THE LAST HABITAT REDD+ PROJECT

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Project Title	THE LAST HABITAT REDD+ PROJECT
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Project Location	Peru, Region Ucayali
Project Proponent(s)	Bosques Amazónicos SA Vía Principal 123, Office 201 Edificio Real Uno San Isidro, Lima 27, Peru Jorge Cantuarias Falconi Phone: (+51) 01 480 11 92 www.bosques-amazonicos.com jcantuarias@bosques-amazonicos.com; mcantuarias@bosques-amazonicos.com
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Validation Body	AENOR CONFIA, S.A.U Jose Luis Fuentes jfuentes@aenor.com (+34) 914 326 000
Project Lifetime	01 January 2020 – 31 December 2039; 20-years
GHG Accounting Period	01 January 2020 – 31 December 2039; 20-years
History of CCB Status	-
Gold Level Criteria	Biodiversity Threatened species, mainly the Handroanthus serratifolius “Tahuarí” and Myrmoborus melanurus “black-tailed antbird”, categorized by the IUCN Red List as Endangered and Vulnerable respectively, will be protected by the

	project activities, as well as other registered species, such as the Tapirus terrestris “sachavaca” (Vulnerable) and Panthera onca “jaguar” (Near Threatened). The project will seek to maintain the fauna populations of these species in their natural conditions, protecting bodies of water and areas of forests of great importance: low terraces, flooded alluvial forest and palm swamps dominated by Mauritia flexuosa (“Aguajales”), that they continue using these spaces and fulfill their ecological role. A Science Program will be implemented through research studies, with field expeditions for periodic evaluations and monitoring of biodiversity, complemented with a network of camera trap stations installed in strategic areas, in order to understand reproductive biology and displacement of fauna species and implement specific measures. Activities will be developed to reduce the threats to the project area, such as forest fires due to land use change in the surroundings of the project area, illegal logging operations and “Aguaje” harvesting with unsustainable practices, in coordination with local populations based on a communication and early warning strategy. Likewise, preventive patrol, control and surveillance actions, channeling environmental complaints with the collaboration of the competent authorities and the implementation of a communication plan with training events for project stakeholders, to promote the conservation of biodiversity and confront driving agents of deforestation, forest degradation and illegal hunting. In the specific case of the “Tahuarí” tree species, area restoration activities and management of natural regeneration will be carried out in areas where this species is distributed. It is expected that these activities to be implemented will help preserve threatened species, ensuring natural regeneration processes in the case of the Tahuarí, generate new knowledge about biodiversity, maintain and improve wild refuge areas and connectivity of forest areas within and around the project area. Finally, it is expected to improve awareness and value of biodiversity among project stakeholders.
Expected Verification Schedule	2024

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1 SUMMARY OF PROJECT BENEFITS

The Last Habitat REDD+ project is a conservation initiative developed by Bosques Amazónicos S.A. (BAM) in Ucayali-Peru, a Peruvian region which ranked first nationally in terms of deforested area in 2020 and second in the period between 2001 and 2020, according to the national forest loss maps (GEOBOSQUES). The project area is comprised by two private estates duly registered in the Register of Property in Pucallpa: Selva Maestra (SM) property owned by Bosques Amazónicos S.A. (project developer), an area of 12,413.5 Has, and Nuestro Señor Jesús (JSC) owned by JCC Inversiones SAC (company part of Bosques Amazónicos SFM S.A. economic group), an area of 8,049 Has.

This forested area is one of the last remaining ecosystems in the vicinity of Pucallpa, capital of Ucayali, an Amazon city undergoing constant growth due to intense migration from both Andean and Amazon regions. Located near the city of Pucallpa (45 minutes) and surrounded by deforestation pressures from agriculture, urbanization and others, the project area harbors an extraordinary ecological wealth, being the last habitat or refuge for various species of flora and fauna (with different degrees of threat according to national regulations) and a "green island" of outstanding ecological value, which creates an opportunity for scientific research on biodiversity and around the value of Amazon rainforests. In addition, the area includes several types of valuable forests, among them the "aguajales", which are the wetlands with the greatest carbon sequestration capacity in the Amazon, making this an essential ecosystem to conserve.

Due to the permanent pressure for the expansion of population settlements and the expansion of the agricultural frontier over primary forests, the project area and its surroundings are in constant threat by socio-environmental conflicts (illegal logging, forest fires, deforestation from unsustainable production activities, land invasion, overlapping rights, among others), which represents a latent risk to the ecological wealth found in the area. In a context of accelerated growth of habitat degradation in the region, BAM allocated these areas for conservation since its purchase more than a decade ago, protecting the ecological value found and allowing the forest to survive the threats and difficulties mentioned above.

The Last Habitat REDD+ Project is designed under the avoided planned deforestation methodology as this area was originally sold to the project proponent with the authorization to convert the forested areas in agrarian production lands (camu camu, palm oil, castor oil plant and cattle ranching). Despite having the legal authorization to carry out traditional productive activities, BAM, with its own resources, has promoted the conservation of these valuable forest and its biodiversity over the years by implementing different strategies and activities such as: territorial supervision with technical and legal support, forest surveillance activities, permanent work with communities for improving their capacities in sustainable forestry management, among others. Such conservation efforts will only be feasible and sustainable over time with the support of carbon revenues from the proposed REDD+ project, which will allow for protection against the growing threats of deforestation in the long term. These resources will generate the necessary income over time to implement the different strategic activities required for avoiding deforestation in the face of a high-risk scenario and making the conservation of these areas more productive, convenient and profitable than its opportunity cost: changing the use of land.

The main expected benefits that the project will provide over time are summarized below:

- Reduction of GHG emissions: the contribution to environmental balance, avoiding 15,639,703.25 tCO_2 equivalent into the atmosphere due to the conversion of forest cover in degraded soils for agricultural purposes.

- Protection and enhancement of environmental balance: contribution to the preservation of valuable biodiversity, including threatened wildlife (flora and fauna), and the preservation of ecosystems of high importance such as the "aguajales" (wetlands) included in the project area.
- Improvement of ways of life and well-being of local and indigenous populations: contribution to improving the quality of life of the communities and their capacity to sustainably manage the forest, generating value chains in harmony with the integrity of the forest and its ecosystem products/ services.

1.1 Unique Project Benefits

Outcome or Impact Estimated by the End of Project Lifetime	Section Reference
1) Under the implementation of a plan for the protection of critical habitats, 09 species of mammals (including a Peruvian endemic species) categorized in appendices I, II and III of CITES will be protected; 02 species of birds in Appendix I (almost threatened in Peru), 01 amphibian species, 02 species of reptiles and 34 species of birds categorized in Appendix II, and one forest species, the quinilla (*Manilkara bidentata*), categorized in situation vulnerable by national regulations (D.S.004-2014-MINAGRI).	2.1.11 5.1.1.2 5.1.1.3
2) Conservation of the biodiversity of the project area as part of an almost continuous biological corridor, around a set of protected natural areas, fragile ecosystems, conservation concessions, and indigenous territories that provide and configure an ecological space necessary for species to ensure connectivity, functionality, and ecological integrity.	2.1.11
3) Generation of a greater knowledge of biodiversity, on the status of prioritized species and evaluated in inventories, and the ecological characterization of natural communities, through the development of a Science Program, which allows zoning, establishing areas for protection of critical habitats and conserve the project area.	2.1.11
4) Ensure the maintenance of ecological processes and environmental services provided by the forest, such as water regulation of both the Lower Manantay basin, a tributary of the Ucayali River, and the Lower Pachitea, resilience to climate change, pollination services and natural regeneration of the forest, among other provision, support, and cultural services.	2.1.11

1.2 Standardized Benefit Metrics

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
GHG emission reductions or removals	Net estimated emission removals in the project area, measured against the without-project scenario	Not applicable	
	Net estimated emission reductions in the project area, measured against the without-project scenario	15,639,703 tCO_2e	3.2.4

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
Forest[1] cover	For REDD[2] projects: Estimated number of hectares of reduced forest loss in the project area measured against the without-project scenario	14,507 ha	3.2.1
	For ARR[3] projects: Estimated number of hectares of forest cover increased in the project area measured against the without-project scenario	Not applicable	
Improved land management	Number of hectares of existing production forest land in which IFM[4] practices are expected to occur as a result of project activities, measured against the without-project scenario	Not applicable	
	Number of hectares of non-forest land in which improved land management practices are expected to occur as a result of project activities, measured against the without-project scenario	Not applicable	
Training	Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities	990	4.1.1 (table 4.1)
	Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	400	4.1.1 (table 4.1)
Employment	Total number of people expected to be employed in project activities,[5] expressed as number of full-time employees[6]	250	2.3.15
	Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	80	2.3.15
Livelihoods	Total number of people expected to have improved livelihoods[7] or income generated as a result of project activities	990	4.1.1 (table 4.1)

[1] Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (*VCS Program Definitions*)

[2] Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (*VCS Program Definitions*)

[3] Afforestation, reforestation and revegetation (ARR) - Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (*VCS Program Definitions*)

[4] Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood and fuelwood (*VCS Program Definitions*)

[5] Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers and community members that are paid to carry out project-related work.

[6] Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region or economic territory (adapted from the UN System of National Accounts (1993) paragraphs 17.14[15.102];[17.28])

[7] Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. *The Sustainable Livelihood Approach to Poverty Reduction*. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
	Number of women expected to have improved livelihoods or income generated as a result of project activities	400	4.1.1 (table 4.1)
Health	Total number of people for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	990	4.1.1 (table 4.1)
	Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	400	4.1.1 (table 4.1)
Education	Total number of people for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Not applicable	
	Number of women and girls for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Not applicable	
Water	Total number of people who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	
	Number of women who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	
Well-being	Total number of community members whose well-being[8] is expected to improve as a result of project activities	990	4.1.1 (table 4.1)
	Number of women whose well-being is expected to improve as a result of project activities	400	4.1.1 (table 4.1)
Biodiversity conservation	Expected change in the number of hectares managed significantly better by the project for biodiversity conservation,[9] measured against the without-project scenario	14,705 ha	5.2.1
	Expected number of globally Critically Endangered or Endangered species[10] benefiting from reduced	"Sachavaca" (*Tapirus terrestris)*; "Hormiguero de cola negra"	5.1.1

[8] Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Livelihoods, Health, Education and Water), and may also include other benefits such as strengthened legal rights to resources, increased food security, conservation of access to areas of cultural significance, etc.

[9] Managed for biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation, e.g. enhancing the status of endangered species

[10] Per IUCN's Red List of Threatened Species

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
	threats as a result of project activities,[11] measured against the without-project scenario	*(Myrmoborus melanurus)*; "Reinita Estriada" *(Setophaga striata)*; "Tahuarí" *(Handroanthus serratifolius)*	

[11] In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

2 GENERAL

2.1 Project Goals, Design and Long-Term Viability

2.1.1 Summary Description of the Project (G1.2)

The Last Habitat REDD+ project is located in Ucayali, the region with the highest rate of deforestation in the Peruvian Amazon in the last 10 years (33,136 ha/yr between 2012-2021 according to GEOBOSQUES). The areas in the proximity of the project have been identified by the Ministry of Environment as one of the largest deforestation hotspots in the country (MINAM, 2021).

The project comprises the maintenance and conservation of forest cover in two private properties, duly registered in the Register of Property in Pucallpa:

- Selva Maestra (SM) property owned by Bosques Amazónicos S.A. (project developer): an area of 12,413.51 Has, bought in 1999.
- Nuestro Señor Jesús (JSC) owned by JCC Inversiones SAC (company part of Bosques Amazónicos SFM S.A. economic group: an area of 8,049.7 ha, bought by JCC Inversiones SAC in 2009.

Prior to the acquisition of these properties by the Bosques Amazónicos group, these lands were property of the Peruvian State, which were awarded to the Bosques Amazónicos group by means of enabling titles in accordance with the applicable regulations, for the development of agro-industrial project that included the installation of oil palm, camu camu and castor oil plant plantations on 7,507 ha of JCC property, and the development of cattle ranching activities in an area of 7,000 ha in SM property.

From an early stage, however, the company decided to change the managing purpose of the properties, from agricultural production towards the protection and conservation of native vegetation. This implies, on the one hand, the loss of the economic benefit expected from crops and livestock, and, on the other hand, the need to invest resources to make the protection of the area effective from the external existing risks.

Hence, the Project is designed as an avoided planned deforestation activity since these properties were acquired with legal authorization for the change of land use change towards agricultural activities.

To date, BAM has been able to manage and protect these properties, nonetheless, due to the type and magnitude of the threats affecting the region and, particularly, the project surroundings, it is unlikely that the area can continue to be conserved optimally without generating the required financial resources for the implementation and straightening of prevention, protection, and conservation measures for the ecosystem within the project area. The estimated emission reduction for the project is 15,639,703 tCO_2e at an average of 781,985 tCO_2e/year, that will be achieved over time through the implementation of various activities grouped into three strategic lines of intervention:

- Mitigation of deforestation risks: despite their great ecosystem value, these areas face increasing threats of deforestation such as land invasion and trafficking, overlapping of rights, illegal logging,

expansion of agricultural frontiers for the implementation of unsustainable agricultural practices that, in many cases, use fire as a preparation to open crop areas in the dry season which put at continuous risk the loss of forest cover within the Project Area. Such hazards are and will be addressed by the project developer over time through the implementation of different monitoring and control strategies as well as social actions that seek to prevent and reduce external risk factors. These strategies and activities include: the implementation of a monitoring and surveillance system (satellite, territorial security that includes patrolling, area demarcation and others), the installation of infrastructure for optimal monitoring and control of the area, the cooperation with forestry authorities and competent entities in order to coordinate joint actions to identify, stop and prevent deforestation, the implementation of training programs for local communities in sustainable forest management and practices, among others.

- Protection of biodiversity and ecological processes: for an adequate conservation and management of the forest, since 2020 BAM implements a Scientific Program in cooperation with prestigious organizations and universities, whose purpose is to understand and monitor the functioning of the forest and its components and identifying habitats and dominant species, oriented to the protection of valuable flora and fauna habitats, specially of those species that may be in some category of threat. The results obtained to date from the research conducted indicate that the project area harbors an important diversity of species, including species classified as threatened according to national legislation and the IUCN (see file: Supporting evidence of biodiversity – BAM's Science Program). For its important contribution to the conservation of Amazon forests, the company requested that the area comprising the JSC property be recognized as a Private Conservation Area (ACP), achieving this category granted by the Ministry of Environment for a period of 40 years. It is worth mentioning that this is the second area of its category to be recognized as an ACP in the Ucayali region.

- Socio-economic management for community development: being located in a region of limited resources, neighboring populations have inadequate access to basic social services, limited access to land and formalization of productive activities, insufficient capacities for social management, a marked absence of good sustainable agricultural and forestry practices and little knowledge of appropriate technologies. All which configures a forest landscape in the process of degradation, with weak or non-existent governance processes that promote restoration and create a mosaic of land uses on fragmented forest areas. In this line, the inclusion of the populations and interest groups is fundamental for the development of the project and the compliance of forest protection. Hence, the project involves neighboring communities as indirect beneficiaries in its value proposition for improving community livelihood and assuring the impact of the efforts in the long term. Project activities include socioeconomic initiatives such as: permanent training for communities in sustainable forest management, the promotion of sustainable production chains to promote alternative sources of income, the implementation of projects to provide better conditions in terms of basic services for the surrounding communities (drinking water, electricity), among others.

The objectives pursued with the implementation of the project are summarized in the following table.

Table 2.1. The Last Habitat REDD+ Project objectives: community, climate, and biodiversity

CCB	Specific Objectives	Impacts
Climate	Reduce GHG emissions caused by deforestation and degradation.	Deforestation and degradation within the project area is avoided. Conservation of flora and fauna in the project area is strengthened.
Community	Contribute to the well- being of the identified communities in the surroundings of the Project by improving their access to basic services, and sustainable productive activities.	Identified communities in the surroundings of the Project strengthen their social relations and general well-being. Identified communities in the surroundings of the Project strengthen their economic capacity and sustainable productive skills through sustainable activities.
Biodiversity	Guarantee and maintain the integrity of biological diversity and ecological processes + services in the Project Area.	Monitoring and conservation of biodiversity in the Project area is strengthened. The awareness and value of the biodiversity found the Project area increases among project stakeholders.

2.1.2 Project Scale

Project Scale	
Project	
Large project	X

2.1.3 Project Proponent (G1.1) 0

Organization name	Bosque Amazónicos S.A. (BAM)
Contact person	Jorge Cantuarias Falconi
Title	General Manager
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2.1.4 Other Entities Involved in the Project

Organization name	PASKAY SAC
Contact person	Jorge Torres Padilla

Title	General Manager
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Telephone	(+51) 01 7452122
Email	www.paskay.pe contacto@paskay.pe jtorres@paskay.pe
Role / Responsibilities	Preparation of the PD and provide general advice on the implementation of the project. Paskay will be in charge of monitoring the changes in GHG emission reductions resulting from project activities, for use as offsets, in accordance with the monitoring plan established in the PD. Likewise, it will be in charge of preparing the monitoring reports according to the validated design, and the requirements of the CCB&VCS standards.

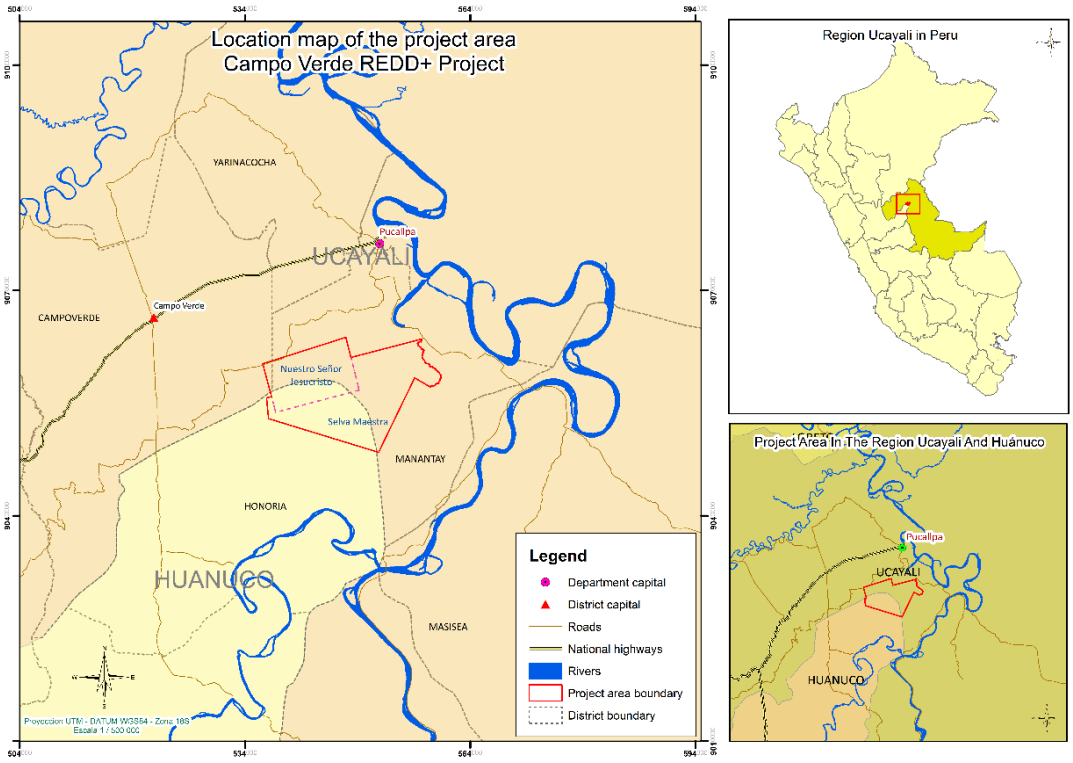
Organization name	JCC Inversiones SAC
Contact person	Jorge Cantuarias Falconi
Title	General Manager
Address	Jr. Atahualpa 760, distrito de Callería, provincia de Coronel Portillo, departamento de Ucayali
Telephone	(+51) 01 480 11 92
Email	www.bosques-amazonicos.com jcantuarias@bosques-amazonicos.com mcantuarias@bosques-amazonicos.com
Role / Responsibilities	Legal owner of the Nuestro Señor Jesucristo property. It has given all the rights to Bosques Amazonicos S.A. for the development of the project over its property as well as the rights over the carbon credits to be generated.

2.1.5 Physical Parameters (G1.3)

Location and limits

The project is located in within the Amazone biome of the country, between the regions of Ucayali and Huánuco, in the provinces of Coronel Portillo (districts of Campo Verde y Manantay) and Puerto Inca (district of Honoria), respectively. It is composed by the areas of the Selva Maestra (12,413.51 ha) and Nuestro Señor Jesucristo (8,049.7 ha) properties, which after deducting the non-forest part, gives a total project area of 19,034.6 ha.

Figure 2.1. Location of project area



Source: Inhouse elaboration.

Table 2.2. Project area vertices

Vertex	Property	X (East)	Y (North)
1	Selva Maestra	551121	9046026
2		542365	9049935
3		538185	9050255
4		538180	9050066
5		538180	9050066
6		536735	9050157
7		536632	9053037
8		536905	9053099
9		536792	9053468
10		536822	9053470
11		537643	9050834
12		548746	9053778
13		547580	9058424
14		557098	9060909
15		556797	9060311
16		556321	9060021
17		557167	9059006

Vertex	Property	X (East)	Y (North)
18		557035	9058416
19		557337	9057501
20		559386	9055933
21		559234	9054810
22		558433	9054517
23		558116	9054277
24		556143	9055416
25		555021	9053100
26		555021	9053100
27		551556	9045949
28	Nuestro Señor Jesucristo	546981	9060813
29		548746	9053778
30		537643	9050834
31		535913	9057306
32		546981	9060813

Physiography

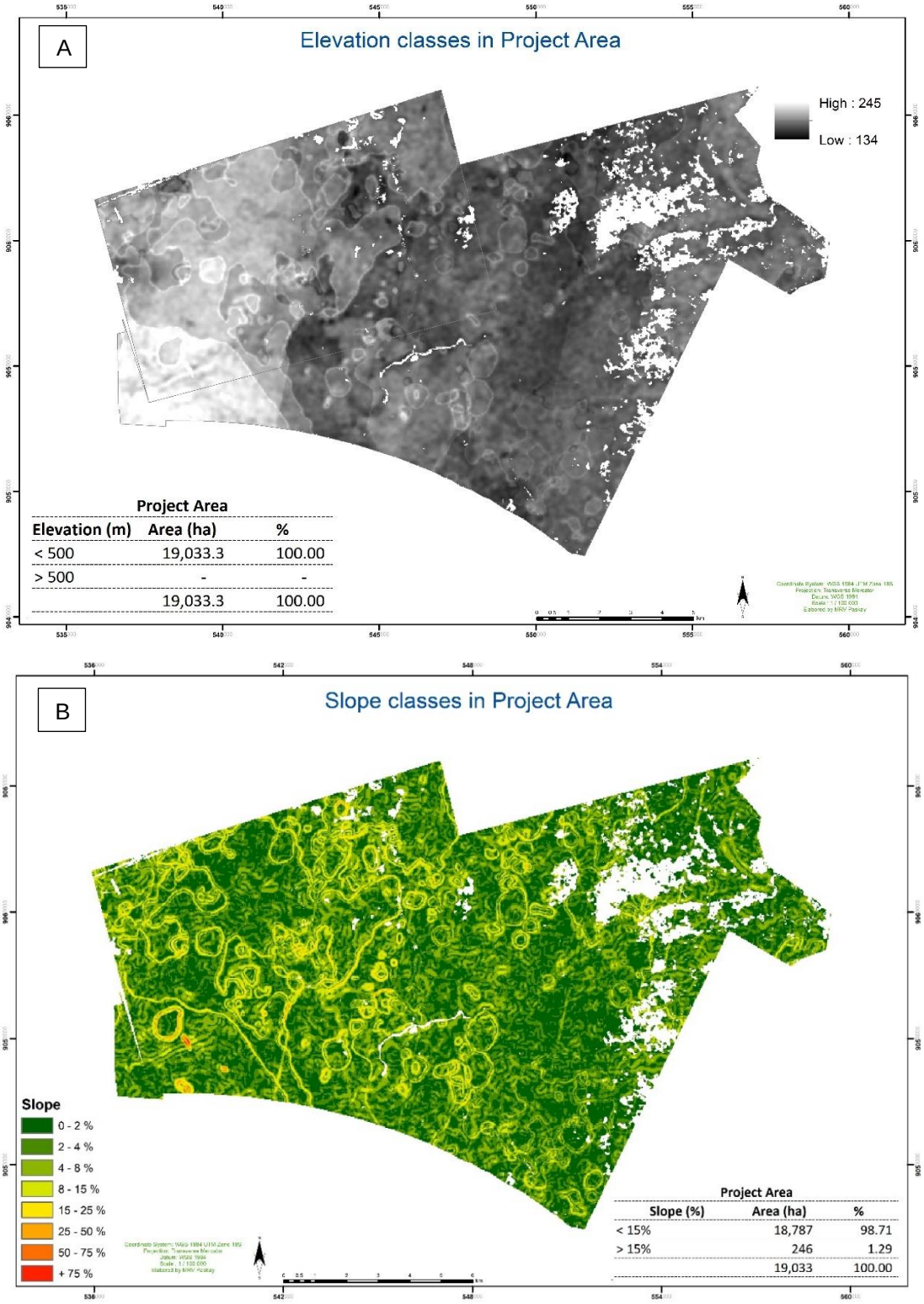
The entire project area is classified as Alluvial Plain Physiography, also known as “Lowland Forests” (in accordance with the Malleux classification from 1981). This physiography is defined based on its similarity of the geo-genetic aspects of the area, which allows the differentiation of an alluvial landscape (alluvial plain), generated by the Manantay River and tributary streams of the first order river that is the Ucayali River (formed of recent or sub-recent sediments of the Quaternary), where the outstanding geo-forms have been originated mainly by climatic factors of floods and hydroerosives, producing a great well-defined landscape that is the Great fluvial-alluvial landscape.

Its main characteristic is that it presents a predominantly flat relief, with the formation of low terraces that in some cases are temporarily flooded and others that are not, made up of recent alluvial materials accumulated during times of higher rainfall and others with older characteristics.

Topography

The altitude and slope maps obtained from the ASTER GDEM satellite show that the total project area is located at an altitude of less than 500 meters and 98% of the area has a slope of less than 15%, which is characteristic of medium terraces and plains.

Figure 2.2. Elevation (A) and slope (B) classes in the project area



Source: Inhouse elaboration. The areas presented in the figures are not exact as it varies from raster to shape.

Soils

The project area is located within two soil types: the Gleysol éutrico - Cambisol dístrico category covering approximately 18,396.8 ha (96.65%), and the Fluvisol éutrico - Gleysol éutrico of 637.8 ha (3.35%).

Climate

The project area has a permanently humid tropical climate: rainfall is in the order of 1,700 mm per year. The annual temperature average is 26.7 ºC, with some monthly maximums around 32 ºC and with monthly minimums of 20 ºC. Relative humidity has an annual average of 84.3%, being the wettest season from February to April. According to the Climate Map of Peru[12], the entire area of the project is classified as B(r)A': Rainy with abundant humidity all year round – Warm.

Hydrology

The hydrographic network of the Ucayali River is composed of 23 hydrographic units between major and minor. To the south of this basin, between the border of the department of Ucayali and Huánuco, the project is located in the "Interbasin 49917", which covers an area of 13,668.01 km^2. Its main tributaries on the right bank are the Abujao, Utiquinia and Callería rivers that make up the sub-basins of the same name and all have their headwaters in the Sierra Divisor protected natural area. According to ANA (2019)[13], the main characteristics are:

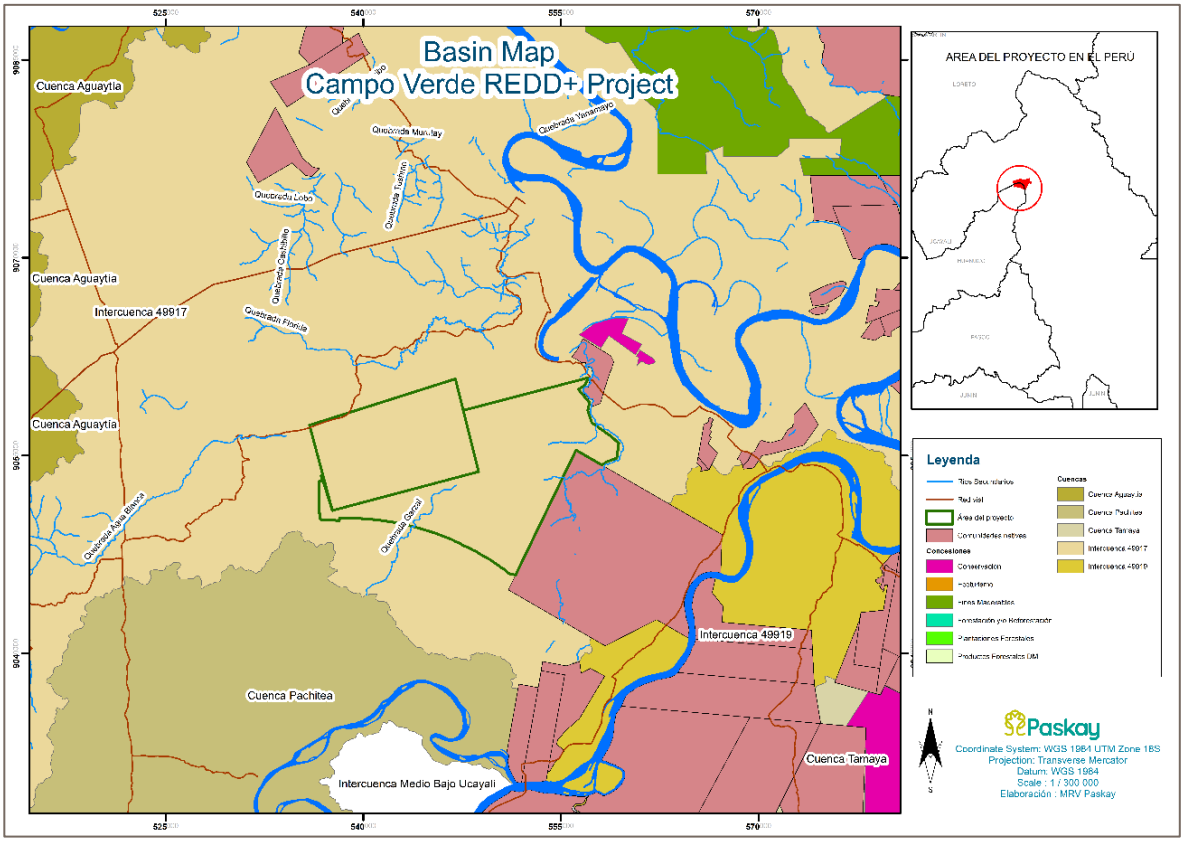
- Utiquinia River has the largest watershed area with 3386.48 km^2 and a length of 159 km,
- Abujao River with a watershed area of 3217.2 km^2 and a length of 114 km,
- Callería River with a basin area of 2,794.54 km^2 and a length of 163 km.

Figure 2.3 shows the streams and watersheds near the project area. To the north is Florida Creek, to the west Agua Blanca Creek, to the south Garzal Creek and to the east it naturally borders another creek.

[12] Mapa Climático del Perú. (10 setiembre 2023). Recurso interactivo del Servicio Nacional de Meteorologia e Hidrologia del Perú. Disponible en: https://www2.senamhi.gob.pe/main.php?dp=ucayali&p=mapa-climatico-del-peru

[13] Autoridad Nacional del Agua (2019). Evaluación de recursos Hídricos en la Intercuenca 49917-Ucayali. Informe Final. Perú. Available at: https://repositorio.ana.gob.pe/handle/20.500.12543/4695

Figure 2.3. Basin map of the project area



Source: National Water Authority (ANA). Inhouse elaboration.

Vegetation

For its location in the Ucayali River basin, the project is within a system of floodplain terraces and humid forests that, according to the list of terrestrial ecoregions of the world by WWF (Olson et. al. 2001), are characteristic of the tropical ecoregions known as: humid forests of the southwest of the Amazon, the Humid forests of Ucayali and the Varzea de Iquitos. Taking as a reference the descriptive memory of the National Map of Ecosystems of Peru (MINAM 2019), within the project area and its surroundings, up to eight ecosystems can be differentiated, characterized by different plant formations, being the most dominant in the project area flooded alluvial forest, palm swamps, non-flooded terraced forests and shrubby herbaceous swamps. In the environment, agricultural areas, pastures or grasslands and areas with secondary vegetation are also identified.

The project area is located in the area where two large regions of endemism for birds converge, which forms a kind of "ecotone" and houses species from both regions: Ucayali and Huánuco. These are the so-called Lowlands of southeastern Peru, which includes the areas of Tambopata and Manu (the project area would be located in the far north), and the Upper Amazon-Napo Lowlands, which includes the ecosystem influenced by the large rivers, such as the upper parts of the Amazon River up to the Maranon and the Ucayali, and the Lower Napo area at its intersection with the Amazon.

Forest inventories were developed around 2007 in each property, to understand the types of forests and ecosystems present in the areas. The summary of those is presented next:

Selva Maestra Property

The first study of forest inventories was carried out by the consulting firm "Peru Forest" in 2007, on an area comprising the Selva Maestra property and another adjacent land owned by the project developer. The following results were found:

It was determined that 14,396.2 ha[14] of land where potentially productive forests, which represents 95.6% and on which the field sampling of the forest inventory was carried out. Seven types of forest were determined in the potentially productive areas, with the largest area corresponding to the Low Terrace Forest with 4,189.3 ha (27.8%), followed by the Lowlands with Sparse Vegetation (3,446.2 ha, 22.9%), the Restinga with Low Vegetation (1,998.1 ha, 13.3%), the Restinga with Semi-Dense Tree Vegetation (1,831.9 ha, 12.2%), the Shallows with Dense Vegetation (1,285.7, 8.5%), the Aguajal (1,167.0 ha, 7.8%) and finally the Restinga with Dense Tree Vegetation (478 ha, 3.2%). The other units correspond to small formations of little importance in terms of their extension and are made up of secondary forests, swamps, gallery forests, streams, lagoons and areas for agricultural use, whose total extension was 662.0 ha, equivalent to 4.4% of the total area.

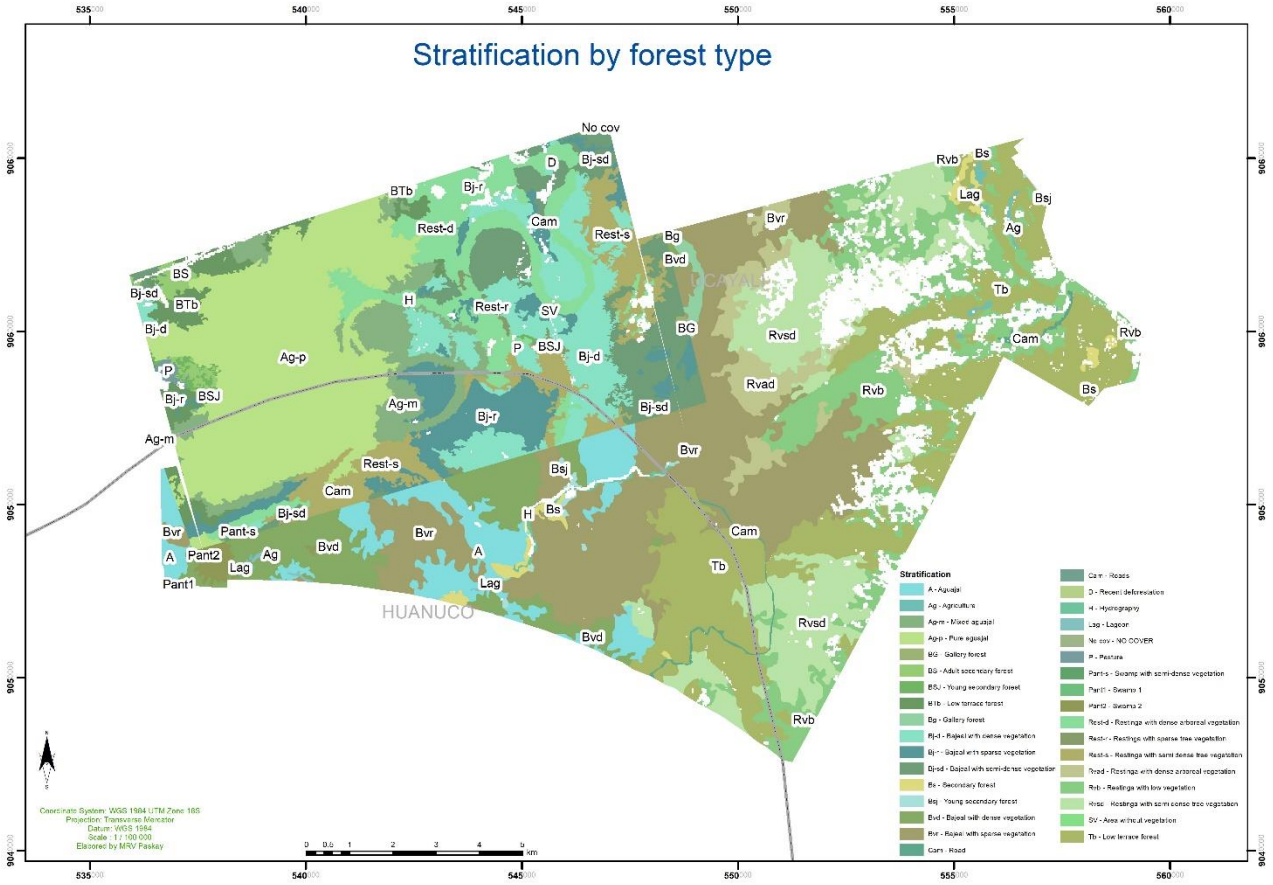
In addition to being the most extensive, the Low Terrace Forest represents the stratum with the greatest productive potential of the studied area. Other stratums present certain limitations due to flooding and drainage. The most representative timber species of the forests, especially in the low terraces, are represented by quinilla colorada, catahua, quinilla blanca and cahuapuri, since only in this type of forest there are 6.61 m^3, 6.36 m^3, 3.43 m^3, and 3.28 m^3 per hectare, respectively.

Nuestro Señor Jesucristo Property

The second study of forest inventories was carried out by the consulting company "Tropical Forest Development SRL", in 2007, from which it was found that two main forest types are within the property: the Low Terraces, that originally occupied the 48.6% but has been reduced to 40.1% because of land clearings for agricultural activities and *purmas* (abandoned areas where previous slashed-and-burn agriculture was performed); and the Aguajal, that area floodplain forests where the "Aguaje" palm (*Mauritia flexuosa*) predominates. It covers approximately the 43.3% of the property.

[14] Total area of the Selva Maestra property.

Figure 2.4. Stratification by forest type in the Selva Maestra and Nuestro Señor Jesucristo properties



Source: Inhouse elaboration

2.1.6 Social Parameters (G1.3)

The project has no settlements, villages, or communities inside its area. The biggest population near the project is the city of Pucallpa which is within a 45-minutes drive on the Federico Basadre highway (FBH), with approximately 144,207 inhabitants[15], located in the district of Callería, province of Coronel Portillo. Pucallpa´s history goes back to pre-colonial times, when indigenous peoples, mainly Shipibo-konibo and Asháninkas, settled and traveled in the surroundings of what is now known as the Ucayali River. Throughout the years Pucallpa began to establish itself as one of the main centers of commercial activity in the Amazon region with important economic activity and levels of migration. According to the average annual growth rate of the census population in Peru, Ucayali has been above the national average since 1940[16], largely due to the migratory phenomenon, and Pucallpa, as its main city, has concentrated a large part of the immigrant population because of its public services and economic activities.

Its modern history is linked to the rubber boom in the Peruvian Amazon during the late 19th century, and significant growth in the 1960s after the construction of the FBH that connected it to the city of

[15] www.visor.geoperu.gob.pe
[16] https://www.inei.gob.pe/estadisticas/indice-tematico/growth-and-size-of-population/

Lima. Nowadays Pucallpa continues its constant expansion with an economy based on timber, agriculture, trade, and tourism.

In the surroundings of the project area, in the districts of Campo Verde, Manantay, Masisea (Ucayali), and Honoria (Huanuco), smaller rural settlements have been identified which are recognized by the Peruvian regulation of territorial organization as "caseríos[17].". These rural population centers do not have defined limits, since they are not political administrative constituencies that exercise formal government and administration. They are characterized by having between 150 and 500 inhabitants and having at least 1 public education or health facility. Their main accesses are secondary (unpaved) roads that connect the FBH with these populations, while other settlements near the Ucayali and Pachitea rivers also use the waterway.

Their populations are mainly engaged in agricultural activities (crops of rice, cassava, banana, cocoa, oil palm, corn, and, to a much lesser extent, livestock) providing unskilled labor services related to these activities, including timber extraction from the forest. Family farming is a regular practice with a low to medium technical level of management, with only some of the lands being mechanized and fertilized. Slash-and-burn agriculture is also a common practice in the rural communities of the area. Fishing and livestock are practiced to a smaller degree and mainly for subsistence. The timber industry has also been historically an important economic activity in some of these populations and the entire region of Ucayali, which is the second region in the country with the most hectares of forest defined as capable of timber production[18].

Land tenure varies and is mixed between privately owned, leased, or granted by public authorities to farmers. Other configurations of land tenure include "proofs of possession" granted by the agrarian agencies and district municipalities, formal and informal purchase-sale contracts or transfer documents that don´t necessarily imply they have recognized rights over the land. In this context, much of the land is not formalized and registered in SUNARP (Public Registries) and the national rural cadaster system.

