed using recognized statistical approaches such as those described in *2006 IPCC Guidelines for National Greenhouse Gas Inventories* Models shall have comprehensive and appropriate requirements for estimating uncertainty in keeping with IPCC or other appropriate guidance, and the model shall be calibrated by parameters such as geographic location and local climate data.	See section Calibration and validation of the regression model in section 3.4.6. The criterion used to fit the model as a loss function was the mean square error (MSE), which together with the coefficient of determination (R2), root mean square error, correlation (r) and scatter plot analysis allowed obtaining an overall assessment of the model fit for biomass quantification. For degradation quantification initially biomass was modeled by combining data from the Japanese Aerospace Exploration Agency's (JAXA) Advanced Land Observing Satellite's (ALOS) Phased Array L-band Synthetic Aperture Radar (PALSAR) (ALOS PALSAR SAR 1 and 2). The images were downloaded for the area of inventory points containing biomass values (information available for the tropics) in the Colombian Amazon. See section Omnibus test applied to changes in section 3.4.6. The Omnibus test with a significance level of 0.05 was used.
Models shall apply conservative factors to discount for model uncertainty (in accordance with the requirements set out in Section 2.1.3) and shall use conservative assumptions and parameters that are likely to underestimate, rather than overestimate, the GHG emission reductions or removals.	The project applied a conservative factor to discount the uncertainty associated with the estimation of changes in biomass associated with forest degradation and estimated from the algorithm based on the Mean Absolute Error (MAE); a measure of the difference between two continuous variables that, considering two series of data (some calculated and others observed) related to the same phenomenon (in this case changes in biomass), served to quantify the accuracy in the prediction of emissions from degradation. The average absolute error is a common measure of time series prediction error, less sensitive to outliers. Once the uncertainties in the source categories have been determined, they can be combined to provide uncertainty estimates for the project's REDD+ activity and the applicable net emission reduction discounts. For the REDD+ Project, uncertainty estimation was performed by source category using the error propagation equation using IPCC proposed rules A and B and a simple combination of the source category uncertainties to estimate the overall uncertainty of the baseline emissions (see section 3.4.6).

Finally, the explanation and justification supporting the proposed methodological deviation are presented in Table 71.

Table 71. Methodology deviations considered by the REDD+ Project for the monitoring and measurement of GHG emission reductions.

Methodology deviations	Justification
According to the Section 6.1.1 of the methodology VCS VM0015 on the 'Estimation of the average carbon stocks of each LU/LC class', to map, measure and calculate the carbon stocks existing in each forest class in the project area prior to the year of baseline deforestation, for all years preceding the year in which the projected baseline deforestation will occur (t <= t*) carbon stocks and boundaries of the forest-classes are assumed to remain the same, except in the following cases: If in the baseline case the forest within certain polygons of the project area is degrading and loosing carbon stocks, a map sequence showing the spatial and temporal sequence of forest classes with successively lower carbon stocks must be prepared to account for the degradation occurring prior to deforestation. If the boundary of the forest classes undergoing degradation is fixed it is sufficient to show the estimated changes in carbon stocks in a table. To do the projection, use credible and verifiable sources of data from existing studies, or measure field plots in degraded forests of different known age. Instead of this traditional approach, which uses canopy cover change maps combined with biomass data from plots, a new method was developed to measure forest degradation based on a procedure to obtain the final biomass map and forest degradation changes observed across the project area using RF, an ML regression algorithm widely employed in the recent literature (Belgiu & Drăguț 2016). This algorithm has been particularly used to map and predict biomass and carbon (Mascaro et al., 2014), with cases reported in Vietnam (Dang et al., 2019) and Colombia's Pacific coast (Meyer et al., 2019), as well as to measure forest degradation, with pilots in the Amazon ecoregion (Bullock et al., 2020; Qin, 2021) and Bajo Calima in Colombia (Pacheco-Pascagaza, 2020). In the modeling process, a code tailored to the local conditions was developed. This code includes an Omnibus test	Instead of the approach proposed in the methodology VCS VM0015, a methodology deviation is proposed here. In this deviation, biomass maps are created using SAR images, field plots, and RF-ML procedures. The following are the reasons for using such deviation: 1. The high concentration of clouds and cloud shadows throughout the year in the Amazon region (department of Amazonas) affects the availability of continuous spectral data sets from optical sensors (Landsat TM, ETM+, OLI, and Sentinel 2), for both the baseline measurement phase and the monitoring required by a given project. 2. Since a reflectance analysis does not consider stock changes occurring in the understory, measuring forest degradation in the Amazon rainforests using canopy reflectance data obtained from optical sensors (Landsat TM, ETM+, OLI, and Sentinel 2), may lead to underestimations of GHG emissions due to changes in the forest biomass stock. This is attributed to the fact that the vegetation indices employed to estimate canopy density or fractional cover saturate (Huete et al., 1997), especially in areas of the Colombian Amazonia with canopy densities above 70%, heights exceeding five meters, and a high forest density (number of individuals per hectare). This means that, due to the saturation effect, when performing a multitemporal analysis using the vegetation index, no changes in this index are observed until the occurrence of a strong disturbance in the forest that implies a reduction process in canopy density, with losses. exceeding 30% in one hectare, and, thus, the optical data underestimate the areas where forest degradation occurs. In these cases, optical reflectance is limited because changes in the signal due to the differences in biomass are too small in comparison to the noise to be detected, which is why only extremely big changes could be detected. This

Methodology deviations	Justification
(Nielsen et al., 2016), which is considered appropriate for this type of analysis and used to detect significant changes in biomass because of analyzing values in biomass time series obtained as a model prediction. To determine the significance of such changes in the biomass values observed in two consecutive years, a p-value below or equal to 0.5 is employed, indicating that if the values are significant, there is evidence of biomass loss attributed to forest degradation. After obtaining the pixels with significant changes in the periods under analysis, changes in biomass are calculated for each pair of years and individually per pixel. These outcomes are converted to losses of tCO_2e emitted due to these changes using the carbon factor (0.47) and the value of conversion to CO_2e emissions (molecular weight ratio of CO_2 and C of 44/12). This is expressed as total values per year in the reference region during the baseline period and for the project area considering the baseline and project execution periods. The methodology deviation also was applied for calculating carbon stocks existing in each forest class in the leakage belt, even although if in the baseline case the forest within certain polygons of the leakage belt is degrading and loosing carbon stocks, changes in carbon stocks can conservatively be omitted and the preparation of a map sequence is optional for these polygons.	makes it difficult to estimate other disturbance processes having less drastic effects on cover densities, such as forest degradation. 3. The tests conducted on the tree cover layers in the study by Sexton et al. (2013), i.e., Landsat vegetation continuous fields in the Colombian Amazonia, confirm the saturation effect of canopy cover estimates (when they represent woody vegetation more than 5 m high in each pixel of 30 m) by means of spectral data. The results presented in Figure 81 regarding canopy cover changes in 2000, 2010, and 2015 reveal a level of stability in canopy cover that does not properly identify degraded areas. Therefore, using optical sensors in the Colombian Amazonia prevents from accurately locating changes due to the forest degradation perceived as significant changes in the carbon and biomass stock in the project area. Moreover, radar sensors are characterized by not being affected by clouds and cloud shadows and particularly by detecting canopy cover changes and the internal structure of forests in the L-band (ALOS sensor - PALSAR) with their backscatter signal, thus overcoming the limitations of using optical sensors in the Colombian Amazonia. In this sense, the REDD+ Project proposes using the L-band because it has been recently demonstrated that this type of data can be effectively employed to characterize the entire vertical structure of tropical forests (Tebaldini et al., 2019). In Gabon (Lavalle, Hawkins, & Hensley, 2017; Pardini et al., 2018), the ability of this L-band to recover the 3D structure of forests and accurately estimate the upper height of dense forests was also demonstrated (El Moussawi et al., 2019). Regarding the tropical region of Latin America, very few studies into this matter have been developed. Nonetheless, progress has been made in this regard in Chocó (Colombia) (Meyer et al., 2019), where such information has been successfully integrated to obtain carbon stock and forest degradation estimates, with satisfactory goodness-of-fit measures (RMSE = 50.66 t/ha, R^2 = 0.68, and bias = 1.18 t/ha) for the regression model that infers the biomass.

Source: prepared by South Pole (2021).

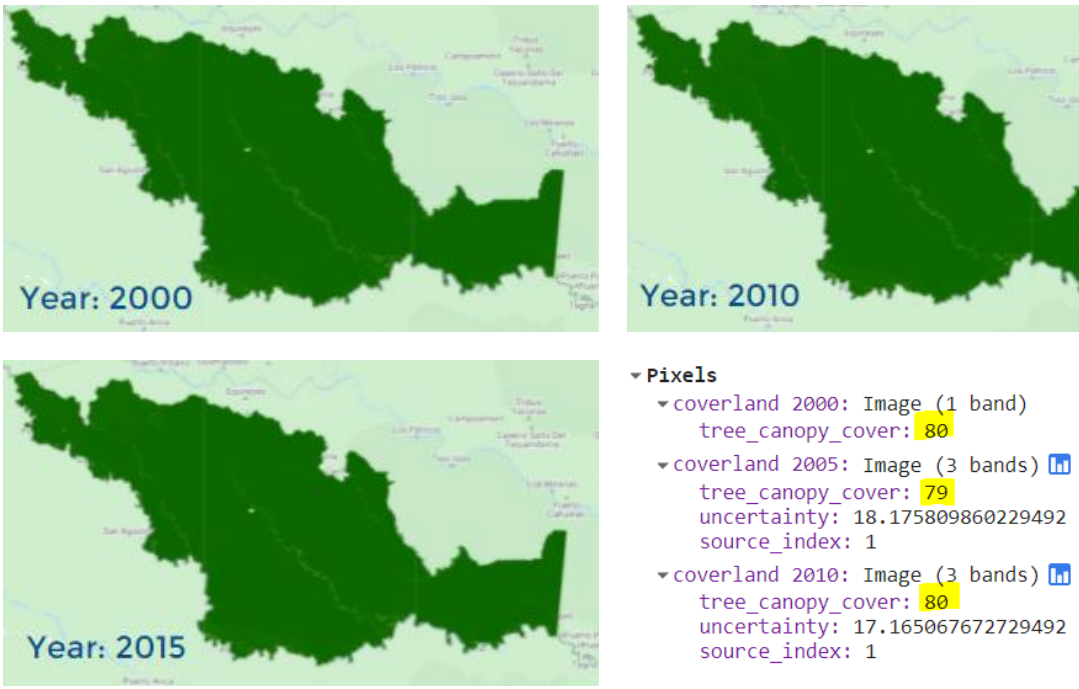


Figure 81. Analysis of changes in canopy cover in 2000, 2010, and 2015 in the REDD+ Project management area.

Source: prepared by South Pole (2021).

4 ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions include all emissions that would have occurred in the project area (PA) if the latter had not been executed. Such emissions were estimated based on the requirements outlined in the steps 1 to 6 of the methodology VCS VM0015. The procedure for quantification of baseline emissions in accordance with the applied methodology, including all relevant equations, and the explanations for relevant methodological choices are presented in Section 3.4.

Emissions from fires used to clear forests in the baseline can always be omitted. As the effect of fire on carbon emissions is counted in the estimation of carbon stock changes; CO2 emissions from forest fires should were ignored to avoid double counting. Non-CO2 emissions from forest fires were found as insignificant. CH4 and N2O emissions represented less than 5% of the GHG emissions attributable to the project activity (ex ante assessment using CDM tool for testing significance of GHG emissions).

Considering the above, the total baseline emissions from unplanned deforestation in the project area were estimated. Table 72 presents the results of such estimation.

Table 72. Baseline emissions from unplanned deforestation in the project area.

Year	Baseline deforestation in PA (hectares) annual ABSLPAt	Sum of baseline carbon stock changes in the project area at year t (tCO2e) ΔCBSLPAt	Sum of baseline emissions from biomass burning in the project area at year t (tCO2e) EBBBSLPAt
2017	4,784	1,994,768	-
2018	5,168	2,163,339	-
2019	5,443	2,286,277	-
2020	5,653	2,382,179	-
2021	6,060	2,554,781	-
2022	6,360	2,684,330	-
2023	6,362	2,698,880	-
2024	6,473	2,754,323	-
2025	6,582	2,808,526	-
2026	6,749	2,883,371	-
2027	6,670	2,870,140	-
2028	6,554	2,840,000	-
2029	6,672	2,891,968	-
2030	7,069	3,044,467	-
2031	7,010	3,031,491	-
2032	7,340	3,156,731	-
2033	7,572	3,248,871	-
2034	7,656	3,288,361	-
2035	7,358	3,189,728	-
2036	7,347	3,191,210	-
2037	7,254	3,160,900	-
2038	7,100	3,108,593	-
2039	7,146	3,126,048	-

Year	Baseline deforestation in PA (hectares) annual ABSLPAt	Sum of baseline carbon stock changes in the project area at year t (tCO2e) ΔCBSLPAt	Sum of baseline emissions from biomass burning in the project area at year t (tCO2e) EBBBSLPAt
2040	7,088	3,103,444	-
2041	7,244	3,157,393	-
2042	7,272	3,163,996	-
2043	7,246	3,149,771	-
2044	7,486	3,229,809	-
2045	7,651	3,286,882	-
2046	8,052	3,429,325	-

Source: prepared by South Pole (2023).

4.2 Project Emissions

The level at which deforestation will actually be reduced in the project case depends on the effectiveness of the proposed activities, which cannot be measured ex ante. To allow ex ante projections to be made, the project proponent determined a conservative assumption about the effectiveness of the proposed project activities and estimate an Effectiveness Index (EI) of 70%.[51] The estimated value of EI was used to multiply the baseline projections by the factor (1 - EI) and the result was considered the ex ante estimated emissions from unplanned deforestation in the project case.

$$\Delta\text{CUDdPA}_t = \Delta\text{CBSL}_t * (1 - EI)$$

Where:

ΔCUDdPAt	Total ex ante actual carbon stock change due to unavoided unplanned deforestation at year t in the project area; tCO_2e
ΔCBSLt	Total baseline carbon stock change at year t in the project area; tCO_2e
EI	Ex ante estimated Effectiveness Index; %
t	1, 2, 3 … T, a year of the proposed project crediting period; dimensionless

[51] To calculate the effectiveness index, the actual effectiveness of the five REDD+ projects registered in the country for the first monitoring period was analyzed. The projects under analysis were the Unified Indigenous Reserve–Mataven Forest REDD+ Project (REDD+ RIU-SM), the TICOYA Indigenous Reserve Forest Mitigation Project in the Amazon Biome, the REDD+ Project Chocó-Darién Conservation Corridor, the Cajambre REDD+ Project in the Pacific Biome, and the Galilea-Amé Forest Conservation emission offset project in the Andean Biome.

Table 73 presents the expected emissions in the project scenario based on the estimated ex ante effectiveness. As forest fires were not included in the baseline scenario, non-CO_2 emissions from biomass burning were omitted in the project scenario.

Table 73. Carbon emissions from unavoidable unplanned deforestation in the project scenario.

Year	Sum of baseline carbon stock changes in the project area at year t (tCO_2e) $\Delta CBSLPAt$	Sum of ex ante estimated actual carbon stock changes in the project area at year t (tCO_2e) $\Delta CPSPAt$	Actual non-CO_2 emissions from forest fire due to unavoided unplanned deforestation at year t $EBBPSPAt$
2017	1,994,768	598,430	-
2018	2,163,339	649,002	-
2019	2,286,277	685,883	-
2020	2,382,179	714,654	-
2021	2,554,781	766,434	-
2022	2,684,330	805,299	-
2023	2,698,880	809,664	-
2024	2,754,323	826,297	-
2025	2,808,526	842,558	-
2026	2,883,371	865,011	-
2027	2,870,140	861,042	-
2028	2,840,000	852,000	-
2029	2,891,968	867,591	-
2030	3,044,467	913,340	-
2031	3,031,491	909,447	-
2032	3,156,731	947,019	-
2033	3,248,871	974,661	-
2034	3,288,361	986,508	-
2035	3,189,728	956,918	-
2036	3,191,210	957,363	-
2037	3,160,900	948,270	-
2038	3,108,593	932,578	-

Year	Sum of baseline carbon stock changes in the project area at year t (tCO_2e) $\Delta CBSLPAt$	Sum of ex ante estimated actual carbon stock changes in the project area at year t (tCO_2e) $\Delta CPSPAt$	Actual non-CO_2 emissions from forest fire due to unavoided unplanned deforestation at year t $EBBPSPAt$
2039	3,126,048	937,815	-
2040	3,103,444	931,033	-
2041	3,157,393	947,218	-
2042	3,163,996	949,199	-
2043	3,149,771	944,931	-
2044	3,229,809	968,943	-
2045	3,286,882	986,065	-
2046	3,429,325	1,028,797	-

Source: prepared by South Pole (2023).

4.3 Leakage

The project may include activities aimed at reducing leakage or providing alternative economic opportunities to dependent communities in the project area that necessarily result in emissions in the project scenario. These emissions must be quantified and deducted from the net emission reductions.

The LK boundary was not used for the calculation of *ex-ante* estimates, and the associated baseline emissions were not quantified for validation. The Project used the following optional default leakage deductions proposed in Section 3.14.13 of *VCS-Standard-v4.2:*

- To consider activity displacement leakage, the project will use a 15% deduction to gross GHG emission reductions and/or removals.
- To account for market leakage, as timber could be an important commodity driving deforestation and/or degradation in the reference scenario, the project will apply a 10% deduction to gross GHG emission reductions and/or removals.

According to the FAO figures for timber product utilization and to the deforestation records in Colombia reported by the IDEAM (González et al., 2018), the Amazon region has shown an increase in forest loss rates over the years. Timber extraction, generally in an unplanned and illegal manner, is a direct cause of deforestation and forest degradation; the latter having greater impact due to the selective logging of species (González et al., 2018). For this reason, timber extraction can be considered a driver of deforestation or degradation of great importance for the Colombian territory. Likewise, FAO does not include Colombia in its list of leading producers or exporters of forest products.

According to the methodology, leakage occurring outside the host country should not be quantified and market leakage is not a mandatory source.

Default factor if 15% proposed by *VCS-Standard-v4.2* was used as "Displacement Leakage Factor" (DLF) representing the percent of deforestation expected to be displaced outside the project boundary. As emissions from forest fires were not included in the baseline, the ex ante emissions from forest fires due to activity displacement leakage were omitted.