It is important to mention that the territory of the native community of Nuevo Paraiso is adjacent to the southwest border of project area, near the Ucayali River. This community from the Shipibo-Konibo indigenous people, is recognized and has the title to their communal territory, as well as all the other rights entitled by the constitution and in the international agreements signed by Peru in favor of the indigenous peoples. Some of the most distinctive characteristics of the Shipibo-Konibo communities is the use of their language, which has the same name, their traditional art, and their fishing skills.

In this social context of a variety of small settlements with distances, interests and concerns varying in relation to the project, priority has been given to joint work with 05 of them, 04 being small rural settlements, and 01 native community, following the assessment criteria described in Section 2.1.8.

The 04 rural settlements are:

- Nuevo Belén.
- Pucallpillo
- Nuevo San Juan

[17] Decreto Supremo N°191-2020 PCM.
[18] Ministerio de la Producción, Industria de la Madera (2015).

- San Antonio de Honoria

And 01 native community belonging to the Shipibo-Konibo indigenous people:
- Nuevo Paraíso

A general description of the social parameters of each of these communities is presented below.

Nuevo Paraiso:

Since before its foundation in 1987, the community maintains their ancestral customs that characterizes them as Shipibo - Konibo and which includes using their language, planting plantain and cassava for self-consumption, using medicinal plants for their cures from the RAO plant (Shipibo language), and handicrafts such as MOCAWAS and KENE learned by their ancestors.

The community is made up of 250 families with an extension area of 17,45.48 hectares and 11,083 as cession in use.

- Education level: 70% men completed high school and only 33% of women.
- Health infrastructure: The native community has a health center cataloged by the Ministry of Health of Peru as a category I-1 health facility without hospitalization, which means that it does not have professionals such as surgeons or to attend emergencies, but only outpatient care and with limited stock of medicines.
- Unsatisfied basic needs: 100% of the population does not have a public network in the house and the water comes from a well that is not necessarily in conditions for human consumption. Water from the streams is also consumed.
  In the case of the use of firewood for their kitchens, 100% of the families use ordinary wood that they collect daily.
- Main economic activity and family income: they identify that their main economic activity is subsistence agriculture, they work approximately 1 hectare per family and their main crops are green plantains and cassava. The average monthly income of the population is less than 990 soles, with 75% located below 500 soles per month.

San Antonio de Honoria

The community is made up of 145 rural families belong to Huánuco region of Perú.

- Education Level: 87% of the population has not been able to complete school studies. 41.7% of women have incomplete primary school.
- Health infrastructure: the populated center has a health center cataloged by the Ministry of Health of Peru as a category I-1 health facility without hospitalization, which means that it does not have professionals such as surgeons or to attend emergencies, but only outpatient care and with limited stock of medicines.
- Unsatisfied basic needs: 25% have water directly in the house through an internal network from an elevated water tank.
  80% of the population uses firewood as the first option for cooking their food due to the economic difficulties to buy gas cylinders in the area.
- Main economic activity and family income: they identify that their main economic activity is agriculture, they work their own land and rent hectares in the area to grow corn, rice, papaya,

cassava, mainly managing farms between 3 to 10 hectares approximately per family and its members. The average monthly income of the population is less than 990 soles, with 75% located below 500 soles per month.

San Juan

The community is made up of 350 rural families belong to Ucayali region of Perú.

- Education Level: 88% of the population has not been able to complete school studies. In the case of women, 29% have not completed primary school.
- Health infrastructure: the populated center has a health center cataloged by the Ministry of Health of Peru as a category I-2 health facility, which means that they have health professionals that may include medical surgeons with or without specialties. However, they continue to lack availability of medicines and doctors do not attend every day.
- Unsatisfied basic needs: 100% water comes from a tank and well that is not suitable for human consumption without treatment.
  Almost all (100%) of the population uses firewood as the first option for cooking their food due to the economic difficulties to buy gas cylinders in the area.
- Main economic activity and family income: they identify that their main economic activity is agriculture, they work their own land and rent hectares in the area to grow corn, plantain, and cassava, mainly managing farms between 3 to 8 hectares approximately per family. The average monthly income of the population is less than 990 soles, with 85% located below 500 soles per month.

Belen

The community is made up of 145 rural families belong to Ucayali region of Perú.

- Education Level: 70% have not been able to complete their high school studies. In the case of women, more than 90% have not been able to complete their school studies and 29% of this group does not even manage to complete the primary level.
- Health infrastructure: it does not have a health facility.
- Unsatisfied basic needs: 100% of the population does not have water supply and drainage. 100% of the population uses firewood as the first option for cooking their food due to the economic difficulties to buy gas cylinders in the area.
- Main economic activity and family income: they identify that their main economic activity is agriculture, they work their own land and rent hectares in the area to grow rice, cassava and corn mainly managing farms between 3 to 8 hectares approximately per family. The average monthly income of the population is less than 990 soles, with 85% located below 500 soles per month.

Pucallpillo

The community is made up of about 100 rural families in the Ucayali region.

- Education Level: 50% of the population has completed school studies and 37% only have complete primary school studies.
- Health infrastructure: the populated center has a health center cataloged by the Ministry of Health of Peru as a category I-1 health facility without hospitalization, which means that it

does not have professionals such as surgeons or to attend emergencies, but only outpatient care and with limited stock of medicines.

- Unsatisfied basic needs: 100% of the population does not have water supply and drainage. The population uses firewood as the first option for cooking their food due to the economic difficulties to buy gas cylinders in the area.
- Main economic activity and family income: they identify that their main economic activity is agriculture, mainly in flood-prone areas to grow camu camu and watermelon, which are the main products they work for sale. The average monthly income of the population is less than 990 soles and an average of 550 soles per month.

2.1.7 Project Zone Map (G1.4-7, G1.13, CM1.2, B1.2)

The project zone is composed by the two company properties where the project activities will be implemented: Selva Maestra and Nuestro Señor Jesucristo[19]. In Figure 2.1 and Table 2.2 are presented the location and properties vertices, respectively. Both properties belong to the owners (see Section 2.1.3 y 2.1.4) that are established in the respective adjudication and purchase and sale contracts granted by the State, represented by the Regional Directorate of Agriculture of Ucayali, and the other documents and records that they recognize the rights of said properties.

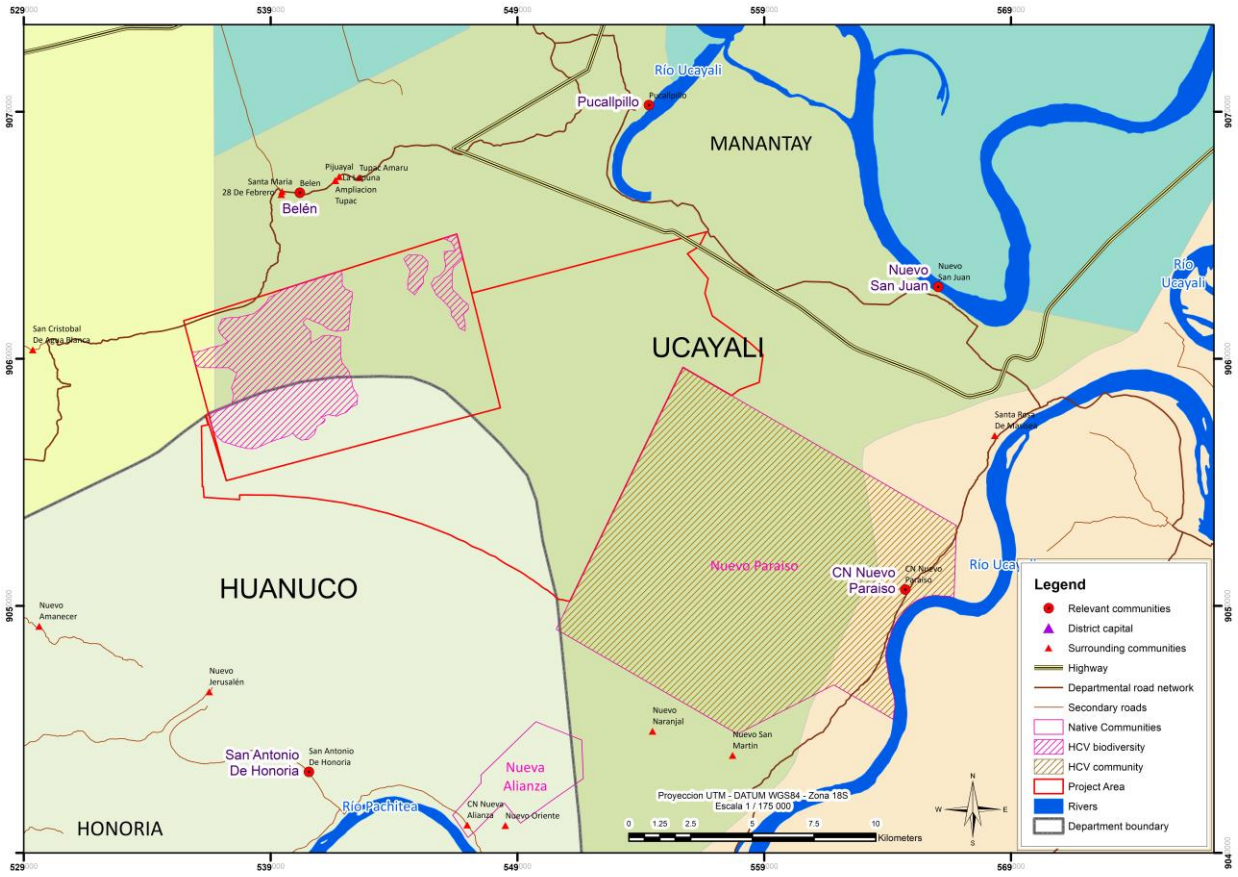
An indirect area of influence is the geographical space around the project area limits, in which population settlements and areas where the inhabitants develop mainly agricultural and livestock production activities are located. In Figure 2.5 the location of the relevant communities and other settlements nearby the project area can be seen.

The project activities related to community development will be targeted to those 5 communities (and others that may choose to establish relationship with the project) to generate benefits in social and productive aspects, as a strategy to meet the project's goals. As such, good neighborly relations will be sought for reaching agreements aimed at territorial security to curb the threats of deforestation and forest degradation, consolidate forest surveillance committees, mitigate illegal logging activities, promote good agricultural practices, and develop capacities in authorities and community leaders to manage works for the improvement and/or expansion of basic social services, so that these communities have better access to them.

Furthermore, high conservation value (HCV) areas have been identified within the PA. The Native Community Nuevo Paraiso is considered one because of the ancestral relation that this Shipibo-Conibo group has with its land, just next to the project area. On the biodiversity side, the floodplain forests inside the project area are also considered as an HCV area, because it is a key habitat for many flora and fauna species, and it is deemed as a fragile ecosystem by the national forestry authority.

[19] The project area equals the project zone as no leakage area is needed per the methodological module VMD0009.

Figure 2.5. Relevant communities within the indirect influence area of the project and HCVs



Source: Inhouse elaboration.

The areas outside the project zone would not be negatively impacted, on the contrary, the project seeks to protect the forests within the project area while contributing to create better conditions for the surrounding communities and promoting the conservation of the remaining natural ecosystems around.

2.1.8 Stakeholder Identification (G1.5)

It is important to note that there are no communities or community groups located within the project area.

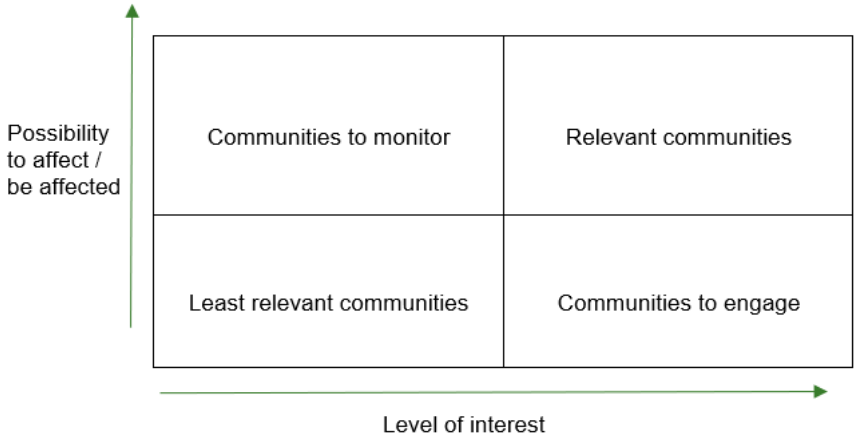
Due to the size of the project, its location (only 45 minutes from the capital of Ucayali) and the number of towns, urbanizations, and settlements in the surrounding area, it is necessary to prioritize the group of project stakeholders following an assertive evaluation process to identify the most relevant groups. This is a dynamic process that will evolve throughout the project.

In this regard, for the project stakeholder identification assessment, all communities or settlements were analyzed through a 2-step process using field data, technologies such as GIS and secondary sources to enable the identification of the most relevant groups.

- Geographical analysis: the proximity of the communities to the project, accesses, population density, socioeconomic dynamics, and the allocation of rights and tenure.
- Stakeholder assessment matrix: a matrix is developed considering two more criteria. The level of interest on the project´s objectives, benefits, and activities in relation to their interests and needs, and the possibility to affect/or be affected by the project´s activities.

Local communities assessed during the identification process can be differentiated by small rural settlements (caseríos) and native communities of indigenous people, both located in the surroundings of the project area. Small rural settlements may also have "annexes" which are expansion of their territories or new settlements, in most of the cases informal or in process of formalization. Although none of these communities derive income directly or formally from the project area, their livelihoods are benefited indirectly by it through the ecosystem services provided.

Figure 2.6. Stakeholder assessment matrix



The communities identified as a result of this analysis and described in section 2.1.9, are considered as the basis for the community monitoring plan, which aims to measure the impact of the project in this aspect over the years.

Other stakeholders, besides communities, such as authorities, national and regional institutions or organizations are also identified as potential (indirect) groups for the implementation of project activities and the achievement of project objectives. These groups are considered according to their level of influence in the project area and objectives.

2.1.9 Stakeholder Descriptions (G1.6, G1.13)

Table 2.3. The Last Habitat REDD+ Project Stakeholder Descriptions

Relevant Stakeholder	Description, interests, and relevance to the project
Nuevo Belén	Nuevo Belén is one of the main rural settlements by the upper limit of the project area, around the km 15 of the Federico Basadre Highway. It is linked to other settlements in the area such as Ampliación Belén, La Lupuna, Túpac and Ampliación Túpac by family members, economic activities and interests,

Relevant Stakeholder	Description, interests, and relevance to the project
	and cultural practices. Their main activity is the production of rice and yuca. Nuevo Belen is relevant to the project because the agricultural and urban frontier in this area is expanding towards the project area, promoted by actors that live in Nuevo Belen or near. Some actors related to this settlement have been linked to illegal timber activities and forms of land trafficking. Nonetheless, current authorities have manifested their interest in working hand in hand with the project to improve the livelihoods and well-being of the community.
Pucallpillo	This rural settlement is in a flood zone, 45 minutes from the city of Pucallpa, next to the Ucayali River, by the northwestern border of the project. Pucallpillo has annexes were some of its inhabitants have family members or also possess land to carry out agricultural activities. Their only access during winter is through navigable waterway. Families' main activity is the production of camu camu, in most of the cases in lands that they don´t own but have temporal authorizations by the regional authority. The community is interested in improving their incomes by the organic certification of the camu camu or fruit pulping. Improving access to the community is also an important interest for the transport of their products and the access to health and education services. Pucallpillo is relevant to the project because during winter this sector of the river is used in favor of illegal login and other activities that can impact the forest, making it an important sector for the surveillance and control actions.
San Antonio de Honoria	San Antonio de Honoria is located by the southern border of the project area, in the banks of the Ucayali and Pachitea rivers. It is the main rural settlement in the district of Honoria (Huánuco) having smaller settlements annexed to its territory such as Jerico and Jerusalen. The principal activities developed are the production of rice, corn, cocoa, papaya, and livestock to a lesser degree. This sector is difficult to access because of the distance and the poor conditions of the roads that are constantly affected by the weather. In addition, being located on the border between two regions (Ucayali and Huánuco), makes them suffer from delays in the supply of medicines from the regional authorities and other basic services, as well as mismanagements in the issuance of authorizations for change in land use and invasions that could mean a risk to the project area, making it a relevant sector and stakeholder for the project.
Native Community Nuevo Paraíso	Nuevo Paraiso is a Shipibo-konibo native community located to the southwest of the project. They are recognized by national authorities and have the rights to their ancestral land and territory, as well as other rights in favor of indigenous people recognized on the constitution and international agreements supported by Peru. As a native community they look forward to preserving their land, language and improving their well-being and livelihoods, based on the production of bananas and other agricultural activities. Although the population center is far away from the project area, their territory is extensive and limits a great part of the southwestern border of the project, making them a great ally to protect the forests of both territories.
Nuevo San Juan	Nuevo San Juan is an important settlement to the west of the project on the bank of the Ucayali River. Historically many of its inhabitants have been involved in timber extraction and agriculture, mainly yuca, banana and other crops. The agricultural frontier in this area is expanding in the direction of the

Relevant Stakeholder	Description, interests, and relevance to the project
	project and is a frequent area where fire alerts are reported. This sector is of key relevance for the project, especially during summer.
Other stakeholders	**Description, interests, and relevance to the project**
Regional Government of Ucayali - GOREU	**The Regional Forestry and Wildlife Management** GERFFS (Regional Ordinance No. 003-2019-GRU-CR), is the line organ dependent on the Regional General Management, in charge to define policies, organize, direct, control, monitor, regulate and exercise functions in matters of forest resources and wildlife, within the framework of current regulations within the scope of the department of Ucayali. It has two-line Organic Units: deputy management of forestry and wildlife management and use, and the deputy management of inspection, supervision, forestry and wildlife control. **The Regional Environmental Authority of Ucayali** (ARAU) as a body dependent on the Regional General Management, is in charge of consolidating, planning and exercising authority in environmental matters, territorial planning, and sustainable management of renewable natural resources within the regional scope in charge of a regional manager, appointed by the regional president. The ARAU is in charge at the regional level of planning, managing, administering, controlling, and inspecting land use planning, sustainable management and conservation of renewable natural resources, biodiversity, and the environment. **The Regional Sectoral Directorate of Agriculture DRAU** of the GOREU is the body responsible for directing, guiding, coordinating, executing, supervising, controlling, and evaluating the different agricultural production activities within its jurisdiction. Among the functions exercised by the DRAU are: formulate, approve, execute, evaluate, direct, control and administer the plans and policies of the region in agrarian matters in accordance with the National policies and the Sectoral plans and the promotional proposals of rural development of part of the Rural Municipalities; promote and provide Technical Assistance services in Agricultural Health; promote research and technology transfer and agricultural extension; promote, manage and administer the process of physical-legal reorganization of agrarian property; comply with and enforce the regulations regarding natural resources inherent to the competence of the agricultural activity; promote activities that facilitate the organization of agricultural producers for the development of the productive chain of the most significant products in the Regional, National and International markets. Through national programs and projects, they provide training to producers in the production chains of bananas, pineapples, among other crops, keeping the register of agricultural producers to improve the services provided to them. It also leads the Regional Technical Table of Productive Chains of prioritized crops in the region, a space for dialogue and agreement between agricultural producers and competent institutions. These entities are relevant to the project because they help to strengthen the activities that aim to protect the forest, wildlife, and promote the sustainable management of natural resources by the neighboring populations while

Relevant Stakeholder	Description, interests, and relevance to the project
	improving their well-being and helping to reduce the deforestation pressure in the project are
Public Ministry – Specialized Prosecutor for Environmental Matters FEMA	FEMA is the prosecutor's office in charge of preventing and directing the investigation of environmental crimes. Exercises interdiction actions: special confiscation, destruction, and reduction of the commercial value of the objects on which the crime falls and/or the instruments of the crime linked to illegal logging and related activities. It is the body in charge of presenting and sustaining criminal cases before the competent judge, with the aim of determining the levels of responsibility of the accused. The FEMA is one of key stakeholder to carry out the joint interventions proposed by the project to stop deforestation threats and other environmental crimes in the project area.
National Forest and Wildlife Service - SERFOR	SERFOR is a specialized technical public body, with legal status under internal public law and as a budget statement attached to the Ministry of Agrarian Development and Irrigation - MIDAGRI, and its function is to plan, supervise, execute, support, and control the National Forest Policy and of Wild Fauna. It is the governing body of the National Forestry and Wildlife System SINAFOR and is constituted as the normative technical authority at the national level, in charge of dictating the norms and establishing the procedures related to its field. SERFOR is relevant to the project it´s an institution that supports the strengthening of capacities in the field of wild flora and fauna; advising and accompanying the control actions; coordinate and direct actions of dissemination, awareness or transfer of capacities related to forest and wildlife resources, acting jointly with the regional authorities.

2.1.10 Sectoral Scope and Project Type

The project falls within VCS sectoral scope 14: Agriculture, Forestry and other Land Uses (AFOLU). It is in the category of Reduced Emissions from Deforestation and Degradation (REDD), more specifically, in the Avoiding Planned Deforestation and/or Degradation (APDD) project type.

The project seeks to conserve the forest ecosystem and carbon stocks of an area where land use change was planned for implementing an agro-industrial exploitation project that considered the establishment of camu camu (*Myrciaria dubia*), oil palm (*Elaeis guineensis*), castor oil plant (*Ricinus communis*) and pastures for livestock.

The activities in these areas will be oriented mainly to the management and conservation of biodiversity, complemented with strategic actions that reduce external threats of deforestation and degradation.

This is a grouped project as other areas within the same regions (Ucayali and Huanuco) could join the project after validation.

2.1.11 Project Activities and Theory of Change (G1.8)

Table 2.4. The Last Habitat REDD+ Project activities and Theory of Change

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs	Outcomes	Impacts	
	(Short term)	(Medium term)	(Long term)	
CLIMATE				
Implement a holistic monitoring, control, and surveillance system (MCSS) to address deforestation threats within the project zone.	A satellite system is implemented by using of geospatial data (GIS) to identify deforestation threats within the project area.	An early warning system is implemented: detect hot spots (fire alerts) using spatial data (e.g. GEOBOSQUES) to identify risks within the project area in a timely manner, duly activating control mechanisms according to the established protocol.	Deforestation and degradation within the project area is avoided. Conservation of flora and fauna in the project area is strengthened.	Reduce GHG emissions caused by deforestation and degradation.
	A territorial security system/protocol is implemented to efficiently identify, monitor, and address threats of deforestation and / or degradation within the project area.	At least 04 control camps are implemented for the permanent surveillance of key and vulnerable areas. Project boundaries and signs are clear and well maintained. Permanent and timely patrols are carried out within the Project area, following the established protocol. Joint interventions with corresponding authorities are carried out when necessary to stop deforestation threats and other environmental crimes. Collaborative actions with community organizations are carried out to avoid deforestation and other environmental crimes.		

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs	Outcomes	Impacts	
	(Short term)	(Medium term)	(Long term)	
Provide training to project stakeholders (neighboring communities) in sustainable forest management and other related topics.	Training workshops for neighbouring communities are carried out in topics such as forest fires prevention and control, wildlife conservation, forest management, among others. Workshops may be carried out in collaboration with authorities and/or other organizations.	At least 01 training campaign is implemented every year for the prevention of wildfires, wildlife conservation, sustainable forest activities.	Communities have better skills and knowledge to adequately manage the forest, promoting its conservation and biodiversity protection.	Reduce GHG emissions caused by deforestation and degradation
Develop communication strategies around forest conservation and sustainable management, promoting the well-being and development of the community in harmony with the environment.	Communication efforts around conservation and project activities and objectives are carried out through channels such as flyers, summaries, posters, radio announcements and others. Promote participation in events and activities organized by regional authorities that promote conservation and environmental awareness.	At least 01 awareness rising initiative is developed every year by the Project to promote forest and biodiversity conservation. At least 01 event or activity promoted by regional environmental authorities is supported by the Project every year.	Stakeholders are more committed to ecosystem conservation and sustainable development in the region.	Reduce GHG emissions caused by deforestation and degradation
COMMUNITY				
Contribute to the well-being of the identified communities (stakeholders) improving their access to basic services,	Projects or activities that contribute to having a better access to basic services (health, water, etc.) and education are implemented in accordance with the communities' prioritized needs.	At least 01 project or activity to improve the access to basic services/education is implemented every year, benefiting at least 1 identified community (stakeholder).	Identified communities in the surroundings of the project increase their access to basic services and education.	Contribute to the well- being of the identified communities in the surroundings of the Project by improving

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs	Outcomes	Impacts	
	(Short term)	(Medium term)	(Long term)	
education, and other socio-cultural needs.	Initiatives that address socio-cultural needs are implemented in accordance with the communities' prioritized needs.	At least 01 activity that responds to local socio-cultural needs is implemented every year, benefiting at least 01 identified community.	Identified communities in the surroundings of the Project strengthen their social relations and general well-being.	their access to basic services, and sustainable productive activities.
Develop sustainable productive activities/projects that favor the economic capacity and productive skills of the communities surrounding the project, reducing pressure on the forest.	Productive economic and/or productive capacity improvement projects that promote better and sustainable management of forest resources are implemented. In topics such as but not limited to: e.g. agroforestry systems, reforestation, sustainable non-timber production, etc. The development of these initiatives might be carried out in collaboration with specialized organizations to increase and ensure their impact and efficiency.	At least 01 productive activity/project is implemented every year, benefiting the economic capacity / productive skills of the participants of at least 01 identified community.	Identified communities in the surroundings of the Project strengthen their economic capacity and sustainable productive skills through sustainable activities.	
BIODIVERSITY				
Implement a Science Program to permanently evaluate and monitor biodiversity (flora, fauna) within the Project area.	Field expeditions are conducted within the framework of BAM's Science Program. The expeditions may be carried out in collaboration with other organizations (e.g., renowned scientific institutions).	At least biannual reports of the flora and fauna species that inhabit the project's forests are developed to monitor biodiversity within the project, permitting the implementation on specific conservation measures if required.	Monitoring and conservation of biodiversity in the Project area is strengthened.	Guarantee and maintain the integrity of biological diversity and ecological processes + services in the Project Area.

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs	Outcomes	Impacts	
	(Short term)	(Medium term)	(Long term)	
Promote biodiversity conservation and prevention on wildlife crimes through communication efforts and training events for project stakeholders.	Awareness-rising initiatives are implemented on the importance of biodiversity in the project area and how to deal with potential threats on the matter. These initiatives may be carried out in collaboration with other organizations and / or local authorities.	At least 01 awareness-raising initiatives is implemented every year regarding biodiversity conservation through radio, photographic exhibitions, fairs, television spots, etc.	The awareness and value of the biodiversity found the Project area increases among project stakeholders.	

2.1.12 Sustainable Development

The sustainable development priorities established in Peru are described and evaluated in the State Policies, which define the general guidelines of the State's action in the long term to achieve the welfare and sustainable development of the country. The 35 existing State Policies were established within the framework of the National Agreement Forum , of which N°19 is focused on sustainable development and environmental management. With this policy, the State undertakes to "… integrate the national environmental policy with economic, social, cultural, and territorial planning policies, to help overcome poverty and achieve sustainable development in Peru." It also commits to "… institutionalize public and private environmental management to protect biological diversity, facilitate the sustainable use of natural resources, ensure environmental protection, and promote sustainable population centers and cities, which will help improve the quality of life, especially for the most vulnerable population in the country" .

The State Policies are the guiding principles in the development and updating of national and sectoral policies, starting from the National Development Strategic Plan (PEDN) to the regional and local plans. Regarding the first, it was recently updated to reflect the vision of national development by 2050. There, National Objectives (ON) which contain Strategic Objectives (OS) and Strategic Actions (AE) are defined for targeting in a more specific way the national priorities.

The following table was prepared in order to represent how the activities proposed by the project intertwine with the main objectives of the PEDN (national level) and these in turn with the UN Sustainable Development Goals (global level) to give an understanding of the vision of the project.

Table 2.5. Contribution of The Last Habitat REDD+ project to sustainable development

National Development Strategic Plan (PEDN)			Sustainable Development Goals (SDG)		Activity Description
ON 2. Manage the territory sustainably in order to prevent and reduce the risks and threats that affect people and their livelihoods, with the intensive use of knowledge and communications, recognizing geographic and cultural diversity, in a context of climate change.	**OE 2.1.** Manage the territory with a strategic and comprehensive national vision at all levels, in such a way that it promotes the use and occupation of the territory, and the management of natural resources in an adequate and sustainable manner for human development.	**AE 2.1.6** Promote the development of sustainable productive activities based on biodiversity and ecosystem services.		**13.3** Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	The project will promote and facilitate the training of neighboring communities through the social an technical area in topics related to sustainable forest management, forest fire prevention and control, wildlife conservation and others. The objective is to provide communities with the appropriate tools to adequately manage their forests allowing the conservation and protection of biodiversity.
	OE 2.4. Ensure the sustainability of ecosystem services, through the integrated management of natural resources and ecosystems.	**AE 2.4.1**. Improve the provision of ecosystem services by implementing actions for the conservation, protection and recovery of ecosystems in order to recover their capacity to produce goods and services for the benefit of the population.		**15.1** By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements. **15.2** By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. **15.4** By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development. **15.5** Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species. **15.7** Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products. **15.9** By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	The project will promote awareness campaigns with skateholders on the importance of biodiversity conservation and possible wildlife crime. In addition, it will promote the diversification of sustainable productive activities for a better use of the land in nearby communities such as agroforestry systems, reforestation of degraded areas, management of non-timber products, etc. These activities will allow the efficient use of the land and will reduce the pressure on the forests, thus reducing GHG emissions to the atmosphere. At the same time, the project will carry out constant monitoring of the project area to identify potential deforestation threats that will assist in the implementation of an early warning system.
	OE 2.6. Ensure high levels of environmental quality in the country, through proper management of solid waste, soil, air and wastewater, as well as strict control and environmental governance.	**AE 2.6.4.** Reduce the emission of greenhouse gases in all economic activities, through actions that address climate change.			
	OE 2.7. Increase the resilience and adaptation of the population and their livelihoods to climate change with an emphasis on moving towards a low carbon economy and intelligent monitoring of geological, hydroclimatic and glaciological phenomena and planning.	**AE 2.7.4.** Achieve low levels of greenhouse gas (GHG) emissions in the country, in compliance with the Nationally Determined Contributions (NDC), its implementation strategy and its intelligent monitoring mechanisms.			
ON 3. Raise the levels of competitiveness and productivity with decent employment and based on the sustainable use of resources, human capital, the intensive use of science and technology, and the digital transformation of the country.	**OE 3.3.** Raise the levels of competitiveness and productivity of the economic sectors, based on productive diversification, generation of added value and technological innovation within all productive sectors, within the framework of a green and low-carbon economy and with the use of emerging technologies.	**AE 3.3.3.** Improve the commercial and productive capacities of agricultural producers, with emphasis on the adoption of good agricultural practices and the vertical integration of family and business agriculture, under the territorial and value chain approach that promotes food and nutrition security.		**8.2** Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sector.	The project promotes the implementation of sustainable activities in nearby communities to improve and diversify the local economy. These initiatives will empower communities and boost development in the region.
	OE 3.5. Raise the scientific and technological innovation capacity of the country, based on research, creation, adaptation and technological and scientific transfer, and the promotion of the national process of digital transformation; favoring the articulation between the academy, the State, the productive sectors and civil society.	**AE 3.5.1.** Increase the levels of research, development and innovation in the country, that respond to the social and productive challenges of the different territories through sustainable interventions that link academia, universities, the State, business and society.		**1.5** By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.	The project is expected to contribute to the well-being of stakeholders through formal employment and the promotion of sustainable activities. The project will also help to raise awareness of the needs of the surrounding communities with the relevant authorities.
				**17.16** Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries	The project under the Sciencie program contemplates cooperation between public-private and academic entities for research within their forests for which funding is foreseen for long-term research and thesis students. On the other hand, the project contemplates constant dialogue with neighboring communities and local and regional authorities.

Source: Own elaboration, based on the documents approved by the competent institutions.

2.1.13 Implementation Schedule (G1.9)

The project milestones are detailed below, for support refer to “Milestones Evidences” folder.

Table 2.6. Milestones in The Last Habitat REDD+ Project’s development and implementation

Date	Milestone(s) in the project’s development and implementation
19 August 2019	BAM institutionalizes the company's Science Program to assess and monitor the biodiversity of the forests in its areas of influence.
15 November 2019	BAM signs a cooperation agreement with CORBIDI (scientific organization) in the framework of the BAM science program.
17 November 2019	As part of the forestry week, training on conservation and fire control is provided to neighboring communities.
December 2019	The construction of the first security camp in Quinillal begins.
01 January 2020	Project Start Date (start of crediting period).
24 January 2020	Territorial security activities implemented: patrolling and boundary maintenance.
March 2020	A first drone overflight is carried out to collect more details on the conservation status of the forests (monitoring system).
09 March 2020	First Biodiversity Expedition - Quinillal Camp takes place.
02 July 2020	COVID-19 Plan is implemented as a health measure in the context of the global pandemic and a first medical campaign is carried out.
15 September 2020	A new training event on prevention and control of forest fires is carried out.
February 2021	A medical campaign is carried out in the community of Nuevo Belén.
23 February 2021	BAM signs a cooperation agreement with Universidad Nacional Agraria La Molina (UNALM) in the framework of the BAM’s Science Program for the promotion of forest conservation and restoration efforts.
August 2021	First diagnose evaluation of climate, community and biodiversity by Paskay
18 August 2021	12 camera traps are installed within the project area (biodiversity evaluation).
28 April 2022	Contribution to the infrastructure of the educational center of the Túpac Amaru Limón community.
May 2022	Construction of a soccer field in the community of Belen as a socio-cultural space that promotes health and sports for the surrounding communities.
01 July 2022	Daily early warning reports (hot spots) were initiated as part of the monitoring system in the project area.
15 July 2022	BAM signs a cooperation agreement with the community of Pucallpillo.
08 Ago 2022	Contribution to the construction of a communal raft as a means of river transportation that allows the community to increase its income and benefits the surrounding communities.
29 September 2022	Part of the forests protected by BAM are recognized as the Second Private Conservation Area of Ucayali, Peru
August 2022	300 camera traps are installed in collaboration with San Diego Zoo as part of BAM’s Science Program.
09 May 2023	New frog species is discovered in the project area.

Date	Milestone(s) in the project's development and implementation
20 June 2023	VVB validation and verification visit.
2039	End of project crediting period.

2.1.14 Project Start Date

Since the acquisition of the land, the Bosques Amazónicos group has been implementing activities to protect the forests from the growing threats that haunt them. Towards the latter half of 2019, BAM implemented activities that committed to biodiversity monitoring in the area (institution of the Science Program in Aug 2019 and signing of a cooperation agreement with scientific institution CORBIDI in Nov 2019) and activities for the prevention, protection and control of deforestation threats in the project area. The latter specifically refer to training the communities in fire prevention and control in Nov 2019 and the installation of the first control post in Quinillal in Dec 2019 (see Supporting Documents – Milestone Evidences). These milestones support the efforts made by the company to prevent and stop deforestation in the project area and hence GHG reductions as a result of the activities implemented.

For the purpose of efficient monitoring, the official project start date and accreditation period is set as the start date for the year 2020: January 1, 2020.

In the same month, January 2020, the company starts with greater force field monitoring activities such as patrolling and boundary marking of the area, which also reinforce efforts to prevent deforestation and reduce emissions (see Supporting Documents – Milestone Evidences).

2.1.15 Benefits Assessment and Crediting Period (G1.9)

January 1, 2020, to December 31, 2039. The accreditation period is for a period of 20 years and corresponds to the same benefit evaluation period.

2.1.16 Differences in Assessment/Project Crediting Periods (G1.9)

No differences

2.1.17 Estimated GHG Emission Reductions or Removals

Table 2.7. Estimated reductions or removals of GHG emissions for The Last Habitat REDD+ Project

Year	Estimated GHG emission reductions or removals (tCO_2e)
2020	665,924
2021	704,482
2022	527,635
2023	1,738,537
2024	1,844,099
2025	1,949,661
2026	2,055,223

Year	Estimated GHG emission reductions or removals (tCO_2e)
2027	753,523
2028	764,910
2029	776,296
2030	760,350
2031	668,071
2032	503,967
2033	434,067
2034	364,166
2035	294,266
2036	224,365
2037	213,875
2038	203,384
2039	192,894
Total estimated ERs	15,639,703
Total number of crediting years	20
Average annual ERs	781,985

2.1.18 Risks to the Project (G1.10)

Table 2.8. The Last Habitat REDD+ Project potential risks

Identify Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
Uncontrolled burning	Prolonged drought events during periods or days of continuous low or no rainfall contribute to the spread of forest fires that originate at that time of year (June to September) when farmers take the opportunity to open their farms (slash and clear, burn forests, low secondary vegetation, pastures) and cannot control the burning (which spreads with the help of climatic events such as strong winds and high ambient temperatures). In 2021, in the department of Ucayali, a total of 234 forest fires were reported, identifying 7,488.6 hectares affected, with the district of Manantay (where the project area is located) being the most affected with 2,637.6 hectares (35%), and the month of August, the month with the highest occurrence of forest fires. https://www.facebook.com/permalink.php?story_fbid=359532442870227&id=100064404236894	▪ Monitoring Control and Surveillance System (MCSS): the project's MCSS includes an early warning system to identify hot spots on a daily basis in the area of influence. These alerts are reported using official satellite data such as that provided by GEOBOSQUES (MINAM). Prior to the start of the forest fire season, priority areas are identified where uncontrolled burning frequently occurs as a result of the opening of farms. The territorial security system involving permanent patrols focuses on these priority areas during the fire season. ▪ Area demarcation: project boundaries and signs are clear and well maintained in order to favor better monitoring and control of the forests. ▪ Training at community-level is key in the attempt to prevent the negative impacts of burning. As part of the training provided by the project, the aim is to train the identified communities in sustainable forest management, including how to react to possible fires. As part of the training events, the project seeks to work with experts and competent authorities in each specific area.

Identify Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
		For example, in the area of fire control, we will seek to work with INDECI (Institute of Civil Defense).
Illegal logging / timber extraction	There are groups of organized settlers that come mainly from neighboring communities and are sometimes financed by timber "habilitadoras" to extract (illegally) timber from the forests in the area of influence. The increase in illegal timber extraction is fueled by the lack of alternative livelihoods in harmony with the environment.	▪ Monitoring Control and Surveillance System: the project proposes a monitoring, control and surveillance system based on spatial analysis of the area (satellite monitoring), as well as technical and legal support for the correct identification and control of deforestation threats in the project area. ▪ Collaboration agreements: the project seeks to collaborate with local and national authorities to strengthen the capacity to prevent or mitigate possible invasions for illegal logging and timber extraction activities. ▪ Area demarcation: project boundaries and signs are clear and well maintained in order to favor better monitoring and control of the forests. ▪ Promotion of sustainable activities related to the conservation and sustainable use of forest resources: the project proposes to promote the development of environmentally friendly activities among project stakeholders (identified communities)
Non-timber products extraction	The same applies to non-timber products: residents of the surrounding areas pose a risk as they can enter the project area without the corresponding authorization to harvest the fruits of the aguaje palm trees (Mauritia flexuosa), ecosystems that mainly dominate the JCC property and the Selva Maestra.	▪ Area demarcation: project boundaries and signs are clear and well maintained in order to favor better monitoring and control of the forests. ▪ Promotion of sustainable activities related to the conservation and sustainable use of forest resources: the project proposes to promote the development of environmentally friendly activities among project stakeholders (identified communities).
Land invasion	The demand for access to forested land to grow agricultural crops is high in an area characterized by limited land availability. This is further enhanced by the wave of migrants from other areas or regions in search of new land for the development of subsistence activities that include land use change. The invasion is often supported by the interests of groups of land traffickers.	▪ Monitoring Control and Surveillance System: the project proposes a monitoring, control and surveillance system based on spatial analysis of the area (satellite monitoring), as well as technical and legal support for the correct identification and control of deforestation threats in the project area. ▪ Collaboration agreements: the project seeks to collaborate with local and national authorities to strengthen the capacity to prevent or mitigate possible invasions to the area. ▪ Area demarcation: project boundaries and signs are clear and well maintained in order to favor better monitoring and control of the forests.

Identify Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
		▪ Promotion of sustainable activities related to the conservation and sustainable use of forest resources: the project promotes the development of environmentally friendly activities among project stakeholders (identified communities) to lower the pressure on the forest. ▪ The project also seeks the improvement of the communities identified in relation to access to basic services such as water, health, electricity and others in order to avoid their displacement to the project area.
Expansion of the agricultural frontier in the surroundings of the project area	The inhabitants of the settlements around the project area who practice migratory slash-and-burn agriculture, as well as the mobilization of migrant population groups that settle around the project area, become drivers of unplanned deforestation in an effort to find and access to new lands with forest cover, developing extensive agricultural activities, applying unsustainable practices to the detriment of forests (primary, residual, secondary), expanding and advancing the agricultural frontier in the vicinity of the limits of the BAM properties which puts at risk the forested areas within the properties,	▪ Monitoring Control and Surveillance System: the project proposes a monitoring, control and surveillance system based on spatial analysis of the area (satellite monitoring), as well as technical and legal support for the correct identification and control of deforestation threats in the project area. ▪ Area demarcation: project boundaries and signs are clear and well maintained in order to favor better monitoring and control of the forests. ▪ Promotion of sustainable activities related to the conservation and sustainable use of forest resources: the project promotes the development of environmentally friendly activities among project stakeholders (identified communities) to lower the pressure on the forest.
Climatic events of precipitation and extreme “droughts”	Both events represent a potential risk for access to the project area since, if prolonged, they could affect the proper implementation of previously planned activities and thus hinder the achievement of the outputs intended to generate benefits for the climate, biodiversity and communities. Seasons of low rainfall (June to September): relatively easy to enter the project area and its surroundings with vehicles and walking through trails or roads which facilitates entry to develop community relations activities in the surrounding area and monitoring within the project area. There are flood-prone sites, which are difficult to access (on foot or by boat) due to muddy terrain with a lot of mud or streams and streams with low flow, which does not allow going beyond certain sites.	▪ Adequate planning of activities, taking possible climate risks into consideration. ▪ Acquisition of proper means of transportation (4x4 truck, farm motorcycles, small boat) ▪ Optimal implementation of the territorial protocol to safeguard the wellbeing of the project team in charge of implementing the monitoring activities (see file Health and Safety of working condition)

Identify Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
	In times of high rainfall, it is no longer possible to enter the temporary flooding areas with vehicles considering that a large part of the project area is floodable. Access is facilitated by using the hydrographic network by means of small boats to cover large areas of the project area and develop certain specific activities.	