Table 74 shows the applicable leakage deductions that can be used to estimate net emission reductions.

Table 74. Ex ante estimated total leakage.

Year	Sum of baseline carbon stock changes in the project area at year t (tCO_2e) $\Delta CBSLPAt$	Sum of ex ante estimated actual carbon stock changes in the project area at year t (tCO_2e) $\Delta CPSPAt$	Total net carbon stock change due to leakage (tCO_2e) $\Delta CLKt$
2017	1,994,768	598,430	209,451
2018	2,163,339	649,002	227,151
2019	2,286,277	685,883	240,059
2020	2,382,179	714,654	250,129
2021	2,554,781	766,434	268,252
2022	2,684,330	805,299	281,855
2023	2,698,880	809,664	283,382
2024	2,754,323	826,297	289,204
2025	2,808,526	842,558	294,895
2026	2,883,371	865,011	302,754
2027	2,870,140	861,042	301,365
2028	2,840,000	852,000	298,200
2029	2,891,968	867,591	303,657
2030	3,044,467	913,340	319,669
2031	3,031,491	909,447	318,307
2032	3,156,731	947,019	331,457
2033	3,248,871	974,661	341,131
2034	3,288,361	986,508	345,278
2035	3,189,728	956,918	334,921
2036	3,191,210	957,363	335,077

Year	Sum of baseline carbon stock changes in the project area at year t (tCO_2e)	Sum of ex ante estimated actual carbon stock changes in the project area at year t	Total net carbon stock change due to leakage (tCO_2e)
2037	3,160,900	948,270	331,894
2038	3,108,593	932,578	326,402
2039	3,126,048	937,815	328,235
2040	3,103,444	931,033	325,862
2041	3,157,393	947,218	331,526
2042	3,163,996	949,199	332,220
2043	3,149,771	944,931	330,726
2044	3,229,809	968,943	339,130
2045	3,286,882	986,065	345,123
2046	3,429,325	1,028,797	360,079

Source: prepared by South Pole (2023).

4.4 Estimated Net GHG Emission Reductions and Removals

4.4.1 Calculation of ex-ante estimation of total net GHG emissions reductions

The net anthropogenic GHG emission reduction of the proposed AUD project activity was calculated as follows:

$$\Delta REDD_t = (\Delta CBSLPA_t + EBBBSLPA_t) - (\Delta CPSPA_t + EBBPSPA_t) - (\Delta CLK_t + ELK_t)$$

Where:

ΔREDDt	Ex ante estimated net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t; tCO_2e
ΔCBSLPAt	Sum of baseline carbon stock changes in the project area at year t; tCO_2e
EBBBSLPAt	Sum of baseline emissions from biomass burning in the project area at year t; tCO_2e
ΔCPSPAt	Sum of ex ante estimated actual carbon stock changes in the project area at year t; tCO_2e
EBBPSPAt	Sum of (ex ante estimated) actual emissions from biomass burning in the project area at year t; tCO_2e
ΔCLKt	Sum of ex ante estimated leakage net carbon stock changes at year t; tCO_2e
ELKt	Sum of ex ante estimated leakage emissions at year t; tCO_2e

t	1, 2, 3 … T, a year of the proposed project crediting period; dimensionless

4.4.2 Calculation of ex ante Verified Carbon Units (VCUs)

The number of Verified Carbon Units (VCUs) to be generated through the proposed AUD project activity at year t was calculated as follows:

$$VCU_t = \Delta REDD_t - VBC_t$$

$$VBC_t = (\Delta CBSLPA_t - \Delta CPSPA_t) * RF_t$$

Where:

VCUt	Number of Verified Carbon Units that can be traded at time t; tCO_2e
ΔREDDt	Ex ante estimated net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t; $tCO_2e\ ha^{-1}$
VBCt	Number of Buffer Credits deposited in the VCS Buffer at time t; tCO_2e
ΔCBSLPAt	Sum of baseline carbon stock changes in the project area at year t; tCO_2e
ΔCPSPAt	Sum of ex ante estimated actual carbon stock changes in the project area at year t; $tCO_2e\ ha^{-1}$
RFt	Risk factor used to calculate VCS buffer credits; %
t	1, 2, 3 … T, a year of the proposed project crediting period; dimensionless

To calculate the amount of emission reductions that will be pooled to address non-permanence risks, the AFOLU VCS Non-permanence Risk Tool, version 4.0 was applied. A total buffer of 27%, considering financial risks, longevity, rights of access to or use of resources, and natural risks of the initiative was used to estimate tradable VCUt (Table 75).[52]

[52] See file 20240306_VCS-Non-Permanence-Risk-Report-PredioPutumayo_English_V5_clean

Table 75. Number of Verified Carbon Units that can be traded at time t.

Year	Sum of baseline carbon stock changes in the project area at year t (tCO_2e) ΔCBSLPAt	Sum of ex ante estimated actual carbon stock changes in the project area at year t (tCO_2e) ΔCPSPAt	Ex ante estimated net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t (tCO_2e)[53] Δ REDDt	Number of Buffer Credits deposited in the VCS Buffer at time t (tCO_2e) VBCt	Number of Verified Carbon Units that can be traded at time t (tCO_2e) VCUt
2017	1,994,768	598,430	1,069,231	377,011	692,220
2018	2,163,339	649,002	1,159,588	408,871	750,717
2019	2,286,277	685,883	1,225,485	432,106	793,379
2020	2,382,179	714,654	1,276,890	450,232	826,659
2021	2,554,781	766,434	1,369,409	482,854	886,555
2022	2,684,330	805,299	1,438,849	507,338	931,511
2023	2,698,880	809,664	1,446,648	510,088	936,560
2024	2,754,323	826,297	1,476,366	520,567	955,799
2025	2,808,526	842,558	1,505,420	530,811	974,609
2026	2,883,371	865,011	1,545,538	544,957	1,000,581
2027	2,870,140	861,042	1,538,446	542,456	995,990
2028	2,840,000	852,000	1,522,291	536,760	985,531
2029	2,891,968	867,591	1,550,147	546,582	1,003,565
2030	3,044,467	913,340	1,631,889	575,404	1,056,485
2031	3,031,491	909,447	1,624,933	572,952	1,051,982
2032	3,156,731	947,019	1,692,064	596,622	1,095,442
2033	3,248,871	974,661	1,741,453	614,037	1,127,416

[53] Adjusted to include uncertainty discount

Year	Sum of baseline carbon stock changes in the project area at year t (tCO_2e)	Sum of ex ante estimated actual carbon stock changes in the project area at	Ex ante estimated net anthropogenic greenhouse gas emission	Number of Buffer Credits deposited in the VCS Buffer at time t (tCO_2e)	Number of Verified Carbon Units that can be traded at time t (tCO_2e)
2034	3,288,361	986,508	1,762,620	621,500	1,141,120
2035	3,189,728	956,918	1,709,751	602,859	1,106,893
2036	3,191,210	957,363	1,710,546	603,139	1,107,407
2037	3,160,900	948,270	1,694,299	597,410	1,096,889
2038	3,108,593	932,578	1,666,262	587,524	1,078,738
2039	3,126,048	937,815	1,675,618	590,823	1,084,795
2040	3,103,444	931,033	1,663,502	586,551	1,076,951
2041	3,157,393	947,218	1,692,419	596,747	1,095,672
2042	3,163,996	949,199	1,695,959	597,995	1,097,963
2043	3,149,771	944,931	1,688,334	595,307	1,093,027
2044	3,229,809	968,943	1,731,235	610,434	1,120,802
2045	3,286,882	986,065	1,761,828	621,221	1,140,607
2046	3,429,325	1,028,797	1,838,180	648,142	1,190,037

Source: prepared by South Pole (2021).

5 MONITORING

5.1 Data and Parameters Available at Validation

All data and parameters that will be available at the time of validation and will remain fixed for the entire crediting period of the REDD+ Project, are presented below.

Datum/Parameter	$ARR_{i,t-1}$
Unit	*Hectares (ha)*
Description	*Area with forest cover in stratum i within the reference region at year t-1*
Source	*See section 3.4.1*

Applied value	*12,680,802 ha*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*RR shares biogeographical and sociocultural criteria, mainly associated with the presence of Amazonian Forest, geomorphology, altitude ranges, hydrographic basins, as a unit of natural delimitation, and cultural manifestations. The defined RR follows the requirements established in the methodology VCS VM0015.* *The forest benchmark maps for the 2005-2016 period was performed by post-processing the forest/non-forest layers of the SMByC at 30-m resolution. The procedure consisted of cutting, cleaning, and improving the overall appearance of the forest cover classification result of the SMByC; combining the cut layers; and assigning the output values for the forest (1), non-forest (2), and no-data (3) categories to the forest/non-forest layers corresponding to the years 2005 to 2016 (ten-year historical reference period). These layers come from the principal component analysis classification of SPOT, Ikonos, and QuickBird images, among others, of high and very high spatial, spectral, and radiometric resolution, to meet a spatial resolution of maximum 10 m, cloud cover of 20-50%, and quality indicator higher than seven (Galindo et al., 2014).*
Purpose	*Emission reduction estimation in the baseline scenario.*
Comments	*NA*

Datum/Parameter	$APA_{i,t-1}$
Unit	*Hectares (ha)*
Description	*Area with forest cover in stratum i within the project area at year t-1*
Source	*See section 3.4.1*
Applied value	*3,610,399 ha*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The PA corresponded to the discrete plot(s) of land entirely covered by forest at the date of initiation of the project activity, which are under threat of deforestation and over which the project proponent has full control. Areas where there is land tenure or right of use are under disputes were excluded for validation and first verification but considered as potentital future project instances (buffer zones) under a grouped project design.*
Purpose	*Emission reduction estimation in the baseline scenario.*
Comments	*NA*

Datum/Parameter	$ALK_{i,t-1}$
Unit	*Hectares (ha)*
Description	*Area with forest cover in stratum i within the leakage belt at year t-1*

Source	*See section 3.4.1*
Applied value	*2,228,282 ha*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*Leakage belt corresponds to the forests, as of December 2016 (project start date), that were not defined as project area, but that are like the project area forests with respect to landscape and social factors.*
Purpose	*Emission reduction estimation in the baseline scenario.*
Comments	*NA*

Datum/Parameter	*Eligible $APA_{i,t-1}$*
Unit	*Hectares (ha)*
Description	*Area with eligible forest cover in stratum i within the project area at year t-1*
Source	*See section 3.4.1*
Applied value	*3,555,041 ha*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The eligibility analysis in the project area for the 2005-2016 period was performed by post-processing the forest/non-forest layers of the SMByC at 30-m resolution. The procedure consisted of cutting, cleaning, and improving the overall appearance of the forest cover classification result of the SMByC; combining the cut layers; and assigning the output values for the forest (1), non-forest (2), and no-data (3) categories to the forest/non-forest layers corresponding to the years 2005 to 2016 (ten-year historical reference period). These layers come from the principal component analysis classification of SPOT, Ikonos, and QuickBird images, among others, of high and very high spatial, spectral, and radiometric resolution, to meet a spatial resolution of maximum 10 m, cloud cover of 20-50%, and quality indicator higher than seven (Galindo et al., 2014).* *The detailed processing information is presented in section 1.3.2.*
Purpose	*Emission reduction estimation in the baseline scenario.*
Comments	*NA*

Datum/Parameter	*$RBSLRR_{i,t}$*
Unit	*Percentage (%)*
Description	*Deforestation rate applicable to stratum i within the reference region at year t; %*
Source	*See section 0*

Applied value	*0.34%*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*It is the result of processing and analyzing the biennial maps of changes in forest cover generated by the SMByC after monitoring the forest cover every two years from 2005 to 2016.* *Given the changes in the forest area for the reference region (RR), annual rates of change are estimated according to the methodology by applying the equations below, and then the average annual change between strata in the historical reference period is estimated:* *ABSLRR_(i,t) = ARR_(i,t-1) * RBSLRR_(i,t)* *Where:* *ABSLRRi,t Annual area of baseline deforestation in stratum i within the reference region at year t; ha yr-1* *ARRi,t-1Area with forest cover in stratum i within the reference region at year t-1: ha* *RBSLRRi,t Deforestation rate applicable to stratum i within the reference region at year t; %* *t 1, 2, 3 … T, a year of the proposed project crediting period; dimensionless* *I 1, 2, 3 … IRR, a stratum within the reference region; dimensionless*
Purpose	*Emission reduction estimation in the baseline scenario.*
Comments	*NA*

Datum/Parameter	$ABSLPA_{i,t}$
Unit	*Hectares (ha)*
Description	*Annual areas of baseline deforestation in the project area at year t-1*
Source	*See section 0*
Applied value	*See Table 49 and Table 53*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The modeling was carried out with the Dinamica EGO V.5.0 that allows modeling of environmental dynamics from the generation of future scenarios to understand their evolution over time. The simulation process was determined by a series of logical steps whose goal is to calibrate, execute and validate a model of change in land use and land cover, resulting from the intervention of agents or causes.* *Sub-step 4.2 Projection of the location of future deforestation* *Location analysis of future deforestation within reference region is required to determine the annual areas of deforestation within the*

	project area and leakage belt. Once location analysis was completed, the portion of annual areas of baseline deforestation within the project area and leakage belt was determined using a GIS. Annex 9 contains the specification of modeling process, variables, simulation and validation steps, and the results to project the future deforestation within the reference region, the project area, and the leakage belt for the project crediting period 2016–2046. *Combinations of possible post-deforestation land uses taking into account the historical location of postdeforestation LU/LC-classes were obtained to adjust the projection of future deforestation in reference region and estimate area projected to be deforested within project area and leakage belt for the fixed baseline period and, for the entire project crediting period. The annual future deforestation areas calculated in the previous steps were adjusted to exclude land-use changes from forests class (I1) to wetlands (f3) and settlements (f4).*
Purpose	*Emission reduction estimation in the baseline scenario*
Comments	*NA*

Datum/Parameter	$ABSLLK_{i,t}$
Unit	*Hectares (ha)*
Description	*Annual areas of baseline deforestation in the leakage belt at year t-1*
Source	*See section 0*
Applied value	*See Table 49 and Table 53*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The modeling was carried out with the Dinamica EGO V.5.0 that allows modeling of environmental dynamics from the generation of future scenarios to understand their evolution over time. The simulation process was determined by a series of logical steps whose goal is to calibrate, execute and validate a model of change in land use and land cover, resulting from the intervention of agents or causes.* *Sub-step 4.2 Projection of the location of future deforestation* *Location analysis of future deforestation within reference region is required to determine the annual areas of deforestation within the project area and leakage belt. Once location analysis was completed, the portion of annual areas of baseline deforestation within the project area and leakage belt was determined using a GIS. Annex 9 contains the specification of modeling process, variables, simulation and validation steps, and the results to project the future deforestation within the reference region, the project area, and the leakage belt for the project crediting period 2016–2046.* *Combinations of possible post-deforestation land uses taking into account the historical location of postdeforestation LU/LC-classes were obtained to adjust the projection of future deforestation in reference region and estimate area projected to be deforested*

	within project area and leakage belt for the fixed baseline period and, for the entire project crediting period. The annual future deforestation areas calculated in the previous steps were adjusted to exclude land-use changes from forests class (I1) to wetlands (f3) and settlements (f4).
Purpose	*Emission reduction estimation in the baseline scenario.*
Comments	*NA*

Datum/Parameter	$Cab_{I1,\,t}$
Unit	*Tonnes of carbon per hectare (tC/ha)*
Description	*Forest class carbon stock in the above-ground biomass per hectare (tC/ha)*
Source	*MADS and IDEAM (2020).*
Applied value	*121,19 ±2,55 tC/ha*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The national FREL defines the carbon content for Colombia's five biomes. For each of the five natural regions, total biomass was calculated by adding up the above-ground biomass and below-ground biomass per hectare. Subsequently, for each natural region, the carbon content of the total biomass was determined as the product of the total biomass and the carbon fraction of dry matter suggested in the 2006 IPCC guidelines (0.47).* *The emission factors were estimated using data from 303 sampling points established in the National Forest Inventory (NFI).*
Purpose	*Emission reduction estimation in the baseline scenario and the project scenario.*
Comments	*NA*

Datum/Parameter	$Cbb_{I1,\,t}$
Unit	*Root-to-shoot ratio (R) (dimensionless)*
Description	$R = e\,(-1{,}085+0{,}9256*lnB)/B$
Source	*CDM_AR_TOOL_1 4. "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities". Page 25* *IDEAM (2020). https://redd.unfccc.int/media/02012019_nref_colombia_v8.pdf*
Applied value	0.2
Justification for the parameter selection or description of the	*The estimations of the BGB were made with the use of the root-to-shoot equation proposed by the CDM. This equation is more*

measurement methods or procedures that were employed	*conservative than the default value proposed by the IPCC and allows changing the potential carbon stock over the crediting period due to its co-relationship with the AGB.* *This equation is also suggested and used in the national FREL for Colombia (page 25 https://redd.unfccc.int/media/02012019_nref_colombia_v8.pdf)*
Purpose	*Emission reduction estimation in the baseline scenario and the project scenario.*
Comments	*NA*

Datum/Parameter	$Csoc_{l1,\,t}$
Unit	*Tonnes of carbon per hectare (tC/ha)*
Description	*Forest class carbon stock in the soil organic carbon per hectare (tC/ha)*
Source	*MADS and IDEAM (2020).*
Applied value	*73,76 ± 4,43 tC/ha*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The national FREL defines the carbon content for Colombia's five biomes. For each of the five natural regions, total biomass was calculated by adding up the above-ground biomass and below-ground biomass per hectare. Subsequently, for each natural region, the carbon content of the total biomass was determined as the product of the total biomass and the carbon fraction of dry matter suggested in the 2006 IPCC guidelines (0.47).* *The emission factors were estimated using data from 303 sampling points established in the National Forest Inventory (NFI).*
Purpose	*Emission reduction estimation in the baseline scenario and the project scenario.*
Comments	*NA*

Datum/Parameter	$\Delta C_{deg,i}$
Unit	*Tonnes of carbon dioxide equivalent per hectare (tCO_2e/ha)*
Description	*Average annual emission factor due to forest degradation (changes in biomass) in the reference region for the 2007–2016 period.*
Source	*See Step 3, section 3.4.6*
Applied value	*0.39 tCO_2e/ha*

Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The methodology proposed for the forest degradation component is based on the estimation of multitemporal biomass maps in stable forest areas (product of the relationship between data from field plots and backscatter values from sensors). This methodology makes it possible to identify areas where there has been a statistically significant loss of biomass (turning them into degraded areas) and then quantify such loss in tonnes of DM/ha for each pixel and convert it to CO_2e emissions.* *The detailed procedure is found in the section 3.4.6*
Purpose	*Emission reduction estimation in the baseline scenario and the project scenario.*
Comments	*NA*

Datum/Parameter	*FCO_2e*
Unit	*Tonnes of carbon dioxide equivalent per tonne of carbon (tCO2e/tC)*
Description	*Carbon dioxide equivalent factor.*
Source	*IPCC (2006).*
Applied value	*3.667*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*Value proposed in the 2006 IPCC guidelines to convert tonnes of carbon sequestered (tC) per tree to tonnes of carbon dioxide equivalent (tCO_2e).* *The 2006 IPCC Guidelines for National Greenhouse Gas Inventories is available at https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html.*
Purpose	*Emission reduction estimation in the baseline scenario and the project scenario.*
Comments	*NA*

Datum/Parameter	*$Cab_{f1,\,t}$*
Unit	*Tonnes of carbon per hectare (tC/ha)*
Description	*Grassland carbon stock in the above-ground biomass per hectare (tC/ha)*
Source	*Yepes et al. (2011)*
Applied value	*6,4 ±7,8 tC/ha*
Justification for the parameter selection or description of the measurement methods or procedures that were	*The carbon stock of post-deforestation classes was estimated as the long-term (20 years) average carbon stock and was determined based on different studies compiled by IDEAM (Yepes et al. 2011) for the presentation of the National Greenhouse Gas (GHG) Inventory reports (Fisher et al. 1994, Noordwijk et al. 2002, Quiñonez 2002,*

employed	*IPCC 2003, IPCC – AFOLU 2006, Leblanch et al. 2002, Rincón & Ligarreto 2007, Arce et al. 2008, Anaya et al. 2009, Phillips et al., IDEAM 2011).* *The initial collection of this information was financed by the Gordon and Betty Moore Foundation, under the project "Technical and Scientific Institutional Capacity to Support Reducing Emissions from Deforestation and Degradation -REDD- Projects in Colombia".*
Purpose	*Emission reduction estimation in the baseline scenario and the project scenario.*
Comments	*NA*

Datum/Parameter	$Cab_{f2,\,t}$
Unit	*Tonnes of carbon per hectare (tC/ha)*
Description	*Shrubland carbon stock in the above-ground biomass per hectare (tC/ha)*
Source	*Yepes et al. (2011)*
Applied value	*19,6 ± 4,2 tC/ha*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The carbon stock of post-deforestation classes was estimated as the long-term (20 years) average carbon stock and was determined based on different studies compiled by IDEAM (Yepes et al. 2011) for the presentation of the National Greenhouse Gas (GHG) Inventory reports (Fisher et al. 1994, Noordwijk et al. 2002, Quiñonez 2002, IPCC 2003, IPCC – AFOLU 2006, Leblanch et al. 2002, Rincón & Ligarreto 2007, Arce et al. 2008, Anaya et al. 2009, Phillips et al., IDEAM 2011).* *The initial collection of this information was financed by the Gordon and Betty Moore Foundation, under the project "Technical and Scientific Institutional Capacity to Support Reducing Emissions from Deforestation and Degradation -REDD- Projects in Colombia".*
Purpose	*Emission reduction estimation in the baseline scenario and the project scenario.*
Comments	*NA*

Datum/Parameter	$Cab_{f5,\,t}$
Unit	*Tonnes of carbon per hectare (tC/ha)*
Description	*Other land carbon stock in the above-ground biomass per hectare (tC/ha)*
Source	*Yepes et al. (2011)*
Applied value	*0,0 tC/ha*

Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The carbon stock of post-deforestation classes was estimated as the long-term (20 years) average carbon stock and was determined based on different studies compiled by IDEAM (Yepes et al. 2011) for the presentation of the National Greenhouse Gas (GHG) Inventory reports (Fisher et al. 1994, Noordwijk et al. 2002, Quiñonez 2002, IPCC 2003, IPCC – AFOLU 2006, Leblanch et al. 2002, Rincón & Ligarreto 2007, Arce et al. 2008, Anaya et al. 2009, Phillips et al., IDEAM 2011).* *The initial collection of this information was financed by the Gordon and Betty Moore Foundation, under the project "Technical and Scientific Institutional Capacity to Support Reducing Emissions from Deforestation and Degradation -REDD- Projects in Colombia".*
Purpose	*Emission reduction estimation in the baseline scenario and the project scenario.*
Comments	*NA*

Datum/Parameter	*EI*
Unit	*Dimensionless*
Description	*Index of the activities' effectiveness in reducing deforestation in the project scenario.*
Source	*Calculated by South Pole using the deforestation monitoring outcomes of the first monitoring period for the different REDD+ projects formulated in the country.*
Applied value	*0.70*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*Considering the deforestation behavior in the project area and the success of the REDD+ mitigation activities in the country, the effectiveness index in controlling deforestation was set to 0.70.* *To calculate the effectiveness index, the actual effectiveness of the five REDD+ projects registered in the country for the first monitoring period was analyzed. The projects under analysis were the Unified Indigenous Reserve–Mataven Forest REDD+ Project (REDD+ RIU-SM), the TICOYA Indigenous Reserve Forest Mitigation Project in the Amazon Biome, the REDD+ Project Chocó-Darién Conservation Corridor, the Cajambre REDD+ Project in the Pacific Biome, and the Galilea-Amé Forest Conservation emission offset project in the Andean Biome.*
Purpose	*Emission reduction estimation in the project scenario.*
Comments	*NA*

Datum/Parameter	$U_{projectREDD}$
Unit	*Percentage (%)*

Description	*Total uncertainty of gross emissions.*
Source	*See Step 6, section 3.4*
Applied value	*9.9 %*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The calculation of uncertainty to determine accuracy was established based on information from activity data available at the sub-national level for the Amazon. The overall process includes error analysis and checks in order not to underestimate or overestimate the detected changes in forest cover and, as far as possible, to reduce the uncertainty of the maps as much as possible.* *This procedure applies estimates of overall accuracy, user accuracy (or commission error) and accuracy producer (or omission error) following the recommendations elaborated by Olofsson et al. (2014), estimated by assessing the accuracy of the forest change map.* *For the Amazon biome, the SMByC reports an uncertainty of 9.0% in historical deforestation data from its spatial information and 2.1% and 2.0% for aboveground and belowground biomass, respectively.* *With respect to the information for the construction of the degradation baseline, the mean absolute error (MAE) of the observed biomass values was estimated in ton ms/ha and in percent. This estimate yielded an overall MAE of 41.03 %.* *The uncertainty of emissions from deforestation was quantified by the SMByC under a Tier 2 process in accordance with the IPCC (2006), where the actual area estimates for Land Converted to Other Land facilitate a more transparent accounting of GHG emissions. The Tier 2 method uses, at a minimum, country-specific values, which in the case of the REDD+ Project correspond to the activity data and emission factors reported by SMByC for the Amazon biome.* *Once the uncertainties in the source categories have been determined, they can be combined to provide uncertainty estimates for the project's REDD+ activity and applicable net emission reduction discounts. MADS and IDEAM conducted a preliminary analysis for the Amazon region using the two methods and the uncertainty results were similar; however, at the national level the error propagation method has been chosen. For the REDD+ Project, the uncertainty estimation was performed by source category using the error propagation equation using the A and B rules proposed by IPCC and a simple combination of the uncertainties by source category to estimate the overall uncertainty of the baseline emissions.*
Purpose	*Counting of net mitigation outcomes.*
Comments	*NA*

Datum/Parameter	*DLF*
Unit	*Percentage (%)*
Description	*Displacement Leakage Factor*

Source	*Section 3.14.13 of VCS-Standard-v4.2*
Applied value	*15%*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*The LK boundary was not used for the calculation of ex-ante estimates, and the associated baseline emissions were not quantified for validation. The Project used the following optional default leakage deductions proposed in Section 3.14.13 of VCS-Standard-v4.2:* *o To consider activity displacement leakage, the project will use a 15% deduction to gross GHG emission reductions and/or removals.* *o To account for market leakage, as timber could be an important commodity driving deforestation and/or degradation in the reference scenario, the project will apply a 10% deduction to gross GHG emission reductions and/or removals.*
Purpose	*Counting of net mitigation outcomes.*
Comments	*NA*

Datum/Parameter	RF_t
Unit	*Percentage (%)*
Description	*Risk factor used to calculate VCS buffer credits; %*
Source	*Amount of emission reductions that are pooled to address non-permanence risks and determined using net changes in carbon stocks and the risk rating estimated using the AFOLU VCS Non-permanence Risk Tool (Version 4.0).*
Applied value	*27%*
Justification for the parameter selection or description of the measurement methods or procedures that were employed	*To ensure the permanence of mitigation activities throughout the project's lifespan, the REDD+ Project will pool 27% of the overall reductions in verified emissions, which cannot be commercialized. With this percentage, aspects related to the permanence of the activities will be covered.*
Purpose	*Counting of net mitigation outcomes.*
Comments	*NA*

5.2 Data and Parameters Monitored

Datum/Parameter	*APSPAt*
Unit	*Hectares (ha)*
Description	*Area of forest land converted to non-forest land in the project area (PA)*

Source	*Forest/non-forest layers of the SMByC at a 30-m resolution.*
Description of the measurement methods or procedures that were employed	*Post-processing of the forest/non-forest layers of the SMByC. The procedure consisted of cutting, cleaning, and improving the overall appearance of the forest cover classification result of the SMByC; combining the cut layers; and assigning the output values for the forest (1), non-forest (2), and no-data (3) categories to the forest/non-forest layers corresponding to monitoring period. These layers come from the principal component analysis classification of SPOT, Ikonos, and QuickBird images, among others, of high and very high spatial, spectral, and radiometric resolution, to meet a spatial resolution of maximum 10 m, cloud cover of 20-50%, and quality indicator higher than seven (Galindo et al., 2014).*
Monitoring frequency	*At least every five years.*
Monitoring equipment or tools	*The monitoring tools that were used are detailed in section 5.3.2.*
Quality control (QA/QC)	*See section 5.3.5 and attached supporting document: Annex2. 20220930_SOP_Informacion_Management*
Purpose	*Emission reduction estimation in the project scenario.*
Estimation method	*The estimation methods that were employed are detailed in section 5.3*
Comments	*NA*

Datum/Parameter	*APSLKt*
Unit	*Hectares (ha)*
Description	*Area of forest land converted to non-forest land in the leakage belt (LK)*
Source	*Forest/non-forest layers of the SMByC at a 30-m resolution.* *Landsat 8 images from the OLI mission.*
Description of the measurement methods or procedures that were employed	*Post-processing of the forest/non-forest layers of the SMByC. The procedure consisted of cutting, cleaning, and improving the overall appearance of the forest cover classification result of the SMByC; combining the cut layers; and assigning the output values for the forest (1), non-forest (2), and no-data (3) categories to the forest/non-forest layers corresponding to monitoring period. These layers come from the principal component analysis classification of SPOT, Ikonos, and QuickBird images, among others, of high and very high spatial, spectral, and radiometric resolution, to meet a spatial resolution of maximum 10 m, cloud cover of 20-50%, and quality indicator higher than seven (Galindo et al., 2014).*
Monitoring frequency	*At least every five years.*
Monitoring equipment or tools	*The monitoring tools that were used are detailed in section 5.3.2.*
Quality control (QA/QC)	*See section 5.3.5 and attached supporting document: Annex2.*

	20220930_SOP_Informacion_Management
Purpose	*Emission reduction estimation in the project scenario.*
Estimation method	*The estimation methods that were employed are detailed in section 5.3*
Comments	*NA*

Datum/Parameter	$\Delta C_{deg,i,\ AP}$
Unit	*Tonnes of carbon dioxide equivalent per hectare (tCO_2e/ha)*
Description	*Annual emission factor due to forest degradation (changes in biomass) in the project area.*
Source	*Data from the Japanese Aerospace Exploration Agency's (JAXA) Advanced Land Observing Satellite's (ALOS) Phased Array L-band Synthetic Aperture Radar (PALSAR) (SAR of ALOS PALSAR 1 and 2).*
Description of the measurement methods or procedures that were employed	*The methodology proposed for the forest degradation component is based on the estimation of multitemporal biomass maps in stable forest areas (product of the relationship between data from field plots and backscatter values from sensors). This methodology makes it possible to identify areas where there has been a statistically significant loss of biomass (turning them into degraded areas) and then quantify such loss in tonnes of DM/ha for each pixel and convert it to CO_2e emissions.* *The detailed procedure is found in Step 3, Section 3.4.6*
Monitoring frequency	*At least every five years*
Monitoring equipment or tools	*The monitoring tools that were used are detailed in Section 5.3*
Quality control (QA/QC)	*See Section 5.3.5 and attached supporting document: Annex2. 20220930_SOP_Informacion_Management*
Purpose	*Emission reduction estimation in the project scenario.*
Estimation method	*The estimation methods that were employed are detailed in Section 5.3*
Comments	*NA*

Datum/Parameter	$\Delta C_{deg,i,\ LK}$
Unit	*Tonnes of carbon dioxide equivalent per hectare(tCO_2e/ha)*
Description	*Annual emission factor due to forest degradation (changes in biomass) in the leakage belt*
Source	*Data from the Japanese Aerospace Exploration Agency's (JAXA) Advanced Land Observing Satellite's (ALOS) Phased Array L-band Synthetic Aperture Radar (PALSAR) (SAR of ALOS PALSAR 1 and 2).*

Description of the measurement methods or procedures that were employed	*The methodology proposed for the forest degradation component is based on the estimation of multitemporal biomass maps in stable forest areas (product of the relationship between data from field plots and backscatter values from sensors). This methodology makes it possible to identify areas where there has been a statistically significant loss of biomass (turning them into degraded areas) and then quantify such loss in tonnes of DM/ha for each pixel and convert it to CO_2e emissions.* *The detailed procedure is found in Step 3, Section 3.4.6*
Monitoring frequency	*At least every five years*
Monitoring equipment or tools	*The monitoring tools that were used are detailed in Section 5.3*
Quality control (QA/QC)	*See Section 5.3.5 and attached supporting document: Annex2. 20220930_SOP_Informacion_Management*
Purpose	*Emission reduction estimation in the project scenario.*
Estimation method	*The estimation methods that were employed are detailed in Section 5.3*
Comments	*NA*

5.3 Monitoring Plan

5.3.1 Monitoring of project activities

To accomplish the goal of reducing GHG emissions, the proponent AATI will be responsible for implementing and monitoring the project activities described in section 1.11.

This monitoring will include, among other things:

- Monitoring the resources invested in the strategic lines and project activities described in section 1.11.
- Tracking the direct impact of the implemented project activities in accordance with the predefined indicators.
- Documenting the project activities that are led or implemented with the help of other institutions.

Once each prioritized project activity is defined to be implemented, a five-year monitoring plan will be designed, with the possibility of being modified or adding new indicators based on the dynamics of the program and specific activity and in compliance with the long-term goals of the REDD+ Project for the crediting period.

Emission reductions, as well as the environmental and social benefits linked to the implementation of the project activities, will be monitored through a transparent system that incorporates remote sensing

actions and the engagement of project proponents and community stakeholders. This will ensure that the activities are properly executed and in line with the conservation objectives of the REDD+ Project.

The monitoring plan for each prioritized project activity will consider the following:

- The methods to measure, document, store, add, collate, and report data and parameters. If applicable, include calibration procedures for control equipment.
- The organizational structure, duties, and competencies of the personnel who will conduct the monitoring activities.
- Internal auditing and quality assurance or quality control (QA/QC) procedures.
- Procedures for dealing with non-conformities with the validated monitoring plan (if applicable).
- The sampling methods employed, including target precision levels, sample sizes, location of sampling sites, stratification, frequency of measurements, and QA/QC procedures (if applicable).

Considering that the REDD+ Project will have an important community component, the monitoring plans will also consider the following:

- The variables that are directly linked to the project's objectives for the communities and community groups, as well as to the expected outputs, outcomes, and impacts that are identified in the project's causal model and are related to the well-being of the communities.
- An assessment of the differentiated impacts for each community group and an evaluation by the affected community groups.
- An evaluation of the effectiveness of the measures taken to maintain or improve all the identified high conservation values associated with the well-being of the communities.

To document the project activities that are led by other entities in the REDD+ Project area and that have a direct or indirect relationship with its design, the cooperation agreements, contracts, or other documents that account for the relationship between the AATI(s) and the entities responsible for the implementation of the activities shall be kept. Documents containing the overall outcomes of the activities' implementation (e.g., maps, plans, outcome reports, attendance lists, teaching materials, and photographs) must also be kept. Where possible, the six aspects previously mentioned for structuring the monitoring plans of the prioritized project activities should be considered in the report of these activities.

The achievements for the 2016–2020 monitoring period (first monitoring period) will be presented considering output and result indicators (Table 76). The other indicators, which did not have information at the time of monitoring, will be followed up in the next period based on the guidelines set forth in this document.

Table 76. Projected indicators for monitoring REDD+ Project activities in the first monitoring period.

Indicator / source of verification	Type	Method	Is data available?	Who measures?	When does it measure?
Number of specific projects or activities implemented with the Associations' own resources.	Result	Review of AE-SGP and other investment plans and supports by AATI.	Yes	AATI	In each monitoring/verification period.
Monetary resources invested by strategic line.	Result	Accounting records, invoices.	No	South Pole and AATI	Every year.
Number of specific projects or activities implemented with the support of other institutions.	Result	Review of supports.	Yes	AATI	In each monitoring/verification period.
Participation, communication, or ownership events carried out within the framework of the EPCAC.	Product	Support of the sessions (attendance lists, minutes and/or technical inputs).	Yes	South Pole and AATI	In each monitoring/verification period.
Number of communities visited within the framework of the EPCAC.	Result	Support of the sessions (attendance lists, minutes and/or technical inputs).	Yes	South Pole and AATI	In each monitoring/verification period.
Number of contractors trained for the execution of project activities or activities associated with the EPCAC.	Result	Signed contracts or payment support.	Yes	South Pole and AATI	Every year.
REDD+ capacity building and project management events executed.	Product	Support of the sessions (attendance lists, minutes and/or technical inputs).	Yes	South Pole and AATI	In each monitoring/verification period.