2.1.19 Benefit Permanence (G1.11)

The project seeks to generate long-term development in relation to the conservation and sustainable management of the forest: the project seeks to promote sustainable activities that benefit the economic situation and living conditions of the surrounding communities, providing them with sustainable livelihood alternatives in order to take pressure off the forest and its resources (i.e. to stop resorting to activities such as illegal logging or change of use for subsistence activities). Furthermore, the project seeks to promote access to basic services for the surrounding communities, so that they can, to the extent possible, adequately live in a given area, so that they do not need to migrate to other areas, which may imply a change of use and further deforestation. The project also seeks to generate positive changes in habits and provide the community with more tools through training in conservation and sustainable production practices. This impact and increase in knowledge and resources is expected to change the behavior of the community and its relationship with the environment in the long term (beyond the life of the project).

In relation to biodiversity, the project seeks to generate scientific knowledge about the biological diversity found in the project area, in collaboration with various universities and prestigious international organizations, so that this knowledge goes beyond the limits of the project and becomes public information for the benefit of society and the protection of the environment. The project seeks especially to generate knowledge and awareness in relation to rare species or species with some degree of vulnerability, in order to reinforce the urgency of protecting these areas among the scientific community, the authorities and the community in general.

It is worth noting that the project has achieved Private Conservation Area status for the JCC property for a period of 40 years, which provides additional protection status for the area in relation to the REDD+ project's crediting period, demonstrating the project developer's commitment to the conservation of the area.

↑ Community development + sustainable forest management ➔ ↓ Deforestation rate ➔ ↑ Biodiversity conservation

(Community benefit) / (Climate benefit) / (Biodiversity benefit)

2.1.20 Financial Sustainability (G1.12)

With respect to the financial flow of the project (See supporting documents - Financial Sustainability file – Financial Analysis) it is important to consider that:

- The opportunity cost, which refers to the value of the land, is supported on BAM's financial statements (See supporting documents - Financial Sustainability file – Land Valuation).
- The average carbon credit price is based on the last sales achieved by the company for carbon credits generated in similar projects (See supporting documents - Financial Sustainability file – VCUs Sales 2019 to 2023).
- Direct project costs are based on the budget developed by the company based on its experience in managing the budget of other similar conservation projects of the company. (See supporting documents - Financial Sustainability file – Project Budget)

All of this supports a real and healthy financial flow, which allows for the generation of revenues from carbon credit sales to cover the activities necessary for the project to meet its climate, community, and biodiversity objectives.

In addition, it is worth highlighting the financial health of the company as follows:

- Real assets: BAM has a private property of 24,544 hectares in Ucayali, Peru, and a forest plantation (biological asset) of +1,200 hectares which backs its operations as real assets (See supporting documents - Financial Sustainability file – Financial Statements).
- Short-term income streams: By selling carbon credits in an increasingly consolidated market, the company expects to have sufficient revenues to ensure financial sustainability to implement activities to meet project objectives. Throughout its years of operation, BAM has consolidated a portfolio of clients that includes the most important actors in the market, achieving an important positioning worldwide. A list of the clients that have purchased carbon credits generated by the Project and examples of the latest transactions will be shared with the auditor. (See supporting documents - Financial Sustainability file – VCUs Sales 2019 to 2023).
- Long-term flows: BAM manages a commercial plantation for more than 12 years, which has begun to be sustainably harvest. The commercial species of the BAM plantation, mainly marupa and shihuahuaco, are forest species with an excellent market price, which ensures an additional revenue stream for the company. (See supporting documents - Financial Sustainability file – Financial Statements).
- Capital Markets: BAM is the first forestry company in Peru to enter the Lima Stock Exchange, successfully placing thematic debt instruments (green/sustainable) in the market. In 2021 alone, BAM placed around US$ 17 million in the capital market, fulfilling all its financial responsibilities, and maintaining an excellent relationship with its investors. Likewise, BAM is the first company in LATAM to certify a green debt instrument under the Climate Bonds Standard of the Climate Bonds Initiative (CBI). The company and its financial health are supervised by the Superintendence of the Securities Market, a decentralized public body attached to Peru's Ministry of Economy and Finance. (See supporting documents - Financial Sustainability file – Financial Statements and Annual Report).

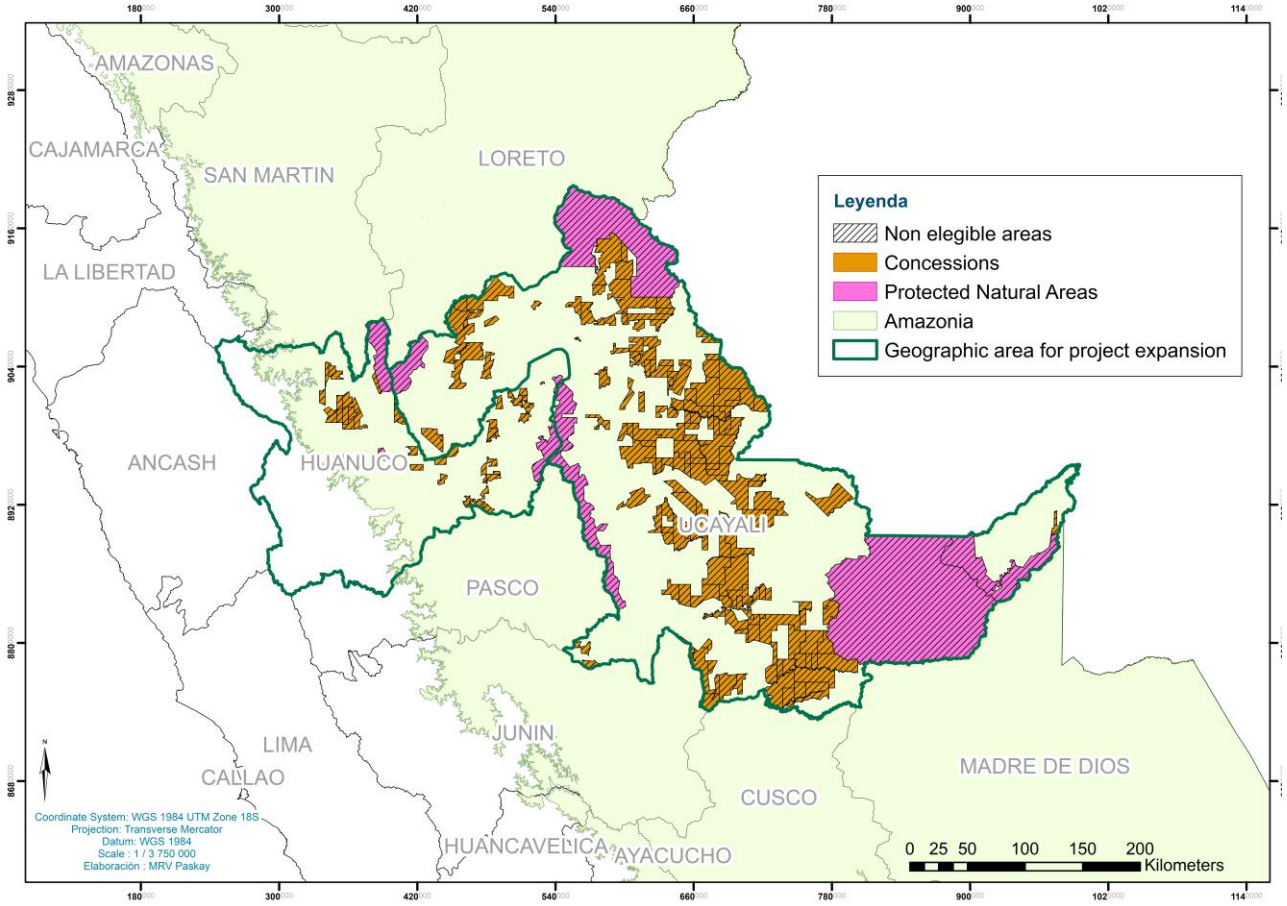
2.1.21 Grouped Projects

This is a grouped project. The geographic area where potential new project instances will be found are the regions of Ucayali and Huánuco, which are the same regions where the initial project area is located. Within these regions, landholders with legal permissions for land cover change that want to

join the project will be considered, provided that the following eligibility criteria described in Section 2.1.21.1) is met.

Within these two regions, forestry concessions of any type (timber extraction, non-wood products, ecotourism, and conservation) or natural protected areas **are not eligible** since forest loss in them is forbidden[20]. Furthermore, **only the Amazonian part of Huánuco could be considered**, to maintain similarities in terms of forest types, biophysical attributes, socio-economic factors, among other factors between the initial and future project activity instances. The boundary and the non-eligible areas are depicted in the following figure.

Figure 2.7. Geographic area for potential new project activity instances



Source: Inhouse elaboration

1) **Eligibility Criteria for Grouped Projects (G1.14)**

Before new project activity instances are incorporated into the project, the eligibility criteria presented next will be assessed and confirmed. Every new instance will have to comply with each and every criterion to be included in the project. The new project activity instances must:

[20] Forestry concessions could change the forest cover of minimal parts of their areas for the development of the infrastructure needed for their management activity.

- Be areas with clear land ownership, preferably with property titles registered in SUNARP and public registries. If the person/organization who manages the new area does not have legal ownership over it, demonstration that prior, free and informed approval of the landowner(s) must be presented. Also, the person/entity with the legal ownership must agree to give the project ownership to the project proponent, before being admitted to the project.
- Possess legal authorization from the competent authorities to change forest cover in part or all of the area over which ownership can be demonstrated.
- Consider only land use change approvals for the development of agricultural activities (agriculture and/or cattle raising).
- Be located within the boundaries of the amazon biome (as established by MINAM) of the Ucayali and Huánuco regions, and not be part of Forestry Concessions or Protected Natural Areas (see Figure 2.7).
- Accept the implementation of the project activities and their periodic monitoring within the new area.
- Comply with the standards' requirements and the methodological applicability conditions.
- The project implementation does not generate the involuntary displacement of populations with rights to land/resources.
- Have conditions that determine the additionality similar to the ones in the initial project activity instance.
- Not be included in other GHG accreditation projects nor overlap with the area of another AFOLU registered project.

It is worth noting that the project activities described in this PD are the same as those that will be implemented in future instances of the project.

Also, before the inclusion of new project activity instances, the project will:

- Ensure that the new instances are described to a sufficient detail in the Monitoring Report and an updated project description, so validation and verifications audits can assess the compliance with the eligibility criteria and standard requirements.
- Demonstrate that the project proponent has the ownership of the new project instances since the time of their inclusion to the project.
- Determine start dates for the new project activity instances that are equal or later than the project start date and seek accreditation of results from the start of the verification period where these new instances are added.
- Ensure that the new instances are eligible for crediting since their start date until the end of the project crediting period, and not before or after that.
- Reassess the non-permanence risk each time a new project activity instance is added to the project and stratify the analysis if needed.

The Project Proponent will develop a protocol for managing the inclusion of new project activity instances, where the following will be detailed:

- The responsible area(s) within the company in charge of the review and approval of potential new project activity instances.
- The supporting documents to be requested for review.
- Checklists and/or other formats to be used during the revision process.
- Where and how the supporting information should be stored, to be presented during the audit.

In such a way that compliance with the eligibility criteria is rigorously ensured and duly supported with detailed documentation that allows for review and verification by the external auditor.

2) **Scalability Limits for the Grouped Projects (G1.15)**

The scalability limits are defined by geographic criteria, mainly to the areas of the Amazon biome within the limits of the Ucayali and Huánuco regions. The CCB standard provides guidance for working in communities up to 20km from project area boundaries where communities impact the project area. The project activities have been designed to generate a positive impact on biodiversity in the project area, therefore, outside the limits there would be no negative impacts on biodiversity. However, it must be considered that an over-expansion of the project will lead to requiring greater economic resources and operational capacities, but on the other hand, it has the advantage that there is a whole network of roads and accesses that interconnect with the possible instances to group, which relatively reduces project costs and facilitates operation.

3) Risk Mitigation Approach for Grouped Projects (G1.15)

BAM has more than 17 years of extensive experience in carbon projects validated and verified under the VCS and CCB standards for more than a decade, and in the commercialization of VCUs, which has allowed it to position itself and win awards in the field, product of knowledge, skills and abilities developed by the project management team. Since 2004, BAM has been carrying out a restoration and reforestation program with native species in other of its properties adjacent to the project area, aimed at enriching and recovering secondary forests and soils that have been degraded mainly for livestock activities conducted for decades. These plantations have been certified under the VCS standard. Furthermore, BAM is the first forestry company in Peru to enter the Lima Stock Exchange and place thematic debt instruments (green / sustainable) successfully and fulfilling all its financial responsibilities. In addition, it has strategic partners to take on much greater scalability responsibilities in terms of financing, operational and management capacity, which allows it to handle and manage risks of different magnitudes.

2.2 Without-project Land Use Scenario and Additionality

2.2.1 Land Use Scenarios without the Project (G2.1)

There are 2 alternative land use scenarios:

- Legal land use change for agro-industrial production
  The main agent of planned deforestation is the same owner of the project area, the company Bosques Amazónicos. The company has authorization from the Regional Directorate of Agriculture of Ucayali to develop agricultural activities, that is, to change the use of land with forest cover to other non-forest uses, based on approved plans for the production of oil pam, castor oil plant, camu camu and pastures for cattle raising.

- Continuation of the pre-project land use.
  The area is under threat from producers who develop migratory agriculture in the vicinity of the project area, under an unplanned and planned deforestation approach, characterized by subsistence migratory agriculture with annual crops of rice, corn and other semi-permanent crops

such as banana, and permanent such as cocoa, oil palm, extensive livestock, among others. In addition, there are risks of land invasion, illegal logging (facilitated by a network of roads and various accesses to the project area), and forest fires as a result of the opening of farms.

Summarizing, the risk of deforestation is associated with two drivers: an internal authorized land use change caused by the owner of the land (BAM) or an external non-authorized land use change caused by the neighbors, mostly dedicated to agricultural or cattle ranching activities.

2.2.2 Most-Likely Scenario Justification (G2.1)

The most-likely scenario is the legal land use change for agro-industrial production (Scenario 3 in Section 3.1.5).

Even if the external pressure of deforestation and forest degradation is high, the larger threat in terms of land use conversion speed and potentially affected area is the implementation of the approved agro-industrial activities (see folder PROPERTY RIGHTS EVIDENCE). Here, the total area to be converted (14,507 ha) and the schedule for implementation are stated (for details see Section 3.2.1). Moreover, one condition for adhering to the purchase-sale contract of the properties with the State is the actual implementation of the agricultural plans committed in them, so failure in developing the originally proposed activities may impact the ownership condition.

2.2.3 Community and Biodiversity Additionality (G2.2)

The project proponent has committed to protect the project area forests, instead of developing the authorized land use change for agricultural activities, that, together with the external preassures of deforestation and forest degradation, would impact the natural ecosystems undermining the services that benefit local populations as well as the habitats of flora and fauna species, some of them in endangered categories.

In fact, the project activities have been designed to ensure the forest protection, by means of forest control and surveillance activities, resolution of social conflicts, capacity building for social management and to have sustainable productive options, the application of good agricultural practices compatible with the conservation of forest resources, monitoring of biodiversity through a science program, among others. In the absence of this project, it would not be possible to finance these activities in a permanent and long-term way.

2.2.4 Benefits to be used as Offsets (G2.2)

No climate (as a result of reduced greenhouse gas emissions), community or biodiversity benefits will be used for any other offset project.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

Full project documentation, such as the Project Description Document (PDD), Monitoring Reports (MRs) and others, is available to communities, community leaders and other stakeholders upon

request, who may require such information (formally and informally) through letters, emails or other means of communication such as WhatsApp or personal communication at the project office (open Monday – Friday from 8am to 6pm) or during informative and dialogue meetings. These requests can also be made formally using the established feedback and grievance procedures (see file: Supporting evidence of community section – MAQR).

All project documents are stored in a digital database and print copies will always be available at the project office.

In addition, the corporate website (www.bosques-amazonicos.com) works as a mechanism for internal and external dissemination of corporate governance practices and project documentation, information which is accessible for the public in general.

2.3.2 Dissemination of Summary Project Documents (G3.1)

Summaries of the project documents are disseminated during the informational meetings with communities as part of the constant processes of project diffusion and stakeholder identification. The summaries are designed as flyers, posters, brochures, and power point presentations with an accessible language and friendly designs. These communicational materials are shared with all participants and their representatives during the meetings (see file: Project Diffusion and Dissemination), in many cases leaving print copies in strategic places like the municipalities or the community center.

All summary documents are also available upon request of community leaders and general population through online channels or physical copies at the project office. Online channels include WhatsApp, email, BAM website and/or social media.

2.3.3 Informational Meetings with Stakeholders (G3.1)

Informational meetings with identified communities are carried out prior communication with their community leaders and representatives. A first informative meeting with community leaders and representatives is organized with the purpose to understand their main concerns and interests and to discuss the topics to be later informed and discussed with a wider audience. After this first meeting, the community leaders meet with the rest of the population in a community assembly, where the points of interest are socialized, and a date and time is coordinated for a public meeting with the project representatives to present information about the project. Their leaders or authorities then communicate to the project team the date and time agreed upon in their community assembly for the informational meeting.

During the public meetings in the agreed date, the information is presented using friendly language and formats (see file: Project Diffusion and Dissemination) and time is given for the participants to express their comments, concerns, and interests, which are registered by the project staff to take into consideration for the project activities that involve the communities. In the case of native community of Nuevo Paraiso, which is bilingual (Spanish and their original language, which is Shipibo), can be accompanied by a translator in the native language, so that not only the objective message is provided, but also the comments and questions made by the residents and their representatives are properly received.

Table 2.9. Initial meetings with communities surrounding The Last Habitat REDD+ Project

Date	Communities	Topic
26/02/2018	Agua Blanca	Dialogue meeting to sign cooperation agreement.
09/09/2018	Tierra Roja	Meeting to coordinate forest fires prevention course
04/08/2020	Agua Dulce, Manco Cápac	Informational meeting about REDD+ project and coordination for data collection
05/08/2021	Agua Blanca, Tierra Roja y CP Nueva Esperanza	Informational meeting about REDD+ project and coordination for data collection
06/08/2021	Túpac Amaru Limón, San Cristóbal de Agua Blanca	Informational meeting about REDD+ project and coordination for data collection
07/08/2021	José Olaya, Native Community Nuevo Oriente de Chanjao	Informational meeting about REDD+ project and coordination for data collection Informational meeting about REDD+ project and coordination for data collection
09/08/2021	Native communities Nueva Alianza y Nuevo Paraíso	Informational meeting about REDD+ project and coordination for data collection
10/08/2021	Nuevo Belén, Ampliación Túpac Amaru, La Lupuna de Manantay	Informational meeting about REDD+ project and coordination for data collection
11/08/2021	Nueva Esperanza y La Soledad	Informational meeting about REDD+ project and coordination for data collection
13/08/2021	Native Community Nueva Alianza	Informational meeting about REDD+ project and coordination for data collection
01/11/2021	Native Community Nuevo Paraíso	Dialogue meeting with the director of the community school
02/11/2021	Native Community Nuevo Paraíso	Informational meeting about REDD+ project
19/03/2022	Native Community Nuevo Paraíso	Informational meeting about REDD+ project
26/06/2022	Ampliación Belén	Dialogue meeting for the implementation of a community health center
10/07/2022	Ampliación Belén	Meeting to coordinate activities with authorities
15/07/2022	Pucallpillo	Meeting to coordinate joint work with community patrols
24/07/2022	Ampliación Túpac, Lupuna	Meeting to coordinate the support for rural electrification
11/08/2022	Nuevo Belén	Presentation of local authority
13/08/2022	Ampliación Túpac, Lupuna de Manantay	Meeting to coordinate activities to improve their roads and access
27/08/2022	Ampliación Túpac, Lupuna de Manantay	Meetings to coordinate the support for rural electrification
31/08/2022	Pucallpillo	Meeting to coordinate joint work with community patrols
12/11/2022	Nuevo Amanecer	Informational meeting about REDD+ project
19/11/2022	Pucallpillo	Informational meeting about REDD+ project
20/11/2022	Jerusalén, San Antonio de Honoria	Informational meeting about REDD+ project
27/11/2022	Nuevo San Juan	Informational meeting about REDD+ project
06/12/2022	Native Community Nuevo Paraíso	Informational meeting about REDD+ project

Date	Communities	Topic
10/01/2023	Nuevo Belén	Meetings to coordinate support for the preschool center
23/02/2023	Nuevo Belén	Meeting to coordinate introduction to the new authorities
23/02/2023	San Antonio de Honoria	Meeting for the introduction to the new authorities
24/02/2023	Lupuna de Manantay	Dialogue meeting to plan activities
24/02/2023	Pucallpillo	Dialogue meeting to plan activities
13/04/2023	Pucallpillo	Meeting to coordinate activities to support the camu camu productive chain
13/04/2023	San Antonio de Honoria	Informational meeting about REDD+ project and plan cooperation agreement
15/04/2023	Nuevo Belén	Informational meeting about REDD+ project and plan support for the farina productive chain
07/06/2023	Nuevo Belén	Meeting to coordinate activities to support farina productive chain
07/06/2023	Pucallpillo	Meeting to coordinate activities to support the farina production chain
02/06/2023	Lupuna de Manantay	Dialogue meeting to sign cooperation agreement
01/06/2023	Ampliación Belén	Dialogue meeting to sign cooperation agreement

In relation to other stakeholders such as authorities, meetings are coordinated informally by phone calls, mail or sometimes by letter. Following the meetings, the main agreements and discussions are recorded (see file: Supporting evidence of community section - Meetings with stakeholders).

2.3.4 Community Costs, Risks, and Benefits (G3.2)

It is worth mentioning that at all times communities and groups are informed that their participation in the project activities is completely voluntary, as they are indirect beneficiaries (they are not part of the project area).

During the informative meetings with the communities, the project team shares relevant information on potential costs, risks and benefits of implementing the project´s activities, using summary documents and communicational materials such as infographics, power point presentations, flyers, and brochures (see file: Project diffusion and dissemination – power point presentation and communication tools). During these meetings it is explained that there are no direct costs nor risks for the communities related to limiting current land uses or significant opportunity costs, as they are not inside the project area.

Concerns about potential indirect costs and risks that may arise during informational meetings and other meetings with community leaders are documented (see file: Supporting evidence of community section - Meetings with stakeholders) and are considered for the implementation of strategies and activities aimed at improving well-being in the communities, which voluntarily agree to participate after having been duly informed. This process and understanding are followed for the structure and design of the cooperation agreements signed with the communities (see file: Supporting evidence of community section - Cooperation agreements with communities).

2.3.5 Information to Stakeholders on Validation and Verification Process (G3.3)

In general, the validation and verification processes are explained to the communities of interest in the informative meetings held by the project (see file: Supporting evidence of community section - Meetings with stakeholders and Project Diffusion and Dissemination).

Likewise, communities are informed of the validation and verification processes through their representatives. The most frequent channels of communication are:

- Informal: through direct contact between community representatives and the project team. This can be in a meeting or visit to the project offices which are open Monday through Friday from 8am to 6pm or by phone calls / whatsapp.
- Formal: through informative communications such as letters sent by the General Coordinator of the project as a representative of BAM to the authorities and representatives of the communities, and stakeholders (see file: Project Diffusion and Dissemination – Socialization – letters auditor visit).

Validation/Verification results are reported as indicated above.

2.3.6 Site Visit Information and Opportunities to Communicate with Auditor (G3.3)

During validation and in each verification process, BAM will ensure that the schedule for the auditor site visit will be properly announced. Due communication can take place directly with community representatives and other stakeholders through informal communication channels (e.g. phone calls, WhatsApp, informal meetings) maintained by the project team (community relations area) and/or formally by sending an informative letter. In this way, the communities are informed and can respond whether or not they wish to participate in the process (see file: Project Diffusion and Dissemination – Socialization letters auditor visit).

In the case of audit visits for validation and/or verification processes, the identified communities are informed of the possibility of a meeting/interview with the external auditor, which will take place only with their consent as indicated above. If there is a positive disposition, the project team coordinates and manages the meeting in order to facilitate an adequate evaluation by the external auditor. These meetings can be directly held between the auditor and the interviewee, without the participation of any member of the company or the project, in a manner that any interested party can communicate with the audit team during the field visit and freely express their perception of the project.

2.3.7 Stakeholder Consultations (G3.4)

BAM has identified a set of stakeholder communities / indirect beneficiaries of the project (neighboring communities that are located outside the project area), which are invited to participate in the development of project activities. This participation, as mentioned above, is completely voluntary. The communities involved are part of the project strategy, but do not have a commitment to the project to generate any climate, biodiversity and community benefits.

The concerns, needs and interests of the communities voluntarily involved in the project are gathered through:

- initial diagnosis of the socio-economic situation of the communities (see file: Supporting evidence of community section – Social diagnosis - evaluation).
- during the initial socialization process of the project (see file: Project Diffusion and dissemination).
- during periodic information meetings and the understandings set forth in the cooperation agreements (see file: Supporting evidence of community section – cooperation agreements with communities).

Furthermore, regarding consultation processes, the project requires the community leaders to discuss any agreement in their community meetings before signing or committing to an activity with the project. An example of this are the cooperation agreements signed with the communities in which their leaders discuss the content and relevance of the agreement in a community meeting as a requirement before signing the document with BAM (see file: Supporting evidence of community section – Cooperation agreements with communities).

With other stakeholders, information has been gathered through informal meetings with authorities and other stakeholders in particular to understand their perception of the threats of deforestation and the potential for sustainable development in the area (see file: Supporting evidence of community section – meetings with stakeholders).

In this way, the project gathers input from stakeholders for the efficient execution of its activities, seeking the greatest impact for the fulfillment of its objectives.

All these inputs are taken into consideration for the development of project strategies and activities, such as:

- community development plan (see file: Supporting evidence of community section – community development plan).
- territorial security protocol (see file: Supporting evidence of community section – community development plan).
- identification and development of the activities proposed by the project (see file: Supporting evidence of community section – community projects).
- Others.

2.3.8 Continued Consultation and Adaptive Management (G3.4).

Carrying out annual participatory workshops and informative meetings generates important feedback that allows some modifications to be made to the proposed strategies and the necessary adjustments to be made to the design of the project, with an adaptive approach in order to advance in the fulfillment of the objectives of the project in a given period of time. It is designed as a participatory instrument to analyze and evaluate the progress of the project in terms of results and impacts, articulated to achieve levels of sustainability. In these workshops, an analysis of the limitations and potentialities regarding the proposals that are being implemented is carried out, the performance of the stakeholders involved and the functionality of the project are evaluated, recommendations are formulated, and strategic options are identified or reformulated aimed at achieving the objectives of the project, based on

information obtained as a result of the various activities carried out, allowing activities to be planned in accordance with the needs of the producers and the project to achieve its results.

In addition, other community participation mechanisms will be used (such as but not limited to: suggestions box installed in strategic places, emails, surveys, and the suggestions and grievance mechanism) to generate almost permanent feedback that allows continuous improvement processes.

2.3.9 Stakeholder Consultation Channels (G3.5)

Consultation and participatory processes have been undertaken directly with all the relevant communities of the project throughout the informational meetings (see file: Diffusion and dissemination of the project) and other meetings with community leaders that take place in their localities or in the project´s office (see file: Supporting evidence of community section – Meetings with stakeholders) as detailed Table 12.

As mentioned above, other community participation mechanisms will be used, such as but not limited to suggestions box installed in strategic places, emails, surveys, and the suggestions and grievance mechanism) to generate almost permanent feedback that allows continuous improvement processes.

Furthermore, as part of the dynamic process of relevant stakeholder identification the legitimate leaders are identified to ensure that dialogue with the right actors is established. As shown in the supporting files and in the sections above, adequate levels of information sharing have occurred and as consequence several communities have trusted in the project by signing cooperation agreements (see file: Supporting evidence of community section – Cooperation agreements with communities).

2.3.10 Stakeholder Participation in Decision-Making and Implementation (G3.6)

Again, it is important to emphasize that the communities identified are indirect beneficiaries of the project, which voluntarily participate in the activities proposed by the project based on the recommendations and needs of their stakeholders and aligned with the fulfillment of its objectives. The identified communities are not part of the project area and have no binding commitments.

There are two important spaces as mechanisms for interaction and effective stakeholder participation, in which the communities are expected to be involved in the planning, execution, monitoring and evaluation of project activities: the initial information meeting through the execution of a process of socialization of the project (described in section 2.3.2) and the participatory evaluation workshops/meetings (described in section 2.3.8), events in which information regarding consultations, opinions, concerns, comments, contributions and recommendations will be gathered and addressed, using a variety of participatory tools and applying an intercultural and gender approach to ensure that all stakeholders and participants have an equal opportunity to express themselves. This information will be systematically collected and considered on an ongoing basis, which will be reflected in project planning.

2.3.11 Anti-Discrimination Assurance (G3.7)

The project proponent has an official policy against any type of discrimination, which is uploaded in the company webpage. The gender equity, diversity and inclusion policy approved in its board of

directors, includes the following basic principles of action. This Policy applies to all employees, directors and officers, as well as contracted consultants, regardless of their nationality or residence. It also applies to relationships with all BAM's stakeholders (see supporting documents - BAM policies).

a) Equal opportunities without discrimination.

- To guarantee the quality of employment with the aim of promoting equal opportunities and non-discrimination, encouraging the maintenance of stable and quality jobs.
- Practice and demonstrate equitable treatment that promotes personal and professional progress.
- Comply with current legislation on diversity, equal opportunities, and inclusion.
- To respect diversity, ensuring non-discrimination based on gender, age, race, nationality, ethnic origin, sexual orientation, religion, ideology, marital status, family responsibility or disability.
- Ensure that all employees, without discrimination based on gender or any other personal condition, are provided with the same opportunities for access to the training necessary for their professional development.
- Extend to BAM's value chain its commitment to respect diversity and equal opportunities. Promote the hiring of suppliers that have policies in this area or adhere to the principles of this Policy.

b) Reconciliation of personal, family and work life.

- Encourage the organization of working conditions with a gender perspective, allowing the reconciliation of personal and professional life for all workers.
- Ensure that working conditions allow the reconciliation of work and personal life of workers, implementing measures such as digital disconnection or flexible schedules in accordance with the responsibilities of each worker.
- Attend with the appropriate integration measures, among others, the situations of single people, married people, unmarried couples, divorced, separated, widowed, with or without children and with other family and emotional circumstances, including the specific link with pets, as living beings endowed with sensitivity.

c) Zero tolerance against sexual harassment.

- Preserve an environment free of workplace harassment, especially that which has as its intention or basis direct or indirect discrimination.
- Collaborate in the fight against gender-based violence.

This policy comprises commitments in:

- Creating a work environment based on respect that values difference and provides equal opportunity, allowing full and active participation of all members of BAM's workforce.
- Create an inclusive team culture characterized by openness and constructive challenge, where people feel respected, valued, and supported.
- Accept and encourage diversity of thought and experience to maximize the company's performance.
- To treat personnel fairly and without any form of discrimination; acting in such a way as to protect all employees from any discriminatory treatment that would be unethical or unlawful.
- To implement and develop policies for selection, hiring, promotion, training, professional classification, and other working conditions, based solely on criteria of merit and ability.

- Provide workers with flexible work options that focus on improving their personal and family life.
- Promote working conditions that prevent labor and sexual harassment due to, among others, gender, sex, sexual orientation, gender identity and expression, as well as any discriminatory conduct based on nationality, ethnic or social origin, skin color, marital status, family responsibility, religion, age, disability, social status, political opinion, health status, both in a face-to-face and digital work environment.
- In addition, BAM is committed to ensuring that its employees, as well as any stakeholders with whom the company interact, interact in an environment free of discriminatory, derogatory, or hostile remarks, gestures, or other behavior.

2.3.12 Feedback and Grievance Redress Procedure (G3.8)

BAM has a well-established Procedure document (see file: Supporting evidence of community section – MAQR), which has been designed to address and solve any possible complaints, requests or suggestions made by the population located within the project's area of influence.

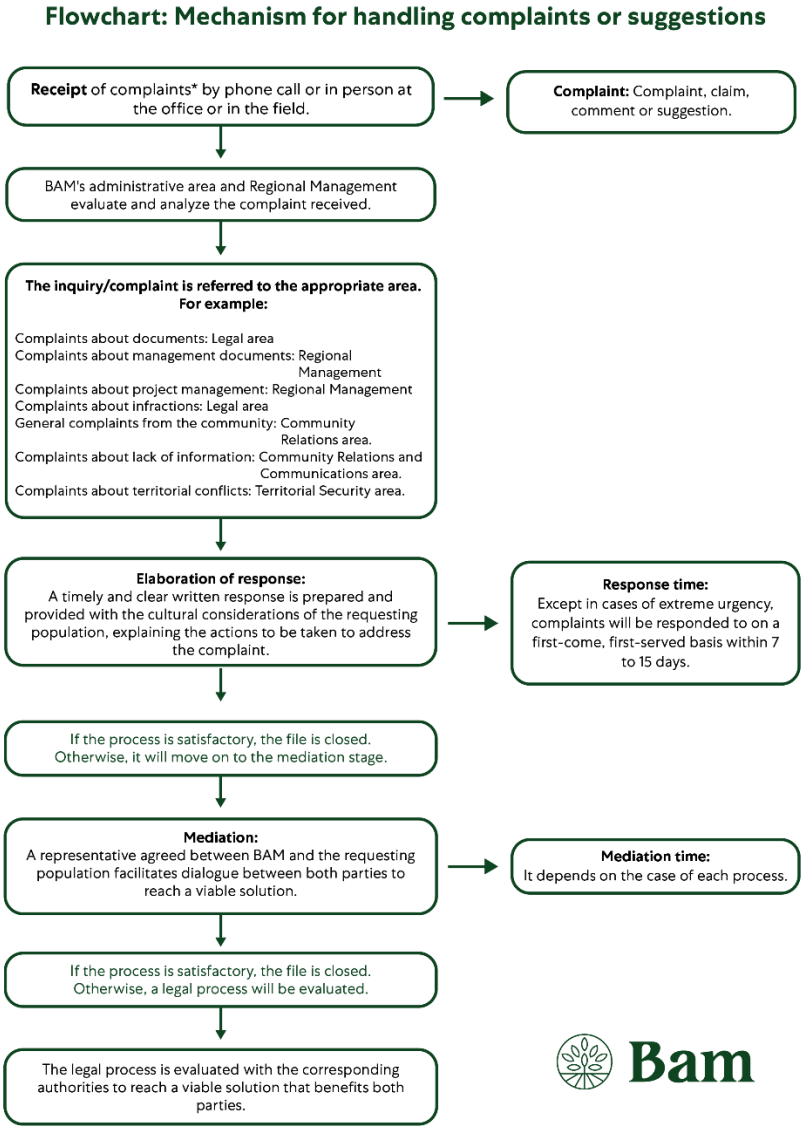
The document provides the guidelines to monitor the process and respond appropriately to manage the possible complaints. The mechanism allows the project to prevent and resolve conflicts with different stakeholders, including the identified communities and others.

The following stages are considered:

- First: BAM's Administrative and/or Community Relations Area will attempt to resolve all grievances in and amicable way and provide written response in a culturally appropriate manner. This includes:
  - Providing accurate and timely information to stakeholders about the Grievance Procedure.
  - Obtain, organize, and document feedback from project stakeholders regarding perceptions, concerns, and requests.
  - Evaluate and transmit the feedback obtained from stakeholders to Management and its contractors, so that this information can be addressed – if applicable – in project decision making.
  - Centralize the tracking and monitoring of complaints.
  - Monitor contractors regarding the effectiveness of the complaint's procedure.
- Second: any grievances that are not resolved by amicable negotiations shall be referred to mediation by a neutral third party in coordination and support of relevant authorities such as the Regional Government of Ucayali, the local Ombudsman office, or the Ministry of the Environment. This stage is carried out to seek a solution to the complaints of local communities or other interested parties in the project area.
- Third: any grievances that are not resolved through mediation shall be referred to a legal process that can be either:
  - Arbitration, to extent allowed by the laws of relevant jurisdiction or;
  - Competent courts in the relevant jurisdiction, without prejudice to a party's ability to submit the grievance to a competent supranational adjudicatory body, if any.

The project office in Pucallpa will provide all the facilities and arrangements to receive complaints and grievances properly and comply all the processes explained in the flowchart above. Furthermore, the Feedback and Grievances Redress Procedure is disseminated and accessible to communities and other stakeholders in all the activities, meetings, and workshops during the project lifetime.

Figure 2.8. Flowchart of the process for attention and response to complaints and claims



Source: Inhouse elaboration.

2.3.13 Accessibility of the Feedback and Grievance Redress Procedure (G3.8)

The process (flowchart) described above will be available to any person, group, community, or local employee who considers themselves affected by the activities; they will then be able to communicate their complaints to BAM. The socialization channels will be sending to community representatives and

other stakeholders and socialization in the project's informative events. It will also be available at the project offices and other strategic points in the communities after coordination with their representatives.

BAM will guarantee that the population of the area of influence knows about the Complaints Procedure, feels welcome to file a complaint, and knows how to do it. BAM's community relations officers will be in constant contact with the communities, and community leaders and social monitors will receive frequent visits from community relations staff. Community members will be encouraged to express their grievances, either in writing or verbally, directly to the community relations team. If they make a verbal complaint, the community relations staff will help them put it in writing and will channel the complaint to the BAM. Any complaint or grievance shall be duly substantiated and stored in the project offices.

2.3.14 Worker Training (G3.9)

Workers are properly briefed on the requirements and responsibilities expected of their role upon entering the position (see supporting documents - entry manual and safety protocol). BAM has trained personnel with several years of experience working on forestry projects, who provide training to new hires and induct them into their new role. Furthermore, employees periodically receive training on topics related to their duties, such as fire control and others.

The project proposes training activities for the identified community as detailed in the Theory of Change Matrix (Table 2.4). For example, for the fulfillment of climate objectives, the project proposes trainings on sustainable forest management and prevention of fires and environmental crimes. To meet biodiversity objectives que project promotes awareness-rising initiatives are implemented on the importance of biodiversity in the project area and how to deal with potential threats on the matter. In this manner, the community is actively involved in monitoring the area, in collaboration with the company.

As part of the performance commitments established by BAM in its Corporate Sustainability Policy (see supporting documents - BAM policies), it promotes employee training, favoring professional promotion.

2.3.15 Community Employment Opportunities (G3.10).

BAM creates employment opportunities at the base of the pyramid, including neighboring communities within the value proposition, generating local rural jobs for both men and women. For example, in 2022, BAM generated 221 direct jobs to fulfill its different responsibilities, which were mainly filled by workers from the communities surrounding BAM's properties in Ucayali (see supporting documents – Financial Sustainability – Annual Report). Women from nearby towns occupied 24% of these positions. It is worth mentioning that these positions cover both the obligations of The Last Habitat REDD+ project and the reforestation project that BAM is developing on one of the company's neighboring properties.

In this sense, labor regulations are strictly complied with and decent, non-forced or child labor is promoted; based on the capabilities and experience of each person. Equality at work and performance of activities is also promoted, without discrimination. All this as part of the action commitments

established in the Corporate Sustainability Policy (See Supporting Documents – BAM Policies), adding that the recruitment, selection and retention of talent is carried out under a favorable framework of labor relations based on equal opportunities, respect for diversity, and in conciliation with personal and work life.

2.3.16 Relevant Laws and Regulations Related to Worker's Rights (G3.11)

Workers enjoy the rights established in the Peruvian Labor Law. They receive a fair wage, which is over the minimum wage established by the Peruvian government, they have vacation days available, retirement compensation, bonuses, health insurance, education grants, and other benefits established in the law. There are complementary benefits for workers over fifty years of age, such as retirement benefits. Without affecting the aforementioned benefits, the workers can organize into labor unions to negotiate better working conditions if they deem it appropriate (see supporting documents – BAM Policies).

The Project is articulated under the standards of the Labor Productivity and Competitiveness Law No. 728, which promotes the training and labor formation of their workers as a mechanism to improve their income and labor productivity, while following the constitutional norms of labor security.

- Supreme Decree 002-97-TR: Single Ordered Text of Legislative Decree No. 728, Law on job promotion and training
- Supreme Decree 007-2002-TR: Single Ordered Text of the Law on working hours, hours and overtime work; and its respective Regulation
- Supreme Decree 004-2006-TR: Provisions on the registration of attendance and exit control in the labor regime of private activity
- Law No. 28051: Law on food benefits for the benefit of workers subject to the labor regime of private activity and its respective Regulation
- Law No. 25129: Concept of family allowance to be received by workers in private activity whose remuneration is not regulated by collective bargaining
- Law No. 27735: Law that regulates the granting of bonuses for workers of the private activity regime for national holidays and Christmas; and its respective Regulation
- Law No. 29549: Law that modifies Legislative Decree No. 688 Law of consolidation of social benefits and creates the mandatory registration of life insurance contracts law; and its respective Regulation
- Supreme Decree 009-2020-TR: Approves the regulations of the Emergency Decree No. 044-2019 related to life insurance
- Supreme Decree 009-1998-TR: Regulation for the application of the right of workers in private activity to participate in the profits generated by the companies where they provide services
- Supreme Decree 001-1997-TR: Single Ordered Text of the Law on compensation for length of service; and its respective Regulation
- Supreme Decree 012-2016-TR. They specify the provisions of Law No. 30334, referring to the non-affectation of legal bonuses and the availability of compensation for time of service
- Law No. 26644: They specify the enjoyment of the right to pre-natal and post-natal rest of the pregnant worker; and its respective Regulation

- Supreme Decree 002-2016-TR: Adaptation of the regulations that regulate maternity leave and the payment of the maternity subsidy to the provisions of Law No. 30367, Law that protects working mothers against arbitrary dismissal and prolongs their period Rest
- Law No. 27403: Law that specifies the scope of the permit for breastfeeding
- Law No. 29409: Law that grants the right to paternity leave to workers in public and private activity; and its respective Regulation
- Law No. 30012: Law that grants the right to leave to workers with direct family members who are seriously or terminally ill and suffer a serious accident; and its respective Regulation.
- Law No. 30119: Law that grants the right to leave to workers in public and private activities for medical assistance and rehabilitation therapy for people with disabilities; and its respective Regulation
- Supreme Decree 039-91-TR: establish the internal work regulations, which determine the conditions that employers and workers must abide by in the fulfillment of their benefits
- Law No. 28783: Occupational Health and Safety Law; its modification (Law 30222)
- Supreme Decree 005-2012-TR: Regulation of the Occupational Health and Safety Law
- Supreme Decree 010-2014-TR: Approving complementary regulations for the adequate application of the Only Temporary Complementary Provision of Law 30222
- Law No. 28048: Protection Law in favor of pregnant women who perform work that puts their health and/or the normal development of the embryo and fetus at risk; and its regulations
- Law 29773: General Law of Persons with Disabilities; and its corresponding Regulation
- Supreme Decree 020-2001-TR: Regulation of the General Law on labor inspection and defense of the worker (Legislative Decree No. 910 and its Amendment)

After the signing of contracts, workers are provided with a “Entry Manuals” with detail information on the legal benefits that they acquire when signing the respective contracts with the company (see Supporting Documents - “Health and safety of working condition”). Furthermore, a list of the relevant legal framework related to workers' rights is detailed below. This information is shared with employees during training/induction events that take place when the person first joins the company.

In addition, workers involved in The Last Habitat REDD+ project are provided with the “Territorial Security System Protocol, where the possible risks and their mitigation measures are detailed for the information of the employees, promoting an adequate and safe response protocol to meet the objectives of the project while safeguarding the welfare of its workers (see Supporting Documents - “Health and safety of working condition”).

2.3.17 Occupational Safety Assessment (G3.12)

All team members have the necessary equipment to comply with the safety measures required to protect the integrity of the personnel from possible risks that may occur, especially in the field work. The project provides its workers with clothing such as vests, polo shirts, long-sleeved shirts so as not to expose the body to risks, sun hats to prevent burns and animal bites, boots, and raincoats. It also provides various personal protection equipment (PPE) such as helmets, safety glasses, backpacks, basic first aid kits, machetes with sheaths, flashlights, drones, GPSs, long-sighted, among others. In the case of vehicles, the project provides its team with 4x4 and motorcycles for safe transportation, which have vehicle insurance policies and SOAT, and undergo permanent preventive maintenance. Above all, The project has contracted occupational medicine services for all BAM personnel, and, in

addition to all the insurance required by law, all field personnel have a Complementary Risk Work Insurance, which provides health and economic benefits for work-related accidents and illnesses.

The project has made a mapping of the possible risks of the project to prevent any occurrence and act appropriately in case of any event, following the due protocols. (See Supporting Documents - Health and safety of working condition – Territorial Security Protocol). The results are presented in the following table.

Table 2.10. Occupational risks assessment results

N°	Risks	Mitigation and control measures	Level of risk	
			Probability	Severity
1	Physical risks from falls, trips, blows with objects, branches or tools, injuries due to improper use or misuse of equipment.	- Trails, roads, and camps maintenance. - Personal protection equipment. - Flashlights.	LOW	LOW
2	Risks due to acts of violence: confrontation with illegal actors, threats or aggressions	- Constant communication and collaboration with authorities. - Regular patrols and monitoring. - Training in negotiation techniques, dialogue, and conflict management. - Security measures in camps: perimeter fences at BAM´s property boundaries near the camps and solar panels for lighting. - Communication equipment (radios) and other tools according to the needs and context.	MEDIUM	MEDIUM
3	Risks due to weather conditions, environmental conditions, bites, injuries caused by animals or plants	- First aid kit in the camps. - Training on vector-borne diseases. - Use of repellent and mosquito nets. - Use of special clothing for field activities, sunscreen, hat with neck protection. - Permanent access to drinking water. - Training in the identification of dangerous plants and animals.	LOW-MEDIUM	LOW-MEDIUM
4	Biological risks due to exposure to existing diseases in the region: dengue fever, malaria, etc.	- Toilets in Good conditions and access to water. - Training in vector-borne diseases. - Monitoring of worker´s health through social worker and occupational physician. - Use of repellent and mosquito nets. - First aid kit in the camps and office.	MEDIUM	MEDIUM

N°	Risks	Mitigation and control measures	Level of risk	
			Probability	Severity
6	Ergonomic and psychosocial risks due to working days in the field	- Route planning and rest stops. - Social worker support.	LOW	LOW

Furthermore, at a company level BAM has analyzed the main legal framework related to occupational safety and has done a specific analysis of the main risks associated to its operations. As mentioned, BAM is committed to protect its employees, complying with the provisions of Law 31246 on occupational safety and health. In addition, BAM has an Occupational Health and Safety Regulation (See Supporting Documents - BAM Policies) which establishes and regulates the procedures to ensure the safety and health of its employees when carrying out their different jobs and activities. As part of the action commitments established by BAM in its Corporate Sustainability Policy (See supporting documents - "BAM Policies"), it ensures a safe and healthy work environment, complying with current legislation in matters of occupational safety and hygiene and sexual harassment.

Workers are provided with the protocol explaining the company's policies, practices and regulations, as well as the activities, methods and forestry techniques used, to ensure that all employees are fully aware of the company's management framework and that of its operations. Furthermore, employees undergo a training process where they are instructed on the different fronts of the project operations and are accompanied in a first stage by the leaders or people with more experience in the group. They are taught about the use of the tools or instruments to be used in the execution of the activities. In addition, in this training process, protocols and action plans are explained in the event of different scenarios such as a (possible) forest fire or the presence of illegal loggers.

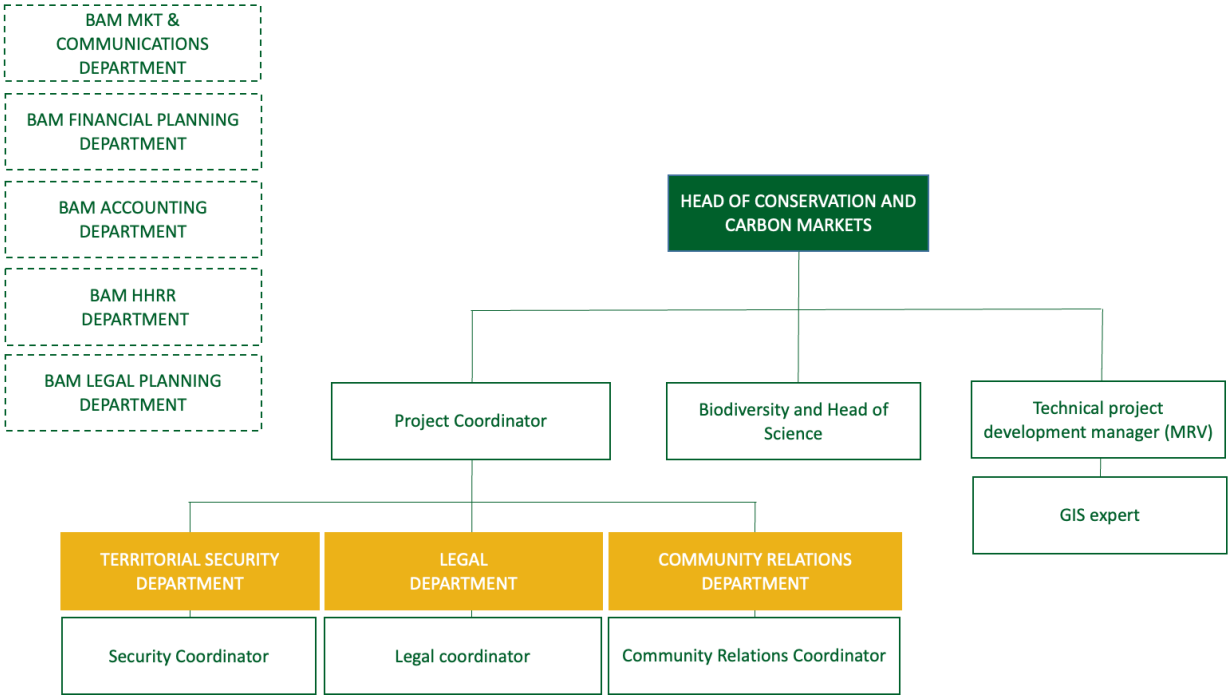
2.4 Management Capacity

2.4.1 Project Governance Structures (G4.1)

The project proponent, BAM, is responsible for implementing all project activities, undergoing the certification processes for the accreditation of carbon benefits, as well as trading the carbon credits generated by the emission reductions achieved. Likewise, BAM is responsible for implementing all project activities with a view to meeting all Climate, Community and Biodiversity objectives, for which it has assigned a specific team of professionals in different areas of specialization.

BAM makes all decisions regarding the development of the Project. In that line, it is worth mentioning that the identified communities are included as indirect beneficiaries of the project, i.e. they do not participate directly in the decisions regarding the course of the project. The communities voluntarily decide to participate in the activities proposed by the project as indirect beneficiaries. The structure of the project is detailed below.

Figure 2.9. Project Organizational Structure



The role and responsibilities of each party are as follows:

Table 2.11. Roles and responsibilities of the project team

Area	Responsibilities
Head of conservation and carbon markets:	is responsible for leading and supervising the implementation of the project, ensuring compliance with climate, community and biodiversity objectives. He/she is responsible for ensuring the monitoring of the project following the requirements of the VCS + CCB standard and reporting progress and compliance to the General Management and Board of Directors.
General coordinator of the Project:	is responsible for ensuring the correct execution of the activities defined and approved by Management. He/she represents BAM in the project's area of influence before stakeholders such as competent authorities, collaborating organizations, and the community, among others. The General Coordinator supervises the actions of the three coordinators in the legal, territorial security and community areas.
Coordinator of the Department of Territorial Security:	is responsible for ensuring the security of the territory, preventing and avoiding threats due to deforestation, degradation and any crime or environmental threat in the project area. In charge of the execution of programmed security activities such as boundary marking, signaling, patrolling the area, etc
Legal Coordinator:	carries out legal management in the face of environmental crimes that may be occurring in the project area and manages complaints and procedures for deforestation, degradation or other environmental crimes that harm the fulfillment of the project's objectives.
Community Relations Coordinator:	ensures the continuous strengthening of the relationship between BAM and its stakeholders, specifically with the communities and villages surrounding the project area, ensuring fluid bilateral communication, a reciprocal and close relationship that allows achieving the objectives of the project. Represents BAM before communities and opinion leaders.

Area	Responsibilities
Biodiversity and Head of Science:	responsible of leading and supervising the efforts made to identify and monitor biodiversity found within the project area, and the implementation of conservation measures accordingly.
Technical Project developer management:	in charge of leading and supervising the MRV processes according to the requirements stablished by the VCS standard. Incgarge of carbon measurement and monitoring.
GIS expert:	responsible of generating and/or processing geospatial information for the monitoring and reporting activities. Also, support in other project activities such as delimitation/sanitation of project BN concessions, elaboration of management plans, etc.

It is worth mentioning that the direct project team also relies on BAM's broader structure to strengthen its project implementation capacity and successfully achieve the objectives of the Last Habitat REDD+ project.

2.4.2 Required Technical Skills (G4.2)

The following key positions and skills are identified as necessary for the project to be implemented:

- Project Coordinator: professional with experience in the development of forestry / conservation projects, with skills for project management in the different areas the REDD+ project requires for its optimal implementation. Preferably, a professional who lives in the region where the project area is located. +5-year experience in managing environmental projects.

- Territorial security coordinator: professional in Forestry Engineering or similar careers, with knowledge and experience in conservation and forest management/monitoring. +4-year experience working in forest conservation projects in the Amazon.

- Legal Coordinator: Lawyer with experience in environmental matters. +4-year experience working in environmental matters.

- Community Relations Coordinator: professional with knowledge and experience in community work, community relations, participatory methodologies, socioeconomic analysis, and diagnostics. +4-year experience working in community relations matters / projects.

- Biodiversity and head of science: professional with expertise in biological assessments, with knowledge in endangered species and in national and international laws that protects them. The candidate must have worked in biological monitoring and special habitat census. +5-year of experience.

- Technical Project developer management: experience in carbon analysis and reporting. Professional with expertise in developing Project Design Documents and Monitoring Reports under the VCS and CCB standards. In charge of drafting the official documents for validation and verification processes. +5-year working in carbon forest projects.

- GIS Specialist: Professional with experience in information development and geospatial calculations, including REDD+ projects in Peru. Specialist in geographic information systems and vegetation cover deforestation modeling analysis. +4-year of experience.

2.4.3 Management Team Experience (G4.2)

BAM is a company with more than 17 years contributing to the restoration, conservation, and sustainable development of the Peruvian Amazon. BAM's awards and recognitions include:

- BAM's restoration and reforestation program with native species has been recognized locally and internationally as one of the most successful experiences, receiving awards such as the United Nations award granted by the FAO to the best company for the restoration of degraded areas in the jungle and Peru category in 2015; the National Entomology Award in 2015; and the Antonio Brack National Environmental Award for the most eco-efficient development model in Peru in 2011.
- BAM's forest conservation and genetic improvement programs have been recognized in the Peru 2021 and 2022 "Boscares" awards, winning the Forests and Climate Change category, and in the Research and Innovation in Forestry category.
- BAM is a pioneer in the international carbon market. Its restoration/reforestation and conservation (REDD+) programs have been among the first forest carbon initiatives in the world to achieve the Verified Carbon Standard (VCS), the most prestigious standard in the global voluntary carbon market.
- BAM's plantations are Forest Stewardship CouncilTM (FSCTM) certified, which validates the sustainable management of its operations and ensures compliance with Forest Stewardship CouncilTM forest management and Chain of Custody standards.
- In accordance with its commitment to sustainability, BAM became the first forestry company to obtain the Environmental Declaration of Ongoing Activities (DAAC) through a Resolution issued by the Ministry of Agrarian Development (MIDAGRI).
- BAM is the first forestry company to enter the Lima Stock Exchange and place debt instruments to scale its sustainable development efforts in the Amazon. In addition, BAM is the first Peruvian company and the first forestry company in LATAM to receive the Climate Bond Initiative's (CBI) "Climate Bond Certified" standard for a green financial instrument aimed at the conservation and restoration of Amazonian ecosystems.

BAM staff has extensive experience in the design and implementation of AFOLU projects, successfully achieving validation and verification of those under VCS and CCB standards. The project has a team of experts dedicated to the implementation of the project activities, and to give permanent assistance and support to all concessionaires that are members of the project. This team includes people specialized in the different areas the project requires.

The management experience of the professionals in key positions is:

- Founder and General Manager: Jorge Cantuarias
  Jorge has more than 25 years of experience working in the development of projects in the Peruvian rainforest with emphasis on forestry operations. His vision to develop sustainable businesses has led him to be a reference in reforestation programs in Peru and a pioneer in the

carbon market in the world. He founded Bosques Amazónicos BAM in 2004 and since then has led it to become one of the leading forestry and environmental services companies in the country. Jorge holds a degree in Economics from the University of Lima, where he also studied law.

- Conservation and Carbon Markets Manager: Maria Alejandra Cantuarias
  María Alejandra holds a Bachelor's degree in Business Management from Universidad del Pacífico, Peru and a Master's degree in Economic Psychology, Behavioural Science, from the London School of Economics LSE, London UK. After specializing in business consulting and economic systems, Maria Alejandra joined BAM in 2019 to complement the REDD+ and Carbon Markets project team. Since then, Maria Alejandra leads the aforementioned area, ensuring the correct registration and development of BAM's conservation projects under the international standards and markets. María Alejandra is also responsible of the commercial side of BAM's carbon business, maintaining the relationship with the client portfolio and ensuring the positioning of BAM and the projects among its different audiences.

- Project coordinator: Alejandro Llaque
  Alejandro has more than 30 years of experience in forest management and on agricultural projects and has been leading the BAM team in the Ucayali region for 11 years. His previous experience includes positions such as Executive Director at SENASA. Alejandro has a Bachelor of Animal Husbandry from the Universidad Nacional Agraria La Molina.

- Territorial Security: Fabiola Rojas
  With a 12-year career, Fabiola has excelled in strengthening indigenous organizations and implementing social projects in native communities and hamlets in the Peruvian Amazon. Her skills span diverse fields, including the facilitation of prior consultation processes, the elaboration of communal life plans and the management of the legal physical sanitation of communal territories. Her professional experience includes roles in organizations such as Rainforest Foundation US, the Instituto del Bien Común (IBC) and the Servicio Nacional de Áreas Naturales Protegidas por el Estado (SERNANP). He is a specialist in community relations from the Universidad Nacional Mayor de San Marcos.

- Head of Community Relations: Sebastian Llerena
  Sebastian holds Bachelor´s degree in Communication from the Universidad de Lima in Perú. He also has a Master´s degree in Interdisciplinary Sustainability Studies with a specialization in Ecological Economics from the Universidad Autónoma de Barcelona in Spain. Other academic experiences include studies in social and environmental considerations for investment projects at the JICA Center, in Tokyo, Japan. Sebastian´s professional experience centers around the analysis, communication, and management of socio-environmental impacts, conflicts, and participatory processes in intercultural contexts around Peru.

- Head of Biodiversity: Walter Wust
  Walter has more than thirty years of leading biological diversity assessment programs on the coast, the Andes, and the Peruvian Amazon. His publications—more than 600 books and guides—have led him to be the most important author on nature, culture and sustainable resource management experiences in the country. He is currently member of the Directing Council of SERNANP, ACCA, IBC, Líderes+1, and CCERO. Mr. Wust is the founder of the new engineering

and environmental management career at the Peruvian University of Applied Sciences, UPC. Walter holds a bachelor's degree in Forestry Engineering from the La Molina National Agrarian University.

- Technical Project developer management: Claudia Polindara
  Forestry Engineer graduated from the Universidad Distrital Francisco José de Caldas, specialist in Environmental Law and Master in Environmental Law and Management from the Universidad del Rosario. With skills in planning, development and analysis of projects aimed at Environmental Management and Environmental Audits. Experience in validation and verification audits of forestry projects aimed at GHG Mitigation (AR/REDD+ Projects) under ISO14064-2, capacity for diagnosis, formulation and implementation of projects aimed at mitigating Climate Change in the forestry sector. Experience in Environmental Feasibility, environmental licensing, design and implementation of Forest Compensation processes (Reforestation, ecological restoration). Experience in Rural Territorial Development, Food Security and socio-environmental aspects in moorlands and environmentally strategic areas.

- GIS Expert: Carlos Huamán
  Carlos holds a Bachelor's degree in Forestry Engineering from Universidad Nacional Agraria La Molina and a Master's degree in Environmental Sciences - UNALM. Specialist in Geographic Information Systems (GIS) with more than 10 years of experience, as well as experience in monitoring, image processing and forest conservation. Carlos has experience using GIS tools and software such as ArcGIS and QGIS to collect, analyze and visualize geospatial data. Carlos' focus has been on conservation and sustainable forest management, generating thematic maps, performing spatial pattern analysis and providing accurate information to support decision making. Keeping up to date on the latest trends and advances in GIS technology.

2.4.4 Project Management Partnerships/Team Development (G4.2)

For the technical development of the project, the company PASKAY (www.paskay.pe) will provide technical support and advice to BAM, contributing the experience of its work team for the execution of key activities for the project.

PASKAY SAC is a consulting company that provides advice on the implementation of comprehensive sustainable development programs and projects with a climate and territorial management approach, contributing to the sustainable development of the environment and the population through the analysis of technical, legal, social, political, and economic, design, execution and promotion of activities, projects, programs, and research with various actors. PASKAY offers a multidisciplinary vision and innovative solutions, through transversal and comprehensive strategies. Within the framework of The Last Habitat REDD+ project, BAM contracted the services of PASKAY SAC for the preparation of the baseline of the community, biodiversity and climate components and the design and formulation of the PD of the project in question, under the VCS & CCB standard.

On the other hand, the project must establish a GHG information system to obtain, register, compile and analyze data and important information for the quantification and notification of GHG emission reductions. In this sense, in order to comply with the standards and the monitoring plan according to the validated PD, the activities that correspond to the measurement, monitoring and evaluation of the

indicators referring to the generation of positive net benefits for the community, the biodiversity generated by the project, will be developed in cooperation with the consulting company PASKAY SAC as a strategic partner of the project, with experience in REDD projects and MRV actions, counting on an interdisciplinary team of specialists in specific topics, to prepare the corresponding Monitoring Reports.

PASKAY is led by Jorge Torres Padilla, an economist with more than 22 years working on the design and development of forest carbon projects, including reforestation and REDD, under VCS and CCB standards. He has been the technical manager of a company in charge of developing a REDD+ project with more than 4 hundred rural families. The company has a multidisciplinary team which covers all aspects of a carbon project design: carbon specialists with experience in REDD and ARR projects, remote sensing specialists, community specialists and a legal area. For further detail please refer to: https://paskay.pe/equipo/

In addition, the project seeks to establish cooperation agreements with other leading organizations and companies to strengthen their capacity to implement project activities. For example, with universities and scientific organizations to implement activities of the Science program (see supporting documents – Inter-Institutional cooperation agreements).

2.4.5 Financial Health of Implementing Organization(s) (G4.3)

BAM is the implementing organization of the Project. The company's audited Financial Statements are public and will be shared with the auditors and VERRA during the verification process. BAM's financial health is supported on:

Real assets: BAM has a private property of 24,544 hectares in Ucayali, Peru, and a forest plantation (biological asset) of +1,200 hectares which backs its operations as real assets (See supporting documents - Financial Sustainability file – Financial Statements).

Short-term income streams: By selling carbon credits in an increasingly consolidated market, the company expects to have sufficient revenues to ensure financial sustainability to implement activities to meet project objectives. Throughout its years of operation, BAM has consolidated a portfolio of clients that includes the most important actors in the market, achieving an important positioning worldwide. A list of the clients that have purchased carbon credits generated by the Project and examples of the latest transactions will be shared with the auditor. (See supporting documents - Financial Sustainability file – VCUs Sales 2019 to 2023).

Long-term flows: BAM manages a commercial plantation for more than 12 years, which has begun to be sustainably harvest. The commercial species of the BAM plantation, mainly marupa and shihuahuaco, are forest species with an excellent market price, which ensures an additional revenue stream for the company. (See supporting documents - Financial Sustainability file – Financial Statements).

Capital Markets: BAM is the first forestry company in Peru to enter the Lima Stock Exchange, successfully placing thematic debt instruments (green/sustainable) in the market. In 2021 alone, BAM placed around US$ 17 million in the capital market, fulfilling all its financial responsibilities, and maintaining an excellent relationship with its investors. Likewise, BAM is the first company in LATAM

to certify a green debt instrument under the Climate Bonds Standard of the Climate Bonds Initiative (CBI). The company and its financial health are supervised by the Superintendence of the Securities Market, a decentralized public body attached to Peru's Ministry of Economy and Finance. (See supporting documents - Financial Sustainability file – Financial Statements and Annual Report).

2.4.6 Avoidance of Corruption and Other Unethical Behavior (G4.3)

Within its Internal Rules of Conduct Chapter VII, 7.3 reporting and reporting of irregularities (See file Supporting Documents BAM Policies), BAM encourages its employees and business partners to report in good faith, or based on a reasonable belief, the attempt of bribery, alleged or actual, or any violation or breach of the Rules of Conduct. Any complaint or query related to any suspicion of non-compliance with these rules may be submitted anonymously, through email channels or web page, protecting the complainant. Likewise, an internal regime of sanctions is established for those who fail to comply with what is indicated in the Internal Rules of Conduct. Any person who is under the scope of the Regulations will receive a copy of said document, recording its receipt in writing, as a sworn statement, in the sense of having received it and committing to read it carefully, understand it and comply with it. The same procedure will be followed with any person who obtains a position in the company, who will also be explained the principles and fundamental values contained in such Rules during the activities induction in which they participate.

The company applies for the development of its activities, policies for the prevention of money laundering and financing of terrorism, which is established in its Corporate Governance Policy (See file Supporting Documents BAM Policies) taking as reference the provisions set forth in the Prevention Rules of Money Laundering and Financing of Terrorism issued by the Superintendency of the Securities Market (PLAFT Regulations), without prejudice to not being an entity supervised by any of the regulatory bodies. In this sense, the company operates under the following directives:

- Not participate and in no way assist in money laundering and financing of terrorism, having as its main commitment to abide by and comply with the regulations on the matter.
- The directors, managers and all company personnel are committed to complying with the PLAFT Standards through the application of the policies described in the Risk Management System document.
- The company will offer its support to the competent authorities through the provision of information that they require for investigation and analysis purposes.

The company, in accordance with the provisions of the PLAFT regulations, considers prohibited operations those that imply the following:

- Customers who receive transfers from countries considered non-cooperative by the FATF, with risk related to money laundering and financing of terrorism, with little banking supervision, or from countries included in the OFAC list.
- Clients acting through trusts without identifying the identity of the settlor, trustee, and trustees.
- Politically exposed persons (PEP) or who manage public resources. It is not considered a PEP when acting on behalf of a legal person participating in the State.

- Legal entities in which a PEP owns at least 5% of the capital stock, contribution, or participation and that, according to the reporting entity, poses a high risk of money laundering or financing of terrorism.

BAM is an organization in which all the processes that are carried out for the hiring of personnel and service providers avoid nepotism and favoritism. As part of its Corporate Sustainability Policy (See the folder "BAM Policies" in the supporting documents - validation CCB 2022) it accepts to support the principles of the United Nations Global Compact, in the fight against corruption.

2.4.7 Commercially Sensitive Information (*Rules* 3.5.13 – 3.5.14)

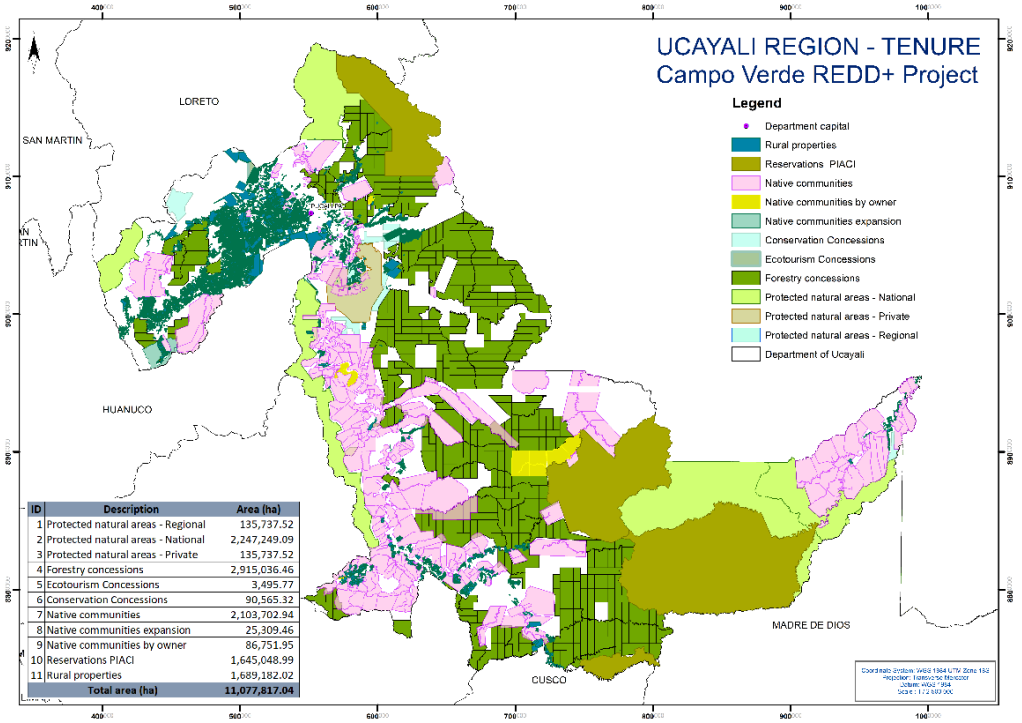
Information regarding BAM's Financial Statements where the company's assets, liabilities and equity are reported, Commercial Contracts and sales details with information on transactions, the number of credits sold per year and price, will be available and shared with audit team during validation process and VERRA if required (see supporting documents: Financial Sustainability).

2.5 Legal Status and Property Rights

2.5.1 Statutory and Customary Property Rights (G5.1)

In the Ucayali region territory, different types of tenure territories are found: indigenous people territories, private property lands, rural properties, forest concessions, National and Regional Protected Areas as well as indigenous people reserves (PIACI), as shown below.

Figure 2.10. Land tenure in Ucayali

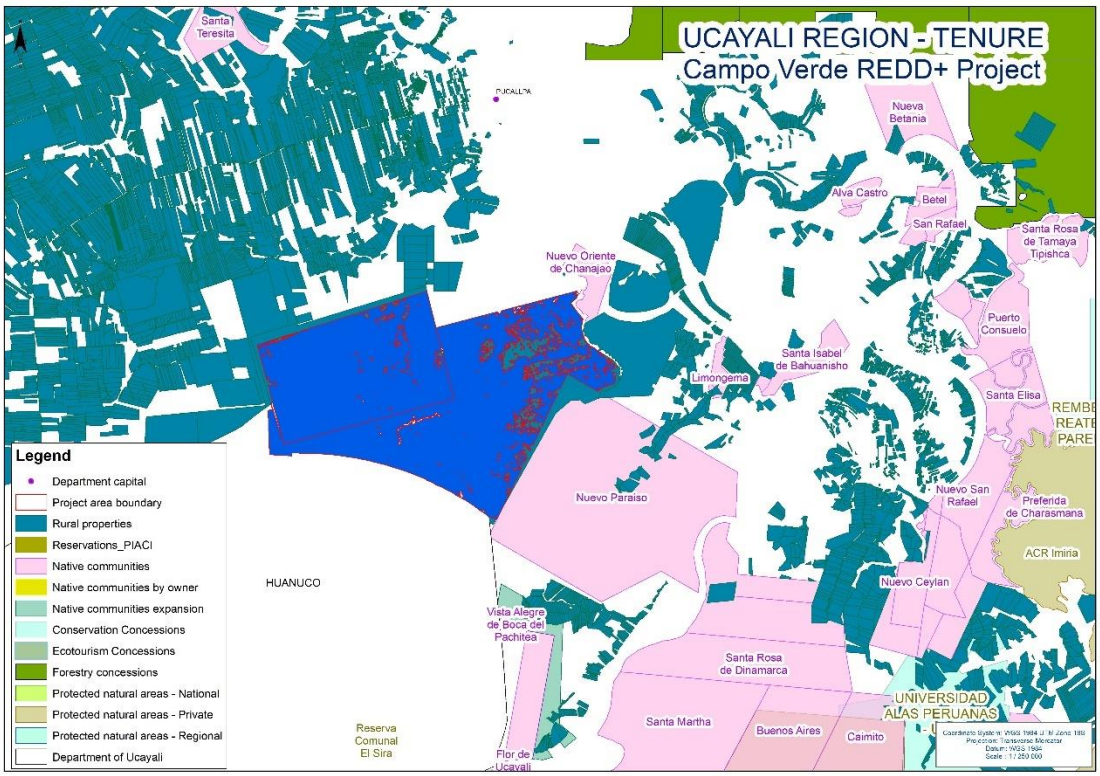


ID	Description	Area (ha)
1	Protected natural areas - Regional	135,737.52
2	Protected natural areas - National	2,247,249.09
3	Protected natural areas - Private	135,737.52
4	Forestry concessions	2,915,036.46
5	Ecotourism Concessions	3,495.77
6	Conservation Concessions	90,565.32
7	Native communities	2,103,702.94
8	Native communities expansion	25,309.46
9	Native communities by owner	86,751.95
10	Reservations PIACI	1,645,048.99
11	Rural properties	1,689,182.02
	Total area (ha)	11,077,817.04

Source: Own elaboration

In the project surroundings, most of the areas are rural lands granted for agriculture and grazing purposes, as well as indigenous communities' territories in the eastern part, as shown below.

Figure 2.11. Land tenure classes around the project area



Source: Own elaboration

The properties comprising the project area, Nuestro Señor Jesucristo and Selva Maestra, are private lands, duly registered and recognized as supported in the following section.

2.5.2 Recognition of Property Rights (G5.1)

The Nuestro Señor Jesucristo property, located in Manantay district, is owned by the company JCC Inversiones S.A.C. (part of the Bosques Amazónicos group) as recorded in the Peruvian Real Estate Registry. JCC Inversiones S.A.C. is a company that has assigned its present and future forest carbon rights to Bosques Amazónicos S.A. (hereinafter BAM), including the authorization to trade the carbon credits generated on NUESTRO SEÑOR JESUCRISTO's land and to receive the corresponding revenues through a Forest Carbon Rights Assignment Agreement signed between both entities (see file: Property rights evidence). In that line, any reference to JCC Inversiones SAC, shall be understood together with the assigned rights in favor of BAM.

The Selva Maestra property is privately owned by Bosques Amazónicos S.A., as recorded in the SUNARP, National Property Registry Office. Both lands are protected by good faith registration, under the following references.

Table 2.12. References of land titles

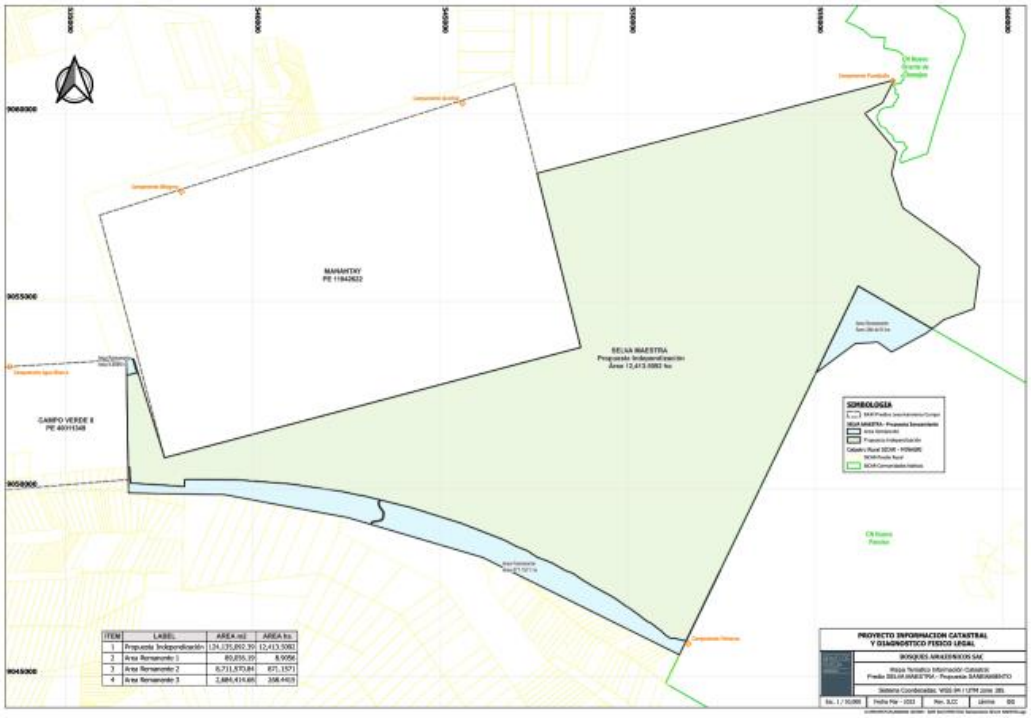
Name	Date	Approval document	File	Area
Selva Maestra	December 15, 1998	Resolution Directorial N˚ 452-98	N˚40010854	12,730.41 ha
Nuestro Señor Jesucristo	January 9, 2009	Resolution Directorial N˚001-2009-GRU-P-DRSAU	N˚ 11042622	8,049.87 ha

Source: Inhouse elaboration

The property rights of both Selva Maestra and Nuestro Señor Jesucristo (JCC) were established through a purchase-sale contract approved by the Regional Directorate of Agriculture of Ucayali (see folder PROPERTY RIGHTS EVIDENCE). All payments to the State have been made, therefore, all property rights are recognized, respected, and supported.

It is worth mentioning that, while Selva Maestra's land title identifies ownership over 12,730.4 ha, the use of more recent techniques has identified that the real extend is over 14,176.1 ha. This is a common problem in the Amazon that is due to evolving methods of calculating areas. The hectares shown on the title were calculated using pencil and paper, while the most recent calculations made have been done using much more accurate software. Having noted this, BAM will only allocate 12,413.5 ha of the Selva Maestra property to the REDD+ Project, as detailed in the following figure. The remaining areas of the Selva Maestra property will remain under BAM's possession for other activities.

Figure 2.12. Selva Maestra boundaries' details



Source: Inhouse elaboration.

2.5.3 Free, Prior and Informed Consent (G5.2)

There are no indigenous groups living in the project area (comprising both Selva Maestra and Nuestro Señor Jesucristo properties) nor traditional uses of forest resources are limited by the project's activities. Thus, no Free, Prior and Informed Consent is needed, and dispositions established in Prior Consultation Law, Law No. 29785, as well as in Agreement 169 of the International Labor Organization on indigenous and tribal peoples (ILO) are duly expected.

As explained in section 2.5.6. the project will not encroach uninvited on private property, community property, or government property.

It is worth mentioning that BAM has been implementing a program of socialization and dissemination of information with the surrounding communities (including native communities outside the project area), which is carried out on an ongoing basis regarding the details of the project, including the area and scope of the project, as indicated in section 2.3.2 (see file: Project Diffusion and dissemination).

2.5.4 Property Rights Protection (G5.3)

Nuestro Señor Jesucristo and Selva Maestra have their rights protected by their sale contract approved by the Regional Directorate of Agriculture of Ucayali, which is protected by good faith registration purchase at the SUNARP, the National Property Registry Office. As above mentioned, the properties were purchased in 1999 and 2009 by companies of the Bosques Amazonicos group. There were/are no groups living in the project area, so there has never been a need for relocation.

Regarding Nuestro Señor Jesucristo, there is no overlap or ongoing disputes, no other landowners or land rights holders are affected. The project does not lead nor will lead to the involuntary removal or relocation of property rights holders from their lands and does not force rights holders to relocate activities in the Nuestro Señor Jesucristo property.

Regarding the area of Selva Maestra property considered for this project, there is no overlap or ongoing disputes in this area, no other landowners or land rights holders are affected. Furthermore, there is no one living in the area allocated for the REDD+ project. BAM have all property rights regarding the Selva Maestra property.

2.5.5 Illegal Activity Identification (G5.4)

Risks from illegal activities are detailed in Section 2.1.18. The main illegal activities of potential risk to the project include land encroachment, which is defined as an infraction in the Forestry and Wildlife Law (Article 146 (e)), normally for change of use for other activities (cattle ranching, agriculture) and others such as forest fires or illegal logging caused by external agents.

Mitigation measures taken by the project to address and avoid these threats include:

- Monitoring Control and Surveillance System (MCSS): the project's MCSS includes an early warning system to identify hot spots on a daily basis in the area of influence. These alerts are reported using official satellite data such as that provided by GEOBOSQUES (MINAM). Also, the MCSS comprises technical and legal support for the correct identification and control of

deforestation threats in the project area in a timely manner. For this purpose, the project area has properly implemented infrastructure (camps) and a monitoring and security team in charge of supervising the area and specifically the boundaries of the property.

- Collaboration agreements: the project seeks to collaborate with local and national authorities to strengthen the capacity to prevent or mitigate possible invasions to the area.

- In case of suspected logging or encroachment, an action protocol is initiated (see sheet: health and safety working conditions - territorial security protocol), which may include notification/involvement of the Forestry Authority, the Public Prosecutor's Office, and the National Police.

- Area demarcation: project boundaries and signs are clear and well maintained in order to favor better monitoring and control of the forests.

- Training at community-level is key in the attempt to prevent the negative impacts of burning. As part of the training provided by the project, the aim is to train the identified communities in sustainable forest management, including how to react to possible fires. As part of the training events, the project seeks to work with experts and competent authorities in each specific area. For example, in the area of fire control, we will seek to work with INDECI (Institute of Civil Defense).