Source: prepared by South Pole (2022).

Prior to the next project verification, the proponent AATI will compile all records (such as photographs, formats, and reports) generated during the execution of the initiatives related to the project activities and make them available for inspection by the VVB.

All the outcomes of the monitoring plan will be available in the media defined by the proponents as part of their permanent communication mechanism (see section 2.2.1). Also, prior to the beginning of the project's public comment periods, summaries shall be developed and disseminated among the community actors and other stakeholders identified in the stakeholder mapping. In addition, all

documents and information on the monitoring outcomes will be made available on the VCS platforms. The monitoring plan, as well as the outcomes, will be published in Spanish (local language).

Regarding the evaluation of the effectiveness of the additional measures that were adopted, each verification will consider a strategy or mechanism that proposes a solution to key questions about the dissemination of the results, such as:

- What will be done to ensure that knowledge about the monitoring outcomes is successfully generated and used?
- What are the obstacles to knowledge sharing?
- What is known about what other people need to know? (e.g., community versus researchers, researchers versus policy makers, politicians versus community, and other sectors)
- What tools can be used or designed to obtain more effective products and knowledge pathways?

All this shall be in line with the permanent communication mechanism.

5.3.2 Monitoring of land-use and carbon stock changes

Monitoring of land-use and land-cover change within the project area and leakage belt

To monitor unplanned deforestation in the project area and in the leakage belt, the REDD+ Project will be doing the following:

- **Collection of appropiate data sources**

Changes in land use and cover in the project area and in the leakage belt will be analyzed by post-processing the **available** forest/non-forest **layers** of the SMByC at a 30-m resolution. The procedure will consist of cutting, cleaning, and improving the overall appearance of the forest cover classification result of the SMByC; combining the cut layers; and assigning the output values for the forest (1), non-forest (2), and no-data (3) categories to the forest/non-forest layers corresponding to the applicable monitoring period. These layers come from the principal component analysis classification of SPOT, Ikonos, and QuickBird images, among others, of high and very high spatial, spectral, and radiometric resolution, to meet a spatial resolution of maximum 10 m, cloud cover of 20-50%, and quality indicator higher than seven (Galindo et al., 2014).

The Institute of Hydrology, Meteorology, and Environmental Studies (IDEAM) is the entity responsible in Colombia for collecting, analysing, and providing maps and cartographic data on the historical distribution of forests.

For this assessment, the information use must satisfy some basic requirements to achieve a consistent multitemporal analysis:

- A similar geographic coordinate system for all years.
- A constant spatial resolution.
- The same extent for each year of forest-non-forest (Equal number of rows and columns).

- Georeferencing of annual raster for displacement correction.

Therefore, pre-processing this secondary information is implemented to prevent thematic omission or commission errors in case corrections. Below is presented a step-by-step on the preprocessing of IDEAM's forest-non-forest raster data using the ArcMap 10.8 program:

- **Coordinate Projection System:** All years of analysis are projected to the WGS84 geographic coordinate system, a key element to prevent changes in forest distribution patterns and maintain consistency in the raster structure (pixel size and extent).
- **Resampling:** The original rasters are built by a set of rectangular pixels with potential variation in the lengths between pairs of years. To avoid any issues, the rasters are corrected through a resampling process to have a final size of 30 m by 30 m, aligned with the information capture scale, 1:100,000.
- **Georeferencing:** This process included assigning specific geographic coordinates to the pixels of a raster image so that each pixel is associated with its precise geographic location on the Earth's surface. This allows raster data to be overlaid and appropriately combined with other geospatial data. To have uniformity between the years, a reference raster is selected as a starting point to correct the entire time series. For this case, the raster used is from the year 2000.
- **Raster Extent Review:** It involves double-checking process of all the temporal series of the raster information to ensure that the information present the same number of rows and columns.
- **Creation of Multitemporal Raster**: Combining rasters from the entire time series into a single file.
- **Reclassification of Classes:** The original IDEAM data provides forest, non-forest, and no-information classes yearly. Reclassification involves applying a mask to the time series with accumulated no-information areas from the entire time series to ensure forest and non-forest data for all pixels within the analysis periods.
- **Format Conversion:** Data is converted from raster to vector to facilitate project-level analysis and area estimation.
- **Thematic Layer Overlay[54]:** It involves integrating the original forest, non-forest, and no-information classes with exclusion areas represented by water bodies (main rivers and bodies of water) and other non-forest (settlements) into the time series, ensuring a more robust process for identifying territorial dynamics.

[54] Basic cartography of Colombia from the IGAC entity at a 1:100,000 scale, download link for open data (https://www.colombiaenmapas.gov.co/?e=-82.43784778320864,-0.17644239911865092,-71.23179309571162,9.90326984502256,4686&b=igac&u=0&t=23&servicio=205)

- **Coordinate System Change**: In vector format, the files are transformed from geographic coordinates in WGS84 (EPSG 4326) to flat coordinates in Magna Colombia Bogotá (EPSG 3116).
- **Area Adjustment to the Country's Forest Definition[55]:** Finally, each year, the distribution of forests is reviewed to meet a minimum area of 1 hectare after all previous steps have been implemented. In cases where they do not meet the criteria, they are reclassified as non-Forest.

These pre-processing activities of the original IDEAM data are designed to meet the requirements of data quality standards, spatial resolution, multitemporal analysis, accuracy of forest distribution and changes (represented by territorial dynamics), and to ensure information for each of the analysis years.

In case of not having the SMByC forest/non-forest layers, the entire Landsat satellite program (7 ETM+ and OLI 8) image catalog with L1T level (reflectance surface) shall be downloaded for each reference year. All images with less than 90% cloud cover and within a time window between January 1 and December 31 in the year to be monitored will be selected, making sure that every image from the last quarter of the year is downloaded and processed. By generating annual temporal composites of images, all the pixels of "clouds" and "cloud shadows" will be excluded from each image, and the forest area and its changes per year will be identified using the approach suggested by the SMByC. The characteristics of the IDEAM forest/non-forest layers are detailed in Table 1. Images from the CBERS, RapidEye, ASTER, or Sentinel 2 sensors will be used when Landsat data do not provide a sufficient cloud-free coverage.

- Analysis of changes in land use and cover

Based on the information on the forest/non-forest category from the SMByC and within the deforestation analysis and final quantification in the monitoring period, it will be necessary to take into consideration that the data exclude the surface without information (0.3% of the project area) and, therefore, it is possible that slightly smaller areas than correspond to forest/non-forest in the land are registered. The no-data category will include the sum of all the pixels that could not be interpreted in the forest/non-forest raster creation due to the presence of clouds or other factors when the SMByC built the layers for each of the periods and the areas that were not analyzed by the SMByC due to the mismatch between the used administrative limit layers.

To determine the annual unplanned deforestation in the monitoring period based on the forest/non-forest layers from the SMByC, the following will be carried out:

- Cropping of IDEAM layers with a general area of influence linked to the project boundary and the leakage belt using the *Extraction by Mask* function.

[55] According to the definition of forest for Colombia, for REDD project activities, forest means land occupied by tree cover with a minimum canopy density of 30%, an area covered by more than 1 ha, and having a minimum height of 5 m. Where no forest corresponds to land that does not have the characteristics of a forest. (http://cdm.unfccc.int/DNA/index.html)

- Merging of raster layers using the *Combine* function.
- Detection of pixels with changes in the forest (1) and non-forest (2) categories and no data pixels (3) resulting from the sum of the original layers.
- Creation of the attribute table with the stable forest (1), stable non-forest (2), no data (3), deforestation (4), and regeneration (5) categories.
- Deletion of isolated polygons smaller than 1 ha using the *Eliminate* function.

Using the resulting raster information, a postprocessing will be carried out. This postprocessing will consist of changing the projection system to MAGNA Colombia Bogotá; converting the resulting layer (raster) to vector format; creating the attribute table with the eligible (stable forest), not eligible (stable non-forest, deforestation, and regeneration), and no-data categories; cropping the final layer of changes in land use and cover according to the boundaries of the project area and the leakage belt; and quantifying the deforestation areas for the period from January 1 through December 31 of the monitoring year.

In the absence of forest/non-forest layers from the SMByC and for satellite image processing, an analysis of changes in land use and cover will be carried out through supervised classification based on the supervised remote sensing methodology (pixel-based) using the Support Vector Machine (SMV) classifier.

This procedure will consist of:

- Atmospheric and radiometric correction to improve the images that will be used for the classification.[56]
- Classification of forest and non-forest covers: Training areas will be generated through visual inspection and then uniformly distributed across the images (Geographic Information Systems and Remote Sensing [GIS] expert criteria), and then class separability statistics will be used to ensure training data independence. The spectral separability of the training areas of the land cover classes will be calculated using the Jeffries-Matusita statistical method, which calculates the separability between training areas to assess their similarities or differences. Values close to 2 indicate that the training areas have a different spectral signature, while values close to 0 indicate that they are identical.
- Once the seeds and the separability have been defined, a classification will be performed using the SVM method of the ENVI 5.5 software, and then a filtering will be performed using the *Majority/Minority Analysis* function to improve the classification and ensure the minimum mapping area (1 ha, as described in the country's definition of forest). At the end, a .TIFF format raster with the representation of forest and non-forest covers for the applicable monitoring year will be obtained from the satellite image.

[56] Radiometric correction serves to homogenize the pixel digital levels that were affected during the sensor capture time or due to other external factors such as atmospheric interference. Atmospheric correction converts the digital levels to top-of-the-atmosphere (TOA) values and corrects atmospheric dispersion and absorption effects.

- Forest and non-forest classes in the final raster will be reclassified by assigning values of 1 to the pixels that represent forest and values of 2 to the pixels that represent non-forest. Subsequently, the obtained raster will be converted to vector format, the areas of the polygons will be recalculated, and a filter will be applied to the areas smaller than 1 ha to merge them with adjacent polygons that meet the area criterion.
- Final forest/non-forest layer: Based on the classification obtained from the satellite image, the forest and non-forest classes will be reclassified by assigning values of 1 to the pixels that represent forest and values of 2 to the pixels that represent non-forest for them to have the same values as the starting year's layer (beginning of the applicable monitoring period).
- Finally, a cartographic combination will be performed between the initial and final layers to determine the changes in the analyzed period, thus obtaining deforested areas and forest regeneration (Table 77).

Table 77. Example of year combination and changes in cover.

Year 1	Year 2	Changes in cover
Forest	Forest	Stable forest
Forest	Non-forest	Deforestation
Non-forest	Forest	Regeneration
Non-forest	Non-forest	Stable non-forest

Source: prepared by South Pole (2021).

Deforestation will be understood as any changes in areas classified as *forest* in year 1 and as *non-forest* in subsequent years. The report of changes in forest cover will only consider the gross unplanned deforestation (i.e., it will not consider any gains). All procedures will be performed using ArcGIS, v.10.5 or newer versions.

- **Assessment of forest changes in the project area and the leakage belt**

Considering the changes in the forest surface resulting from the analysis of the information from the SMByC or the supervised classification of satellite images, changes will be estimated in accordance with the methodology by applying the following equations:

$$APA_{i,t-1} = APA1_{t1} - APA2_{t2}$$

Where:

$APA_{i,t-1}$ Annual forest class change from time t1 to time t2.

$APA1_{t1} - APA2_{t2}$ Forest change in APA1 (ha) in time t1 that has changed to the classification APA2 (ha) in time t2.

t1 Year of the first forest change analysis period.

t2 Year of the second forest change analysis period.

Moreover, the average annual rate of forest cover change was estimated in this way:

$$APA(1 \rightarrow 2)_{t2-t1,rate} = \left(\frac{APA_{i,t-1}}{APA1_{t1}}\right) * 100$$

Where:

$APA(1 \rightarrow 2)_{t2-t1,rate}$ Average annual rate of forest change from stratum 1 to stratum 2 from time t1 to time t2; %

$APA_{i,t-1}$ Average annual forest change from stratum 1 to stratum 2 from time t1 to time t2; ha

$APA1_{t1}$ Total area classified in APA1 (ha) in time t1; ha

- **Monitoring LU/LC change categories**

Identify and describe the land-use and land-cover (LU/LC) classes present in the project area and the leakage belt during the monitoring period. A LU/LC class is a unique combination of land-use and land-cover for which: a) The boundary can be defined at hand of remotely sensed data and/or other sources of information, such as maps of vegetation, soil, elevation, management category, etc., as defined by the project proponent to unambiguously define a LU/LC class.

The results of monitoring shall be reported by creating ex post tables of activity data per initial forest class icl and per category of land-use change ct based on IPCC land-use categories of LU/LC change (Cropland, Grassland, Shrubland, Wetlands, Settlements, Other land). Forest class changes to Wetlands and Settlements will not be considered as 'Deforestation'. See IPCC 2006 GL AFOLU Chapter 3, Section 3.2, p. 3.5 for a description of these classes. Category is the term used in IPCC reports to refer to specific sources of emissions or removals of greenhouse gases. Under the AFOLU sector, "categories" are land-use / land-cover (LU/LC) transitions:

(a) Forest Land to Forest Land (degradation and regeneration of forest land remaining forest land)

(b) Forest Land to Crop Land (deforestation followed by agriculture)

(c) Forest Land to Grass Land (deforestation followed by pasture)

(d) Forest Land to Settlements (excluded due to the scope of the VCS VM0015)

(e) Forest Land to Wetlands (excluded because of the high fluvial dynamics in project area)

(f) Forest Land to Other Land (deforestation followed by other land)

This change matrix of LU/LC is determined for the project using two main inputs the information. The first one corresponds to the cumulate deforestation detected for the historical period of reference in the baseline or the monitoring period. This data is obtained from the previous assessment of forest- no forest. The second data set includes land cover data from the Amazonian Institute of Scientific Research SINCHI[57], which provides information for the entire Amazon biome in Colombia. This information categorises land cover using the Corine Land Cover system at a 1:100,000 scale, but as was indicated before, a standardised to the IPCC categories must be done to achieve the final classes of Grassland, Other land, Settlements, Shrubland, Wetland, and Non-data. As well as was made for the baseline, in the Monitoring process, it was used the same homologation process between Corine Land Cover and IPCC, see section 3.4.5 [58]. It is essential to highlight that the categories of flooded forests were categorised as Wetlands and to be conservative any land cover change detected in these areas was not included in the assessment due to the variability presented in these ecosystems due to the natural dynamic of the rivers and the ecosystems themselves.

- **Calculation of classification precision**

It will be performed through a confusion matrix with commission errors (pixel classified in a land cover class where it does not belong) and omission errors (pixel that belongs to a land cover class but was not classified in this manner) to obtain a percentage value of the classification's general precision. Random precision assessment points or control points will be selected, and they will be assigned the forest and non-forest classes based on the satellite images to compare them with the supervised classification to generate the confusion matrix. The classification's general precision shall be between 90% and 95%.

Monitoring of area of forest land undergoing carbon stock decrease.

To monitor unplanned degradation (changes in biomass) in the project area and the leakage belt, the REDD+ Project will do the following:

- **Collection appropiate data sources**

To quantify the degradation, spatial data, applicable to the monitoring period, from the Japanese Aerospace Exploration Agency's (JAXA) Advanced Land Observing Satellite's (ALOS) Phased Array L-band Synthetic Aperture Radar (PALSAR) (SAR of ALOS PALSAR 1 and 2)[59] will be combined. In addition, an SRTM DEM (SRTMGL1 product, spatial resolution of approximately 30 m at equator)[60] will be used (Farr et al., 2007), as well as a global biomass layer (Dinerstein et al., 2017). Biomass field data will be

[57] Download link for SICHI land cover information (https://datos.siatac.co/pages/coberturas)

[58] Supporting information Excel file 20231204_PA_LKB_Putumayo_REDD_Stratified deforestation_2016_2020_LC2020_SINCHI

[59] Images were downloaded for the area of inventory points containing biomass values (information available for the tropics).

[60] https://earthdata.nasa.gov/learn/articles/nasa-shuttle-radar-topography-mission-srtm-version-3-0-global-1-arc-second-data-released-over-asia-and-australia

drawn from the data grid (Selected reference data) available from Avitabile et al. (2016) or from available official sources for the applicable monitoring period, such as the NFI.

- **Analysis of emissions from changes in biomass**

To perform the annual calculation of emissions from changes in the forest's biomass, the ML procedure will be executed by using the RF regression algorithm (Breiman, 2001) coded in Python to define the baseline and the first monitoring period. Detailed information on the construction of the algorithm is provided in Steps 2 and 3 of section 3.4.

For each year of the monitoring period, the analysis will determine whether the change was negative (decrease in species occupying the canopy and, therefore, in the stored biomass), and it will also assess whether such change is statistically significant by using the Omnibus test (Nielsen et al., 2016) to be reported as emissions from degradation by applying a 5x5 pixel median filter.

In the analysis, deforestation areas detected for the monitoring period will be excluded through the overlay of available space data by applying a mask with the stable forest area to January 1 of the year in question. Thus, it will be possible to apply the model to predict the areas affected by degradation and, subsequently, to quantify the biomass in the project area and the leakage belt at a 25 m resolution.

- **Calculation of uncertainty**

Based on the link found between the biomass and the ALOS-PALSAR backscatter, elevation and biome values, the biomass values will be estimated. Each estimated value has an associated uncertainty value calculated through the MAE using the following formula:

$$MAE(\%) = \frac{\frac{1}{n} * \sum|Observed - Predicted|}{\frac{1}{n} * \sum|Observed|}$$

Where:

N	Number of observations used for the calibration of the model.
Observed	Observed biomass value (secondary source of information) (t DM/ha).
Predicted	Biomass predicted by the model (t DM/ha).

5.3.3 Monitoring of impacts of natural disturbances and other catastrophic events.

Each one of the communities of the reserve will be responsible for identifying significant disturbances in the forest and registering them on an electronic form prepared for this purpose.

The visits will be performed by boat or on foot depending on available transportation to inspect and identify disturbances. They will be coordinated with the control and surveillance activities covered in the environmental management plans already published by the proposing AATI or similar programs led by the community.

For each disturbance event, at least the following items shall be identified and registered:

- Type of disturbance: fires, plagues and diseases, extreme climate events such as hurricanes, blizzards, prolonged droughts, floods, or geological events such as earthquakes.
- Location of disturbance: georeference by GPS and indicate area and community.
- Date
- Estimated area: number of hectares that could have been affected by the disturbance.