- Promotion of sustainable activities related to the conservation and sustainable use of forest resources: the project proposes to promote the development of environmentally friendly activities among project stakeholders (identified communities)

- The project also seeks the improvement of the communities identified in relation to access to basic services such as water, health, electricity, and others in order to avoid their displacement to the project area.

2.5.6 Ongoing Disputes (G5.5)

Litigation involving the property that has been resolved over the past twenty years is detailed below.

NUESTRO SEÑOR JESUCRISTO: all litigation has been resolved.

Previous:

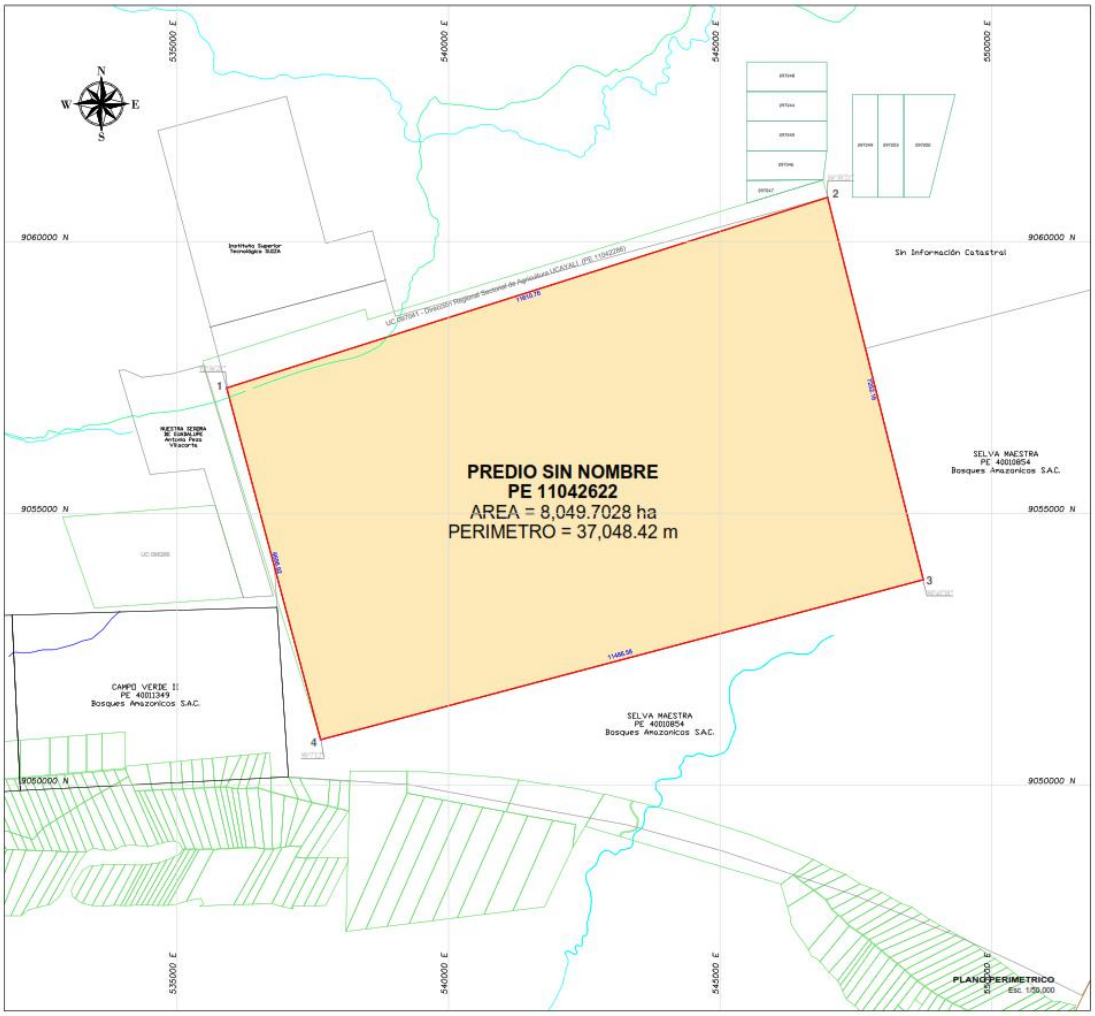
- Land overlapping litigation with the Instituto Superior Technological Suiza, was filed by the authorities and therefore resolved. Report 28-2019-OPDR-ABOG/AAR of the Regional Attorney's Office of the Regional Government of Ucayali confirmed that the deadline to file the lawsuit for nullity of the legal act of resolution of purchase and sale of the land in favor of JCC had expired (Article 2001 of the Peruvian Civil Code establishes a 10-year term). In this sense, the definitive file was declared closed and, consequently, it is a closed conflict. There is no overlapping of properties with the Instituto Superior Tecnológico Suiza.

- There is no issue of conciliation of balances for the purchase and sale of land in JCC. This dispute is archived and, therefore, solved. In this regard, Regional Directorial Resolution No.155-2020-GRU-DRA left without effect letter No.182-2016-GRU-DRA for the collection by conciliation of

balances for purchase and sale of land and confirmed that BAM had already proceeded with the payment of this debt. Therefore, a letter from the Regional Management confirming that the reversion of the property does not proceed is not required because the Regional Directorial Resolution No.155-2020-GRU-DRA already confirms the non-reversion. In short, all balances have been paid and the dispute was solved.

- There is no dispute of overlapping with public domain-State-owned land in JCC which was archived and solved by Report No. 002-2022-GRU-DRA/DISAFILPA/PSCR-TUPA of the Directorate for Land Rights Consolidation Processes of the Regional Directorate of Agriculture of Ucayali (see the orange strip in the figure here below to visualize the overlap solved and archived). This report confirmed that BAM has ownership over the overlapping area.

Figure 2.13. Nuestro Señor Jesucristo (predio sin nombre) boundaries' details



Source: Own elaboration

SELVA MAESTRA:

BAM has considered the areas described in section 2.5.2 for the REDD+ project. This area has no past or current conflicts. The remaining areas of the Selva Maestra property will remain under BAM's possession for other activities.

2.5.7 National and Local Laws (G5.6)

The project complies with all relevant national and regional laws and regulations relevant to the Project activities. We detail this regulatory framework in table 16 here below.

Table 2.13. National and Regional regulatory framework relevant to the project activities

Law	Legal analysis
General Environment Law, Law No. 28611	According to article 92, the "State promotes the sustainable use of forest resources and wildlife, as well as the conservation of natural forests". Besides, "the State promotes and supports the sustainable management of wild fauna and flora, prioritizing the protection of endemic and endangered species and varieties, based on technical information, scientific, economic and traditional knowledge". In this framework and to achieve those goals, the State recognizes in article 94 that "natural resources and other components of the environment perform functions that allow maintain the conditions of the ecosystems and the environment, generating benefits that are used without mediate remuneration or compensation, for which the State establishes mechanisms to value, remunerate and maintain the provision of said environmental services, seeking to achieve the conservation of ecosystems, biological diversity and other natural resources". The State recognizes that mitigation of green gas emissions is considered environmental services (article 94.2). Thus, to achieve those conservation forest goals, "the National Environmental Authority promotes the development of mechanisms for financing, payment and supervision of environmental services", such as those developed in this project. In the same line, article 150 recognizes that "measures or processes that, at the initiative of the owner of the activity, are implemented and executed with the purpose of reducing and/or prevent degradation of natural resources, beyond what is required by the applicable regulations or the competent authority and that responds to the objectives of environmental protection", "constitute behaviors that can be rewarded with incentives". Accordingly, BAM and Nuevo Paraiso's activities which are implemented for forest conservation purposes can be rewarded with incentives such as carbon credits benefits.

Law	Legal analysis
National Environmental Policy approved by Supreme Decree No. 12-2009-MINAM	The elaboration of the National Environmental Policy is a mandate that comes mainly from the Political Constitution of Peru and the General Environmental Law, constituting a set of guidelines, objectives, strategies and instruments of a public nature that have the purpose of defining and orienting the actions of the entities of the National, Regional and Local Government, the private sector and the civil society, in environmental matters. The National Environmental Policy is divided into 5 objectives, 4 policy axes and specific objectives and guidelines for each policy. One objective of the National Environmental Policy relevant to the Project is to achieve the conservation and sustainable use of the country's natural heritage, with efficiency, equity and social welfare, prioritizing the integrated management of natural resources. The environmental services are identified within the National Policy of the Environment in diverse points, indicating the necessity to foment its economic valuation through economic and financial instruments, emphasizing the importance of implementing systems of conservation of forests and protection of such as far as the degradation and deforestation.
Organic Law for the sustainable use of Natural Resources, Law No. 26821	According to article 8 “the State shall ensure that the granting of the right to the sustainable use of natural resources is carried out in harmony with the interest of the Nation, the common good, and within the limits and principles established in this Law, in special laws and in regulatory norms on the matter”. On the other hand, the Law confirms that “all use of natural resources by individuals creates a financial retribution that is determined by economic, social and environmental criteria. The financial retribution previously mentioned, includes any concept that must be contributed to the State for the natural resource, whether as compensation, right of granting or right of validity of the title containing the right, established by special laws. In this regard, BAM has paid all balances.
Forest and Wildlife Law, Law No, 29763	Both Selva Maestra and Nuestro Señor Jesucristo, according to the Forest and Wildlife Law No. 29763 (LFFS), the title of ownership includes ownership over emissions reductions.
Regulation for forest management approved by Supreme Decree No. 018-2015-MINAGRI	According to article 39.1 “the enabling title is the administrative action granted by the forest and wildlife authority, that allows the natural or legal person the access for the sustainable use of natural resources, wildlife, and forest ecosystem services, through Management Plan. BAM has a title of ownership.
Prior Consultation Law	The implementation of this project does not constitute an administrative or legislative measure and, consequently, it does not require a prior consultation process in accordance with Article 1 of the Prior Consultation Law.
Law No. 27783 Law on the Bases of Decentralization	It regulates the structure and organization of the State in a democratic, decentralized and deconcentrated way, corresponding to the National Government, Regional Governments and Local Governments. It also defines the rules that regulate administrative, economic, productive, financial, tax and fiscal decentralization. Likewise, this law establishes the competencies of the three levels of government and determines the assets and resources of the regional and local governments; and regulates the relations of government in its different levels. Article 36 mentions shared competences, one of them being the promotion,

Law	Legal analysis
	management and regulation of economic and productive activities in their scope and level, corresponding to the different sectors, including the environmental sector.
Law No. 27867 Organic Law of Regional Governments	Law that, in its sections 9 and 10, establishes constitutional, exclusive, and shared competences to Regional Governments in environmental matters to promote and regulate activities or services in the environmental sector. They also establish exclusive competences to promote the sustainable use of forest resources and biodiversity, and shared competences for the sustainable management of natural resources, the improvement of environmental quality and the preservation and administration of regional reserves and natural protected areas. Article 53 of the same law establishes the functions of the regional governments in environmental and land-use planning matters. For the Regional Governments to be able to exercise the competences assigned by this law, a process of transference of those competences must be followed, which has the objective of accrediting that this level of government has the institutional capacities to assume them.

2.5.8 Approvals (G5.7)

The purchase and sale contracts of the Selva Maestra and Nuestro Señor Jesucristo properties are approved by the Regional Directorate of Agriculture of Ucayali. These contracts recognize the rightful owners as Bosques Amazónicos SA and JCC Inversiones S.A.C. and can be found in the file: Property rights evidence, shared with both the auditor and VERRA. Also, the Assignment of Forest Carbon Rights executed between Bosques Amazónicos SA and JJC Inversiones S.A.C, where the carbon right is assigned to Bosques Amazónicos SA (Project Developer) in relation to the Nuestro Señor Jesucristo property is uploaded in said file.

2.5.9 Project Ownership (G5.8)

As mentioned above, Selva Maestra and Nuestro Señor Jesucristo are private lands granted by the Regional Directorate of Agriculture of Ucayali in favor to each owner, Bosques Amazónicos SA and JJC Inversiones S.A.C, respectively. All documentation supporting Project ownership can be found in file: Property rights evidence, shared with both the auditor and VERRA. The Assignment of Forest Carbon Rights between JCC Inversiones SAC and BAM related to Nuestro Señor Jesucristo's property is also attached as a supporting document in said file.

2.5.10 Management of Double Counting Risk (G5.9)

The project does not seek to be eligible under any other program or scheme that generates environmental or social credits, except the voluntary market and through VERRA platforms. Traceability will be ensured by this way.

2.5.11 Emissions Trading Programs and Other Binding Limits

The project does not participate in any other emissions trading program. All the reductions will be traded in the VERRA voluntary carbon market.

2.5.12 Other Forms of Environmental Credit

As stated in 2.5.10, the project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates, nor plans to do it.

2.5.13 Participation under Other GHG Programs

The Project does not participate under any other GHG program. It will apply only to the validation and verification of VCS and CCB standards.

2.5.14 Projects Rejected by Other GHG Programs

The project has never been rejected by any other GHG programs because it never applied to any GHG program as it is recently being developed.

2.5.15 Double Counting (G5.9)

Double sale and double counting are not allowed and will not be practiced. All the sales will be done under a unique voluntary carbon market so there is no risk of double counting. All the transactions will be public through the web platform of VERRA so there will not be in conflict with Peru climate commitments. In addition, it must be remembered that these reductions are originated from avoided planned deforestation, while Peru FREL is based on unplanned deforestation.

3 CLIMATE

3.1 Application of Methodology

3.1.1 Title and Reference of Methodology

This project is using VCS approved methodology **VM0007**, Version 1.6, 08 September 2020, Sectoral Scope 14, “REDD+ Methodology Framework (REDD+ MF)”.

The project also applies a set of modules and tools:

Carbon pool modules:

- **VMD0001** Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools (CP-AB), Version 1.1.
- **VMD0004** Estimation of stocks in the soil organic carbon pool (CP-S), Version 1.0.

Baseline modules:

- **VMD0006** Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation/forest degradation and planned wetland degradation (BL-PL). Version 1.3.

Leakage modules:

- **VMD0009** Estimation of emissions from activity shifting for avoiding planned deforestation/forest degradation and avoiding planned wetland degradation (LK-ASP), Version 1.3.

Emission modules:

- **VMD0013** Estimation of greenhouse gas emissions from biomass and peat burning (E-BPB), Version 1.2.

Monitoring modules:

- **VMD0015** Methods for monitoring of greenhouse gas emissions and removals in REDD project activities (M-REDD), Version 2.2.

Miscellaneous modules:

- **VMD0016** Methods for stratification of the project area (X-STR), Version 1.2.
- **VMD0017** Estimation of uncertainty for REDD+ project activities (X-UNC), Version 2.2.

Tools:

- CMD Tool for testing significance of GHG emissions in A/R CDM project activities (**T-SIG**), Version 1.
- **VT0001** Tool for the demonstration and assessment of additionality in VCS agriculture, forestry, and other land use (AFOLU) project activities **(T-ADD)**, Version 3.0.
- VCS AFOLU Non-Permanence Risk Tool (**T-BAR**), Version 4.0.

3.1.2 Applicability of Methodology

Table 3.1. Applicability of the methodology and tools

Methodology element	Applicability condition	Explanation
REDD+ MF (General)	The justification of the choice of modules and why they apply to the proposed project activity must be given in the PD.	The justification for the choice of each module of the methodology is found in this table.
	Specific applicability conditions exist for each module and must be met for the module to be used.	The applicability conditions of each module are met as explained in this table.
	This methodology includes unplanned forest degradation caused only by the extraction of wood for fuel. No modules are included for activities to reduce emissions from forest degradation caused by illegal harvesting of trees for timber.	The REDD+ MF (footer 9) states that exclusion of illegal logging emissions from the baseline is conservative, and if they are monitored ex-post within the project area, emissions should be deducted.
REDD+ MF (All project activities)	All land areas registered under the CDM or under any other GHG program (both voluntary and compliance-oriented) must be transparently reported and excluded from the project area. The exclusion of land in the project area from any other GHG program must be monitored over time and reported in the monitoring reports.	The project area does not have land under any GHG program.
REDD+ MF (REDD)	Land in the project area has qualified as forest (following the definition used by VCS; in addition,	In Perú, forests are defined as:

Methodology element	Applicability condition	Explanation
	see Section 5.1.2) for at least 10 years prior to the project start date.	*It is a predominantly arboreal ecosystem with a surface area of at least 0.5 hectares, with minimum canopy coverage of 10% of its area. It houses trees of woody consistency with a minimum height of 2 meters in their adult state on the Coast and Highlands; and 5 meters in the Amazon.* (SERFOR, 2020)[21]. The project area only considers the existing forest area by the end of 2019, reported in GEOBOSQUES[22]. It should be noted that inside the boundaries of the project properties, there are non-forest areas (native vegetation that does not qualify as forest and forest loss previous to 2001) as well as forest loss areas from the 2001-2019 period. These non-forest areas are not considered part of the project area. See Figure 3.1. The definition of forest adopted by GEOBOSQUES is based on the establishment of a forest baseline for the year 2000, which was established following the criteria detailed in the "Descriptive Memory of the Map of Forest/Non Forest 2000 and Map of Loss of Amazonian Rainforests of Peru 2000-2011", where it is detailed that the definition established in the Methodological Framework of the National Forest Inventory is used, as a "predominantly arboreal ecosystem that must have an area larger than 0.5 ha, with a minimum width of 20 m and a minimum canopy cover of

[21] SERFOR (2020). Inventario Nacional Forestal y de Fauna Silvestre. Informe De Resultados del Panel 1. Available in: https://sniffs.serfor.gob.pe/inventarios/pu/panel1/descargas/INFFS_PANEL_1_libro_ok.pdf

[22] GEOBOSQUES presents a Forest/Non-Forest benchmark map from the year 2000, on which it monitors and reports forest loss annually (results available for the period 2001-2021). Due to the type of methodology used, GEOBOSQUES does not detect deforested areas that at some point in time could have recovered their forest cover; rather, it reports the "gross" loss of forest. Similarly, the Forest area that is updated year after year comes from the subtraction of the 2000 Forest minus the annual losses, so the annual Forest area represents the "primary" forest that continued to be forest (did not suffer deforestation). With this, it is concluded that the forest areas that make up the project area meet the eligibility criteria for REDD projects. More detail can be reviewed in GEOBOSQUES' protocols "Protocolo metodológico detección pérdida de bosque" and "Memoria Descriptiva del Mapa de Bosque/No Bosque año 2000 y Mapa de pérdida de los Bosques Húmedos Amazónicos del Perú 2000-2011", both available in: https://geobosques.minam.gob.pe/geobosque/view/descargas.php?122345gxxe345w34gg

Methodology element	Applicability condition	Explanation
		10%. The predominant vegetation is represented by trees of woody consistency that have a minimum height of 2 meters in their adult state for the coast and highlands, and 5 meters for the Amazon rainforest". The base unit is based on the identification of a pixel (30 m x 30 m). In order to achieve consistency between the theoretic definition, an operational definition of forest is also established, where it is considered as such the vegetal formations conformed by Aguajales, Varillales forest, Pacales forest, Riparian forest, Terrace forest, Hill forest and Mountain forest, and a combination of geospatial criteria in the selection of training areas that allow complying with the proposed definition, which includes: - Brightness - hue: closely related to the spectral behavior of the different canopies. - Color: The most common shades correspond to the following canopies: 1) Red-magenta: denotes vigorous vegetation, such as irrigated crops, deciduous forests and rainfed herbaceous crops. 2) Pink: shows less dense vegetation areas and/or vegetation in early growth stage. White: areas with little or no vegetation, but maximum reflectivity: clouds, sands, bare soil, snow, etc. 3) Dark blue to black: surfaces totally or partially covered by water: rivers, canals, lakes, reservoirs. 4) Gray to metallic blue: cities or populated areas. 5) Brown: shrubby vegetation, variable depending on the density and shade of substrate. 6) Beige-gold: identifies transition zones, dry meadows, often associated with sparse material. - Texture: relationship between object size and sensor resolution.

Methodology element	Applicability condition	Explanation
		- Spatial context: Discrimination in interpretation based on geographic location. - Other criteria: Shadows, spatial organization, shape, or contour of a particular feature. Finally, given that the operative unit is 1 pixel (0.09 ha), and that year after year the baseline forest has been losing areas, a final filtering of the GEOBOSQUES data was performed, considering forest only to those groups of pixels that have a minimum aggregation of 6 cells (0.54 ha), under a criterion of 8-connectivity (pixels connected to others by a complete side or by a vertex), those formations that did not exceed the threshold were catalogued as non-forest.
	If land within the project area is, peatland or tidal wetlands and emissions from the SOC pool are deemed significant; the relevant WRC modules (see Table 3) must be applied alongside other relevant modules.	The project area does not include peatlands or tidal wetlands, so WRC modules were not used.
	Baseline deforestation and forest degradation in the project area fall within one or more of the following categories: ● Unplanned deforestation (VCS category AUDD) ● Planned deforestation/degradation (VCS category APD) ● Degradation through the extraction of wood for fuel (fuelwood and charcoal production) (VCS category AUDD)	The project baseline is planned deforestation (VCS category APD).
	Leakage avoidance activities must not include: ● Agricultural lands that are flooded to increase production (e.g., rice paddy) ● Intensifying livestock production through the use of feed-lots and/or manure lagoons.	These activities are not included in the project design.
REDD+ MF (Avoiding planned deforestation/ degradation)	Avoiding planned deforestation/degradation activities are applicable under the following condition: ● Where conversion of forest lands to a deforested condition must be legally permitted.	Conversion of forest lands to a deforested condition is legally permitted, in accordance with the terms provided in the enabling title granted by the Peruvian State, through which it authorized the onerous transfer in favor of JCC and Selva Maestra, as well as in the contract for the acquisition of the properties.

Methodology element	Applicability condition	Explanation
Module VMD0001	This module is applicable to all forest types and age classes. Inclusion of the aboveground tree biomass pool as part of the project boundary is mandatory as per the framework module REDD-MF.	Aboveground tree biomass is included.
	Non-tree aboveground biomass must be included as part of the project boundary if the following applicability criteria are met (per framework module REDD-MF): ● Stocks of non-tree aboveground biomass are greater in the baseline than in the project scenario, and, ● Non-tree aboveground biomass is determined to be significant (using the T-SIG module).	Non-tree aboveground biomass is considered not significant using T-SIG, so it was excluded from the project boundary.
	Belowground (tree and non-tree) biomass is not required for inclusion in the project boundary because omission is conservative.	Belowground tree biomass is a project carbon pool, while non-tree belowground biomass was excluded from the project boundary.
Module VMD0004	This module is applicable to non-organic soils under all forest types and age classes. This module is applicable if the soil organic carbon pool is included as part of the project boundary as per applicability criteria in the framework module REDD-MF, specifically: -Soil organic carbon shall be included if stocks are greater, or are increasing at a greater rate, in the baseline than in the project scenario. Ex ante determination that stocks are greater in the baseline than in the project scenario can be made on the basis of IPCC 2006GL Relative Stock Change Factors (FLU, FMG, and FI)1 – if the average combined stock change factor for the baseline (area-weighted by post conversion land use) is greater than or equal to 1, then soil organic carbon must be included, otherwise it can be conservatively omitted, and;	Soil organic carbon is expected to be lower in the baseline than in the project scenario, however, as it is a relevant carbon pool for the project, it is included in the project boundary.
	Soil organic carbon shall be included if determined to be significant (using T-SIG).	Soil organic carbon is considered significant using T-SIG.
Module VMD0006	The module is applicable for estimating the baseline emissions on forest lands (usually privately or government-owned) that are legally authorized and documented to be converted to non-forest land.	Forest lands are private and have legal permission to carry out changes in land use for agricultural and cattle-raising production.
	Where, pre-project, unsustainable fuelwood collection is occurring within the project boundaries Modules BL-DFW and LK-DFW must be used to determine potential leakage.	No unsustainable fuelwood collection occurred in the pre-project period.
Module VMD0009	The module is applicable for estimating the leakage emissions due to activity shifting from forest lands that are legally authorized and documented to be converted to non-forest land, including activity shifting to forested wetland that is drained or	The project seeks to avoid planned deforestation, which is legally authorized and documented.

Methodology element	Applicability condition	Explanation
	degraded as a consequence of project implementation.	
	The module is also applicable for estimating the leakage emissions due to activity shifting from non-forested wetlands that are legally authorized and documented to be converted and degraded. Under these situations, displacement of baseline activities can be controlled and measured directly by monitoring the baseline deforestation or wetland degradation agents or class of agents.	Leakage emissions due to change in activity of non-forest wetlands were not considered as it is not part of the project baseline.
	This tool must be used for projects in areas where planned deforestation happens on forested wetlands, regardless of the absence of wetland within the project boundaries.	In the project area there are forested wetlands, such as *Mauritia flexuosa* dominated palm swamp and Palm and Mixed Palm Swamp Forest.
	The module is mandatory if Module BL-PL has been used to define the baseline, and the applicability conditions in Module BL-PL must be complied with in full.	The BL-PL Module has been used to define the baseline, and the applicability conditions of the BL-PL Module are fully met.
Module VMD0013	This module is applicable to REDD project activities with emissions from biomass burning and REDD-WRC project activities with emissions from biomass and/or peat burning. This module is also applicable to RWE and ARR-RWE project activities with emissions from peat burning.	This is a REDD (APD) project, so the module was used to estimate emissions from biomass burning.
Module VMD0015	Strata as defined in the relevant baseline modules are fixed and may not be changed without baseline revision.	Strata will remain fixed during the crediting period.
	The module is mandatory for REDD, CIW-REDD, RWE-REDD and stand-alone CIW project activities.	This is a REDD (APD) project, so the module is being used.
	Where selective logging is taking place in the project case: ● Emissions from logging may be omitted if it can be demonstrated the emissions are de minimis using Tool T-SIG. ● If emissions from logging are not omitted as de minimis, logging may only take place within forest management areas that possess and maintain a Forest Stewardship Council (FSC) certificate for the years when the selective logging occurs. ● Logging operations may only conduct selective logging that maintains a land cover that meets the definition of forest within the project boundary. ● All trees cut for timber extraction during logging operations must have a DBH greater than 30 cm. ● During logging operations, only the bole/log of the felled tree may be removed. The top/crown of the tree must remain within the forested area.	No legal selective logging is planned in the project design. If illegal logging takes place inside the project area, within the ex-post project scenario, it will be assessed through PRAs and T-SIG to include/exclude emissions (as per requirements of REDD+ MF).

Methodology element	Applicability condition	Explanation
	● The logging practices cannot include the piling and/or burning of logging slash. ● Volume of timber harvested must be measured and monitored.	
VMD0016	In case of REDD, aboveground biomass stratification is only used for pre-deforestation forest classes, and strata are the same in the baseline and the project scenario. Post-deforestation land uses are not stratified.	Aboveground biomass stratification was used for forest classes prior to deforestation.
VMD0017	This module is mandatory when using methodology REDD+ MF. It is applicable for estimating the uncertainty of estimates of emissions and removals of CO2-e generated from REDD and WRC project activities.	All estimations include an uncertainty analysis.
	The module focuses on the following sources of uncertainty: ● Determination of rates of deforestation and degradation. ● Uncertainty associated with estimation of stocks in carbon pools and changes in carbon stocks. ● Uncertainty associated with estimation of peat emissions. ● Uncertainty in assessment of project emissions. Where an uncertainty value is not known or cannot be simply calculated, a project must justify that it is using an indisputably conservative number and an uncertainty of 0% may be used for this component. Guidance on uncertainty – a precision target of a 95% confidence interval half-width equal to or less than 15% of the recorded value must be targeted.	All values used in the calculation process had an intrinsic uncertainty that was described in the form of its standard error, or the 95% confidence interval half-width.
T-SIG	The tool shall be used in the application of an A/R CDM approved methodology to an A/R CDM project activity: a) To determine which decreases in carbon pools and increases in emissions of the greenhouse gases measured in CO2 equivalents that result from the implementation of the A/R project activity, are insignificant and can be neglected. b) To ensure that it is valid to neglect decreases in carbon pools and increases in GHG emissions by sources stated as being insignificant in the applicability conditions of an A/R CDM methodology.	The tool was used to determine the significance of carbon pools and emission sources.
T-ADD	The tool is applicable under the following conditions: ● Forestation of the land within the proposed project boundary performed with or without being registered as the A/R CDM project activity shall not lead to violation of any applicable law even if the law is not enforced.	Project activities are compliant with all relevant national laws.

Methodology element	Applicability condition	Explanation
	• This tool is not applicable to small - scale afforestation and reforestation project activities	

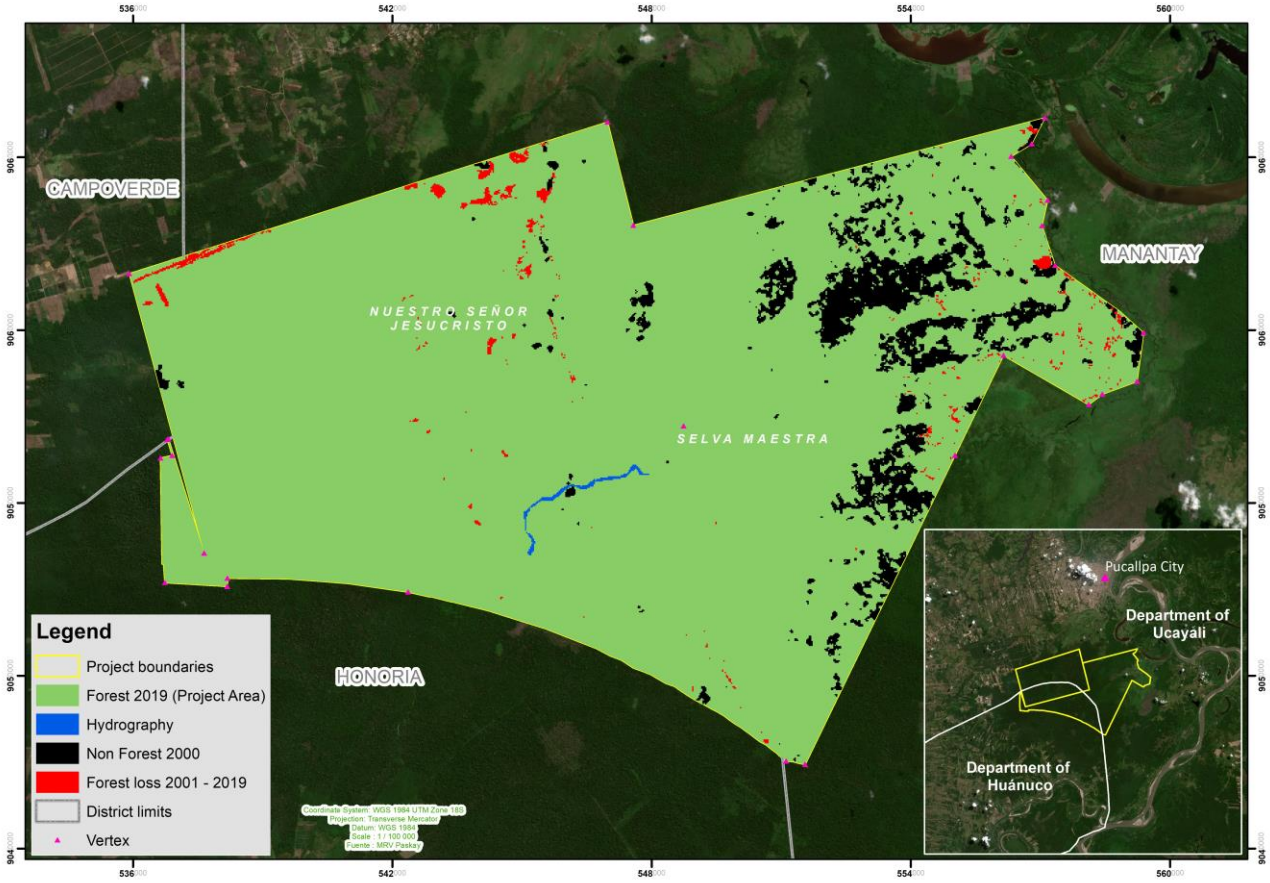
3.1.3 Project Boundary

A. Geographical boundaries

The project area is made up by the 19,034.65 ha of forest land (at the start of the accreditation period)[23] within the properties Selva Maestra and Nuestro Señor Jesucristo, which are located in the Peruvian regions of Ucayali and Huánuco. Three districts are present in the project area, the Campo Verde and Manantay districts (Ucayali), and the Honoria district (Huánuco).

Figure 3.1 shows the forest/non-forest status at the end of the year 2019, and Table 2.2 (from Section 2.1.5) shows the vertices of the property limits.

Figure 3.1. Project area boundary



Source: Inhouse elaboration.

[23] The forest area of year 2019, estimated based on the GEOBOSQUES data, is representative of the forest land at the beginning of the project crediting period.

B. Carbon pools

Table 3.2 shows the relevant carbon reservoirs considered in the scope of the project, according to Table 4 of VM0007, and their respective justification.

Table 3.2. Carbon pools included and excluded from project boundary

Carbon pools	Included?	Justification/Explanation
Above-ground tree biomass	Yes	Inclusion is mandatory as per VM0007 v1.6, Table 04. It does not include non-tree woody biomass.
Above-ground non-tree biomass	No	Not mandatory by methodology.
Belowground tree biomass	Yes	Not mandatory by methodology. Included in the project because it is generally the second most significant carbon pool in forest biomass and because it is significant (represents more than 5% of the tree woody biomass), as indicated by the T-SIG tool.
Belowground non-tree biomass	No	Not mandatory by methodology.
Deadwood	No	Not mandatory by methodology.
Harvested wood products	No	Optional. The inclusion of the harvested wood pool as part of the project boundary is mandatory when the process of deforestation involves timber harvesting for commercial markets, as per VM0007 v1.6, Table 04.
Litter	No	Not mandatory by methodology.
Soil organic carbon	Yes	Not mandatory by methodology. Inclusion is optional in the case stocks are not greater in the baseline than in the project scenario, per VM0004 v1.0.

C. Sources of GHG emissions

The relevant GHG sources, sinks, and reservoirs for the project and baseline scenarios are shown in Table 3.3.

Table 3.3. GHG emissions sources included and excluded from project boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Carbon Stock Changes	CO_2	Yes	Stock changes were included, as they are mandatory in the methodology.
		CH_4	No	Not applicable.
		N_2O	No	Not applicable.
	Biomass Burning	CO_2	No	Carbon stock decreases due to burning are already accounted as carbon stock change.
		CH_4	Yes	

Source		Gas	Included?	Justification/Explanation
		N_2O	Yes	Fire is used as an instrument for converting the forest to pasture or other land uses in the baseline scenario. In the process of legal forest suppression, commercial wood is extracted, and the remaining woody material is felled and burned on site. Non-CO_2 gases are expected to be emitted due to woody biomass burning in the baseline scenario.
	Fossil fuel Combustion	CO_2	No	As per VMD0014 (E-FCC), the *"Fossil fuel combustion in all situations is optional emission source."*
		CH_4	No	
		N_2O	No	
	Use of Fertilizers	CO_2	No	CO_2 and CH_4 are negligible and exclusion of N_2O is conservative, as per Table 7 of VM0007 v1.6.
		CH_4	No	
		N_2O	No	
Project	Carbon Stock Changes	CO_2	Yes	Stock changes were included, as they are mandatory in the methodology.
		CH_4	No	Not applicable.
		N_2O	No	Not applicable.
	Biomass Burning	CO_2	No	Carbon stock decreases due to burning are already accounted as carbon stock change.
		CH_4	Yes	Biomass Burning is not anticipated in the project scenario by means of the proponent, but external forces can cause (in a minimal degree) forest loss.
		N_2O	Yes	
	Fossil fuel Combustion	CO_2	No	Can be neglected if excluded from baseline accounting, as per Table 7 of VM0007 v1.6.
		CH_4	No	
		N_2O	No	
	Use of Fertilizers	CO_2	No	Excluded in the project scenario as they were conservatively excluded in the baseline scenario, as per Table 7 of VM0007 v1.6.
		CH_4	No	
		N_2O	No	

3.1.4 Baseline Scenario

The baseline scenario is the planned land use change of the forests in the project area, for the installation and production of agro-industrial crops and livestock pastures. As described in Section 3.1.5, landowners have the right to undertake land use conversion at a rate and for crops set forth in their purchase contracts.

The baseline scenario was set according to provisions in VM0007 and its relevant module VMD0006, v1.3. This module provides a stepwise approach for estimating GHG emissions related to planned deforestation. This section will calculate the annual area of land to be deforested.

A. Agent of Planned Deforestation

The company "Bosques Amazónicos SA" is identified as the single agent of planned deforestation in the baseline, which is considered as the "simplest scenario", according to VMD0006 v1.3, Section 5, Part 1.1.

B. Area of deforestation

The area of deforestation ($A_{planned,i}$) is defined according to an immediate site-specific threat of deforestation, which is demonstrated by documentary proof of the following:

1) Legal permissibility for deforestation:

The Selva Maestra property was awarded under Legislative Decree No. 653 (1992), and the Nameless Property (Nuestro Señor Jesucristo) was awarded under Legislative Decree No. 838 (1996). Both are regulations for the promotion of agrarian activity, by means of which lands were awarded for carrying out agricultural activities (agricultural and livestock). Table 3.4 presents the contractual conditions of these two properties (see folder Property Rights Evidence).

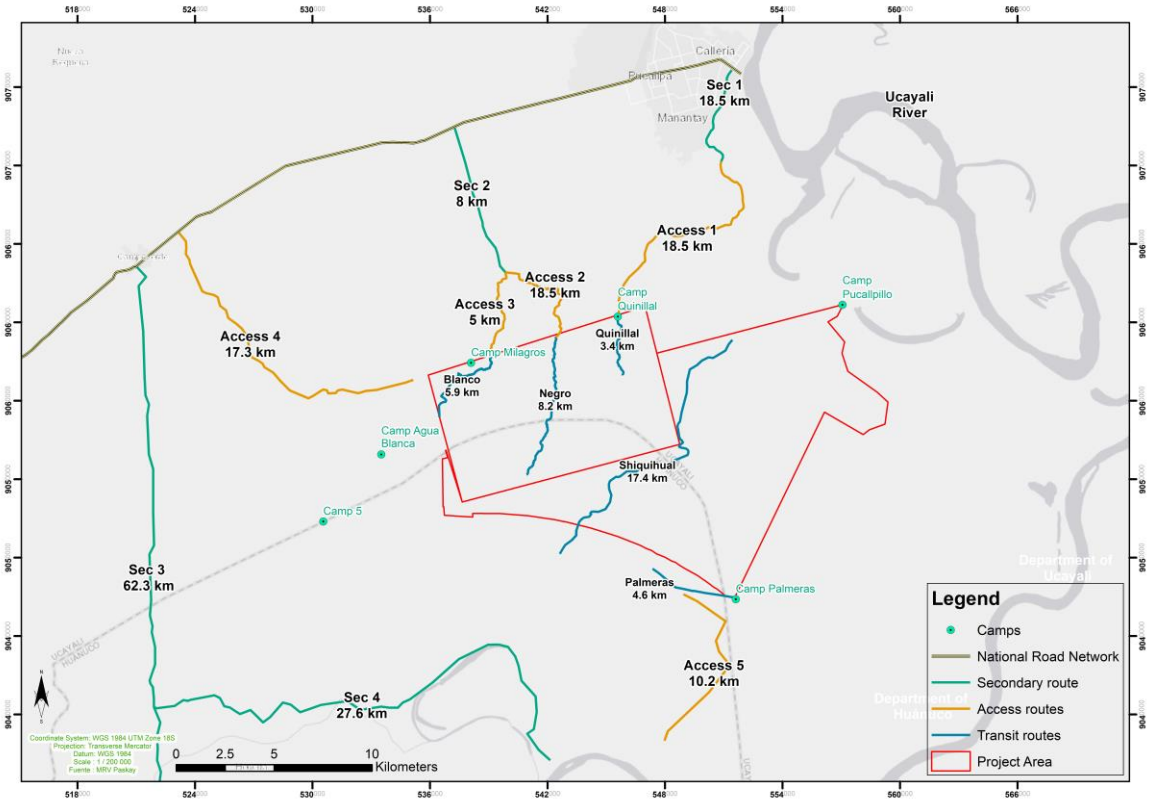
Table 3.4. BAM (Bosques Amazónicos SAC) contractual conditions

Property	Contract	Date	Law	State	Particular
Selva Maestra	Contract for the Purchase and Sale of Lands in the Ceja de Selva No. 126666-AG-PETT	20/09/1999	D.Leg. 653 (Annex 25)	Ucayali Agricultural Sector Regional Directorate / PETT	Ganadera Campo Verde SA
Nuestro Señor Jesucristo (Nameless Property)	Public Deed 66 Contract for the Purchase and Sale of Ceja de Selva Lands with Property Reserve	01/12/2009	D.Leg. 838 (Annex 26)	Ucayali Agricultural Sector Regional Directorate	JCC Inversiones SAC

2) Suitability of project area for conversion to alternative non-forest land use:

The suitability of the area is demonstrated by the ability of the land to be converted to the activities proposed in the project scenario. In this case, the project area is one of the few areas with the presence of continuous forest in the surroundings of the city of Pucallpa, one of the main cities of the Peruvian Amazon. Due to its central location, it is one of the main collection points for river transport, a major trading port, especially for forest products, and it also has an important land connection through the "Federico Basadre" national highway.

Figure 3.2. Accessibility map to the project area



Source: Inhouse elaboration.