It will also be necessary to photograph and interview witnesses to identify the causes and those responsible and, in every case, notify the co-manager team of the REDD+ Project so that the corresponding registry can be made.

Finally, if the area affected by natural perturbations or man-made events had generated mitigation outcomes in previous checks, the gross total change in carbon stocks and GHG emissions will be estimated in the area that generated these outcomes and an equivalent number of credits will be canceled from the stock of emissions for non-permanence risk.

5.3.4 Organizational structure, duties, and competencies of the personnel who will conduct the monitoring activities.

The implementation of the monitoring plan will be led by a technical committee established with the four AATI proponent of the REDD+ Project and South Pole. Its actions will be directly guided by the decisions adopted by the traditional authorities and the directive bodies of the four AATI proponent which, for the purpose of the implementation, are established in the governance structure and the benefit distribution system within the framework of the CCB component formulation. The main role of the committee is to provide the executors with technical support so that they perform the monitoring activities and record the results in a proper way prior to each verification event of the initiative.

Preliminarily, the traditional authorities and the directive bodies of the four AATI proponent have the option of appointing community members to perform activities complementary to the monitoring plan, especially those related to field validation of deforestation and degradation monitoring, including associated impacts, agents, and drivers. Participating in the monitoring process will help the communities to maintain control over their territory and also to make informed decisions to participate in the dialog about the future of the REDD+ Project, to correctly guide the activities that must be prioritized in the monitoring period following each verification event, and to foster a better coordination between the project proponents and the regional and national forest directive bodies towards reducing the impacts of climate change and implementing mitigation activities.

South Pole will support the collection of monitoring results and will also accompany the reporting and verification processes of the REDD+ Project. South Pole's work team will provide advice on the development of the monitoring report, including especially the monitoring of unplanned deforestation and degradation based on the procedures described above in Monitoring of unplanned deforestation and forest degradation (see section 5.3.2). Prior to each verification, it will inform the communities of the four AATI proponent about the outcome of this monitoring and the implications for carbon

accounting. South Pole will also be responsible for the risk analysis and will collect the implementation support of the outlined mechanism of requests, feedback, and claims (see section 2.2). It will also support validation and verification under VCS/CCB regarding auditor visits, response to corrective measures, project registration, and clarifications requested by the standards.

Regarding other capabilities required to implement the monitoring plan, no technical or administrative gaps that need to be filled by an entity other than the project participants have been detected. However, if during the prioritization and development of the project activities and their monitoring there is the need to hire the services of freelance professionals, natural persons, or legal persons, the technical committee and the four AATI proponent will determine the most appropriate procedure to find, manage, and hire them. They will also establish the deadlines, resources, and level of involvement of external parties that provide services to the REDD+ Project in accordance with the project document.

5.3.5 Internal auditing and QA/QC procedures

The main guidelines for the management of information are outlined below. For more details on the standard operating procedure, information management, and document control, see attached supporting document *Annex2. 20220930_SOP_Informacion_Management*

Information quality management

Each proponent will appoint a member or internal committee that will be responsible for ensuring the implementation of a management system to assure the quality of the REDD+ Project information. The appointed people, in association with South Pole, shall establish, implement, and maintain the documented procedures of management of information on GHG emission reduction to ensure the following:

- Coherent routine revisions/audits to assure the accuracy and total coverage of activities in the forestry sector.
- Detection and handling of errors and omissions in the quantification of GHG remotion.

Delegates shall explain the actions performed to fix the detected errors and omissions and manage the outcomes of routine revisions/audits to prevent repetition.

Control of documents and records

In the attached document, the documented procedure to define the requested controls for the following items is outlined:

- Gathering, indexation, access, filling, storage, protection, and retrieval of records, as well as definition of holding times and final arrangement to assure the information traceability and the project verification.

Approval of the documents that are part of the management system, detection of changes in the documents, and removal of documents that are obsolete at the time of use.

6 ACHIEVED GHG EMISSION REDUCTIONS AND REMOVALS

6.1 Data and Parameters Monitored

Datum/Parameter	*APSPAt*
Unit	*Hectares (ha)*
Description	*Area of forest land converted to non-forest land in the project area (PA)*
Applied value	

Period	Grassland	Other land	Shrubland	Actual deforestation (ha) APSPAt
2016-2017	343	0	146	489
2017-2018	152	0	63	215
2018-2019	226	0	346	572
2019-2020	441	0	80	521

Comments	*The results of monitoring shall be reported by creating ex post tables of activity data per initial forest class icl and per category of land-use change ct based on IPCC land-use categories of LU/LC change (Cropland, Grassland, Shrubland, Wetlands, Settlements, Other land). Forest class changes to Wetlands and Settlements will not be considered as 'Deforestation'.*

Datum/Parameter	*APSLKt*
Unit	*Hectares (ha)*
Description	*Area of forest land converted to non-forest land in the leakage belt (LK)*
Applied value	

Period	Grassland	Other land	Shrubland	Actual deforestation (ha) APSLKt
2016-2017	507	0	228	736
2017-2018	226	0	54	280
2018-2019	442	0	90	532
2019-2020	591	0	101	692

Comments	*The results of monitoring shall be reported by creating ex post tables of activity data per initial forest class icl and per category of land-use change ct based on IPCC land-use categories of LU/LC change (Cropland, Grassland, Shrubland, Wetlands, Settlements,*

	Other land). Forest class changes to Wetlands and Settlements will not be considered as 'Deforestation'.

Datum/Parameter	$\Delta C_{deg,i,\ AP}$
Unit	*Tonnes of carbon dioxide equivalent (tCO_2e) per hectare*
Description	*Annual factor emission from forest degradation (changes in biomass) in the project area (PA)*
Applied value	

Period	Emissions from changes in biomass in the project area $\Delta C_{deg,i,\ AP}$ (tCO_2e)
2016-2017	626,032
2017-2018	738,442
2018-2019	3,012,677
2019-2020	2,263,886

Comments	*NA*

Datum/Parameter	$\Delta C_{deg,i,\ LK}$
Unit	*Tonnes of carbon dioxide equivalent (tCO_2e) per hectare*
Description	*Annual factor emission from forest degradation (changes in biomass) in the leakage belt (LK)*
Applied value	

Period	Emissions from changes in biomass in the leakage belt $\Delta C_{deg,i,\ LK}$ (tCO2e)
2016-2017	646,160
2017-2018	389,906
2018-2019	1,703,964
2019-2020	1,195,153

Comments	*NA*

6.2 Baseline Emissions

Baseline emissions regarding the REDD+ Project are shown in Table 78 and their quantification procedure is detailed in sections 3.4 and 4.1. For the first monitoring period, no changes were made regarding the baseline deforestation estimation, the deforestation location, or the carbon contents in the total biomass or the soil organic carbon. Emissions data expected under the baseline scenario cover the period from January 1, 2017, to December 31, 2020 (Table 78).

Table 78. Baseline emissions applicable to the first monitoring period in the project area.

Year	Baseline deforestation in PA (hectares) annual ABSLPAt	Sum of baseline carbon stock changes in the project area at year t (tCO2e) ΔCBSLPAt	Sum of baseline emissions from biomass burning in the project area at year t (tCO2e) EBBBSLPAt
2017	4,561	1,994,768	-
2018	4,927	2,163,339	-
2019	5,189	2,286,277	-
2020	5,389	2,382,179	-

Source: prepared by South Pole (2023).

6.3 Project Emissions

6.3.1 Monitoring of land-use and land-cover change within the project area and leakage belt

Collection of appropiate data sources

For the years 2017, 2018, 2019 and 2020 the forest/non-forest layers from the SMByC were used. These cartographic layers were built based on the semiautomated digital processing of remote sensors of medium space resolution (30 m) Landsat (TM, ETM+, and OLI) imagery downloaded from the Earth Resources Observation and Science Center (EROS) server of the USGS to generate information about forest and non-forest cover distribution at a 1:100,000 spatial scale (Cabrera et al., 2011; Galindo et al., 2014). (Table 79).

Table 79. Cartographic information from the SMByC used for monitoring deforestation.[61]

Layer	Spatial resolution	Minimum mapping unit	Geographical boundaries		Source data
			Latitude	Longitude	
Forest/non-forest cover. Fine resolution. Republic of Colombia. Year	30 m	1 ha	12°28.7' N – 4°14.7' S	66°39.4' W – 79°6.1' W	Landsat TM and ETM+ satellite images from the 2017 period

[61] This product contains the information about the surface of the forest cover and its distribution throughout Colombia's mainland as well as the areas with other types of non-forest covers. The results were generated from a country-level digital processing and interpretation of remote sensor imagery for the 2016 period with a 30 m spatial resolution at a geographical scale of 1:100,000. The geographical layers are in raster format and include three thematic classes: natural forest, non-forest, and no-data areas. The digital processing of the images to generate the information was performed using semiautomated methods with the ERDAS IMAGINE 2013 software and processing algorithms in the Python language specifically developed to generate the product and making interpreter criterion thematic adjustments to obtain the final map. The spatial limiting for the information was performed based on Colombia's mainland official boundaries.

Layer	Spatial resolution	Minimum mapping	Geographical boundaries		Source data
2017.					
Forest/non-forest cover. Fine resolution. Republic of Colombia. Year 2018.	30 m	1 ha	13°24.7' N – 4°14.7' S	66°39.4' W – 81°47.7' W	Landsat TM and ETM+ satellite images from the 2018 period
Forest/non-forest cover. Fine resolution. Republic of Colombia. Year 2019.	30 m	1 ha	13°24.7' N – 4°14.7' S	66°39.4' W – 81°47.7' W	Landsat TM and ETM+ satellite images from the 2019 period
Forest/non-forest cover. Fine resolution. Republic of Colombia. Year 2020.	30 m	1 ha	13°24.7' N – 4°14.7' S	66°39.4' W – 81°47.7' W	Landsat TM and ETM+ satellite images from the 2020 period

Source: SIAC – Metadata Management

As indicated in Section 5.3.2 these images were pre-processed to prevent thematic omission or commission errors in case corrections. After this process, the images used accomplished the basic requirements to achieve a consistent multitemporal analysis, which included:

- A similar geographic coordinate system for all years.
- A constant spatial resolution.
- A same extent for each year of forest-non-forest (Equal number of rows and columns).
- Georeferencing of annual raster for displacement correction.

Analysis of changes in land use and cover in the 2016-2020 monitoring period

Based on the 2017, 2018, 2019 and 2020 information on the forest/non-forest category from the SMByC and within the deforestation analysis and final quantification in the monitoring period, the no-data surface had to be excluded. The no-data category included the sum of all the pixels that could not be interpreted in the forest/non-forest raster creation due to the presence of clouds or other factors when the SMByC built the layers for each of the periods and the areas that were not analyzed by the SMByC due to the mismatch between the used administrative limit layers.

To determine the annual unplanned deforestation in the monitoring period based on the forest/non-forest layers from the SMByC, the following was carried out:

- Cropping of IDEAM layers with a general area of influence linked to the project boundary and the leakage belt using the *Extraction by Mask* function.
- Merging of raster layers using the *Combine* function.

- Detection of pixels with changes in the forest (1) and non-forest (2) categories and no-data pixels (3) resulting from the sum of the original layers.
- Creation of the attribute table with the stable forest (1), stable non-forest (2), no data (3), deforestation (4), and regeneration (5) categories.
- Deletion of isolated polygons smaller than 1 ha using the *Eliminate* function.

Using the resulting raster information, a postprocessing was carried out. This postprocessing consisted of changing the projection system to MAGNA Colombia Bogotá; converting the resulting layer (raster) to vector format; creating the attribute table with the eligible (stable forest), not eligible (stable non-forest, deforestation, and regeneration), and no-data categories; cropping the final layer of changes in land use and cover according to the boundaries of the project area and the leakage belt; and quantifying the deforestation areas for the period from January 1, 2017, through December 31, 2020.

Deforestation was understood as any changes in areas classified as forest in year 1 and as non-forest in subsequent years. The report of changes in forest cover considered only the gross unplanned deforestation (i.e., it did not consider any gains). All procedures were performed using ArcGIS, v.10.5 or newer versions.

Besides these classifications, for the areas detected with a land cover change (deforestation process), the change matrix of LU/LC was made to determine the post-deforestation land cover and its proportion in the monitoring. For that, the cumulative deforestation between 2017 and 2020 (year by year) was used from the data of previously classified Forest and Non- Forest activity. Then, the land cover data for the year 2020 from the Amazonian Institute of Scientific Research SINCHI[62], with the standardisation process from the Corine Land Cover system at a 1:100,000 scale to the six IPCC classes: Grassland, Other land, Settlements, Shrubland, Wetland, and Non-data (more detail of these process in Section 5.3.2). The results are presented in Table 82 and Table 83.

Assessment of forest changes in the project area and the leakage belt in the monitoring period

Considering the changes in the forest surface resulting from the analysis of the information from the SMByC. Changes were estimated using the following equations:

$$APA_{i,t-1} = APA1_{t1} - APA2_{t2}$$

Where:

$APA_{i,t-1}$	Annual forest class change from time t1 to time t2.
$APA1_{t1} - APA2_{t2}$	Forest change in APA1 (ha) in time t1 that has changed to the classification APA2 (ha) in time t2.
t1	Year of the first forest change analysis period.

[62] Download link for SICHI land cover information (https://datos.siatac.co/pages/coberturas)

t2 Year of the second forest change analysis period.

Moreover, the average annual rate of forest cover change was estimated in this way:

$$APA(1 \rightarrow 2)_{t2-t1,rate} = \left(\frac{APA_{i,t-1}}{APA1_{t1}}\right) * 100$$

Where:

$APA(1 \rightarrow 2)_{t2-t1,rate}$ Average annual rate of forest change from stratum 1 to stratum 2 from time t1 to time t2; %

$APA_{i,t-1}$ Average annual forest change from stratum 1 to stratum 2 from time t1 to time t2; ha

$APA1_{t1}$ Total area classified in APA1 (ha) in time t1; ha

The results of unplanned deforestation in the project area and the leakage belt are shown in Table 80, Table 81 and Figure 82.

Table 80. Results of actual unplanned deforestation of the project area in the monitoring period.

Period	Project area (PA)			
	Forest area (ha)		Total forest change (ha)	Deforestation rate (%) $APA(1 \rightarrow 2)_{t2-t1,rate}$
	$APA1_{t1}$	$APA2_{t2}$	$APA_{i,t-1}$	
2016-2017	3,555,041	3,553,105	1,936	0.05%
2017-2018	3,553,105	3,552,864	241	0.01%
2018-2019	3,552,864	3,552,139	725	0.02%
2019-2020	3,552,139	3,551,596	543	0.02%

Source: prepared by South Pole (2023).

Table 81. Results of actual unplanned deforestation of the leakage belt in the monitoring period.

Period	Leakage belt (LK)			
	Forest area (ha)		Total forest change (ha)	Deforestation rate (%) $ALK(1 \rightarrow 2)_{t2-t1,rate}$
	$ALK1_{t1}$	$ALK2_{t2}$	$ALK_{i,t-1}$	
2016-2017	2,142,481	2,141,376	1,105	0.05%

Period	Leakage belt (LK)			
	Forest area (ha)		Total forest change (ha)	Deforestation rate (%) $ALK(1 \rightarrow 2)_{t2-t1\,rate}$
2017-2018	2,141,376	2,141,085	291	0.01%
2018-2019	2,141,085	2,140,508	577	0.03%
2019-2020	2,140,508	2,139,794	713	0.03%

Source: prepared by South Pole (2023).

The results of monitoring were reported by creating ex-post tables of activity data per initial forest class icl and per category of land-use change ct based on IPCC land-use categories of LU/LC change (Cropland, Grassland, Shrubland, Wetlands, Settlements, Other land). Forest class changes to Wetlands and Settlements were not considered as 'Deforestation' (Table 82 and Table 83).

Table 82. Results of actual unplanned deforestation in project area stratified per IPCC land-use categories of LU/LC change.

Year	Total forest change (ha) $APA_{i,t-1}$						Adjusted actual deforestation (ha)
	Grassland	Other land	Settlements	Shrubland	Wetland	Total	
2016-2017	343	0	1	146	1,446	1,936	489
2017-2018	152	0	0	63	27	241	215
2018-2019	226	0	0	346	153	725	572
2019-2020	441	0	0	80	22	543	521

Source: prepared by South Pole (2023).

Table 83. Results of actual unplanned deforestation in leakage belt stratified per IPCC land-use categories of LU/LC change.

Year	Total forest change (ha) $ALK_{i,t-1}$						Adjusted actual deforestation (ha)
	Grassland	Other land	Shrubland	Wetland	No Data	Total	
2016-2017	507	0	0	228	369	1	1,105
2017-2018	226	0	0	54	11	0	291
2018-2019	442	0	0	90	45	0	577
2019-2020	591	0	0	101	22	0	713

Source: prepared by South Pole (2023).

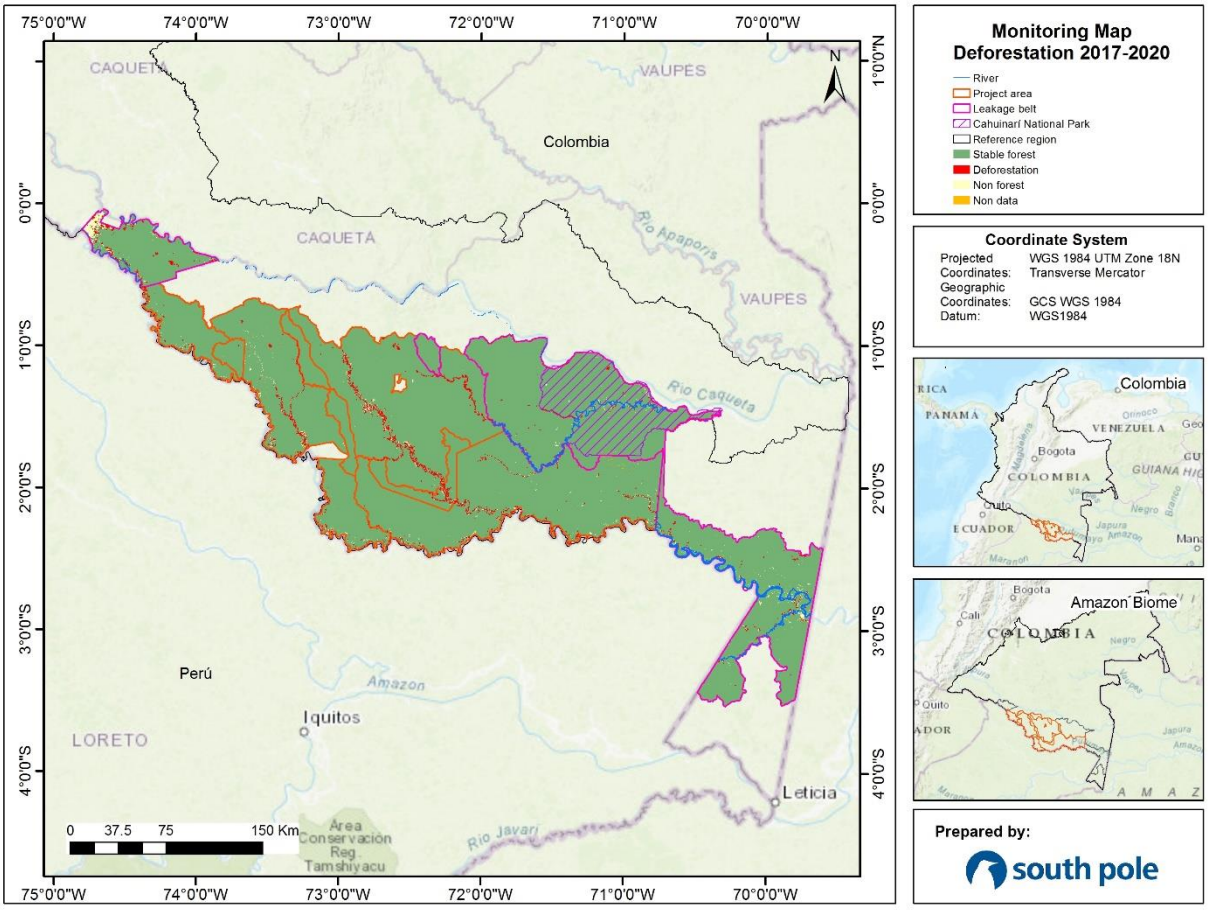


Figure 82. Map of the deforestation of the project area and the leakage belt in the monitoring period.

Source: prepared by South Pole (2021).

Calculation of classification precision

379 control points were randomly selected from the strata of the population, in this case, land cover according to the IPCC classification of the entire project area and the leakage belt. Table 84 displays the results of the Map Accuracy Assessment (MAA) for the spatial classification data of land cover changes in the year 2020, with an overall accuracy of 94.2% concerning the control points correctly assigned to IPCC land cover classes by stratum. The forest, representing the established forest in the baseline, exhibited a classification omission error of 2.2% and a visual commission error of 4.02% in forest coverages, with a success rate exceeding 90%. For other classes depicting deforestation between the years 2016 and 2020, the average classes showed accuracies above 80%, while associated errors were distributed among non-forest classes. Furthermore, and 91.62% kappa coefficient is achieved, indicating that the classification performed discriminates classes better than unsupervised (random) classification.

For more detailed information, please see the Annex 10 Map Accuray Montoring period.

Table 84. Confusion matrix – Land Cover and Land Use Change in the Monitoring period

Land cover	Validation points (units)									
	Forest	Grassland	Other land	Settlements	Shrubland	Wetland	**Total**	User accuracy	Overall accuracy	Kappa
Forest	174	3	0	0	1	0	178	97.8%	-	-
Grassland	1	64	0	0	1	6	72	88.9%		
Other land	2	0	6	0	0	0	8	75.0%		
Settlements	0	0	0	10	0	0	10	100%		
Shrubland	0	0	1	0	41	1	43	95.3%		
Wetland	6	0	0	0	0	62	68	91.2%		
Total	183	67	7	10	43	69	379		-	-
Production accuracy									-	-
Overall accuracy	95.08%	95.52%	85.71%	100.00%	95.35%	89.86%		-	-	-
Kappa	--						-	-	-	91.62%

Source: South Pole (2024)

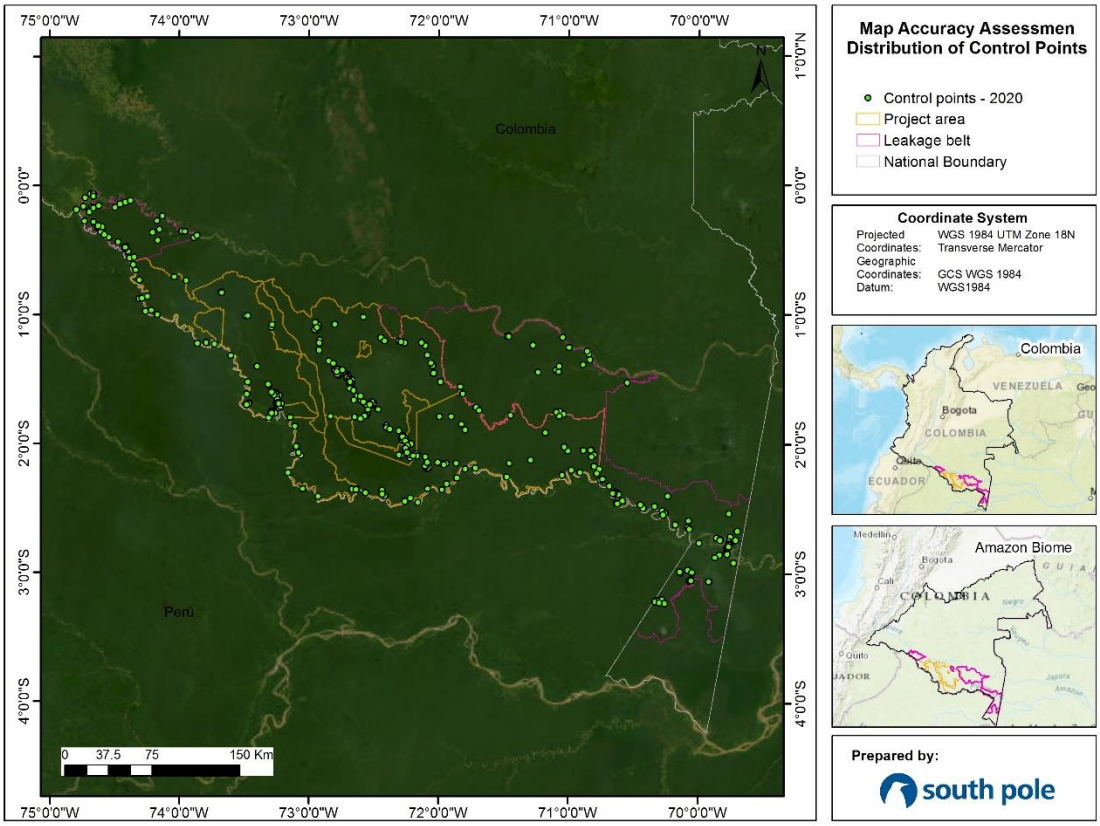


Figure 83. Control Points 2020 – Planet image RGB 3–2–1.

Source: prepared by South Pole (2024).

6.3.2 Monitoring of area of forest land undergoing carbon stock decrease.

Collection of appropriate source data

To quantify the degradation, spatial data, applicable to the monitoring period, from the Japanese Aerospace Exploration Agency's (JAXA) Advanced Land Observing Satellite's (ALOS) Phased Array L-band Synthetic Aperture Radar (PALSAR) (SAR of ALOS PALSAR 1 and 2) was combined.[63]

The specific information of the Global 25 m Resolution PALSAR-2/PALSAR Mosaic was downloaded.[64]The 25 m resolution global mosaic PALSAR-2/PALSAR and the forest/non-forest map are free and open data generated by applying JAXA's sophisticated processing and analysis

[63]Images were downloaded for the area of inventory points containing biomass values (information available for the tropics).

[64] https://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/fnf_index.htm

method/technique to many images obtained with the Japanese L-band Synthetic Aperture Radars (PALSAR and PALSAR), Japanese L-band (PALSAR and PALSAR-2) on the ALOS and ALOS-2.

The 25 m resolution global mosaic PALSAR/PALSAR-2 is a global SAR image created using the mosaic of backscatter coefficient SAR images measured by PALSAR/PALSAR-2. The mosaic processing after the 2019 data is done in units of 3x15 degrees in latitude and longitude, and it is done in units of 10x10 degrees in latitude and longitude up to the 2018 data.

Correction of the specific geometric distortion of the SAR (orthorectification) and the topographic effects on the intensity of the image (correction of the slope) are applied to facilitate the classification of forests. The size of a pixel is approximately 25 m by 25 m. The mosaic time interval is generally 1 year.[65]

The global forest/non-forest map is generated by classifying the SAR image (backscatter coefficient) in the 25 m resolution global mosaic PALSAR-2/PALSAR so that the pixels with strong and low backscatter are assigned the forest (colored in green) and non-forest (colored in yellow) categories, respectively. Here, "forest" is defined as the land covered with trees with an area greater than 0.5 ha and with a canopy cover greater than 10%, according to the FAO definition, so it can be guaranteed that the information can be scaled to the definition of forest in Colombia.

Analysis of emissions from changes in biomass in the monitoring period

To perform the annual calculation of emissions from changes in the forest's biomass, the ML procedure was executed by using the RF regression algorithm (Breiman, 2001) coded in Python.

For each year of the monitoring period, the analysis identified whether the change was negative (decrease in species occupying the canopy and, therefore, in the stored biomass), and it also assessed whether such the change was statistically significant by using the Omnibus test (Nielsen et al., 2016) to be reported as emissions from degradation by applying a 5x5 pixel median filter.

In the analysis, deforestation areas detected for the monitoring period were excluded through the overlay of available spatial data by applying a mask with the stable forest area to January 1 of the year in question. Thus, it was possible to apply the model to predict the areas affected by degradation and, subsequently, to quantify the biomass in the project area and the leakage belt at a 25 m resolution.

In the described method, stratification by forest type or canopy density was not used, which is suggested in the methodology; instead, a more appropriate stratification was chosen considering two types of biomes in an adjusted general model, which allowed for regression statistics for the validation data of the model in the tropical humid forest biome and subtropical broadleaf forest (correlation = 70.38%, R^2=0.42) that represented a sufficient precision to measure the above-ground biomass using remote sensors.

[65] https://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/DatasetDescription_PALSAR2_Mosaic_FNF_revK.pdf

It was demonstrated in the results of the degradation rates obtained for the REDD+ Project that through the proposed procedure the minimum level of precision set in the methodology was exceeded: correlation greater than 70% between the observed values and values predicted by the biomass model and a 95% confidence level for the detection of areas with significant biomass changes.

The adjustment of the biomass model and the MAE statistics in units of tonnes of DM/ha and percentage are graphically presented for each of the estimated biomass values. Additionally, the average values of estimated biomass (tonnes of DM/ha) for the stable forest area of the project and the leakage belt are presented (Figure 84 and Figure 85). The average value of biomass in this area is 212.16 t DM/ha.

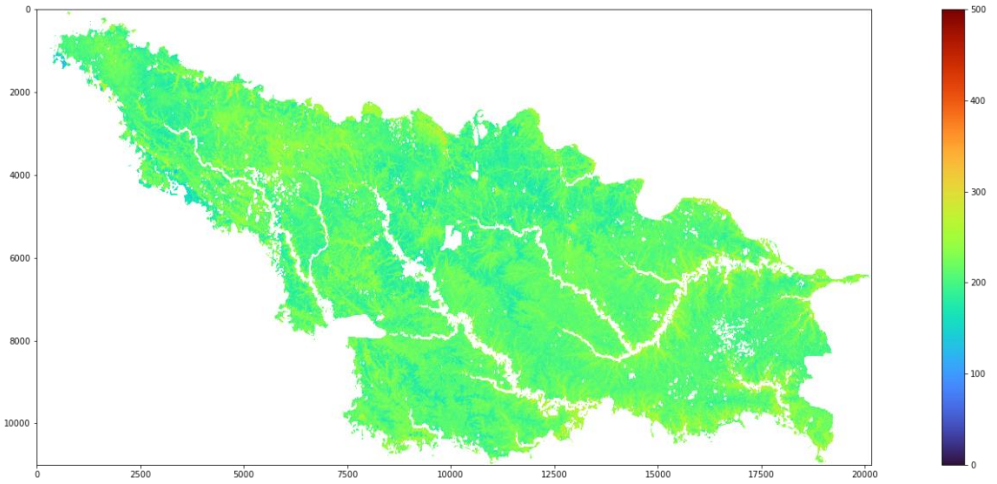


Figure 84. Average values of estimated biomass (t DM/ha) for the stable forest area of the project and the leakage belt.

Source: prepared by South Pole (2021).

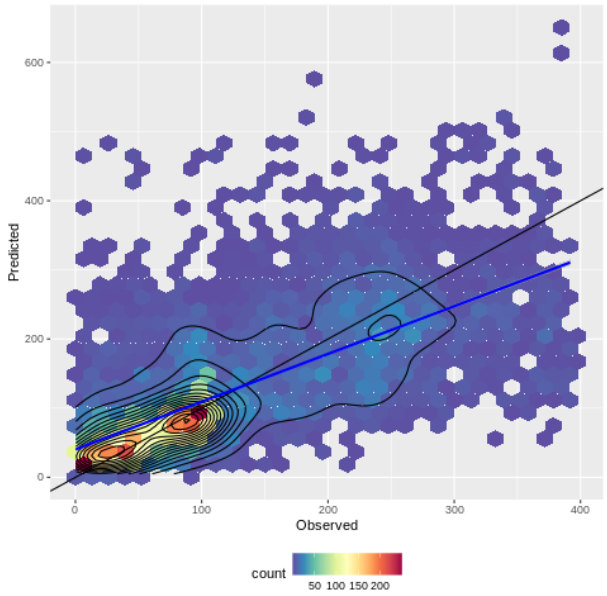


Figure 85. Biomass values (t DM/ha) predicted by the model versus observed data. The black line is the 1:1 line and the blue line is the trend line; black outlines and bins represent the density of the points.

Source: prepared by South Pole (2021).

The results obtained are possible from an inference framework based on the model to estimate the biomass in a specific time considering specific years, which provides estimators and predictions at the pixel level and spatially explicit information of the above-ground biomass with the same or greater precision than conventional canopy coverage and layering methods. Finally, the expected emissions from degradation for the monitoring period in the project area and the leakage belt are presented in Table 85.

Table 85. Expected emissions from biomass changes for the monitoring period in the project area and the leakage belt.

Period	Emissions due to changes in biomass in the project area $\Delta C_{deg,i,PA}$ (tCO_2e)	Emissions due to changes in biomass in the leakage belt $\Delta C_{deg,i,LK}$ (tCO_2e)
2016-2017	626,032	646,160
2017-2018	738,442	389,906
2018-2019	3,012,677	1,703,964
2019-2020	2,263,886	1,195,153

Source: prepared by South Pole (2023).

The advantage of the method is that it is possible to obtain time series data with backscatter values, at a higher frequency depending on the available radar images and that they directly measure the volume recorded in the pixel; that is, they take structural information instead of a signal of optical data such as reflectance/radiance that are easily affected in a region like Amazonia by multiple challenges such as the presence of clouds and signal saturation.

In addition, due to the characteristics of the adjusted ML regression models, it is not necessary to use data from biomass plots by stratum in addition to the classification by biomes, since these reflect the climatic variability and specifically with humidity conditions (an important variable in the use of radar data), besides the structural parameters analyzed. The parameters for measuring the goodness of fit of these models and the distribution of backscatter values and, therefore, of final estimators of biomass values per pixel throughout the region favored the observation of statistically significant negative changes that represent a loss in carbon content and biomass.

These significant negative changes in biomass associated with forest degradation are not observable to the naked eye through the traditional use of other images such as Landsat and MODIS used to calculate change matrices and separate strata by crown densities, given the saturation in the signal that is observed in this type of Amazon forests.

Ultimately, the described methodology yielded results that do not negatively affect the principle of conservativity of GHG reductions and therefore it is considered adequate since, in the sense of application, it gives estimates with greater precision than what would happen when not being able to observe the forest degradation process using images from optical sensors and vegetation fractionation procedures. The present methodology deviation is directly related to the degradation measurement procedures and subsequent monitoring.

The results confirm the importance of quantifying the loss of biomass from forest degradation, as indicated in recent studies by Bullock (2020) and Qin (2021), who estimate that the degradation of forest biomass in the Brazilian Amazonia is approximately three times greater than deforestation.

Calculation of uncertainty

Regarding the information on emissions from degradation (changes in biomass) in the monitoring period, the MAE of the observed biomass values in tonnes of DM/ha and the percentage was estimated.

Based on the link found between the biomass and the ALOS-PALSAR backscatter, elevation and biome values, the biomass values were estimated. Each estimated value has an associated uncertainty value, calculated through the MAE using the following formula:

$$MAE(\%) = \frac{\frac{1}{n} * \sum|Observed - Predicted|}{\frac{1}{n} * \sum|Observed|}$$

Where:

N Number of observations used for the calibration of the model.

Observed Observed biomass (secondary information source) (t DM/ha).

Predicted Biomass predicted by the model (t DM/ha).

This estimation showed a general MAE of 41.03%.

6.3.3 Project emissions

Once the actual deforestation in the project area and the actual changes in biomass in the monitoring period were estimated, the total project emissions from unavoidable deforestation were calculated following the same methodological reasoning as the one used in Sections 3.4 and 4.1 for baseline emissions (Table 86).

Table 86. Project carbon stock changes in the carbon pools in the project area for land-use change categories.

Year	Project carbon stock changes land-use change categories (tCO_2e)								
	Forest to grassland			Forest to shrubland			Forest to other land		
	$\Delta Cabr_{f1,t}$	$\Delta Cbbr_{f1,t}$	$\Delta Csocr_{f1,t}$	$\Delta Cabr_{f2,t}$	$\Delta Cbbr_{f2,t}$	$\Delta Csocr_{f2,t}$	$\Delta Cabr_{f5,t}$	$\Delta Cbbr_{f5,t}$	$\Delta Csocr_{f5,t}$
2017	147,325	2,711	131	62,366	1,113	56	30	1	1
2018	64,527	3,912	189	26,178	1,589	80	0	1	1
2019	94,571	5,687	275	140,883	4,207	212	0	1	1
2020	181,626	9,145	443	31,883	4,806	242	0	1	1

Source: prepared by South Pole (2023).

Table 87. Project carbon stock changes in the carbon pools in the project area.