The project area is surrounded by rural properties where agriculture and livestock work are intensive (the same activities that are planned to be carried out). At the same time, it has five distinguishable access routes, 3 of them being the entrance to the "Milagros", "Quinillal", and "Paleras" camps, which are settled trails (except in the rainy season, access to “Quinillal” is carried out by boat since the land is flooded); and access through the "Rio Negro” and “Shiquihual” streams, which are by boat, and restricted to the rainy season. Access, as shown in Figure 3.2, is wide, with great availability of secondary roads, and ease of providing maintenance to existing roads, which will allow a direct flow of transport of goods to the city of Pucallpa, which is a main center of commerce.

On the other hand, the area does not have steep slopes (as shown in Figure 2.2.B from Section 2.1.5), so the entry of heavy machinery, for the use of intensive agricultural activities, is feasible. Regarding physiographic, geologic, and climatic conditions, these conditions are similar in all the regions surrounding the project area, where this type of activity is already carried out.

3) Government approval for deforestation to occur:

The same purchase contracts presented in Table 3.5 indicate the approval of the land-use change for the alternative uses such as agricultural activities and/or livestock raising. These are in accordance to the terms provided in the enabling title granted by the Peruvian State, through which it authorized the onerous transfer in favor of JCC and Selva Maestra, as well as in the contract for the acquisition of the properties.

4) Intention to deforest:

The intention to deforest is demonstrated in the agro-industrial plans[24] developed for each property, which enabled their purchase. In the case of "Nuestro Señor Jesucristo" property, the land-use change for producing permanent crops (oil palm, castor oil plant and camu camu) is considered, while the area of "Selva Maestra" presents a land-use change authorization for the installation of pastures for cattle raising (see the folder Property Rights Evidence).

C. Rate of Deforestation

The deforestation rates ($D\%_{planned,i}$) are defined based on the agro-industrial plans of each property, where the annual and total area of installation of crops and pastures is determined. Table 3.5 presents the planned deforestation rates in each property in the baseline scenario, in accordance with the management plans.

Table 3.5. Description of the planned deforestation area for each property

Property	Planned deforestation area (ha)
JCC - Nuestro Señor Jesucristo	8,049 ha, where 5,000 ha of them represents the conversion from forest to croplands; and the rest (2,507 ha), infrastructure development (including roads).
Selva Maestra	7,000 ha destined to be converted to pastures.

D. Likelihood of Deforestation

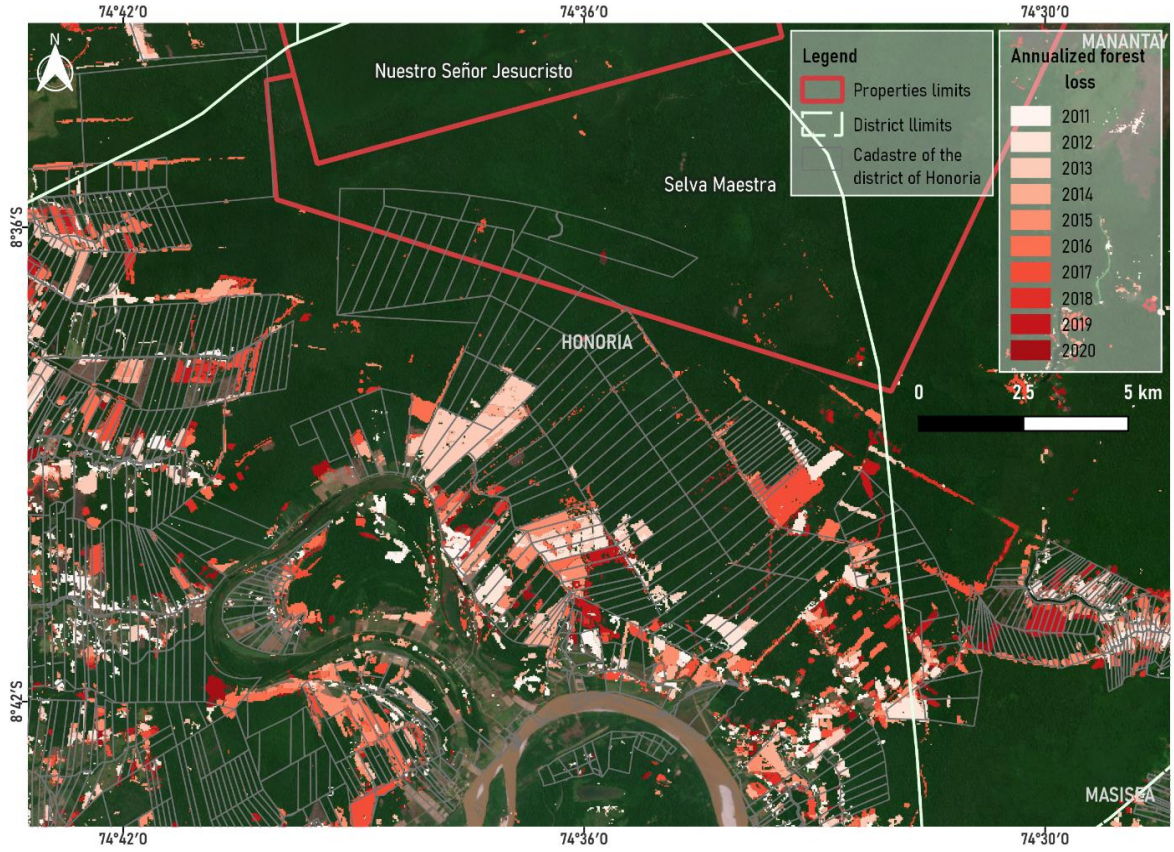
The likelihood of deforestation (*L-Di*) is set to be 100%, according to the VMD0006, Section 1.4 criteria. The private properties under BAM scope are not under government control and are not zoned for deforestation.

E. Risk of Abandonment

The risk of abandonment is considered based on proxy areas by the same class of deforestation agent in a 10-year interval. Information from the "Geobosques" portal, provided by the Ministry of the Environment of Peru, was used, which shows the deforestation produced in the project area on an annualized basis. In this way, the changes produced in the last 10 years, starting in 2011, were observed.

[24] The Technical Economic Feasibility Study for Nuestro Señor Jesucristo and the Project Profile for Selva Maestra present the projected productive activities and its areas.

Figure 3.3. Deforested areas in the last 10 years

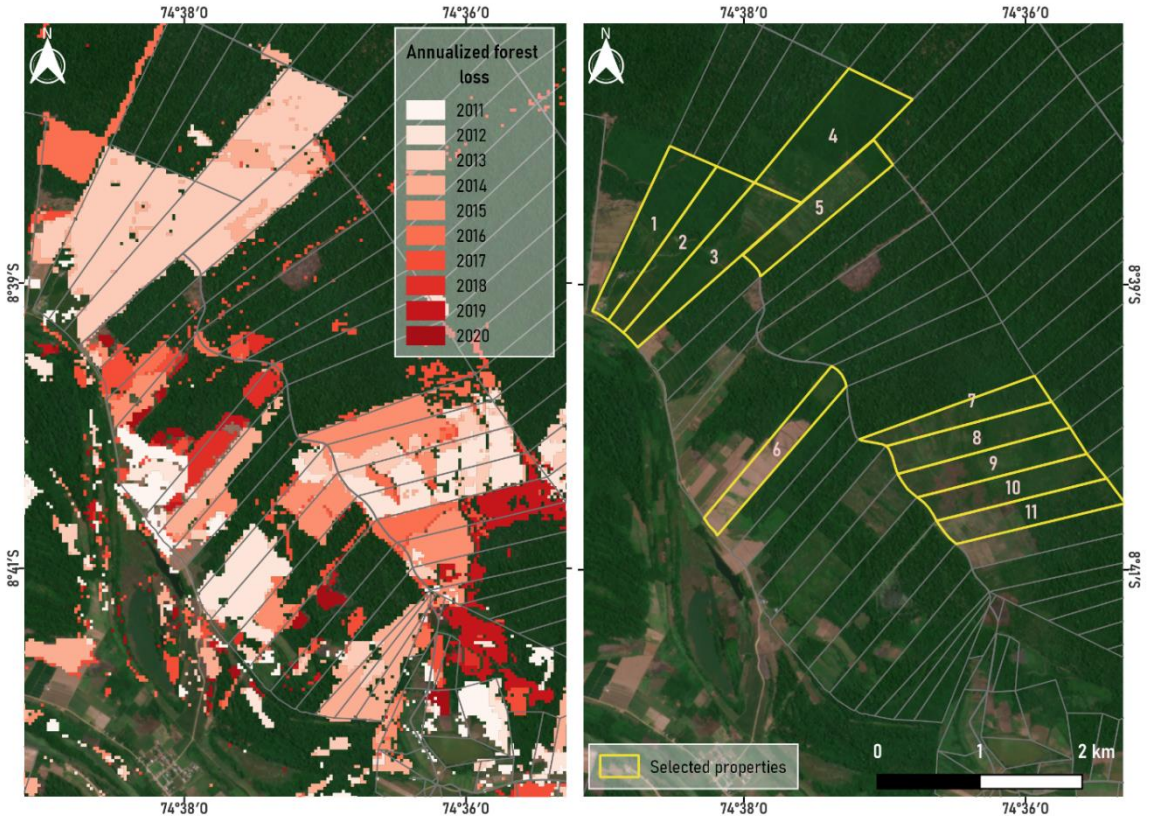


Depending on the level of deforestation, the areas indicated in Table 3.6 were chosen, these properties that suffered deforestation were analyzed through a visual evaluation using the temporal tool of Google Earth Pro and at the same time, a base image of November 2021 (provided by the Planet–NICFI service), to verify that the chosen areas are still deforested. The properties selected are visualized in the following figure.

Table 3.6. Properties selected to assess the risk of abandonment

Nº	Property	Area (ha)	Centroid – UTM 18S – E (m)	Centroid – UTM 18S – N (m)	Deforestation years
1	El Garzalito	60.65	540,603	9,044,825	2013
2	Tres Hermanitas	54.24	540,882	9,044,646	2013
3	Fundo Liberia	66.55	541,189	9,044,504	2013
4	Rosalina	83.64	542,350	9,045,677	2013 - 2014
5	Fundo Victoria	48.40	542,218	9,044,980	2013 - 2014
6	Fundo Vencedor	43.17	541,800	9,042,638	2011 - 2018
7	Fundo Silva	37.70	543,663	9,042,991	2015 - 2016
8	Los 2 Hermanitos	48.97	543,754	9,042,749	2013 - 2015
9	Elver	48.34	543,915	9,042,500	2012 - 2016
10	Fundo Paraiso	46.10	544,108	9,042,265	2012 - 2019
11	Los 5 Hermanos	46.28	544,286	9,042,030	2015 - 2019

Figure 3.4. Properties selected with the required criteria.



By 2021, the selected properties were still deforested, which can be corroborated with the right image of Figure 3.4, therefore there is no risk of abandonment since the main change in land use is towards agricultural land, which generates high returns due to the proximity to a main city (Pucallpa) and the presence of a road network that facilitates the movement of goods, which can also be seen with the strong anthropic pressure of the adjoining properties (Figure 3.3).

3.1.5 Additionality

To develop this section, the "Tool for the demonstration and assessment of additionality in VCS agriculture, forestry, and other land use (AFOLU) project activities, version 3.0" (VT0001) was used.

STEP 1: Identification of Alternative Land Use Scenarios to the AFOLU Project Activity

Sub-step 1a. Identify credible alternative land use scenarios to the proposed VCS AFOLU project activity

The most credible land use scenarios within the project area, according to the approved tool, are the following:

i. Scenario 1: Continuation of the pre-project land use.
The project area is under increasing threat of deforestation and forest degradation, associated to illegal logging, as was confirmed during field assessment and different control and

surveillance reports. This scenario has been occurring in the last decades, not only within the project area but in the surrounding zone. Illegal logging is very frequent. In addition, deforestation rate in the project zone confirms that this scenario is very extended.

ii. Scenario 2: Project activity without being registered as a VCS project.
Actions to ensure the conservation of the forest area within the boundaries of the project area are taken, without obtaining the benefits from carbon credits. This scenario is credible as the project proponent is committed to protect the existing forests within the project area, but with the incomes expected to be obtained from the sale of carbon credits.

iii. Scenario 3: Legal land use change.
Conversion from the current forest state for the establishment of the following agro-industrial crops and pastures for cattle raising:
- Pastures for grazing = 7,000 ha
- Palm oil = 2,000 ha
- Camu camu = 1,000 ha
- Castor oil plant = 2,000 ha
- Infrastructure = 2,507 ha

A total of 14,507 ha would be converted according to the land use plans for which the sale of the properties was approved by the State. The terms are provided in the enabling titles granted by the Peruvian State, through which it authorized the onerous transfer in favor of the owner companies (BAM S.A. and JCC), as well as in the contracts for the acquisition of the properties. Hence, this scenario is credible. When the project proponent purchased the lands from the Ministry of Agriculture, it was sold with the condition that part of the area was converted for the above-mentioned land uses.

The **outcome of sub-step 1.a is that all the scenarios presented are credible.**

Sub-step 1b. Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations

The Scenario 1 is clearly not in compliance with the Peruvian legal framework, as invasions and deforestation for other purposes, illegal logging and other unsustainable activities are not authorized by the Peruvian Government. The Forest and Wildlife Law (N° 29763) establishes the modalities and their requirements for accessing the forest lands and developing management activities on them. Despite this, the practices leading to deforestation and forest degradation are widespread in the project landscape, while the laws designed to protect the forest heritage do not have the needed governance to be enforced.

The districts where the project is located, Campo Verde and Manantay (Ucayali region) and Honoria (Huánuco region) are a good example of the intensity of forest loss, mainly for small scale agriculture (GEOBOSQUES – MINAM). The percentage of deforested area in these three districts is detailed in the following table.

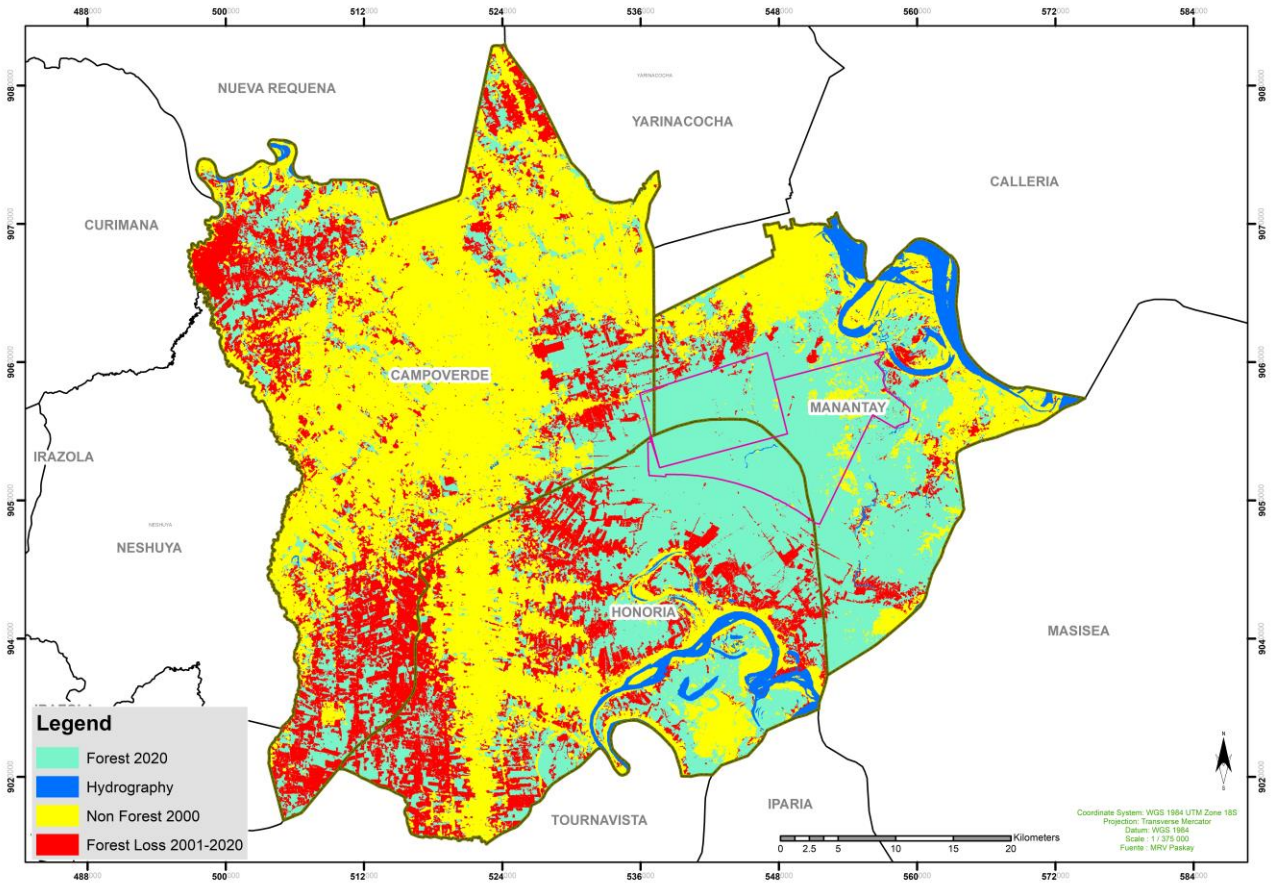
Table 3.7**.** Percentage of deforested area in the three districts where the project area is located

District	Total Area (in ha)	Non-forest area (in ha)	% of non-forest area
Campo Verde	129,247	104,332	81%
Honoria	94,854	50,175	57%
Manantay	64,444	23,482	45%
TOTAL	288,545	177,989	65%

This represents more than 30%, which is the threshold defined by the methodological tool. It is even more dramatic as around ¼ of the remnant forest are the forest that are currently being protected by this proposed REDD project.

The map below is very illustrative about how the project area is the last barrier for the illegal expansion of the agrarian frontier.

Figure 3.5. Project area and illegal expansion of agrarian frontier.



Source: GEOBOSQUES. Inhouse elaboration.

Regarding forest degradation, the level of extension is more difficult to measure. According to research[25] from CIFOR, 62% of the harvested timber is illegal:
"Esta madera es legalizada utilizando varios mecanismos de blanqueo. Según nuestros datos, la madera movilizada de forma totalmente informal alcanza un 62% del total registrado." This wood is legalized using various laundering mechanisms. According to our data, wood moved completely informally reaches 62% of the total registered.

OSINFOR, the official forest supervision entity, estimates that 67% of timber is illegally harvested[26], and that is a common situation: 68% in 2016, 89% in 2015 and 89% in 2014. This clearly ratifies that neither legislation prohibiting deforestation nor prohibiting forest degradation is effectively enforced in the zone.

Regarding Scenario 2, the Peruvian legal framework is complied with, although it does not require maintaining forest cover in areas classified for their best use capacity as agricultural or grazing lands, nor does it prohibit maintaining forest cover in those areas.

In Scenario 3, the land-use conversion is expected for complying with the terms of the acquisition of the project properties. The Ministry of Agriculture considered as a priority the economic development of the amazon region, for which it allowed the sale of public lands that had the land use capacity for agriculture and pastures for the development of agro-industrial projects, as is the case of the Nuestro Señor Jesucristo and Selva Maestra properties.

The **outcome of Sub-step 1b is that all three scenarios are plausible alternative land use scenarios.**

Sub-step 1c. Selection of the baseline scenario

The **selected baseline scenario is Scenario 3: Legal land use change.** It is selected because is the most likely scenario for the project area. The Nuestro Señor Jesucristo and Selva Maestra plots were purchased for agro-industrial exploitation, an objective that only changed due to the alternative of developing a carbon project on them that could help finance protection activities.

Investment analysis (Step 2), instead of Barrier analysis (Step 3) is selected.

STEP 2. Investment analysis to determine that the proposed project activity is not the most economically or financially attractive of the identified land use scenarios

Sub-step 2a. Determine appropriate analysis method

The project does not expect to generate other incomes different than the carbon sales, as the project pretends to not sell the property to third parties for agroindustry conversion nor they pretend to deforest, as legally authorized, to install agrarian crops and pastures for large-scale grazing.

[25] Mejía E, Cano W, de Jong W, Pacheco P, Tapia S y Morocho J. 2015. Actores, aprovechamiento de madera y mercados en la Amazonía peruana. Documentos Ocasionales 145. Bogor, Indonesia: CIFOR
[26] https://elcomercio.pe/peru/60-madera-movilizada-peru-2017-tuvo-origen-ilegal-noticia-558040-noticia/

In that sense, according to the tool, Option I (simple cost analysis) must be used in sub-step 2b, instead of Options II (Investment comparison analysis) or Option III (Benchmark analysis).

Sub-step 2b. – Option I: Apply simple cost analysis

According to the budget of the project, the estimated expenses are 3.3 million dollars, meanwhile, as the project plans to opt for conservation purposes instead of authorized land use change to agrarian crops, neither agrarian nor forest incomes are expected to occur as the project proponent does not plan to harvest any forest resource (timber or NTFP). Only if a VCS project is implemented, carbon incomes could be received.

Table 3.8. Expenses Flows

PRESUPUESTO PROYECTO REDD+ CAMPO VERDE (UCY): PERIODO ENERO 2022 - DICIEMBRE 2025 (US$)		2022	2023	2024	2025
	Periodo total	Año 0	Año 1	Año 2	Año 3
EGRESOS CORRIENTES (OVERHEAD)	**1,378,308**	**182,924**	**397,238**	**399,073**	**399,073**
REMUNERACIONES	**958,679**	**149,680**	**269,666**	**269,666**	**269,666**
Coordinador general del proyecto	100,062	0	33,354	33,354	33,354
Responsable conservación de la biodiversidad	94,435	0	31,478	31,478	31,478
Coordinador legal	76,385	13,846	20,846	20,846	20,846
Coordinador relaciones comunitarias	80,258	17,719	20,846	20,846	20,846
Asistente relaciones comunitarias	50,031	0	16,677	16,677	16,677
Coordinador técnico seguridad territorial	80,258	17,719	20,846	20,846	20,846
Asistente técnico seguridad territorial	50,031	0	16,677	16,677	16,677
Capataces campamentos seguridad territorial	128,079	32,020	32,020	32,020	32,020
Cocineras campamentos seguridad territorial	34,188	8,547	8,547	8,547	8,547
Guarda bosques campamentos seguridad territorial	264,955	59,828	68,375	68,375	68,375
SOPORTE DE GESTIÓN	**419,629**	**33,245**	**127,571**	**129,407**	**129,407**
Gastos de representación/caja chica	27,692	0	9,231	9,231	9,231
Imagen institucional, publicidad y difusión	90,000	0	30,000	30,000	30,000
Alquiler de local	27,692	0	9,231	9,231	9,231
Agua y energía eléctrica	2,769	0	923	923	923
Telefonía fija, móvil, cable	6,462	0	2,154	2,154	2,154
Materiales de oficina e higiene /Mantenimiento/Limpieza oficina y campamentos	32,308	0	10,769	10,769	10,769
Combustible, peaje, seguros vehiculares	8,862	2,215	2,215	2,215	2,215
Alquiler de camionetas para actividades genénericas	25,846	6,462	6,462	6,462	6,462
Mantenimiento camioneta propia (01)	23,077	0	7,692	7,692	7,692
Mantenimiento motos propias (04)	20,923	0	6,974	6,974	6,974
Mantenimiento embarcaciones (04)	3,671	0	0	1,835	1,835
Mantenimiento equipos (cómputo, etc.)	4,615	0	1,538	1,538	1,538
Procedimientos plan COVID19 para el personal (oficina y campamentos)	32,308	0	10,769	10,769	10,769
EPPs (campamentos)	9,282	199	3,028	3,028	3,028
Alimentación campamentos vigilancia	104,123	24,369	26,585	26,585	26,585
EGRESOS NO CORRIENTES	**122,065**	**0**	**70,696**	**47,523**	**3,846**
EQUIPAMIENTO DE OFICINA	**30,744**	**0**	**14,974**	**11,923**	**3,846**
VEHÍCULOS Y EQUIPOS DE CAMPO	**91,321**	**0**	**55,721**	**35,600**	**0**
EGRESOS COMPONENTES DEL PROYECTO	**1,836,877**	**317,076**	**432,067**	**498,404**	**589,331**
DISEÑO, IMPLEMENTACIÓN Y VERIFICACIONES	**339,250**	**143,550**	**95,700**	**0**	**100,000**
CLIMA	**491,297**	**143,674**	**131,726**	**107,949**	**107,949**
BIODIVERSIDAD	**419,851**	**1,067**	**153,800**	**129,992**	**134,992**
COMUNIDAD	**586,478**	**28,785**	**50,841**	**260,463**	**246,390**
TOTAL	**3,337,250**	**500,000**	**900,000**	**945,000**	**992,250**

Source: Inhouse elaboration.

As shown, the proposed VCS AFOLU project produces no financial benefits other than VCS related income, then the tool requests to proceed to Step 4 (Common practice analysis).

Sub-step 2c. Calculation and comparison of financial indicators

This sub-step has not been developed as the tool states that it is only applicable to Options II and III, not to Option I.

Sub-step 2d. Sensitivity analysis.

This sub-step has not been developed as the tool states that it is only applicable to Options II and III, not to Option I.

STEP 3. Barrier analysis

Not applicable as Step 2 (Investment analysis) has been selected.

STEP 4. Common practice analysis

There is no precedent of forest lands authorized to be converted in agrarian lands that voluntarily is decided to keep as forest lands to implement a forest conservation project.

Even more, according to the Peruvian forestry and wildlife law, in private lands with forest cover, 30% of the forest cover must be kept (Art. 38 of Law 29763). It means that the project could clear 15,563 ha of forest land, according to the law, which is higher than the planned deforestation area (14.507 ha) of the project, authorized by the Ministry of Agriculture.

For all these considerations, as no similar activities were found in the surrounding areas, it may be concluded that the project is additional.

3.1.6 Methodology Deviations

No methodology deviations are reported.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions

The baseline emissions calculated in the project are based on the conversion of forest to croplands: oil palm, camu camu (*Myrciaria dubia)*, and castor oil plant (*Ricinus communis)*.

Considering the total area of the two properties (20,463 hectares), the permitted and planned conversion area is 14,507 ha. Accordingly, the planned deforestation module VMD0006 (BL-PL) is applied to the conversion area. The ex-ante stratification is based on ancillary data as described in module VMD0016 (X-STR). The areas of strata delineated prior to allocation of inventory plots using stratified sampling are known exactly and require no accuracy assessment.

The stratification was based on forest inventories conducted in 2006 and 2012 on the two properties. These inventories worked with multiple representations of ecozones, depending on the existing vegetation. However, given that the carbon values to be worked on (Table 3.14) represent the

Peruvian lowland forest in general (which includes a large part of the ecozones of the Peruvian Amazon), it was only necessary to highlight two different zones of this large group, the ecozones belonging to characteristic wetlands of the Peruvian jungle, the "aguajales".

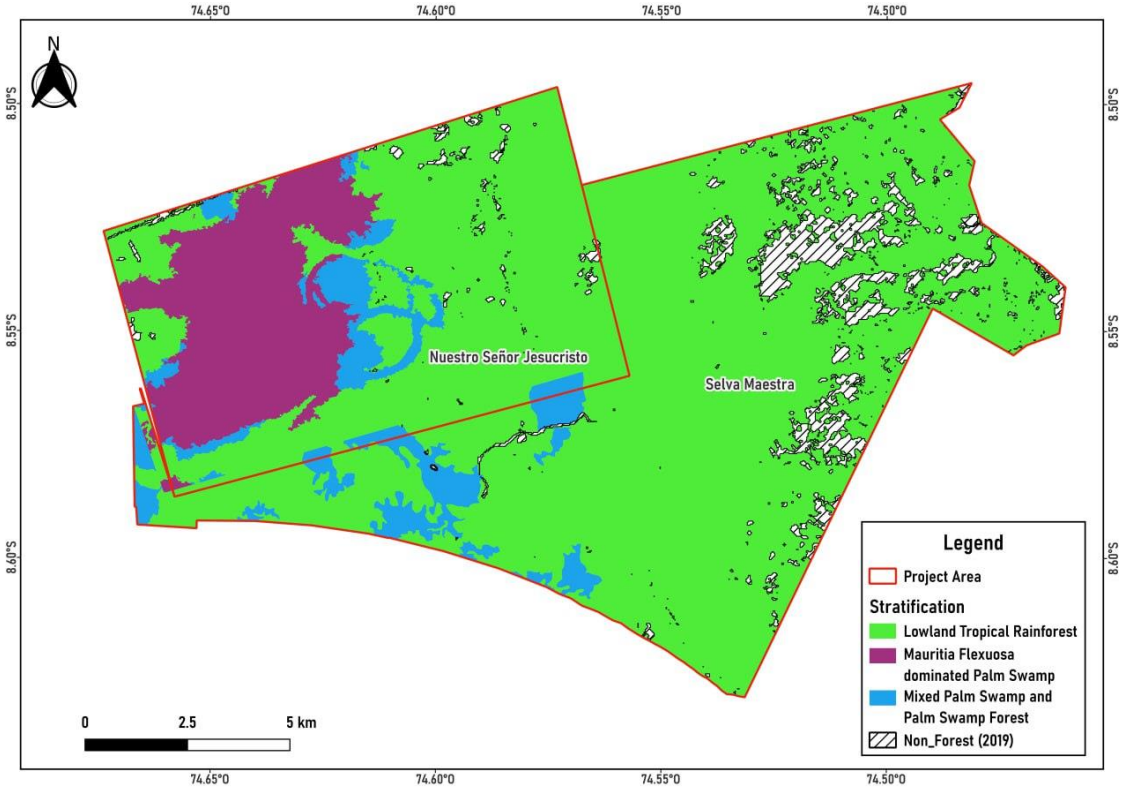
It was necessary to highlight this class to the detriment of the others, due to its high carbon levels (especially in the SOC compartment), and the dominance of a palm tree (*Mauritia flexuosa*) above the presence of trees. In this way, the ecozones were regrouped according to three defined classes, described in Table 3.9.

Table 3.9**.** Ecozone stratification of the properties that comprise the project area

Property	Stratum	Description	Area (ha)	Percentage (%)
Nuestro Señor Jesucristo	1	Lowland Tropical Rainforest	4,722.07	58.66
	2	Palm and Mixed Palm Swamp Forest	704.13	8.75
	3	*Mauritia flexuosa* dominated palm swamp	2,449.86	30.43
	4	Other lands (non-forest)	173.65	2.16
	Total		**8,049.71**	100%
Selva Maestra	1	Lowland Tropical Rainforest	10,442.02	84.12
	2	Palm and Mixed Palm Swamp Forest	698.19	5.62
	3	*Mauritia flexuosa* dominated palm swamp	18.38	0.15
	4	Other lands (non-forest)	1,254.94	10.11
	Total		**12,413.53**	100%

On the 2006/2012 ecozone map, the forest/non-forest map was intersected in order to eliminate the non-forest areas existing at the end of year 2019. In this way, the remaining forest area per stratum can be calculated and shown in Figure 3.6.

Figure 3.6. Ecozone stratification and deforested areas by 2020



Source: Inhouse elaboration

Projected annual proportion of land that will be deforested

The deforestation rate for the baseline scenario of each property was calculated based on the values given by the "Technical Economic Feasibility Study Agro-industrial Exploitation" and "File 7698 of the Special Project for Land Titling and Rural Cadaster" revised (see folder Property Rights Evidence). The annual area of baseline planned deforestation ($AA_{planned,i,t}$) is calculated according to Equation 5 of VMD0006.

Equation 3.1. Annual area of baseline planned deforestation

$$AA_{planned,i,t} = \left(A_{planned,i} * D\%_{planned,i,t}\right) * L - D_i$$

$AA_{planned,i,t}$	Annual area of baseline planned deforestation for stratum *i* at time *t*; ha
$D\%_{planned,i,t}$	Projected annual proportion of land that will be deforested in stratum *i* during year *t*
$A_{planned,i}$	Total area of planned deforestation over the baseline period for stratum *i*; ha
$-D_i$	Likelihood of deforestation for stratum *i*; %
i	1, 2, 3, … M strata

The total area of planned deforestation over the baseline period ($A_{planned,i,t}$), in each property (Table 3.10), is determined according to what is recognized as an immediate site-specific threat of deforestation, which, in its turn, is a function of the legal permissibility for deforestation, the suitability

of the project area for conversion to alternative non-forest land use, the government approval for deforestation and a management plan for deforesting the project area. The projected annual proportion of land that will be deforested in stratum *i* during year *t* (*D%planned,i,t*) is determined according to the provisions of the land title granted by the Ministry of Agriculture for "Selva Maestra" and by the Technical Economic Feasibility Study Agro-industrial Exploitation for "Nuestro Señor Jesucristo". These authorizations should be understood as verifiable plans where the actual annual deforestation proportion is known and documented. As only private areas are under this project's scope, *L-Di* is set to be 100%, according to the VMD0006 requirements.

Table 3.10. Projected areas to be deforested in each property, per year

Conversion to:	Selva Maestra (ha)	JCC - Nuestro Señor Jesucristo (ha)				
	Pastures	Oil palm	Camu camu	Castor oil plant	Infrastructure	Total JCC
Year 1	600	-	-	-	1,000	1,000
Year 2	600	-	-	-	1,000	1,000
Year 3	600	-	-	-	507	507
Year 4	600	500	250	500	-	1,250
Year 5	600	500	250	500	-	1,250
Year 6	600	500	250	500	-	1,250
Year 7	600	500	250	500	-	1,250
Year 8	600	-	-	-	-	-
Year 9	600	-	-	-	-	-
Year 10	600	-	-	-	-	-
Year 11	600	-	-	-	-	-
Year 12	400	-	-	-	-	-
Total	7,000	2,000	1,000	2,000	2,507	7,507

Because the deforestation plans do not detail the distribution of hectares to be deforested by stratum, a conservative solution was chosen to allocate the area to be deforested in proportion to the percentage of forest per ecozone. In this way, the 600 hectares per year in the Selva Maestra sector were distributed proportionally over the 3 ecozones, until the planned 7,000 hectares were reached (Table 3.11). The same was done for the "Nuestro Señor Jesucristo" sector, where the 7,507 hectares were distributed proportionally by stratum (Table 3.12).

Table 3.11. Planned area to be deforested by stratum (Selva Maestra)

Year	Selva Maestra			Total
	$AA_{planned,1,t}$ (ha) (Stratum 1)	$AA_{planned,2,t}$ (ha) (Stratum 2)	$AA_{planned,3,t}$ (ha) (Stratum 3)	$AA_{planned,i,t}$ (ha)
Year 1	553.00	45.94	1.06	600.00
Year 2	553.00	45.94	1.06	600.00
Year 3	553.00	45.94	1.06	600.00
Year 4	553.00	45.94	1.06	600.00
Year 5	553.00	45.94	1.06	600.00
Year 6	553.00	45.94	1.06	600.00
Year 7	553.00	45.94	1.06	600.00
Year 8	553.00	45.94	1.06	600.00
Year 9	553.00	45.94	1.06	600.00
Year 10	553.00	45.94	1.06	600.00

Year	Selva Maestra			Total
	$AA_{planned,1,t}$ (ha) (Stratum 1)	$AA_{planned,2,t}$ (ha) (Stratum 2)	$AA_{planned,3,t}$ (ha) (Stratum 3)	$AA_{planned,i,t}$ (ha)
Year 11	553.00	45.94	1.06	600.00
Year 12	368.67	30.62	0.71	400.00
Total	6,451.69	535.94	12.38	7,000.00

Table 3.12. Planned area to be deforested by stratum (Nuestro Señor Jesucristo)

Year	JCC - Nuestro Señor Jesucristo			Total
	$AA_{planned,1,t}$ (ha) (Stratum 1)	$AA_{planned,2,t}$ (ha) (Stratum 2)	$AA_{planned,3,t}$ (ha) (Stratum 3)	$AA_{planned,i,t}$ (ha)
Year 1	599.37	89.41	311.22	1,000.00
Year 2	599.37	89.41	311.22	1,000.00
Year 3	303.88	45.33	157.79	507.00
Year 4	749.21	111.76	389.03	1,250.00
Year 5	749.21	111.76	389.03	1,250.00
Year 6	749.21	111.76	389.03	1,250.00
Year 7	749.21	111.76	389.03	1,250.00
Year 8	-	-	-	-
Year 9	-	-	-	-
Year 10	-	-	-	-
Year 11	-	-	-	-
Year 12	-	-	-	-
Total	4,499.44	671.21	2,336.36	7,507.00

Estimation of carbon stocks by carbon pools

To calculate baseline emissions, three carbon pools were considered: aboveground biomass (AGB) that considers stems, branches, and foliage; belowground biomass (BGB) that includes roots; and organic carbon from the soil (SOC). Litter and deadwood pools were conservatively excluded, as allowed by methodology. The harvested wood products pool is not applicable since there are no predicted forest management activities related to logging and wood milling in the project.

Carbon forest values were extracted from literature sources, which involved documents prepared with data at the national level (Forest Reference Emission Levels, FREL), as well as institutional studies carried out for the study area (department of Ucayali). The details on the carbon stocks of AGB ($C_{AB\_pre,i}$), BGB, ($C_{BB\_pre,i}$), SOC ($C_{SOC\_pre,i}$)) and the corresponding post-deforestation use carbon data ($C_{AB\_post,i}$; $C_{BB\_post,i;}$ $C_{SOC\_post,i}$) are shown in Table 3.13 and Table 3.14, respectively.

In the case of the strata containing palm swamps, it was decided that the SOC deposits should be treated conservatively as "shallow peat strata", and therefore considered as "mineral soil" according to module VMD0016. In this way, overestimations are avoided since the true depth of the organic layer of the soil is unknown. The SOC values were taken from studies carried out in similar wetlands of Ucayali.

Also, for estimating the BGB of the dominant specie *(Mauritia flexuosa)* of the palm swamps strata, a regional root-shoot expression was used, developed from studies in the Pacaya Samiria National Reserve located in the Peruvian Amazon.

Table 3.13. Carbon pools considered for calculation of the baseline scenario (pre-deforestation)

Parameter	Carbon pool	Mean Value (tCO_2e/ha)	CI (95%)	Source
Forest stratum: Lowland Tropical Rainforest				
$C_{AB.\ pre,i}$	Aboveground carbon	427.07	15.21	Peruvian Forest Reference Emissions Level https://redd.unfccc.int/files/nref_peru_281122_final__2_.pdf
$C_{BB.\ pre,i}$	Belowground biomass	195.44	6.39	
$C_{SOC.\ pre,i}$	Soil organic carbon	262.03	35.31	Cuellar & Salazar 2016 http://repositorio.inia.gob.pe/handle/20.500.12955/490
Total		884.54	38.97	
Forest stratum: Mixed Palm Swamp and Palm Swamp				
$C_{AB.\ pre,i}$	Aboveground carbon	188.03	59.73	Garcia, Honorio & Del Castillo 2012 http://revistas.iiap.org.pe/index.php/foliaamazonica/article/view/43/80
$C_{BB.\ pre,i}$	Belowground biomass	76.07	6.35	Freitas *et al.* 2006
$C_{SOC.\ pre,i}$	Soil organic carbon	725.49	327.51	Garcia, Honorio & Del Castillo 2012
Total		989.59	332.40	
Forest stratum: *Mauritia flexuosa* dominated palm swamp				
$C_{AB.\ pre,i}$	Aboveground carbon (AGB)	353.21	55.59	Garcia, Honorio & Del Castillo 2012
$C_{BB.\ pre,i}$	Belowground biomass (BGB)	142.90	11.94	Freitas *et al.* 2006
$C_{SOC.\ pre,i}$	Soil organic carbon (SOC)	725.49	327.51	Garcia, Honorio & Del Castillo 2012
Total		1,221.60	332.40	

Table 3.14. Carbon pools considered for calculation of the post-deforestation use

Parameter	Carbon pool	Mean Value (tCO_2e/ha)	CI (95%)	Source
Pastures				
$C_{AB.\ post,i}$	Aboveground carbon (AGC)	78.41	75.48	Cuellar & Salazar 2016
$C_{BB.\ post,i}$	Belowground biomass (BGC)	13.04	10.44	Cuellar & Salazar 2016
$C_{SOC.\ post,i}$	Soil organic carbon (SOC)	260.35	55.50	Cuellar & Salazar 2016
Total		95.95	33.38	
Oil palm				
$C_{AB.\ post,i}$	Aboveground carbon (AGC)	52.74	11.98	Cuellar & Salazar 2016
$C_{BB.\ post,i}$	Belowground biomass (BGC)	17.47	9.45	Cuellar & Salazar 2016
$C_{SOC.\ post,i}$	Soil organic carbon (SOC)	263.53	40.86	Cuellar & Salazar 2016

Parameter	Carbon pool	Mean Value (tCO_2e/ha)	CI (95%)	Source
Total		91.02	11.89	
Croplands: Camu camu				
$C_{AB.\ post,i}$	Aboveground carbon (AGC)	59.58	25.90	Díaz-Córdova et al. 2015 https://www.researchgate.net/publication/316711165_ALMACENAMIENTO_DE_CARBONO_EN_INDIVIDUOS_DE_CAMU_CAMU_ARBUSTIVO_Myrciaria_dubia_HBK_Mc_Vaugh_PLANTADOS_EN_EL_CENTRO_EXPERIMENTAL_SAN_MIGUEL_IQUITOS_PERU
$C_{BB.\ post,i}$	Belowground biomass (BGC)	9.32	3.29	Díaz-Córdova et al. 2015
$C_{SOC.\ post,i}$	Soil organic carbon (SOC)	261.95	41.12	Cuellar & Salazar 2016
Total		330.85	48.71	
Croplands: Castor oil plant				
$C_{AB.\ post,i}$	Aboveground carbon (AGC)	12.42	5.19	Valdez-Rodriguez et al. 2018 http://cienciasagricolas.inifap.gob.mx/index.php/agricolas/article/view/734/1807
$C_{BB.\ post,i}$	Belowground biomass (BGC)	3.20	1.10	Valdez-Rodriguez et al. 2018
$C_{SOC.\ post,i}$	Soil organic carbon (SOC)	261.95	41.12	Cuellar & Salazar 2016
Total		277.57	41.46	

It was decided to conservatively omit SOC changes in the transitions from lowland forest to crops and infrastructure, because the difference was spurious, only for the cases of conversion of wetlands to other uses was the change considered. For the transition from wetlands to infrastructure, a factor of 0.8 (IPCC 2006) for SOC was used, where the remaining carbon in infrastructure areas was conservatively estimated to be 80% of the Lowland Tropical Rainforest SOC pool (262.03 *0.8 = 209.624).

Table 3.15. Calculation of the differences between pre and post deforestation uses

Parameter	Carbon pool	Value (tCO_2e/ha)
Forest stratum: Lowland Tropical Rainforest to Pastures		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	348.66
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	182.40
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	Set to 0
Total		531.06
Forest stratum: Mixed Palm Swamp and Palm Swamp to Pastures		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	109.62

Parameter	Carbon pool	Value (tCO_2e/ha)
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	63.03
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	465.14
Total		637.79
Forest stratum: *Mauritia flexuosa* dominated palm swamp to Pastures		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	274.8
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	129.86
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	465.14
Total		869.80
Forest stratum: Lowland Tropical Rainforest to Oil Palm		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	374.33
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	177.97
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	Set to 0
Total		522.30
Forest stratum: Mixed Palm Swamp and Palm Swamp to Oil Palm		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	135.29
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	58.6
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	461.96
Total		655.85
Forest stratum: *Mauritia flexuosa* dominated palm swamp to Oil Palm		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	300.47
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	125.43
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	461.96
Total		887.86
Forest stratum: Lowland Tropical Rainforest to Camu Camu		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	367.49
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	186.12
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	Set to 0
Total		553.61
Forest stratum: Mixed Palm Swamp and Palm Swamp to Camu Camu		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	128.45
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	66.75
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	463.54
Total		658.74
Forest stratum: *Mauritia flexuosa* dominated palm swamp to Camu Camu		

Parameter	Carbon pool	Value (tCO_2e/ha)
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	293.63
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	133.58
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	463.54
Total		890.75
Forest stratum: Lowland Tropical Rainforest to Castor oil plant		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	414.65
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	192.24
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	Set to 0
Total		606.89
Forest stratum: Mixed Palm Swamp and Palm Swamp to Castor oil plant		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	175.61
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	72.87
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	463.54
Total		712.02
Forest stratum: *Mauritia flexuosa* dominated palm swamp to Castor oil plant		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	340.79
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	139.7
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	463.54
Total		944.03
Forest stratum: Lowland Tropical Rainforest to Infrastructure		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	427.07
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	195.44
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	Set to 0
Total		622.51
Forest stratum: Mixed Palm Swamp and Palm Swamp to Infrastructure		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	188.03
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	76.07
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	518.49
Total		779.97
Forest stratum: *Mauritia flexuosa* dominated palm swamp to Infrastructure		
$\Delta C_{AB.,i} = C_{AB.\ pre,i} - C_{AB.\ post,i}$	Aboveground carbon	353.21
$\Delta C_{BB.,i} = C_{BB.\ pre,i} - C_{BB.\ post,i}$	Belowground biomass	142.9
$\Delta C_{SOC.,i} = C_{SOC.\ pre,i} - C_{SOC.\ post,i}$	Soil organic carbon	515.87
Total		1,011.98

Estimation of carbon stocks changes and GHG emissions

Equation 13 of VMD0006 is applied to calculate the carbon stock changes and GHG emissions in the baseline scenario ($\Delta C_{BSL,i,t}$). Below it is presented considering the exclusion of variables not applicable to the project (non-tree biomass, litter, dead wood and harvested wood products) as explained before.

Equation 3.2. Equation for estimating carbon stock changes in the baseline scenario:

$$\Delta C_{BSL,i,t} = AA_{planned,i,t} * (\Delta C_{ABtree,i}) + \sum_{t-10}^{t} \left(AA_{planned,i,t} * (\Delta C_{BBtree,i}) * \frac{1}{10} \right) + \sum_{t-20}^{t} (AA_{planned,i,t} * (\Delta C_{SOC,i}) * \frac{1}{20})$$

$\Delta C_{BSL,i,t}$	Sum of the baseline carbon stock change in all terrestrial pools in stratum *i* in year *t*, tCO_2e
$AA_{planned,i,t}$	Annual area of baseline planned deforestation for stratum *i* in year *t*; ha
$(\Delta C_{ABtree,i})$	Baseline carbon stock change in aboveground tree biomass in stratum *i*; tCO_2e/ha
$\Delta C_{BBtree,i}$	Baseline carbon stock change in belowground tree biomass in stratum *i*; tCO_2e/ha
$\Delta C_{SOC,i}$	Baseline carbon stock change in soil organic carbon in stratum *i*; tCO_2e/ha

The first part of Equation 3.2 corresponds to the carbon stock changes of AGB from replacing forest to pasture/crops (baseline). In turn, the second refers to the emissions from root decomposition in a 10-year lifespan. The third part refers to emissions from soil organic carbon in a 20-year lifespan. Carbon stock changes, distributed by year and by carbon pool, are presented in Table 3.16.

Table 3.16. Carbon stock changes, distributed by year and by carbon pool

Year	SELVA MAESTRA				NUESTRO SEÑOR JESUCRISTO				ΔCBSL,i,t (tCO_2)
	AGB	BGB	SOC	Subtotal	AGB	BGB	SOC	Subtotal	
Year 1	200,154.00	10,490.47	896.08	211,540.56	382,727.51	16,842.50	10,328.98	409,898.99	621,439.55
Year 2	200,154.00	20,980.93	1,792.17	222,927.11	382,727.51	33,685.01	20,657.97	437,070.48	659,997.59
Year 3	200,154.00	31,471.40	2,688.25	234,313.66	194,042.85	42,224.15	25,894.76	262,161.76	496,475.42
Year 4	200,154.00	41,961.86	3,584.34	245,700.21	1,279,301.63	101,634.22	60,660.03	1,441,595.89	1,687,296.09
Year 5	200,154.00	52,452.33	4,480.42	257,086.76	1,279,301.63	161,044.29	95,425.30	1,535,771.22	1,792,857.98
Year 6	200,154.00	62,942.79	5,376.51	268,473.31	1,279,301.63	220,454.36	130,190.57	1,629,946.56	1,898,419.87
Year 7	200,154.00	73,433.26	6,272.59	279,859.86	1,279,301.63	279,864.42	164,955.84	1,724,121.90	2,003,981.75
Year 8	200,154.00	83,923.73	7,168.68	291,246.41		279,864.42	164,955.84	444,820.26	736,066.67
Year 9	200,154.00	94,414.19	8,064.76	302,632.96		279,864.42	164,955.84	444,820.26	747,453.22
Year 10	200,154.00	104,904.66	8,960.85	314,019.51		279,864.42	164,955.84	444,820.26	758,839.77
Year 11	200,154.00	104,904.66	9,856.93	314,915.59		263,021.92	164,955.84	427,977.76	742,893.35
Year 12	133,436.00	101,407.83	10,454.32	245,298.16		246,179.42	164,955.84	411,135.26	656,433.42
Year 13		90,917.37	10,454.32	101,371.69		237,640.27	164,955.84	402,596.11	503,967.80
Year 14		80,426.90	10,454.32	90,881.23		178,230.20	164,955.84	343,186.04	434,067.27
Year 15		69,936.44	10,454.32	80,390.76		118,820.13	164,955.84	283,775.97	364,166.73
Year 16		59,445.97	10,454.32	69,900.29		59,410.07	164,955.84	224,365.91	294,266.20
Year 17		48,955.51	10,454.32	59,409.83			164,955.84	164,955.84	224,365.67
Year 18		38,465.04	10,454.32	48,919.36			164,955.84	164,955.84	213,875.20
Year 19		27,974.58	10,454.32	38,428.90			164,955.84	164,955.84	203,384.74
Year 20		17,484.11	10,454.32	27,938.43			164,955.84	164,955.84	192,894.27
Total	**2,335,130.06**	**1,216,894.02**	**153,230.49**	**3,705,254.56**	**6,076,704.39**	**2,798,644.22**	**2,652,539.38**	**11,527,887.99**	**15,233,142.55**

Furthermore, since fire after deforestation is a common practice, the emissions from biomass burning shall be calculated. Following Equation 15 of VMD0006 and Equation 1 of VMD0013, the estimation was made using parameters and values cited in Table 3.17, and the calculations are displayed in Table 3.18.

Equation 3.3. Equation to estimate emissions from biomass burning in the baseline scenario

$$GHG_{BSL-E,i,t} = E_{BiomassBurn,i,t} = \sum_{g=1}^{G}(((A_{Burn,i,t} * B_{i,t} * COMF_i * G_{g,i}) * 10^{-3}) * GWP_g)$$

Where:

$E_{BiomassBurn,i,t}$	Greenhouse emissions due to biomass burning as part of deforestation activities in stratum *i* in year *t*; tCO_2e of each GHG (CO_2, CH_4, N_2O)
$A_{Burn,i,t}$	Area burnt for stratum *i* at time *t*; ha
$B_{i,t}$	Average aboveground biomass stock before burning stratum *i*, time *t*; t d.m./ha
$COMF_i$	Combustion factor for stratum *i*; dimensionless (default value derived from Table 2.6 of IPCC, 2006)
$G_{g,i}$	Emission factor for stratum *i* for gas g; kg/t d.m. burnt (default values derived from Table 2.5 of IPCC, 2006)
GWP_g	Global warming potential for gas g; tCO_2/t gas *g* (default values from IPCC AR5 – IPCC (2013): CO_2 = 1; CH_4 = 25; N_2O = 298)
g	1, 2, 3 … *g* greenhouse gases
i	1, 2, 3, … M strata
t	1, 2, 3, … t* years elapsed since the start of the REDD

Table 3.17. Parameters for estimation of emissions from biomass burning

AGC	Mean Value (tCO_2e/ha)	Biomass (tC/ha)	$COMF_i$	Gas	$G_{g,i}$	GWP_g
Stratum 1	427.07	247.82	0.5	CO_2	1580	1
Stratum 2	188.03	109.11	0.5	N_2O	0.2	265
Stratum 3	353.21	204.96	0.5	CH_4	6.8	28

Table 3.18. Emissions calculations from biomass burning

Year	Total $A_{Burn,i,t}$			Emissions N_2O	Emissions CH_4	$E_{Biomassburn}$ (tCO_2e)
	Stratum 1	Stratum 2	Stratum 3			
Year 1	1,161.02	126.94	312.04	9,686.47	34,798.17	44,484.63
Year 2	1,161.02	126.94	312.04	9,686.47	34,798.17	44,484.63
Year 3	865.44	82.87	158.69	6,785.03	24,374.89	31,159.92
Year 4	1,310.90	149.29	389.80	11,157.78	40,083.81	51,241.59
Year 5	1,310.90	149.29	389.80	11,157.78	40,083.81	51,241.59
Year 6	1,310.90	149.29	389.80	11,157.78	40,083.81	51,241.59
Year 7	1,310.90	149.29	389.80	11,157.78	40,083.81	51,241.59

Year	Total $A_{Burn,i,t}$			Emissions N_2O	Emissions CH_4	$E_{Biomassburn}$ (tCO_2e)
	Stratum 1	Stratum 2	Stratum 3			
Year 8	561.47	37.54	0.99	3,801.20	13,655.62	17,456.82
Year 9	561.47	37.54	0.99	3,801.20	13,655.62	17,456.82
Year 10	561.47	37.54	0.99	3,801.20	13,655.62	17,456.82
Year 11	561.47	37.54	0.99	3,801.20	13,655.62	17,456.82
Year 12	374.31	25.03	0.66	2,534.13	9,103.75	11,637.88

Baseline net GHG emissions for planned deforestation

The calculation of net emissions for planned deforestation is performed with Equation 1 of VMD0006, which accounts the emissions generated by changes in carbon stocks and emissions from biomass burning.

Equation 3.4. Baseline net GHG emissions for planned deforestation

$$\Delta C_{BSL,planned} = \sum_{t=1}^{t*} \sum_{i=1}^{M} (\Delta C_{BSL,i,t} + \Delta GHG_{BSL-E,i,t})$$

$\Delta C_{BSL,planned}$	Net greenhouse gas emissions in the baseline from planned deforestation up to year *t**; tCO_2e
$\Delta C_{BSL,i,t}$	Net carbon stock changes in all pools in the baseline stratum *i* in year *t*; tCO_2e
$\Delta GHG_{BSL-E,i,t}$	Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline stratum *i* in year *t*; tCO_2e/yr
*t**	1, 2, 3, … t* years elapsed since the projected start of the project activity

Table 3.19. Net and accumulated baseline GHG emissions for planned deforestation

Year	$\Delta C_{BSL,i,t}$ (tCO_2e)	GHG_{BSL-E} (tCO_2e)	$\Delta C_{BSL,planned}$ (tCO_2e)	$\Delta C_{BSL,planned,\ accum}$ (tCO_2e)
Year 1	621,439.55	44,484.63	665,924.18	665,924.18
Year 2	659,997.59	44,484.63	704,482.22	1,370,406.40
Year 3	496,475.42	31,159.92	527,635.34	1,898,041.74
Year 4	1,687,296.09	51,241.59	1,738,537.68	3,636,579.43
Year 5	1,792,857.98	51,241.59	1,844,099.57	5,480,678.99
Year 6	1,898,419.87	51,241.59	1,949,661.45	7,430,340.45
Year 7	2,003,981.75	51,241.59	2,055,223.34	9,485,563.79
Year 8	736,066.67	17,456.82	753,523.49	10,239,087.28
Year 9	747,453.22	17,456.82	764,910.04	11,003,997.32
Year 10	758,839.77	17,456.82	776,296.59	11,780,293.91
Year 11	742,893.35	17,456.82	760,350.17	12,540,644.08
Year 12	656,433.42	11,637.88	668,071.29	13,208,715.37
Year 13	503,967.80	0.00	503,967.80	13,712,683.17
Year 14	434,067.27	0.00	434,067.27	14,146,750.43

Year	$\Delta C_{BSL,i,t}$ (tCO_2e)	GHG_{BSL-E} (tCO_2e)	$\Delta C_{BSL,planned}$ (tCO_2e)	$\Delta C_{BSL,planned,\ accum}$ (tCO_2e)
Year 15	364,166.73	0.00	364,166.73	14,510,917.17
Year 16	294,266.20	0.00	294,266.20	14,805,183.37
Year 17	224,365.67	0.00	224,365.67	15,029,549.04
Year 18	213,875.20	0.00	213,875.20	15,243,424.24
Year 19	203,384.74	0.00	203,384.74	15,446,808.98
Year 20	192,894.27	0.00	192,894.27	15,639,703.25
Total	**15,233,142.55**	**406,560.70**	**15,639,703.25**	

3.2.2 Project Emissions

Expected project emissions are estimated ex-ante by applying Equation 1 (Equation 3.5 in this document) of module VMD0015 (M-REDD). Values for individual parameters are explained in Table 3.20 and Table 3.21. Ex-ante projections of deforestation in the project case assume no deforestation, nor forest degradation, will take place since the project proponent has committed to not undertake land clearing and activities or forest degradation on the property. No removals are accounted from forest growth.

Equation 3.5. Equation to estimate net GHG emissions in the REDD project scenario:

$$\Delta C_{WPS-REDD} = \sum_{t=1}^{t*}\sum_{i=1}^{M}(\Delta C_{P,DefPA,i,t} + \Delta C_{P,Deg,i,t} + \Delta C_{P,DistPA,i,t} + GHG_{P-E,i,t} - \Delta C_{P,Enh,i,t})$$

Where:

$\Delta C_{WPS-REDD}$	Net GHG emissions in the REDD project scenario up to year *t**; tCO_2e
$\Delta C_{P,DefPA,i,t}$	Net carbon stock change as a result of deforestation in the project area in the project case in stratum *i* within the project area in year *t*; tCO_2e
$\Delta C_{P,Deg,i,t}$	Net carbon stock change as a result of degradation in the project area in the project case in stratum *i* within the project area in year *t*; tCO_2e
$\Delta C_{P,DistPA,i,t}$	Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum *i* within the project area in year *t*; tCO_2e
$GHG_{P-E,i,t}$	Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project case in stratum *i* in year *t*; tCO_2e
$\Delta C_{P,Enh,i,t}$	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline[2] in stratum *i* in year *t*; tCO_2e (not accounted in the project)
i	1, 2, 3, … M strata
t	1, 2, 3, … t* years elapsed since the start of the REDD VCS project activity

Equation 3.6. Equation to estimate GHG emissions in the project scenario:

$$GHG_{P,E,i,t} = E_{FC,i,t} + E_{BiomassBurn,i,t} + N_20_{direct-N,i,t}$$

Where:

$E_{BiomassBurn,i,t}$	Non-CO_2 emissions due to biomass burning in stratum *i* in year *t*; tCO_2e
$E_{FC,i,t}$	Emission from fossil fuel combustion in stratum *i* within the project area in year *t*; tCO_2e
$N_20_{direct-N,i,t}$	Direct NO_2 emission as a result of nitrogen application on the alternative land use in stratum *i* within the project area in year *t*; tCO_2e
i	1, 2, 3, … M strata
t	1, 2, 3, … t* years elapsed since the start of the REDD VCS project activity

Table 3.20. Parameters and values used to calculate net GHG emissions in the REDD project scenario

Parameter	Description	Value	Justification
$\Delta C_{P,DefPA,i,t}$	Net carbon stock changes as a result of deforestation in the project area in the project case in stratum i at time t; t CO_2e	Set to 0	As the agent of deforestation has committed to not deforest
$\Delta C_{P,DegPA,i,t}$	Net carbon stock changes as a result of degradation in the project area in the project case in stratum i at time t; t CO_2e	Set to 0	It is not expected that degradation related to fuelwood or charcoal extraction is going to be present in the project, as the proponent has committed to not deforest or generate a negative impact in the project area.
$\Delta C_{P,DistPA,i,t}$	Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum i within the project area in year t; tCO2e	Set to 0	Natural disturbances with potential to affect carbon stocks are not common in the landscape.
$\Delta C_{P,Enh,i,t}$	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline[2] in stratum i in year t; tCO2e	Set to 0	Conservatively set to cero as allowed by VMD0015.

All parameters set to cero in the *ex-ante* estimates will be monitored and accounted as required by the methodology for the *ex-post* calculations.

Table 3.21. Parameters and values used to calculate annual ex-ante GHG emissions

Parameter	Description	Value	Justification
$GHG_{P,E,i,t}$	Greenhouse gas emissions as a result of deforestation activities within the project area in the project case in stratum *i* in year *t*; tCO_2e	Set to 0	As the agent of deforestation has committed not to deforest and degrade the forest. No biomass burning is expected to take place in the project scenario. No N fertilizers will be applied in the project scenario. GHG emissions from fossil fuel combustion are not significant.
$E_{BiomassBurn,i,t}$	Non-CO2 emissions due to Biomass burning in stratum *i* in year *t*; tCO_2e	Set to 0	As the agent of deforestation has committed to not deforest.

Parameter	Description	Value	Justification
$E_{FC,i,t}$	Net carbon stock changes in all pools in baseline stratum i; tCO_2e/ha	Set to 0	GHG emissions from fossil fuel combustion are not significant.
$N_2O_{direct-N,i,t}$	Direct N2O emission as a result of nitrogen application on the alternative land use in stratum *i* within the project area in year *t*; tCO_2e	Set to 0	No N fertilizers will be applied in the project scenario.

3.2.3 Leakage

Leakage emissions from displacement of planned deforestation are estimated in compliance with the VCS REDD methodology VM0007, specifically the module VMD0009 (LK-ASP).

Estimation of Activity Shifting Leakage

Activity shifting leakage due to displacement of planned deforestation was assessed using a series of equations outline in the VMD0009 module. The primary equation is listed as Equation 3.7. Other equations applied are Equation 3.8 and Equation 3.9. The parameters, values used, and the justification are given in Table 3.22.

Equation 3.7. Equation to estimate leakage from displacement of planned deforestation:

$$\Delta C_{LK-AS,planned} = \sum_{t=1}^{t*}\sum_{i=1}^{M}((LKA_{planned,i,t} * \Delta C_{BSL,i}) + GHG_{LK,E,i,t})$$

Where:

$\Delta C_{LK-AS,planned}$	Net greenhouse gas emissions due to activity shifting leakage for projects preventing planned deforestation up to year *t**; tCO_2e
$LKA_{planned,i,t}$	The area of activity shifting leakage in stratum i at time t; ha
$GHG_{LK,E,i,t}$	Greenhouse gas emissions as a result of leakage of avoided deforestation activities in stratum *i* in year *t*; tCO_2e

Equation 3.8. Equation to leakage area from displacement of planned deforestation:

$$LKA_{planned,i,t} = A_{defLK,i,t} - NewR_{i,t}$$

Where:

$LKA_{planned,i,t}$	The area of activity shifting leakage in stratum i at time t; ha
$NewR_{i,t}$	New calculated forest clearance by the baseline agent of the planned deforestation in stratum i at time t where no leakage is occurring; ha
$A_{defLK,i,t}$	The total area of deforestation by the baseline agent of the planned deforestation in stratum i at time t; ha
i	1, 2, 3, … M strata

t	1, 2, 3, … t* years elapsed since the start of the REDD project activity

If $iNewR_{i,t}$ exceeds $A_{defLK,l,t}$ then $LKA_{planned,i,t}$ must be set as zero as positive leakage is not considered under the VCS.

Equation 3.9. Emissions as a result of leakage of avoided deforestation

$$GHG_{LK,E,i,t} = E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t}$$

Where:

$GHG_{LK,E,i,t}$	Greenhouse gas emissions as a result of leakage of avoided deforestation activities in stratum *i* in year *t*; tCO_2e
$E_{BiomassBurn,i,t}$	Non-CO_2 emissions due to biomass burning in stratum i in year t; tCO_2e
$N_2O_{direct-N,i,t}$	Direct NO_2 emission as a result of nitrogen application on the alternative land use in stratum *i* within the project area in year *t*; tCO_2e
i	1, 2, 3, … M strata
t	1, 2, 3, … t* years elapsed since the start of the REDD project activity

Table 3.22. Parameters and values used to estimate activity shifting leakage of the project

Parameter	Description	Value	Justification
$LKA_{planned,i,t}$	The area of activity shifting leakage in stratum i at time t; ha	Set to 0	No activity shifting will be caused by the REDD project since no economical/ commercial activity or deforestation/ degradation has been carried out so far in the project area and elsewhere by the agent of deforestation. According to Section 3.7.16 of the VCS Methodology Requirements, v4.4 and the VMD0009, "Where the specific deforestation agent can be identified, leakage need not be considered where it can be demonstrated that the management plans and/or land-use designations of the deforestation agent's other lands (which shall be identified by location) have not materially changed as a result of the project (e.g., the deforestation agent has not designated new lands as timber concessions, increased harvest rates in lands already managed for timber, cleared intact forests for agricultural production or increased fertilizer use to enhance agricultural yields). In this sense, the purpose of BAM are projects to prevent deforestation and reforestation projects for the purpose

Parameter	Description	Value	Justification
			of restoring degraded areas. Consequently, they do not have any other property with the purpose of deforestation; the purpose of the company can be seen in the company name and in the Registries of Peru.
$\Delta C_{BSL,i}$	Net carbon stock changes in all pools in baseline stratum i; tCO_2e/ha	Calculated in Table 3.19	
$GHG_{LK,E,i,t}$	Greenhouse gas emissions as a result of leakage of avoided deforestation activities in stratum i in year t; tCO_2	Set to 0	No biomass burning or use of fertilizers are considered in the project, nor are practices developed by the specific agent of planned deforestation.

No project emissions and leakage are predicted by this project once other activities such as timber harvesting, charcoal/fuelwood collection are not taking place, or are taken as insignificant.

3.2.4 Net GHG Emission Reductions and Removals

Table 3.23. Ex-Ante Estimated of Net Emission Reduction Credits

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
2020	665,924.18	0.00	0.00	665,924
2021	704,482.22	0.00	0.00	704,482
2022	527,635.34	0.00	0.00	527,635
2023	1,738,537.68	0.00	0.00	1,738,537
2024	1,844,099.57	0.00	0.00	1,844,099
2025	1,949,661.45	0.00	0.00	1,949,661
2026	2,055,223.34	0.00	0.00	2,055,223
2027	753,523.49	0.00	0.00	753,523
2028	764,910.04	0.00	0.00	764,910
2029	776,296.59	0.00	0.00	776,296
2030	760,350.17	0.00	0.00	760,350
2031	668,071.29	0.00	0.00	668,071
2032	503,967.80	0.00	0.00	503,967
2033	434,067.27	0.00	0.00	434,067
2034	364,166.73	0.00	0.00	364,166
2035	294,266.20	0.00	0.00	294,266
2036	224,365.67	0.00	0.00	224,365
2037	213,875.20	0.00	0.00	213,875

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
2038	203,384.74	0.00	0.00	203,384
2039	192,894.27	0.00	0.00	192,894
Total	15,639,703.25	0.00	0.00	15,639,703
Mean	781,985.16	0.00	0.00	781,985

Uncertainty of Emissions and Removals in Project Area in Baseline Scenario

The uncertainty calculated by the combination of the uncertainties of each parameter used in the baseline scenario ($C_{AB-tree}, C_{BB-tree}, C_{SOC}, E_{Biomassburn}$) was obtained. For this, the following equations were applied.

Equation 3.10. Uncertainty in the combined carbon stocks in stratum I, in REDD Baseline

$$U_{REDD-BSL,SS,i} = \frac{\sqrt{\sum_1^n (U_{REDD-BSL,SS,i,pool\#} \; x \; E_{REDD-BSL,SS,i,pool\#})^2}}{\sum_1^n E_{REDD-BSL,SS,i,pool\#}}$$

Where:

$U_{REDD-BSL,SS,i}$	Percentage uncertainty in the combined carbon stocks and greenhouse gas sources in the REDD baseline scenario in stratum *i*; %
$U_{REDD-BSL,SS,i,pool\#}$	Percentage uncertainty for carbon stocks and greenhouse gas sources in the REDD baseline scenario in stratum *i*; %
$E_{REDD-BSL,SS,i,pool\#}$	Carbon stock or GHG sources in the REDD baseline scenario; tCO_2e
i	1, 2, 3, … M strata

Equation 3.11. Uncertainty across combined strata, in REDD baseline

$$U_{REDD-BSL,SS,} = \frac{\sqrt{\sum_1^n \quad (U_{REDD-BSL,SS,i} \; x \; E_{REDD-BSL,SS,i})^2}}{\sum_1^n \quad E_{REDD-BSL,SS,i}}$$

Where:

$U_{REDD-BSL,SS}$	Total uncertainty in the combined carbon stocks and greenhouse gas sources in the REDD baseline scenario; %
$U_{REDD-BSL,SS,i}$	Percentage uncertainty in the combined carbon stocks and greenhouse gas sources in stratum i in the REDD baseline scenario; %
$E_{REDD-BSL,SS,i}$	Sum of combined carbon stocks and GHG sources in the REDD baseline scenario; tCO_2e
i	1, 2, 3, … M strata

Equation 3.12. Total uncertainty in REDD Baseline Scenario

$$U_{REDD-BSL,t*} = \sqrt{{U_{REDD-BSL,RATE,t*}}^2 + {U_{REDD-BSL,SS}}^2}$$

Where:

$U_{REDD-BSL,t*}$	Cumulative uncertainty in REDD baseline scenario up to year *t**; %
$U_{REDD-BSL,RATE,t*}$	Cumulative uncertainty in the baseline rate of deforestation up to year *t*; %
$E_{REDD-BSL,SS}$	Total uncertainty in the combined carbon stocks and greenhouse gas sources in the REDD baseline scenario; %
t	1, 2, 3, …t* time elapsed since the start of the project activity; years

Equation 3.13. Total error in REDD+ project activity

$$NER_{REDD+ERROR} = \sqrt{(U_{REDD-BSL,t*} \times \Delta C_{BSL-REDD,t*})^2} * (\frac{1}{\Delta C_{BSL-REDD,t*}})$$

Table 3.24. Uncertainty across combined strata, in REDD baseline

LUC Baseline scenario	$U_{REDD-BSL,SS,I}$ (%)
Lowland Tropical Rainforest	3.61
Palm and Mixed Palm Swamp Forest	33.66
Mauritia flexuosa dominated palm swamp	27.20
Oil Palm	13.07
Camu camu	13.74
Higuerilla	13.54
Pastures	15.01
E Biomassburn	
Lowland Tropical Rainforest	3.56
Palm and Mixed Palm Swamp Forest	31.77
Mauritia flexuosa dominated palm swamp	15.74

Table 3.25 shows the total uncertainty accounts for uncertainty for activity data ($Uncertainty_{BSL,RATE,t*}$ = 0%, according to Section 5.1.1 of VMD0017 v.2.2 – Step 1: Assess Uncertainty in Projection of Baseline Rate of Deforestation or Degradation – $Uncertainty_{BSL,RATE,t*}$ is assumed to be zero when the deforestation rate used to estimate the baseline is based on actual deforestation plans) and emission factor ($Uncertainty_{REDD\_BSL,SS}$ = 5.09%). Total uncertainty is therefore 5.09%.

Table 3.25. Total error in REDD+ project activity

Variables	Value
$U_{REDD-BSL,SS}$	5.09%
$U_{REDD-BSL,RATE,t*}$	0.00%
$U_{REDD-BSL,t*}$	5.09%
$\Delta C_{BSL,REDD}$	15,639,703.25
$NER_{REDD+ERROR}$	5.09%

Variables	Value
$U_{REDD-WPS}$	0,00%

As the total uncertainty for the project baseline (5.09%) is below the threshold of 15%, no deduction to the net emission reductions should be operated.

Estimation of VCS buffer

To account for non-permanence risks associated with an AFOLU project, the VCS standard requires setting aside in a buffer account a fraction of the total carbon stock benefits. According to the VM0007 methodology, leakage emissions do not factor in this calculation. To calculate the buffer, the VCS AFOLU non-permanence risk tool (v4.0) was used. The resulting buffer discount is 10%.

Calculation of Verified Carbon Units

Expected VCUs correspond to the net emission reductions according to the baseline, minus the non-permanence risk buffer (10% in the present case) and minus the uncertainty buffer (0% in the present case). The ex-ante estimation of VCUs to be generated during the first 20 years is presented in Table 3.26.

Table 3.26. Ex-ante calculation of the expected Verified Carbon Units

Year	NER_{REDD}	Buffer (10%)	Deduction due to uncertainties (tCO_2e)	VCU
2020	665,924	62,144	-	603,780
2021	704,482	66,000	-	638,482
2022	527,635	49,648	-	477,987
2023	1,738,537	168,730	-	1,569,807
2024	1,844,099	179,286	-	1,664,813
2025	1,949,661	189,842	-	1,759,819
2026	2,055,223	200,398	-	1,854,825
2027	753,523	73,607	-	679,916
2028	764,910	74,745	-	690,165
2029	776,296	75,884	-	700,412
2030	760,350	74,289	-	686,061
2031	668,071	65,643	-	602,428
2032	503,967	50,397	-	453,570
2033	434,067	43,407	-	390,660
2034	364,166	36,417	-	327,749
2035	294,266	29,427	-	264,839
2036	224,365	22,437	-	201,928
2037	213,875	21,388	-	192,487
2038	203,384	20,338	-	183,046

Year	NERREDD	Buffer (10%)	Deduction due to uncertainties (tCO_2e)	VCU
2039	192,894	19,289	-	173,605
Total	**15,639,703**	**1,523,314**	**-**	**14,116,381**
Mean	**781,985**	**76,166**	**-**	**705,818**

3.3 Monitoring

3.3.1 Data and Parameters Available at Validation

Data / Parameter	AAplanned,i,t
Data unit	ha
Description	Annual area of baseline planned deforestation for stratum i in year t.
Source of data	Calculated based on VMD0006 v1.3 equation 4.
Value applied:	See the values applied in the table 3.11 and 3.12.
Justification of choice of data or description of measurement methods and procedures applied	Estimated based on total area of planned deforestation over the baseline period for stratum I (Aplanned,i), the projected annual proportion of land that will be deforested in stratum i during year t (D%planned,i,t) and the Likelihood of deforestation for stratum I (L-Di) according to VMD0006 v1.3 equation 5.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	Aplanned,i
Data unit	Ha
Description	Total area of planned deforestation over the fixed baseline period for stratum i.
Source of data	Remote Sensing data.
Value applied:	See the values applied in the table 3.11
Justification of choice of data or description of measurement methods and procedures applied	Determined according to what is recognized as an immediate site- specific threat of deforestation, which, in its turn, is a function of the legal permissibility for deforestation, the suitability of the project area for conversion to alternative non-forest land use, the government approval for deforestation and a management plan for deforesting the project area. See Section 3.2.1 for a complete description of measurement methods and procedures applied.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	D%planned,i,t
Data unit	% $year^{-1}$
Description	Projected annual proportion of land that will be deforested in stratum i at year t.
Source of data	-
Value applied:	There is no fixed proportion, but fixed annual areas (see table 3.11)

Justification of choice of data or description of measurement methods and procedures applied	Where a valid verifiable plan exists for rate at which deforestation is projected to occur, this rate must be used, according to VMD0006 v1.3, Section 1.3 criteria.
Purpose of Data	Determination of baseline scenario.
Comments	-

Data / Parameter	L-Di
Data unit	%
Description	Likelihood of deforestation in stratum i.
Source of data	Analysis of Land Tenure.
Value applied:	100%
Justification of choice of data or description of measurement methods and procedures applied	L-Di is equal to 100% for all planned deforestation areas that are not both under Government control and zoned for deforestation, according to VMD0006 v1.3, Section 1.4.
Purpose of Data	Determination of baseline scenario.
Comments	-

Data / Parameter	$\Delta C_{AB\_tree,i}$
Data unit	t CO2e.ha^{-1}
Description	Baseline carbon stock change in aboveground tree biomass in stratum i; t CO2-e ha^{-1}.
Source of data	Calculated based on VMD0006 v1.3 equation 6.
Value applied:	See the values applied in the Tables 3.16.
Justification of choice of data or description of measurement methods and procedures applied	Estimated based on the forest carbon stock in aboveground tree biomass in stratum I (CAB_tree,bsl,i) and the post-deforestation carbon stock in aboveground tree biomass in stratum I (CAB_tree,post,i), according to VMD0006 v1.3 Equation 6.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$\Delta C_{BB\_tree,i}$
Data unit	t CO2e.ha^{-1}
Description	Baseline carbon stock change in belowground tree biomass in stratum i.
Source of data	Calculated based on VMD0006 v1.3 equation 8.
Value applied:	See the values applied in the tables 3.16.
Justification of choice of data or description of measurement methods and procedures applied	Estimated based on the forest carbon stock in aboveground tree biomass in stratum I (CAB_tree,bsl,i) and the post-deforestation carbon stock in aboveground tree biomass in stratum I (CAB_tree,post,i); according to VMD0006 v1.3 Equation 8.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$\Delta C_{SOC,i}$
Data unit	t CO2e.ha^{-1}

Description	Baseline carbon stock change in soil organic carbon in stratum i.
Source of data	Calculated based on VMD0006 v1.3 equation 12.
Value applied:	See the values applied in the tables 3.16.
Justification of choice of data or description of measurement methods and procedures applied	Estimated based on forest carbon stock in soil organic carbon in stratum (CSOC,bsl,i) and post-deforestation carbon stock in soil organic carbon in stratum i (CSOC,PD-BSL,i), according to VMD0006 v1.3 Equation 12.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$C_{AB\_tree,i}$
Data unit	t CO2e.ha^{-1}
Description	Carbon stock in aboveground biomass in trees in the baseline in stratum i
Source of data	FREL 2021[27] - Lowland Tropical Rainforest Garcia, Honorio & Del Castillo 2012[28] - Mixed Palm Swamp and Palm Swamp - Mauritia flexuosa dominated palm swamp
Value applied:	See the values applied in the tables 3.14
Justification of choice of data or description of measurement methods and procedures applied	The selected sources meet the criteria VMD0001 v1.1
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$C_{BB\_tree,i}$
Data unit	t CO2e.ha^{-1}
Description	Carbon stock in belowground biomass in trees in the baseline in stratum i
Source of data	FREL 2021 - Lowland Tropical Rainforest Freitas et al. 2006[29] - Mixed Palm Swamp and Palm Swamp - Mauritia flexuosa dominated palm swamp
Value applied:	See the values applied in the tables 3.14
Justification of choice of data or description of measurement methods and procedures applied	The selected sources meet the criteria VMD0001 v1.1
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	R
Data unit	Dimensionless
Description	Root to shoot ratio appropriate to forest type.
Source of data	Freitas et al. 2006
Value applied:	Pure and mixed aguajal = 0.40

[27] https://redd.unfccc.int/files/nref_peru_final.pdf
[28] https://revistas.iiap.org.pe/index.php/foliaamazonica/article/view/43/80
[29] https://repositorio.iiap.gob.pe/bitstream/20.500.12921/228/2/Freitas_documentotecnico_2006.pdf

Justification of choice of data or description of measurement methods and procedures applied	BGB of pure and mixed palm swamps.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$C_{SOC,i}$
Data unit	t $CO_2e.ha^{-1}$
Description	Mean carbon stock in soil organic carbon in the baseline in stratum i.
Source of data	Cuellar & Salazar 2016[30] and Garcia, Honorio & Del Castillo 2012[31]
Value applied:	See the values applied in the tables 3.14.
Justification of choice of data or description of measurement methods and procedures applied	The selected sources meet the criteria VMD0004 v1.0.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	CF
Data unit	Dimensionless
Description	Carbon fraction
Source of data	IPCC 2006
Value applied:	0.47
Justification of choice of data or description of measurement methods and procedures applied	The reference level of forest emissions due to gross deforestation of Peru in the Amazon biome works with the carbon fraction proposed by the IPCC (2006).
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$C_{AB\_tree,post,i}$
Data unit	t $CO_2e.ha^{-1}$
Description	Post-deforestation carbon stock in aboveground tree biomass in stratum i.
Source of data	FREL 2021[32] - Lowland Tropical Rainforest Garcia, Honorio & Del Castillo 2012[33] - Mixed Palm Swamp and Palm Swamp - Mauritia flexuosa dominated palm swamp
Value applied:	See the values applied in the tables 3.15
Justification of choice of data or description of measurement methods and	-

[30] http://repositorio.inia.gob.pe/handle/20.500.12955/490
[31] https://revistas.iiap.org.pe/index.php/foliaamazonica/article/view/43/80
[32] https://redd.unfccc.int/files/nref_peru_final.pdf
[33] https://revistas.iiap.org.pe/index.php/foliaamazonica/article/view/43/80

procedures applied	
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$C_{SOC, PD-BSL,i}$
Data unit	t CO2e ha^{-1}
Description	Mean post-deforestation stock in soil organic carbon in the post deforestation stratum i
Source of data	Cuellar & Salazar 2016 and Garcia, Honorio & Del Castillo 2012
Value applied:	See the values applied in the tables 3.15
Justification of choice of data or description of measurement methods and procedures applied	Based on referenced literature values.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$GHG_{BSL-E,i,t}$
Data unit	t $CO2e.yr^{-1}$
Description	Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline stratum i in year t.
Source of data	Calculated based on VMD0006 v1.3 Equation 15.
Value applied:	See the values applied in the table 3.19
Justification of choice of data or description of measurement methods and procedures applied	Calculated based on the non-CO_2 emissions due to biomass burning in stratum i in year t (EBiomassBurn,i,t), according to VMD0006 v1.3 equation 15.
Purpose of Data	Calculation of baseline emissions.
Comments	Net CO_2e emission from fossil fuel combustion in stratum i in year t (EFC,i,t) and direct N_2O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t (N_2Odirect-N,i,t) are conservatvelly excluded from the project scope and the calculation of the baseline estimates following VM0007 v1.6 Section 5.4 criteria.

Data / Parameter	$E_{BiomassBurn,i,t}$
Data unit	t CO_2e
Description	Greenhouse gas emissions due to biomass burning in stratum i in year t of each GHG (CO_2, CH_4, N_2O).
Source of data	Calculated based on VMD0013 v1.3 equation 1.
Value applied:	See the values applied in the table 3.19.
Justification of choice of data or description of measurement methods and procedures applied	Calculated based on area burnt for stratum i in year t (Aburn,i,t), average aboveground biomass stock before burning stratum i, in year t (Bi,t), combustion factor for stratum i (unitless) (COMFi), emission factor for stratum i for gas g (Gg,i) and the Global warming potential for gas g (GWPg), according to VMD0013 v1.3 Equation 1.
Purpose of Data	Calculation of baseline emissions.