Year	Adjusted actual deforestation in PA (hectares) annual APSPAt	Total project carbon stock change within the project area at year t (tCO_2e)			
		Δ Cab i1,t	Δ Cbb i1,t	Δ Csoc i1,t	Δ CPSPAt
2017	489	209,721	3,825	187	213,733
2018	215	90,705	5,502	269	96,476
2019	572	235,455	9,894	487	245,836
2020	521	213,509	13,952	686	228,147

Source: prepared by South Pole (2023).

6.4 Leakage

6.4.1 Decrease in carbon stocks and increase in GHG emissiones due to leakage prevention measures.

Decrease in carbon stocks and increase in GHG emissions due to leakage prevention measures.

If leakage prevention measures include tree planting, agricultural intensification, fertilization, fodder production and/or other measures to enhance cropland and grazing land areas, a reduction in carbon stocks and/or an increase in GHG emissions may occur compared to the baseline case. If such decrease in carbon stock or increase in GHG emission is significant, it must be accounted, and monitoring will be required. If it is not significant, it must not be accounted, and ex post monitoring will not be necessary.

The REDD+ project has considered in the framework of the vulnerability and risk assessments around the activities of the project, the complementarity and replaceability of the use spaces associated with subsistence, which were evaluated taking into account whether there are several spaces of cultural-productive use such as the *chagras* that provide benefits to the community, and if they are affected, there are others, or if there are other spaces that can replace them in case they are lost. The loss of *chagras* is precisely one of the main underlying causes of potential leakage, which could increase under the project scenario due to the implementation of conservation measures around the REDD+ project.

Therefore, the *chagras* areas were prioritized as Leakage Management Areas (LMZ), considering the relevance of these areas for the livelihood of the communities regardless of the project scenario. Depending on the ethnic group, the *chagras* in the Colombian Amazon Region have a characteristic spatial distribution (Corpoamazonia, IAvH, SINCHI, UAESPNN, 2007) and are generally located close to the communities at a distance that varies between one and two kilometers from the settlement, so the mapping of the LMZ of the REDD+ project is limited to a buffer area of 1-2 km around the 55 communities participating in the initiative; area where the sources from which forest goods and services will be used/acquired during the first 10 years from the project start date will be concentrated. This buffer area will be validated and redefined at each verification of the REDD+ project considering that the distribution of the *chagras* has an important relationship with the demographic growth within the communities.

In this sense, it is expected that the same amount of goods and services from the forests will be extracted in the project scenario compared to the baseline scenario, based on the implementation of activities to strengthen productive activities: *chagras* and ancestral crops (recovery of seeds and native fruit species, fish farming practices with native species, breeding, and reproduction of minor species), under the strategic line of sustainable economy and food sovereignty. The plans for strengthening the *chagras* will be based on different studies and diagnoses in which the project communities have participated under the accompaniment of organizations such as SINCHI and Corpoamazonia (Acosta et al. 2011; Mendoza et al. 2017; among others).

The opening of new chagras and their management could lead to the opening of new areas of deforestation or reduction in the forest's carbon stock. Both variables are already monitored as part of the activities for reporting project emissions (see sections 5.3.2 and 6.3), so counting them as part of leakage from prevention activities could lead to double counting of emissions.

In any case, and according to the monitoring of changes in the forest and project emissions, even with the maintenance of the ancestral establishment and management practices of the chagras, the expected emissions threshold was not exceeded under the baseline projection, so leakage from prevention activities is considered as zero ($\Delta CLPMLKt = 0$).

The project activities do not consider grazing animals, which have been basically null for the communities in the project area during the historical reference period and have not been observed in the project scenario. For this reason, methane (CH_4) and nitrous oxide (N_2O) emissions from livestock intensification (involving a change in the animal diet and/or animal numbers) were omitted.

Nitrous oxide (N2O) emissions from nitrogen fertilization were considered always insignificant according to the most recent version of the VCS Standard. Consumption of fossil fuels is considered always insignificant in AUD project activities, so they were not considered under project carbon accounting.

6.4.2 Decrease in carbon stocks and increase in GHG emissions due to activity displacement leakage.

A possible consequence of the implementation of project activities to reduce deforestation and degradation rates is undoubtedly the displacement of deforestation agents to areas surrounding the project and there is an increase in pressure for forest resources, in response to the protection of the project area.

The magnitude of this displacement depends on the accessibility to neighboring areas of the project with forest cover and, ultimately, it could increase the rate of deforestation; therefore, the changes in carbon stocks for these areas must be quantified.

Leakage emissions under baseline scenario

The emissions in the leakage belt were projected considering the same assumptions used for the project area emissions that are described in section 3.4 and 6.2. Table 88 and Table 89 present the expected emissions from the leakage belt in the years applicable to the monitoring period.

Table 88. Baseline carbon stock changes in the carbon pools in the leakage belt for land-use change categories.

Year	Baseline carbon stock changes land-use change categories (tCO_2e)								
	Forest to grassland			Forest to shrubland			Forest to other land		
	$\Delta Cab_{f1,t}$	$\Delta Cbb_{f1,t}$	$\Delta Csoc_{f1,t}$	$\Delta Cab_{f2,t}$	$\Delta Cbb_{f2,t}$	$\Delta Csoc_{f2,t}$	$\Delta Cab_{f5,t}$	$\Delta Cbb_{f5,t}$	$\Delta Csoc_{f5,t}$
2017	1,046,993	19,266	930	223,576	3,990	200	23,453	504	686

Year	Baseline carbon stock changes land-use change categories (tCO_2e)								
	Forest to grassland			Forest to shrubland			Forest to other land		
	$\Delta Cab_{f1,t}$	$\Delta Cbb_{f1,t}$	$\Delta Csoc_{f1,t}$	$\Delta Cab_{f2,t}$	$\Delta Cbb_{f2,t}$	$\Delta Csoc_{f2,t}$	$\Delta Cab_{f5,t}$	$\Delta Cbb_{f5,t}$	$\Delta Csoc_{f5,t}$
2018	1,096,294	39,667	1,916	232,118	8,215	413	24,860	1,039	1,414
2019	1,152,225	61,355	2,967	241,817	12,706	639	26,454	1,607	2,189
2020	1,192,310	84,060	4,068	247,952	17,407	876	27,720	2,201	3,001

Source: prepared by South Pole (2023).

Table 89. Baseline carbon stock changes in the carbon pools in the leakage belt.

Year	Baseline deforestation in LK (hectares) annual ABSLLKt	Total baseline carbon stock change within the leakage belt at year t (tCO_2e)			
		Δ Cab i1,t	Δ Cbb i1,t	Δ Csoc i1,t	Δ CBSLLKt
2017	3,017	1,294,023	23,761	1,816	1,319,599
2018	3,201	1,353,271	48,920	3,742	1,405,933
2019	3,409	1,420,496	75,667	5,794	1,501,957
2020	3,576	1,467,982	103,669	7,946	1,579,597

Source: prepared by South Pole (2023).

Leakage emissions under the project scenario

The changes in forest cover and the expected emissions from the leakage belt were analyzed considering the following:

- For analyzing the changes in land use and land cover in the leakage belt, the same procedure and sources of information used in the analysis carried out in section 6.3.1 for the monitoring period between 2017 and 2020 were used.
- The carbon contents in biomass and soil organic carbon used to quantify changes in carbon stocks in the monitoring period, leakage, were the same used for the project area.
- Forest carbon stock in leakage belt was affected the same procedure described in section 6.3.2 was used.
- For estimating the total emissions from deforestation, the same procedures and assumptions described in Section 6.3.3 were used.

Table 90 presents the results of the total emissions from deforestation and unplanned degradation in the project scenario from the leakage belt.

Table 90. Project carbon stock changes in the carbon pools in the leakage belt for land-use change categories.

Year	Project carbon stock changes land-use change categories (tCO_2e)								
	Forest to grassland			Forest to shrubland			Forest to other land		
	$\Delta Cab_{f1,t}$	$\Delta Cbb_{f1,t}$	$\Delta Csoc_{f1,t}$	$\Delta Cab_{f2,t}$	$\Delta Cbb_{f2,t}$	$\Delta Csoc_{f2,t}$	$\Delta Cab_{f5,t}$	$\Delta Cbb_{f5,t}$	$\Delta Csoc_{f5,t}$
2017	217,905	4,010	193	97,235	1,735	87	0	0	0
2018	95,990	5,796	280	22,364	2,142	107	0	0	0
2019	184,756	9,268	448	36,818	2,823	142	82	2	2
2020	243,619	13,907	674	40,265	3,584	180	0	2	2

Source: prepared by South Pole (2023).

Table 91. Project carbon stock changes in the carbon pools in the leakage belt.

Year	Adjusted actual deforestation in LK (hectares) annual APSLKt	Total project carbon stock change within the leakage belt at year t (tCO_2e)			
		Δ Cab i1,t	Δ Cbb i1,t	Δ Csoc i1,t	Δ CPSLKt
2017	736	315,140	5,745	280	321,166
2018	280	118,354	7,938	387	126,679
2019	532	221,657	12,093	593	234,342
2020	692	283,884	17,492	856	302,233

Source: prepared by South Pole (2023).

In the case of leakage from activity shifting, a comparison was made between the expected emissions under the baseline scenario and the actual emissions associated with the results of the monitoring period. This comparison is presented in Table 92, which shows that the actual emissions in the monitoring period were lower than those projected under the baseline scenario in the 2017-2020 period, and therefore no leakage emissions from activity shifting were identified.

Table 92. Expost activity shifting leakage during the monitoring period.

Year	Sum of baseline carbon stock changes in the leakage belt at year t (tCO_2e) Δ CBSLLKt	Sum of actual carbon stock changes in the leakage belt at year t (tCO_2e) Δ CPSLLKt	Total ex post decrease in carbon stocks due to displaced deforestation (tCO_2e) Δ CADLKt

Year	Sum of baseline carbon stock changes in the leakage belt at year t (tCO_2e) Δ CPSLLKt	Sum of actual carbon stock changes in the leakage belt at year t (tCO_2e) Δ CPSLLKt	Total ex post decrease in carbon stocks due to displaced deforestation (tCO_2e) Δ CADLKt
2017	1,319,599	321,166	0
2018	1,405,933	126,679	0
2019	1,501,957	234,342	0
2020	1,579,597	302,233	0

Source: prepared by South Pole (2023).

Table 93 presents the total leakage applicable to the monitoring period.

Table 93. Total leakage applicable to the monitoring period.

Year	Carbon stock decrease due to leakage prevention measures (tCO_2e) Δ CLPMLKt	Total ex post decrease in carbon stocks due to displaced deforestation (tCO_2e) Δ CADLKt	Total net carbon stock change due to leakage Δ CLKt
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0

Source: prepared by South Pole (2023).

6.5 Net GHG Emission Reductions and Removals

6.5.1 Calculation of ex-post estimation of total net GHG emissions reductions

The net anthropogenic GHG emission reduction of the proposed AUD project activity was calculated as follows:

$$\Delta REDD_t = (\Delta CBSLPA_t + EBBBSLPA_t) - (\Delta CPSPA_t + EBBPSPA_t) - (\Delta CLK_t + ELK_t)$$

Where:

ΔREDDt	Ex post estimated net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t; tCO_2e
ΔCBSLPAt	Sum of baseline carbon stock changes in the project area at year t; tCO_2e

EBBBSLPAt	Sum of baseline emissions from biomass burning in the project area at year t; tCO_2e
ΔCPSPAt	Sum of ex post estimated actual carbon stock changes in the project area at year t; tCO_2e
EBBPSPAt	Sum of (ex post estimated) actual emissions from biomass burning in the project area at year t; tCO_2e
ΔCLKt	Sum of ex post estimated leakage net carbon stock changes at year t; tCO_2e
ELKt	Sum of ex post estimated leakage emissions at year t; tCO_2e
t	1, 2, 3 … T, a year of the proposed project crediting period; dimensionless

6.5.2 Calculation of ex ante Verified Carbon Units (VCUs)

Estimated carbon emissions and removals arising from AFOLU activities have uncertainties associated with the measures/estimates of area or other activity data, carbon stocks, biomass growth rates, expansion factors, and other coefficients. It is assumed that the uncertainties associated with the estimates of the various input data are available, either as default factors given in IPCC Guidelines (2006) or estimates based on sound statistical sampling (as those presented by Colombian FREL). So, before calculating the number of buffer credits to deposited in the VCS Buffer, an additional uncertainty discount was included to adjust the net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity and report indisputably conservative estimates (see section 3.4.6 for details on uncertainty calculations) (Table 94).

The number of Verified Carbon Units (VCUs) to be generated through the proposed AUD project activity at year t was calculated as follows:

$$VCU_t = \Delta REDD_t - VBC_t$$

$$VBC_t = (\Delta CBSLPA_t - \Delta CPSPA_t) * RF_t$$

Where:

VCUt	Number of Verified Carbon Units that can be traded at time t; tCO_2e
ΔREDDt	Ex post estimated net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t; $tCO_2e\ ha^{-1}$
VBCt	Number of Buffer Credits deposited in the VCS Buffer at time t; tCO_2e
ΔCBSLPAt	Sum of baseline carbon stock changes in the project area at year t; tCO_2e
ΔCPSPAt	Sum of ex post estimated actual carbon stock changes in the project area at year t; $tCO_2e\ ha^{-1}$
RFt	Risk factor used to calculate VCS buffer credits; %
t	1, 2, 3 … T, a year of the proposed project crediting period; dimensionless

To calculate the amount of emission reductions that will be pooled to address non-permanence risks, the AFOLU VCS Non-permanence Risk Tool, version 4.0 Was applied. A total buffer of 27%, considering financial risks, longevity, rights of access to or use of resources, and natural risks of the initiative was used to estimate tradable VCUt (Table 95).

Table 94. Adjusted ex post emissions reduction attributable to the AUD project activity.

Year	Sum of baseline carbon stock changes in the project area at year t (tCO_2e) $\Delta CBSLPAt$	Sum of ex post estimated actual carbon stock changes in the project area at year t (tCO_2e) $\Delta CPSPAt$	Total ex post estimated leakage (tCO2e) Δ CLKt	Ex post estimated net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t (tCO_2e) Δ REDDt	Adjusted ex post emisions reduction attributable to the AUD project activity at year t (tCO_2e) $\Delta REDDt_{adjust}$
2017	1,994,768	213,733	0	1,781,035	1,604,482
2018	2,163,339	96,476	0	2,066,863	1,861,975
2019	2,286,277	245,836	0	2,040,440	1,838,172
2020	2,382,179	228,147	0	2,154,032	1,940,504

Source: prepared by South Pole (2023).

Table 95. Number of Verified Carbon Units that can be traded at time t.

Year	Adjusted ex post emisions reduction attributable to the AUD project activity at year t (tCO_2e) $\Delta REDDt_{adjust}$	Number of Buffer Credits deposited in the VCS Buffer at time t (tCO_2e) VBCt	Number of Verified Carbon Units that can be traded at time t (tCO_2e)	
			VCUt	VCU
2017	1,604,482	433,210	1,171,272	1,171,272
2018	1,861,975	502,733	1,359,242	2,530,514
2019	1,838,172	496,306	1,341,866	3,872,379
2020	1,940,504	523,936	1,416,568	5,288,947

Source: prepared by South Pole (2023).

6.6 Status of the REDD+ Project implementation in the monitoring period

6.6.1 Retroactive scenario and impact identification

The REDD+ scenario in the first monitoring period (retroactive) reflects an active process of development of local projects and actions that have global repercussions in contrast and possible response to the accelerated progress of deforestation and degradation and the negative impacts on traditional lifestyles. As the representatives of the indigenous communities express, the ecological calendar has changed, and this means social disorder and imbalance. Harvest times, the size and quality of the fruits, and the abundance of bushmeat and fish have changed; there are also more and more heavy rains and longer summers. Table 96 presents the balance of the projects and activities carried out by the project proponent AATI in their contribution to the forests and the territory as a space for the development of culture and social, economic, political, and ecological relationships.

Table 96. Projects executed and activities conducted by the proponent AATI of the REDD+ Project during the monitoring period.

AATI	Year	Projects	Activities	Impacts
AIZA	2016-2020	Execution of 18 projects of the SGP mainly: Infrastructure (11), culture (3), research (2), sanitation (1), and health (1).	Bridge construction Housing enhancement *Maloca* adaptation Advisory Manual construction of culture and environment functions.	Infrastructure enhancement for mobility and adaptation to climate change effects such as floods, housing enhancement, sports, and cultural space (1,153 people benefited). Legal consulting and accompaniment to traditional authorities. Strengthening of the autonomous justice system through functions, culture, and environment manuals.
AIZA	2016-2018	Project titled *Human well-being indicators: proposal for monitoring indigenous peoples' ways of life and territories* in partnership with the SINCHI Institute.	SINCHI Institute - AIZA agreement; dissemination of the IBHI project; endorsement for IBHI application; training of indigenous facilitators; methodological adjustments; baseline survey of 21 IBHIs by indigenous facilitators (2016). Analysis and interpretation of the IBHI; delivery of information by the facilitators and the SINCHI Institute; approval of the baseline by the traditional authorities (2017). Approval	The baseline information collected is visible from the territories whose goal was to enable the traditional authorities to value the territorialities, generate their own policies to consolidate governability in their territories, and receive recognition by the state as traditional environmental authorities (1,350 people benefited).

AATI	Year	Projects	Activities	Impacts
			and application of the IBHI monitoring (2018).	
AZICACTH	*2015*	Workshop and dialog on climate change, forests, and indigenous peoples. First approach with the authorities and *mayores sabedores* in the process of agreeing and building the RIA initiative.	Considering the priorities of the POA with the support of COICA, OPIAC, and WWF, AZICATCH approached the authorities and *mayores sabedores* to start an agreement process and build the RIA proposal in La Chorrera. (RIA informative meeting: September 14 to 16, 2015, Bogota).	Contribute to the zoning and allocation of the ancestral territories of the Murui-Muina+, Bora, Okaina, and Muinane indigenous peoples registered with AZICATCH.
	2018	Ecosystem service analysis projects	Methodological training. Ecosystem service identification. Cultural and ecological value zone mapping.	Strengthening of La Chorrera indigenous communities on territory management.
CIMPUM	2016	Attendance to the courses of the associate degree in Forest Resources in agreement with the SENA.	Training for community leaders in the settlement of San Rafael.	Education and capacity building on the sustainable use and management of natural resources.
	2016-2019	Execution of 22 projects: productivity (7), infrastructure (5), education (4), self-government (2), health (2), culture (1), security (1). Financing of the SGP mainly and inter-institutional agreements.	Construction of a community school, healthcare center, community center, and pedestrian bridge (494 people benefited). Training on farming and natural resources. Sowing of edible plants in 23.6 ha (418 people benefited). Cultural events.	Enhancement of social and transport infrastructure (494 people benefited). Organizational strengthening of self-government (1,876 people benefited). Improvement of the administrative practices, economic resources, and fulfillment in the implementation of the

AATI	Year	Projects	Activities	Impacts
				formulated projects.
COINPA	2016	Formulation of the Intercultural Environmental Management Plan of the Inga and Muina peoples of COINPA. Inter-Administrative Agreement No. 0145 of 2015 between CORPOAMAZONIA and COINPA. The formulation of the plan ends with the conclusion of the participatory workshop, Intercultural Environmental Management Plan - COINPA, Corporación Ozono, 2016.	Characterization, diagnosis of conflicts due to use and management of natural resources, and participatory formulation of the environmental management plan including programmatic content, project profiles, and budgets.	Strengthening of guidelines for the sustainable use and management of natural resources of the ancestral lands conserving the Amazon ecosystem equilibrium.
	2017-2018	Execution of 28 projects: infrastructure (9), productivity (9), education (4), health (3), culture (2), and sanitation (1). All of them from the SGP.	Construction of community infrastructure; boat, classroom, pedestrian bridge, bridge (647 people benefited). Creation of *chagras* of corn, rice, and monoculture in 31 ha (736 people benefited). Teachers and healthcare staff hired. Cultural events.	Enhancement of social and transport infrastructure. Strengthening of food security.

Source: prepared by South Pole (2021) based on the supporting information provided by the AATI.

Table 97. Synthesis of projected indicators for monitoring REDD+ Project activities in the 2016-2020 period.

Indicator / source of verification	Type	Timeliness	Results of the monitoring period
Number of specific projects or activities Implemented with the Associations' own resources.	Result	2017-2020	AIZA: 18 projects/activities associated with the AE-SGP. CIMPUM: 22 projects/activities associated with the AE-SGP. COINPA: 28 projects/activities associated with the AE-SGP.
Monetary resources invested by strategic line.	Result	NA	No information for the monitoring period.
Number of specific projects or activities implemented with the support of other institutions.	Result	2017-2020	AIZA: 1 project/activity implemented in collaboration with the SINCHI Institute. AZICATCH: 2 projects/activities implemented; 1 in collaboration with OPIAC and 1 in collaboration with WWF Colombia. CIMPUM: 1 project/activity implemented in collaboration with SENA. COINPA: 1 project/activity implemented in collaboration with Corpoamazonía.
Participation, communication, or ownership events carried out within the framework of the EPCAC.	Product	2017-2020	75 events up to the start date of the audit process for validation
Number of communities visited within the framework of the EPCAC.	Result	2017-2020	54 communities visited (85% of the total).
Number of contractors trained for the execution of project activities or activities associated with the EPCAC.	Result	2019-2020	2019: 12 people; 4 per Association considering AIZA, CIMPUM and COINPA. 2020: 15 people; 9 from AZICATCH. 2 from COINPA. 2 from AIZA and 2 from CIMPUM.
Capacity building events on REDD+ and Project management executed	Product	2017-2020	2 capacity building events executed.

Source: prepared by South Pole (2022).

6.6.2 Activities conducted as part of the certification process of the REDD+ Project.

Participation, Communication, and Knowledge Appropriation Strategy

One of the key elements when developing the REDD+ Project has been the integration of the collective, community-based, and joint participation of the population to keep the transparency and clarity in the process. To do so, several strategies, approaches, and methodologies have been implemented among which workshops with the stakeholders involved or influencing the project, interviews, and direct encounters with local leaders are included with the purpose of consolidating and identifying the key stakeholders for the project and building a baseline through the exchange of knowledge and the identification of impacts, benefits, and communication mechanisms within the framework of the EPCAC described in section 2.2.

Thanks to this strategy, the inquiry and socialization with the interested parties has been conducted by stages. The first stage was to visit the territory in which 53 dissemination events could be developed with an emphasis on dialog of knowledge to identify the context and preliminary actors. So far, a visit to 54 communities belonging to the AATI participating in the project was conducted. Likewise, in this first stage, the election and training of co-managers was started, as well as the construction of the PBL through the execution of techniques such as surveys, information collection, territory tours, visits, and interviews.

Co-managers program

One of the main activities of the REDD+ Project in the certification process has been the consolidation of the co-managers team. The co-managers are leaders of the territory's indigenous communities working jointly with the AATI to formulate projects and ensure a continuous communication between the organizations and the other stakeholders. Within the training processes, and with the collaboration of South Pole, key concepts of the REDD+ initiatives and their articulation with climate change and forest conservation matters have been strengthened to be multiplied and replicated in the communities and, in that way, facilitate a proper understanding of the project.

As previously mentioned, the agreements among the AATI established the selection and training of the co-managers team, made up by members of the indigenous communities, to support the in-field works so that the proponents have the required information for the company assisting the certification process. Likewise, co-managers have been the facilitators who disseminate knowledge about the REDD+ Project and favor a transparent, timely, and clear communication regarding the initiative. They mediate and facilitate the dialog among the stakeholders, promoting the dialog of knowledge for a balance between the knowledge and technical concepts about the REDD+ Project and the wisdom and language of the local communities. The co-manager team keeps a constant interaction with the communities, listens to them, clears their doubts, receives their proposals and ideas to communicate and direct them to those responsible, and promotes the participation on pedagogic and dissemination activities as part of the exchange of knowledge conducted in the territory regarding the REDD+ initiatives, conservation, and climate change.

This team is made up by community actors with different strengths, skills, and aptitudes such as pedagogic knowledge, skills for interaction with leaders or administrative authorities, handling of technological tools, and abilities to mobilize the community. Elders and people with experience on community leadership are also involved, since they have the strength to conduct dialogs with the other traditional authorities and contribute to the interpretation and translation of the technical knowledge into the local knowledge and vice versa, fulfilling their role of links and mediators, not only between the proponents and the company, but also between the technical and local knowledge and among the diverse focuses on the territory. Thus, co-managers are articulators and multipliers contributing to the materialization in the territory of the three foundations of the EPCAC: participation, communication, and knowledge appropriation of the project and the matters in relation to it.

The community work of co-managers has been assisted by the technical team (forest engineers, environmental engineers, biologists, anthropologists, cultural facilitators, and communicators) of South Pole, the partner company for the certification. By means of in-person and virtual training sessions, an exchange of knowledge process has been conducted for co-managers to build or strengthen their knowledge on REDD+ topics, climate change, carbon market, and other matters related to the REDD+ Project. Similarly, they have been trained on qualitative and differential research methodologies and techniques, as well as on technological, registration, and information communication tools. In turn, the co-managers team has exchanged and shared with the technical team its experiences and knowledge on the territory and the sociocultural groups to which they belong.

The first recruitment and training were completed in the second semester of 2019 with co-managers from AIZA, CIMPUM, and COINPA. Once their performance was assessed and as agreed with the AATI, a second recruitment was conducted in which co-managers from AZICATCH were included. This second recruitment extended to April 2020; however, because of the pandemic, which blocked in-field works, the contract was suspended. It was later resumed through an addendum and the training process restarted, this time on a virtual basis. Said training sessions focused on the strengthening of key concepts of the REDD+ Project, qualitative information collection techniques, technological and administrative tools, and exercises to promote the dialog of knowledge to keep on sharing the project with the communities and promoting the appropriation of knowledge on the project among the local stakeholders.

Currently, the project has 15 co-managers distributed as follows: nine co-managers from AZICATCH, two from COINPA, two from AIZA, and two from CIMPUM (p, 106), as shown in Table 98.

Table 98. Participants of the REDD+ Project co-manager program.

AATI	Co-manager	Community	People (ethnicity)
AZICATCH	Blanca Emma Cruz	Lago Grande	Bora
	Silverio Kuguao	Petani	Bora

AATI	Co-manager	Community	People (ethnicity)
	Roy Teteye	Providencia	Bora
	Robin Paad	Cair	Okaina
	Hermenegildo Attama	Cair	Okaina
	Alex Kue	San Francisco	Uitoto
	Omer Teteye	Providencia Nueva	Bora
	Rubiel Umire	Sabana	Muinane
	Jairo Jaita	Mue	Okaina
AIZA	Adelita Rimabake	Nueva Esmeralda	Uitoto
	Roldan Fajardo	Puerto Arica	Uitoto
CIMPUM	Josué Jittoma	San Rafael	Uitoto
	Benedicto Ortíz	San Rafael	Uitoto
COINPA	Boxander Cote	Puerto Alegría	Uitoto
	Yilmar Guamán	Puerto Perea	Inga

Source: prepared by South Pole (2021).

The work of the co-managers is regularly executed at the *malocas* where they interact with the older adults of the communities; advice and orientation are received to properly conduct the activities in line with the context and the cultural manners; and, at the same time, permission is asked from the elders, who are the traditional authorities of the territory, for developing the rest of the activities.

Similarly, the co-managers conduct socialization activities around the contract agreement, the project progress, matters related to the strategic guideline's formulation, the project cycle, the compromises of the community to the conservation, and any other frequently asked questions from the communities about the REDD+ initiative. Regarding the educational and communicative component, they generate community's spaces to open dialogs about climate change, REDD+ concepts, topics related to the

carbon market, conservation, and traditional practices, among others. They prepare audiovisual informative material, such as community's billboards and informative newsletters, on the project and other topics of interest. Furthermore, they develop qualitative research techniques to validate topics such as stakeholder mapping, project area mapping, social mapping, land uses and changes, *chagras*, and demographic information collection.



Figure 86. First co-manager team while starting activities in 2019.

Photograph: South Pole (2019).

Community's monitoring of deforestation and degradation

In the context of the REDD+ Project, South Pole, and the proponent AATI decided to start the implementation of a community's monitoring pilot for deforestation and degradation. The indigenous communities decided to first conduct community activities of forest monitoring on their territories. This activity was discussed and approved by the community authorities and members in a general assembly.

The community's monitoring was supported by the co-managers explained how to fill in the forms and help the activity coordinator in each community to collect the information. Additionally, the coordinator defined with the community members the distribution of the places to be visited to encompass the largest possible area and avoid visiting a place twice.

This activity was implemented during the second quarter of 2021 and, therefore, the results will not be presented for the first monitoring period. However, it is a priority for the project proponents that the communities start integrating to this process since, as previously stated, participating in the monitoring will help the communities, not only to have control over their territory, but also to make informed decisions to participate in the dialog about the future of the REDD+ Project and correctly direct the activities to be prioritized in the monitoring period following each verification event.

REDD+ Project identity contest

During 2021, the REDD+ Project identity contest was also held to create in a participatory way the logo, name, and slogan of the initiative led and formed by the communities of the four AATI proponent. In this

way, the contest could ensure an image and a proper name that represents the 55 communities participating in the project and that represents the resulting programs and activities to reduce deforestation and degradation.

This activity was carried out in the field with the following criteria:

1. Community workshops, drawing and collective-creation spaces organized by the co-manager team of the REDD+ Project.
2. Focus or guidelines: the logo, name, and slogan needed to refer to the care of the forest, traditions, and territory according to the indigenous vision and the principles of a REDD+ project.
3. Characteristics:
    a. Logo: drawn by hand in a letter-size or notebook-size sheet; including no words or letters.
    b. Name: short; four words at most preferably.
    c. Slogan: short, creative, and informative phrase expanding the project information; from three to seven words preferably.

On August 27, 2021, in a virtual meeting, the four AATI chose their favorite or finalist logos, names, and slogans. Then, the jury (made up of visual artists and designers) had a meeting and unanimously elected the first place for the logo, name, and slogan based on the selection made by the AATI.



Figure 87. Community activities for the REDD+ Project identity contest.

Photograph: South Pole (2021).

6.6.3 Implementation, mitigation, and monitoring scenario

This scenario constitutes the possibility to consolidate, ensure continuity, and coordinate the numerous processes in the territory. In this stage, the REDD+ Project consolidates the actions required to contribute to the reduction of deforestation and mitigation actions by supporting the territorial governance and traditional conservation practices and lifestyles. Therefore, the purpose of this scenario was to collect actions and motivations by the AATI, traditional authorities, and people from the indigenous ethnicities in the context of the project. Said motivations were analyzed in detail, discussed, and assessed for feasibility and appropriateness to reach the goals and achievements set to reduce the negative impacts, not only of the global climate change, but also of other factors influencing the indigenous lifestyle. Among those factors which persist in the territory and represent a threat, we find the legal and illegal exploitation of natural resources (wood, gold, coca, commercial fishing) and the armed conflict. Moreover, other cultural interaction processes possibly creating risks due to their cultural influence and relation to nature are the growing presence of school-based education without an ethnic and differential focus and the mass media, as well as the increasing relations of indigenous people with governmental and non-governmental institutions. For that matter, this scenario collects their resistance practices for forest conservation and their cultural systems and worldviews.

These negative factors also reinforce the relevance of the REDD+ Project implementation, since it would enable the participating indigenous communities to strengthen their territorial governance and their subsistence activities without being forced to leave their territory or modify their cultural system beyond their principles and autonomy.

For this scenario, the project proposals and ideas resulting from the REDD+ retroactivity scenario and, in general, from the dialog process through the EPCAC (see Table 99) were gathered. Likewise, each of the AATI at the different spaces and the co-managers in their mediating role expressed several proposals that were collected and, subsequently, organized in the strategic lines described in section 1.11 for territorial governance, deforestation reduction, and mitigation of possible impacts.

Table 99. REDD+ Project implementation and monitoring scenario.

AATI	Territorial proposals of the REDD+ Project implementation and continuity
AIZA	• Preparation of a function manual involving the neighboring AATI for proper management, autonomy, and responsibility for the cultural resources, patrimonial resources, and the environment. • Assessment of the community's conditions and validation and adjustment of the human well-being indicators. • Reinforcement of the community's health structure through traditional physicians and midwives. • Agricultural production project, pisciculture, poultry farming, tree reforestation, and fishing following traditional methods. • Creation of the forest ranger team. • Generation of an autonomous environmental management and zoning plan for the

AATI	Territorial proposals of the REDD+ Project implementation and continuity
	territory. • Introduction of the self-sustainability component in the projects: seed recovery, selection, and determination of areas for cocoa growing, poultry farming, and others. • Dialog and inter-generation education process for valuation of the community's products. • Identification of threatened species and consolidation of repopulation actions. • Strengthening of self-knowledge based on and for youth.
AZICACTH	• Strengthening of culture. • Land use planning with spatial demarcation of the community's management areas.
CIMPUM	• Assessment of the communities' lifestyles. • Dissemination and feedback processes of information about the projects to contribute to governance and autonomy of the territory. • Articulation of the REDD+ projects with the economy and production component and the indigenous women and family component of the life plan. • Regulation of the use and management of natural resources. • Training of environmental promoters.
COINPA	• Actions for forest conservation through the consolidation of "indigenous-thinking rainforest guardians" and forest protectors. • Project of good practices with nature: proper non-organic waste management and recycling, organic fertilizer production, native species reforestation, use of wild fruit trees, and water protection. • Reinforcement of the cultural system: native language recovery, handicrafts, and support for craftswomen. • Incorporation of renewable-energy systems through solar panels.

Source: prepared by South Pole (2021).

6.6.4 Contributions to national sustainable-development priorities in the monitoring period

Even though the monitoring of the contributions to the sustainable-development priorities will only be totally implemented for periods after 2021 (second verification of the REDD+ Project and subsequent verifications). Table 100 shows some preliminary results of the first monitoring period regarding the prioritized SDGs, targets, and indicators referred to in section 1.17.

Table 100. Results of the first monitoring period regarding the contributions of the REDD+ Project to the prioritized SDGs, targets, and indicators.

SDG	SDG-related target(s)	National indicator	Assimilation by the communities of the national indicator	Contribution achieved
SDG 13: Climate action	13.2 - Integrate climate change measures.	Total GHG emission reduction.	-	8,042,370 tCO_2e[66]
	13.3 – Build knowledge and capability to face the climate change challenges.	-	Spaces for education, participatory knowledge, and strengthening of local organizational capacities on climate change.	75 spaces[67]
SDG 15: Life on land	15.A - Increase financial resources to conserve and sustainably use biodiversity and ecosystems	-	Number of VCUs issued for the execution of the REDD+ Project.	5,288,947 VCUs[68]
SDG 6: Clean water and sanitation	6.6 - Protect and restore freshwater ecosystems.	-	Number of hectares considered in community planning instruments.	18,016 ha[69]
SDG 11: Sustainable cities and communities	11.A - Strengthen national and regional development planning.	Thousands of hectares of protected areas.	Number of tools/activities promoting conservation of cultural and natural heritage.	75 activities implemented including the EPCAC and the co-managers program
SDG 17: Partnerships for the goals	-	-	Money mobilized through the sale of VCUs issued thanks to the project activities.	20 M EUR[70]

Source: prepared by South Pole (2021) based on the Colombian National Planning Department (2019).

[66] Adjusted to include uncertainty discounts

[67] 75 spaces up to the moment when the project information was shared with the VVB.

[68] Amount of VCUs issued before the audit.

[69] Water bodies within the first stage of the REDD+ Project.

[70] Income projected by VCU trading of the first verification of the REDD+ Project with a conservative credit price of 3,9 EUR.

ANNEXES

List of attached supporting documents.

Annex1. Supporting_ Document_ No.6__HWP_fires_20211015__Documento soporte_Taller_Capacitacion_Cogestores

Annex2. 20211015_Documento_soporte_concepto_mecanismos_participacion

Annex3. 20220930_Supporting_Document_No_2_Training_workshops_Co-Managers

Annex4. Supporting_Document_No_1_Socio-environmental _Characterization

Annex5. 20220930_Supporting_document_No_5_Mapping of relevant actors

Annex 6-Agents and drivers of deforestation-Predio Putumayo V1.1

Annex7. 20220930_LEGAL_CONCEPT_MECHANISMS_FOR_ PARTICIPATION

Annex8. 20220930_Supporting_Document_No_3_RCCFS_Project_Consultation_Mechanism.pdf

Annex 9_Future_deforestation_model_V2.1_clean

Annex 10. Map Accuray Montoring period

Annex 11. Theory of Change REDD+ project Indigenous Peoples Safeguarding the Rainforest

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