Comments	-

Data / Parameter	Aburn,i,t
Data unit	Ha
Description	Area burnt for stratum i in year t.
Source of data	Equal to AAplanned,i,t in the baseline case.
Value applied:	See the values applied in the table 3.19.
Justification of choice of data or description of measurement methods and procedures applied	For the calculation of baseline emissions, the burned area is considered equivalent to the annual deforested area, assuming that all deforestation is preceded by a fire to clear the land in the baseline case.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	Bi,t
Data unit	tonnes d.m. ha^{-1}
Description	Average aboveground biomass stock before burning for stratum i, year t.
Source of data	Calculated based on VMD0013 v1.3 Equation 2.
Value applied:	See the values applied in the table 3.18.
Justification of choice of data or description of measurement methods and procedures applied	Calculated based on carbon stock in aboveground biomass in trees in stratum i in year t (CAB_tree,i,t), Carbon stock in dead wood for stratum i in year t (CDWi,t), Carbon stock in litter for stratum i in year t (CLI,i,t) and Carbon fraction of biomass (CF), according to VMD0013 v1.3 Equation 2.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	COMFi
Data unit	Dimensionless
Description	Combustion factor for stratum i.
Source of data	IPCC 2006
Value applied:	0.5
Justification of choice of data or description of measurement methods and procedures applied	Default values in Table 2.6 of IPCC, 2006 - Appendix 2.
Purpose of Data	Calculation of baseline emissions.
Comments	The combustion factor is a measure of the proportion of the fuel that is actually combusted, which varies as a function of the size and architecture of the fuel load (i.e., a smaller proportion of large, coarse fuel such as tree stems will be burnt compared to fine fuels, such as grass leaves), the moisture content of the fuel and the type of fire (i.e., intensity and rate of spread).

Data / Parameter	Gg,i
Data unit	kg t^{-1} d.m. burnt
Description	Emission factor for stratum i for gas g

Source of data	IPCC (2006)
Value applied:	CH_4 = 6.8; N_2O = 0.2
Justification of choice of data or description of measurement methods and procedures applied	Default values in Table 2.6 of IPCC, 2006 - Appendix 2.
Purpose of Data	Calculation of baseline emissions.
Comments	Defaults can be found in Volume 4, Chapter 2, of the IPCC 2006 Inventory Guidelines in table 2.5 (see Appendix 2: emission factors for various types of burning for CH_4 and N_2O).

Data / Parameter	GWPg
Data unit	Dimensionless
Description	Global warming potential for gas g.
Source of data	Fifth Assessment Report (AR5)
Value applied:	CH_4 = 28; N_2O = 265
Justification of choice of data or description of measurement methods and procedures applied	Default factor from the latest IPCC Assessment Report.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$\Delta C_{BSL,i,t}$
Data unit	t CO_2e
Description	Net carbon stock changes in all pools in the baseline stratum i in year t.
Source of data	Calculated based on VMD0006 v1.3 Equation 4.
Value applied:	See the values applied in the table 3.20.
Justification of choice of data or description of measurement methods and procedures applied	Estimated based on the annual area of baseline planned deforestation for stratum i in year t (AAplanned,i,t), the baseline carbon stock change in aboveground tree biomass in stratum I (ΔCAB_tree,i), the baseline carbon stock change in belowground tree biomass in stratum I (ΔCBB_tree,i), the baseline carbon stock change in aboveground non-tree biomass in stratum (ΔCAB_non-tree,i), the baseline carbon stock change in belowground non-tree biomass in stratum I (ΔCBB_non-tree,i), the baseline carbon stock change in wood products in stratum I (ΔCWP,i), the baseline carbon stock change in dead wood in stratum I (ΔCDW,i), the baseline carbon stock change in litter in stratum I (ΔCLI,i) and the baseline carbon stock change in soil organic carbon in stratum I, according to VMD0006 v1.3 Equation 4.
Purpose of Data	Calculation of baseline emissions.
Comments	-

Data / Parameter	$\Delta C_{BSL,planned}$
Data unit	t CO_2e
Description	Net greenhouse gas emissions in the baseline from planned

	deforestation.
Source of data	Calculated based on VMD0006 v1.3 Equation 1.
Value applied:	See the values applied in the table 3.20.
Justification of choice of data or description of measurement methods and procedures applied	Estimated based on the net carbon stock changes in all pools in the baseline (ΔCBSL,i,t) and GHG emissions as a result of deforestation activities within the project boundary in the baseline stratum i in year t (GHGBSL-E,i,t), according to equation 1 from VMD0006 v1.3.
Purpose of Data	Calculation of baseline emissions.
Comments	-

3.3.2 Data and Parameters Monitored

Data / Parameter	$A_{DefPA,i,u,t}$
Data unit	ha
Description	Area of recorded deforestation in the project area in stratum I converted to land use u in year t.
Source of data	Remote sensing imagery
Description of measurement methods and procedures applied	Annual deforestation is measured in GIS using remote sensing techniques and reported with spatial explicit data by raster and shapefile. evidence.
Frequency of monitoring/recording	Annual
Value applied:	0
Monitoring equipment	Planet
QA/QC procedures applied	GIS measurement using remote sensing techniques and field evaluations.
Purpose of data	Calculation of project emissions
Calculation method	Monitoring will be carried out with the country's official tool GEOBOSQUES.
Comments	-

Data / Parameter	$C_{P,post,u,i}$
Data unit	t CO_2e
Description	Carbon stock in all pools in post-deforestation land use u in stratum i.
Source of data	Calculated according to VMD0015 v2.2, Equation 06

Description of measurement methods and procedures applied	Calculated based on carbon stock in aboveground tree biomass in stratum I (CAB_tree,i), carbon stock in belowground tree biomass in stratum I (CBB_tree,i), carbon stock in aboveground non-tree vegetation in stratum (CAB_non-tree,i), carbon stock in belowground non-tree vegetation in stratum I (CBB_non-tree,i), carbon stock in dead wood in stratum I (CDW,i), carbon stock in litter in stratum I (CLI,i), mean post-deforestation stock in soil organic carbon in the post deforestation stratum I (CSOC,PD-BSL,i), according to VMD0015 v2.2, equation 06.
Frequency of monitoring/recording	10 years (in each baseline revalidation)
Value applied:	See the values applied in the table 3.15.
Monitoring equipment	N/A
QA/QC procedures applied	-
Purpose of data	Calculation of project emissions
Calculation method	See VMD0015 v2.2, Equation 05.
Comments	-

Data / Parameter	$\Delta C_{pools,Def,u,i,t}$
Data unit	t CO_2e
Description	Net carbon stock changes in all pools as a result of deforestation in the project case in land use u in stratum i at time t.
Source of data	Calculated according to VMD0015 v2.2, Equation 05.
Description of measurement methods and procedures applied	Calculated based on carbon stock in all pools in the baseline case in stratum I (CBSL,i), carbon stock in all pools in post-deforestation land use u in stratum I (CP,post,u,i) and carbon stock sequestered in wood products from harvests in stratum I (CWP,i), according to VMD0015 v2.2, equation 05.
Frequency of monitoring/recording	10 years (in each baseline revalidation)
Value applied:	See the values applied in the table 3.16.
Monitoring equipment	N/A
QA/QC procedures applied	-
Purpose of data	Calculation of project emissions
Calculation method	See VMD0015 v2.2, Equation 05.

Comments	-

Data / Parameter	$\Delta C_{P,DefPA,i,t}$
Data unit	t CO_2e
Description	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t.
Source of data	Calculated according to VMD0015 v2.2, equation 03
Description of measurement methods and procedures applied	Calculated based on the area of recorded deforestation in the project area stratum i converted to land use u at time t (ADefPA,u,i,t) and the net carbon stock changes in all pools in the project case in land use u in stratum i at time t (ΔCpools,Def,u,i,t), according to VMD0015 v2.2, Equation 03.
Frequency of monitoring/recording	Before every verification event with a maximum frequency of 05 years.
Value applied:	0
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of project emissions
Calculation method	See VMD0015 v2.2, Equation 03.
Comments	-

Data / Parameter	$A_{DegW,i}$
Data unit	ha
Description	Area potentially impacted by degradation processes in stratum i
Source of data	Measured
Description of measurement methods and procedures applied	The area subject to degradation is delineated based on an access buffer from all access points, such as roads and rivers or previously cleared areas, to the project area, with a width equal to the distance of degradation penetration.
Frequency of monitoring/recording	Before every verification event with a maximum frequency of 05 years.
Value applied:	Set to zero
Monitoring equipment	GPS and Compass.

QA/QC procedures applied	Each brigade has a brigade chief in charge of supervising the collection of information. All the information collected will be checked again in the cabinet.
Purpose of data	Calculation of project emissions
Calculation method	See VMD0015 v2.2, Equation 08.
Comments	Ex-ante estimates of net carbon stock changes as a result of degradation in stratum i in the project area in year t ($\Delta CP,DegW,i,t$) will be made based on participatory rural appraisals (PRA) and field evaluations.

Data / Parameter	$C_{DegW,i,t}$
Data unit	$tCO_2e\ ha^{-1}$
Description	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum i in year t.
Source of data	Estimated through diameter of stumps directly measured in the field.
Description of measurement methods and procedures applied	The diameter of all tree stumps is measured and conservatively assumed to be the same as the DBH. The above and below ground carbon stock of each harvested tree are estimated using the same allometric regression equation and root to shoot ratio used for estimating the carbon pool in trees in the baseline scenario
Frequency of monitoring/recording	Before every verification event with a maximum frequency of 05 years.
Value applied:	Set to zero.
Monitoring equipment	Diameter tape.
QA/QC procedures applied	Field measurement quality control.
Purpose of data	Calculation of project emissions.
Calculation method	Calculated through allometric equation used for estimating the carbon pool in trees in the baseline scenario.
Comments	Ex-ante estimates will be made based on PRAs, which considered the amount of wood used for firewood, construction of houses and boats per family.

Data / Parameter	A_{Pi}
Data unit	ha
Description	Total area of degradation sample plots in stratum i.

Source of data	Ground measurement.
Description of measurement methods and procedures applied	Sampling plots covering 3% of AdegWi
Frequency of monitoring/recording	Before every verification event with a maximum frequency of 05 years.
Value applied:	0
Monitoring equipment	Tape measure, GPS.
QA/QC procedures applied	-
Purpose of data	Calculation of project emissions.
Calculation method	Fixed area plots covering 3% of the ADegW,I in the monitoring period.
Comments	-

Data / Parameter	$\Delta C_{P,DegW,i,t}$
Data unit	tCO_2e
Description	Net carbon stock changes as a result of degradation in stratum i in the project area in year t.
Source of data	Calculated according to VMD0015 v2.2, Equation 08.
Description of measurement methods and procedures applied	Calculated based on area potentially impacted by degradation processes in stratum I (ADegW,i) and biomass carbon of trees cut and removed through degradation process from plots measured in stratum i in year t (CDegW,i,t) and total area of degradation sample plots in stratum I (APi), according to VMD0015 v2.2, Equation 08.
Frequency of monitoring/recording	Annual
Value applied:	0
Monitoring equipment	N/A
QA/QC procedures applied	-
Purpose of data	Calculation of project emissions
Calculation method	See VMD0015 v2.2, Equation 08.
Comments	-

Data / Parameter	$\Delta C_{P,SelLog,i,t}$

Data unit	tCO_2e
Description	Net carbon stock change as a result of degradation through selective logging of FSC certified forest management areas in the project area in the project case in stratum i in year t.
Source of data	Calculated according to VMD0015 v2.2, Equation 09.
Description of measurement methods and procedures applied	Calculated based on actual net project emissions arising in the logging gap in stratum i in year t (CLG,i,t), actual net project emissions arising from logging infrastructure in stratum i in year t (CLR,i,t) and the carbon stock in wood products pool from stratum i, in year t (CWPi,t), according to VMD0015 v2.2, Equation 09.
Frequency of monitoring/recording	Not monitored as it will not happen.
Value applied:	Set to zero
Monitoring equipment	N/A
QA/QC procedures applied	-
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	This activity will not be carried by the project.

Data / Parameter	$A_{burn,i,t}$
Data unit	ha
Description	Area burnt for stratum i in year t.
Source of data	Equal to ADistPA,q,i,t + ADefPA,i,u,t in the project case.
Description of measurement methods and procedures applied	For the calculation of project emissions, the burned area is considered equivalent to burn scars monitored plus annual deforested area monitored, assuming that all deforestation is preceded by a fire to clear the land in the project case.
Frequency of monitoring/recording	Annual.
Value applied:	See the values applied in the table 3.19.
Monitoring equipment	-
QA/QC procedures applied	Remote monitoring and surveillance system.

Purpose of data	Calculation of project emissions
Calculation method	-
Comments	-

Data / Parameter	$GHG_{P,E,i,t}$
Data unit	$tCO_2e.yr^{-1}$
Description	Greenhouse gas emissions as a result of deforestation activities within the within the project area in the project case stratum i in year t.
Source of data	Calculated based on VMD0006 v1.3 Equation 30.
Description of measurement methods and procedures applied	Calculated based on the non-CO_2 emissions due to biomass burning in stratum i in year t (EBiomassBurn,i,t), according to VMD0006 v1.3 Equation 15.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	See the values applied in the table 3.19.
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of project emissions.
Calculation method	Calculated based on VMD0006 v1.3 Equation 30.
Comments	Net CO_2e emission from fossil fuel combustion in stratum i in year t (EFC,i,t) and direct N_2O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t (N_2Odirect-N,i,t) are conservatively excluded from the project scope and the calculation of the baseline estimates following VM0007 v1.6 Section 5.4 criteria.

Data / Parameter	$E_{BiomassBurn,i,t}$
Data unit	tCO_2e
Description	Greenhouse gas emissions due to biomass burning in stratum i in year t of each GHG (CO_2, CH_4, N_2O)
Source of data	Calculated based on VMD0013 v1.3 Equation 1.
Description of measurement methods and procedures applied	Calculated based on area burnt for stratum i in year t (Aburn,i,t), average aboveground biomass stock before burning stratum i, in year t (Bi,t), combustion factor for stratum i (unitless) (COMFi), emission factor for stratum i for gas g (Gg,i) and the Global

	warming potential for gas g (GWPg), according to VMD0013 v1.3 Equation 1.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	See the values applied in the Table 3.19.
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of project emissions.
Calculation method	Calculated based on VMD0013 v1.3 Equation 1.
Comments	-

Data / Parameter	$\Delta C_{WPS-REDD}$
Data unit	t CO_2e
Description	Net GHG emissions in the REDD project scenario up to year t.
Source of data	Calculated according to VMD0015 v2.2, Equation 01.
Description of measurement methods and procedures applied	Calculated based on net carbon stock change as a result of deforestation in the project area in the project case in stratum i in year t ($\Delta CP,DefPA,i,t$), Net carbon stock change as a result of degradation in the project area in the project case in stratum i in year t ($\Delta CP,Deg,i,t$), Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum i in year t ($\Delta CP,DistPA,i,t$) and Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project case in stratum i in year t ($GHGP-E,i,t$), according to VMD0015 v2.2, Equation 01.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	0
Monitoring equipment	N/A
QA/QC procedures applied	GHG information system and controls associated with the project and its monitoring. This information system rules the process for obtaining, recording, compiling, and analyzing data and information important for quantifying and reporting GHG emissions and removals relevant for the project (including leakage) and baseline scenario.

Purpose of data	Calculation of project emissions
Calculation method	See VMD0015 v2.2, Equation 01.
Comments	-

Data / Parameter	$\Delta C_{LK\text{-}AS,planned}$
Data unit	t CO2e
Description	Net GHG emissions due to activity shifting leakage for projects preventing planned deforestation up to year t*
Source of data	Calculated according to VMD0009 v1.3, equation 01.
Description of measurement methods and procedures applied	Calculated based on the area of activity shifting leakage in stratum i in year t (LKAplanned,i,t), the net carbon stock changes in all pre-deforestation pools in baseline stratum I, (ΔCBSL,i) and the Greenhouse gas emissions as a result of leakage of avoiding deforestation activities in stratum i in year t (GHGLK,E,i,t), according to VMD0009 v1.3, Equation 01.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	0
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of leakage.
Calculation method	Calculated according to VMD0009 v1.3, Equation 01.
Comments	-

Data / Parameter	NER_{REDD}
Data unit	tCO_2e
Description	Total net GHG emission reductions of the REDD project activity up to year t (tCO_2e).
Source of data	Calculated according to VM0007 v1.6 Equation 2.
Description of measurement methods and procedures applied	Calculated based on the net GHG emissions in the REDD baseline scenario up to year t (ΔCBSL-REDD), the net GHG emissions in the REDD project scenario up to year t (ΔCWPS-REDD) and the net GHG emissions due to leakage from the REDD project activity up to year t (ΔCLK-REDD), according to VM0007 v1.6 Equation 2.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.

Value applied:	See the values applied in Table 3.24
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of VCUs
Calculation method	According to VM0007 v1.6 Equation 2.
Comments	-

Data / Parameter	BufferPlanned
Data unit	t CO_2e
Description	Buffer withholding for avoiding planned deforestation project activities
Source of data	Calculated according to VM0007 v1.6 Equation 8.
Description of measurement methods and procedures applied	Calculated based on the net greenhouse gas emissions in the baseline from planned deforestation up to year t ($\Delta CBSL,planned$) and the buffer withholding percentage (Buffer%), according to VM0007 v1.6 Equation 14.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	10%
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of VCUs
Calculation method	Calculated according to VM0007 v1.6 Equation 14.
Comments	-

Data / Parameter	$Uncertainty_{REDD\text{-}BSL,SS}$
Data unit	%
Description	Total uncertainty in the combined carbon stocks and greenhouse gas sources in the REDD baseline scenario
Source of data	Calculated according to VMD0017 v2.2 Equation 5.
Description of measurement methods and procedures applied	Calculated based on the percentage uncertainty in the combined carbon stocks and greenhouse gas sources in stratum i in the REDD baseline scenario ($UREDD\text{-}BSL,SS,i$), and the sum of combined carbon stocks and GHG sources in the REDD baseline

	scenario (EREDD- BSL,SS,t,i),according to VMD0017 v2.2 Equation 5.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	See the values applied in Table 3.26
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of VCUs
Calculation method	Calculated according to VMD0017 v2.2 Equation 5.
Comments	Uncertainty in baseline rate of deforestation is set as zero ($Uncertainty_{REDD\text{-}BSL,RATE} = 0$), as the deforestation rates are based on actual deforestation plans, following VMD0017 v2.2, Section 5.1.1 criteria. In this sense $Uncertainty_{REDD\text{-}BSL,SS}$ equals to cumulative uncertainty in REDD baseline scenario up to year t ($Uncertainty_{REDD\text{-}BSL,t^*}$).

Data / Parameter	$UncertaintyR_{EDD\text{-}WPS}$
Data unit	%
Description	Total uncertainty in the REDD project scenario
Source of data	Calculated according to VMD0017 v2.2 Equation 13.
Description of measurement methods and procedures applied	Calculated according to the percentage uncertainty in the combined carbon stocks and greenhouse gas sources in stratum i in the REDD project scenario (UREDD-WPS,SS,i) and the sum of combined carbon stocks and GHG sources multiplied by the area of stratum i (Ai) in the REDD project scenario (EREDD-WPS,SS,t,i), according to VMD0017 v2.2 Equation 13.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	See the values applied in Table 3.26
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of VCUs.
Calculation method	Calculated according to VMD0017 v2.2 Equation 13.
Comments	-

Data / Parameter	$NER_{REDD+ERROR}$
Data unit	%
Description	Cumulative uncertainty for the REDD+ project activities up to year t
Source of data	Calculated according to VMD0017 v2.2 equation 21
Description of measurement methods and procedures applied	Calculated based on Cumulative uncertainty in REDD baseline scenario up to year t (UncertaintyREDD_BSL,t), the total uncertainty in the REDD project scenario (UncertaintyREDD_WPS), the Net GHG emissions in the REDD baseline scenario up to year t (ΔCBSL-REDD,t), and the Net GHG emissions in the REDD project scenario up to year t (ΔCWPS-REDD,t), according to VMD0017 v2.2 Equation 21
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	See the values applied in Table 3.27
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of VCUs
Calculation method	Calculated according to VMD0017 v2.2 Equation 21
Comments	-

Data / Parameter	$Adjusted\_NER_{REDD+}$
Data unit	%
Description	Total net GHG emission reductions of the REDD+ project activities up to year t* adjusted to account for uncertainty
Source of data	Calculated according to VMD0017 v2.2 Equation 21
Description of measurement methods and procedures applied	Calculated based on the total net GHG emission reductions of the REDD project activity up to year t (NERREDD), and the cumulative uncertainty for the REDD+ project activities up to year t (NERREDD+_ERROR).
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	Equals the value of NER_{REDD}
Monitoring equipment	-
QA/QC procedures applied	-

Purpose of data	Calculation of VCUs.
Calculation method	Calculated according to VMD0017 v2.2 Equation 21.
Comments	No deduction should result for uncertainty given that the value (5.03%) is below the threshold (15%)

Data / Parameter	VCUt
Data unit	VCU
Description	Number of Verified Carbon Units at year t* or t2 - t1
Source of data	Calculated according to VMD0017 v2.2 Equation 19.
Description of measurement methods and procedures applied	Calculated based on the total net GHG emission reductions of the REDD+ project activity up adjusted to account for uncertainty (Adjusted_NERREDD+), and the total permanence risk buffer withholding (BufferPlanned), according to VMD0017 v2.2 Equation 19.
Frequency of monitoring/recording	Before every verification event with a minimum frequency of 05 years.
Value applied:	See the values applied in Table 3.27
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	Calculation of VCUs
Calculation method	Calculated according to VMD0017 v2.2 Equation 19.
Comments	-

3.3.3 Monitoring Plan

The objective of the Monitoring Plan is to provide tools that allow the verification of the data related to deforestation within the project area and its leakage belt across time, and it is fundamental to periodically update the emission estimates as well as the generation of information. In addition, it is important to monitor the results of the activities implemented by The Last Habitat REDD Project BAM and make the necessary adjustments in the activities to comply with the project objectives.

Organization structure

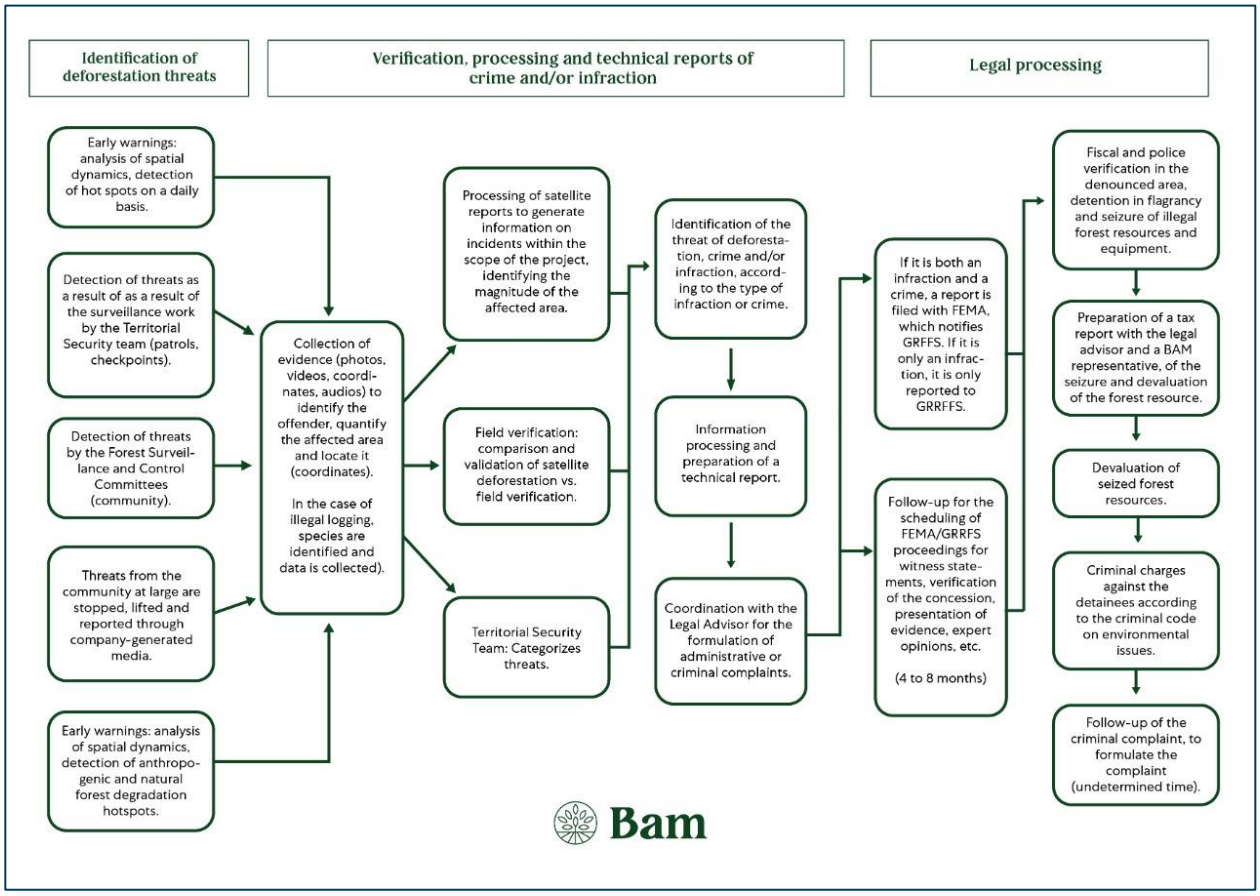
The Project is implemented by BAM SAC, a company with almost two decades of experience in the sustainable management of natural tropical forests in order to obtain ecosystem benefits from the sustainable management of the landscape. BAM SAC has a trained and experienced technical team for the implementation of the project, capacities that also extend to monitoring tasks.

A multidisciplinary team oversees the development of the Monitoring Plan, led by a general project coordinator, a territorial security specialist, and a community relations coordinator allowing a comprehensive approach to the different components of the plan. Its implementation is in charge of the head of the General project coordinator, who must articulate it with the technical field staff, the latter is the one who performs the measurements on the ground and corroborates the information in the office. It has specialized SIG specialist with extensive experience who provide support in the calculations of emissions, as well as support in GIS for the analysis and interpretation of satellite images necessary for the calculation of deforestation.

The flowchart of the information of the monitoring system and the organizational structure of the project monitoring system is depicted in Figure 2.8 of Section 2.3.12.

The information collected in the field by the technical staff is reviewed and systematized by the technical assistance of the Territorial Security Department. At the end of the period (annually) will present the corresponding monitoring reports to the Security Coordinator for their review and validation. The relevant information is incorporated to review the management tools and the preparation of the new Operational Plan for the project. The flow chart of the data management is presented below:

Figure 3.7.Flow chart of the reviewing process of information



The previous figure shows a clear structure of how the data is managed by the team. First, the initial procedures aim to identify deforestation threats where the Territorial Security Team actively works. Then, In the verification, processing, and technical reports of the crime take place by the Territorial Security Team. Finally, with all the information gathered in the field, the team proceed to initiate legal actions against the perpetrators. The physical files are stored in the project's administrative office located in the town of Pucallpa, while the digital files are stored in an electronic folder called "THE LAST HABITAT REDD PROJECT - BAM" located on the BAM server, which is managed by the Forestry Specialist. These files will be kept throughout the life of the project and for at least two years after the end of their crediting period.

Analysis of deforestation

For this monitoring component, information management comprises the following steps or processes:

Step 1: Selecting and analyzing the source of land use change

1.1. For the fifth-year monitoring period, the following actions will be taken:

a) The data collected and analyzed should cover the entire project area. The data must correspond to the year in which the verification occurs.

b) For the calculation of each category of land use change:
- The area of each category will be calculated within the project area.
- The reference forest cover maps for the project area will be updated.
- The remaining forest area within the project area will be updated.

1.2. For the tenth-year monitoring period, a review of the baseline corresponds:

a) Use of medium resolution images (30 mx 30 m or less, if available) at the end of the period in which the baseline will be renewed.

b) The data collected and analyzed must cover:
- Entire reference region: data available for the baseline renewal year or no less than one year earlier.
- For the processing of Land Use Capacity, geometric corrections will be georeferenced and made, as well as cloud and shadow detection.
- The area of each category will be calculated within the reference region, the project area and, when necessary, within the leakage belt.
- The forest cover maps will be updated for the reference region, the project area and the leakage belt.
- The total deforested areas will be estimated during the first 10 years to adjust the baseline and the deforestation rate if necessary.

Note: The indications of the corresponding Module of the REDD Methodology Modules regarding clouds will be taken into account for the determination of maps. A classification accuracy of 90% or more will be sought.

Step 2: interpretation and analysis

2.1 Monitoring deforestation

a) Deforested area within the Project Area (PA) by stratum.

In this case, it must be specified to which type of Land Use (LU) the deforested areas have been changed. For the recalculation of the baseline, it must be established or indicated whether the percentages of change in land use remain the same as in the initial baseline.

c) Carbon stocks in carbon pools:

- The carbon stock is maintained in each stratum defined in the baseline. It will be re-evaluated for the baseline review (in 10 years).
- The carbon stock of each land use is maintained. It will be re-evaluated for the baseline review (in 10 years).

e) Deforested area within the Reference Region (for baseline review).

Quality assurance

Review processes will be carried out in order to ensure the quality of the project information, minimizing the risks of error; thus, obtaining reliable data as the basis of a solid monitoring system. It includes the following steps:

1. Training

Training will be provided to staff in general in the different roles that they must play in the framework of the project, activities, and the methodologies to be followed, as well as the care they must take in those critical points of information management in its different stages: collection of field data, fingering, processing.

2. On-site verification

It basically consists of the monitoring in the field that the Security Coordinator must carry out on the work of the technical team, always taking care that the procedures established in the methodological guidelines of the guides and manuals are implemented and that have been disseminated to the staff in the process. training.

An error in the implementation of the procedures must be corrected in the field during the execution of the samplings or evaluations.

3. Review of data collected before and after digitization

- Field data collection: form header review, complete fields, data consistency (values within parameters).

- Typing: once 100% of the information contained in the form has been entered into the database, an indication of "typing" must be entered in the corresponding form and once the consistency of the fingering has been checked, it must be entered an indicative of "revised".
- Processing: is the responsibility of the Security Coordinator. They should take into consideration the methodological guidelines defined in the monitoring guides or manuals developed by the project.

If any inconsistency of information is identified at the field form level, this information must be verified in the field. If the inconsistency is found in the digitized information, it must be corroborated in the field forms and if the inconsistency persists, it must be corroborated in the field.

4. Review of monitoring reports before publication.

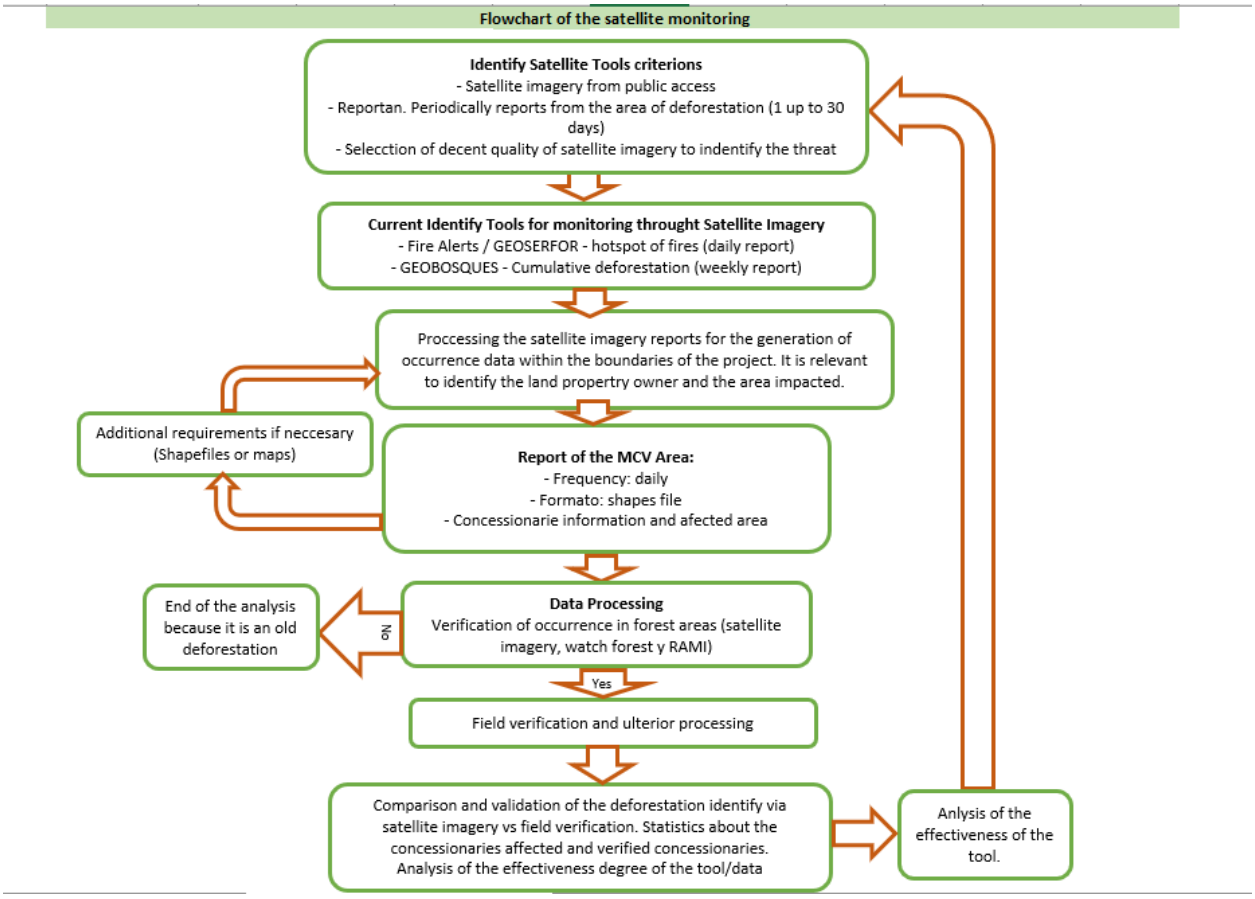
The monitoring reports should be reviewed before publication to confirm that the calculations, analysis, and conclusions are correct and if they have been obtained following the corresponding guidelines. This work is in charge of the Forestry Specialist.

If there are non-conformities during the internal or external audit processes, the data should be reviewed, and the non-conformities addressed.

Internal audit procedures

For the internal Audit Procedures, the project will follow the flowchart depicted in Figure 3. 8. With this procedure, the project will validate the appropriate usage of satellite imagery to identify areas of deforestation because it indicates the steps to follow in case of any threat of the area within the project. In addition, this procedure contemplates a comparison between satellite imagery monitoring and field verification.

Figure 3.8. Flowchart of the internal procedure to analyze the satellite monitoring.



Finally, the flowchart presented above in Figure 35 also serves as a internal audit procedure because shows how the data gathered from the field should be conducted by following a series of steps in charge of the competent team member.

3.3.4 Dissemination of Monitoring Plan and Results (CL4.2)

The Last Habitat REDD+ reports and progress (regarding monitoring of the area, activities carried out, biodiversity studies and reports, community projects, agreements, among others) will be communicated to the various communities surrounding the project and other key stakeholders such as local authorities and BAM staff. Within the offline channels, easy-to-read information brochures, maps and monthly bulletins will be generated. These will include the company's telephone number and contact email (info@bosques-amazonicos.com) to maintain direct communication with the team. In addition, public meetings and workshops will be held on dates and at locations mutually agreed upon with the communities and hamlets.

Similarly, regarding online channels, there is the Facebook page: Bosques Amazónicos - BAM (https://www.facebook.com/bam.Bosquesamazónicos), where the brochures and bulletins mentioned above will be shared, as well as photos, videos, and testimonials, also shared on the YouTube

channel: BAM - Bosques Amazónicos (https://www.youtube.com/channel/UCKrJZHTukUr6gwwHS1_wMBA).

Lastly, relevant news and articles will be published in the Blog section of the Bam website (www. Bosques-amazonicos.com)

More detail is presented in the Communications Plan of The Last Habitat REDD+ project in the document.

3.4 Optional Criterion: Climate Change Adaptation Benefits

Not applicable.

3.4.1 Regional Climate Change Scenarios (GL1.1)

Not applicable.

3.4.2 Climate Change Impacts (GL1.2)

Not applicable.

3.4.3 Measures Needed and Designed for Adaptation (GL1.3)

Not applicable.

4 COMMUNITY

4.1 Without-Project Community Scenario

4.1.1 Descriptions of Communities at Project Start (CM1.1)

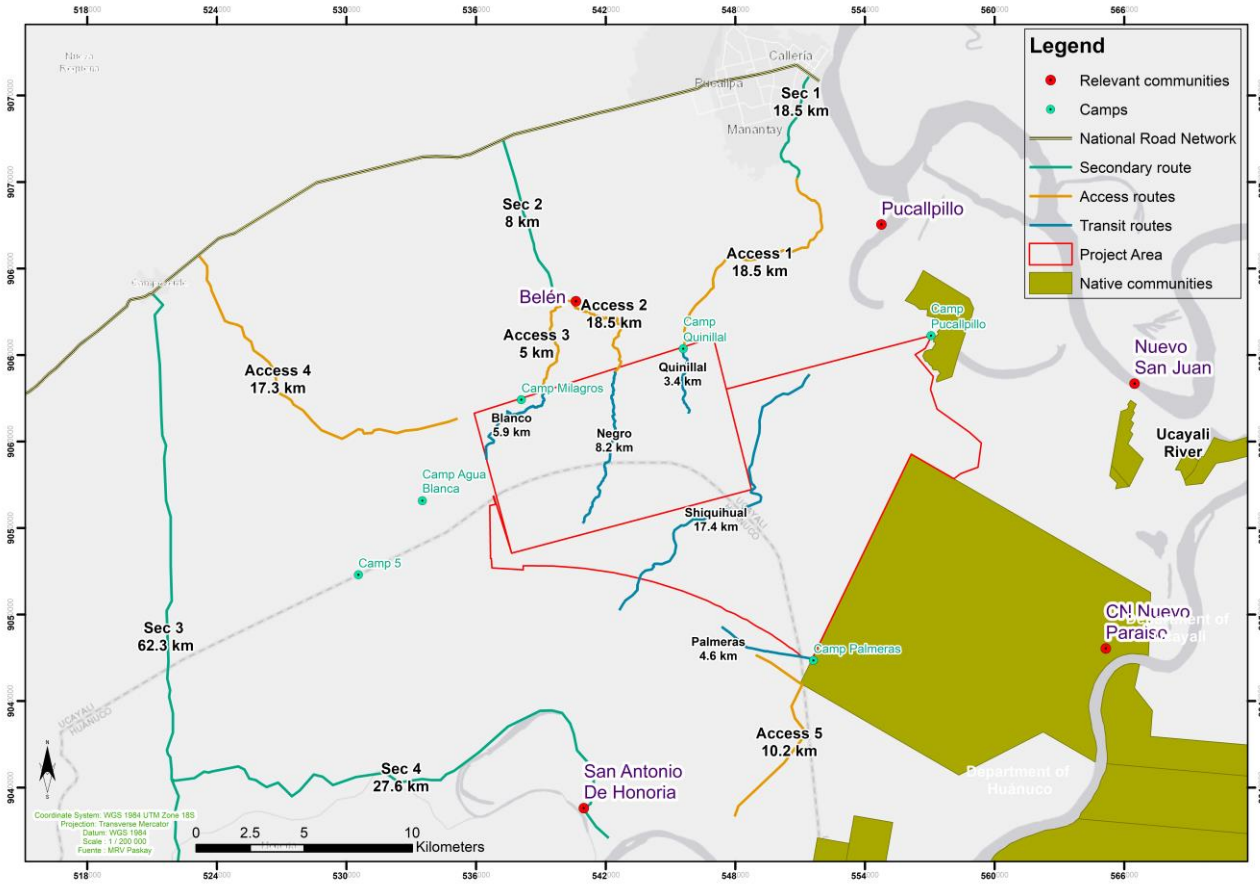
For the description of the relevant communities identified, a social diagnosis (for more detail see file: Social Diagnosis – Evaluation) was elaborated using surveys, interviews, and secondary sources to illustrate the socioeconomic situation of the communities at the start of the project. The general characteristics of the relevant communities identified are described below.

Table 4.1. Characterization of relevant communities to the project

Communities	Population[34]	Type	Region
Nuevo Belen	100 families Women 45.45% 36.93% age between 1-14 20.45% age between 15-29 19.89% age between 30-44 11.36% age between 45-64 11.36% more than 65	Rural settlement	Ucayali
Nuevo San Juan	240 families Women 50.38% 42.82% age between 1-14 20.15% age between 15-29 15.37% age between 30-44 11.08% age between 45-64 10.58% more than 65	Rural settlement	Ucayali
Pucallpillo	100 families Women 48.87% 28.5% age between 1-14 23.31% age between 15-29 15.79% age between 30-44 12.78% age between 45-64 19.55% more than 65	Rural settlement	Ucayali
CCNN Nuevo Paraíso	250 families Women 51.34% 53.67% age between 1-14 22% age between 15-29 13.42% age between 30-44 6.80% age between 45-64 4.11% more than 65	Native community (Indigenous people)	Ucayali
San Antonio de Honoria	145 families Women 44.14% 34.42% age between 1-14 23.05% age between 15-29 21.43% age between 30-44 13.31% age between 45-64 9% more than 65	Rural settlement	Huánuco

[34] Population information about the number of women and ages has been obtained from https://visor.geoperu.gob.pe/

Figure 4.1. Location of the relevant communities to the project



Source: Inhouse elaboration.

General Characteristics

As can be seen in the table above, there are 4 rural settlements and one native community with a total universe of approximately 835 families. In the case of the 4 rural settlements, they are families that have settled in the territory for between 20 and 5 years, involved mainly in agricultural activities in a subsistence economy. Many of the adults of these rural settlements come from other places such as the region of Loreto, San Martín, or other localities within Ucayali.

Land is normally managed individually by each family and common affairs are decided in community assemblies lead by a president and other representatives with specific functions that are elected by the community.

On the other hand, the Nuevo Paraiso native community has been settled in its territory since 1987 (34 years), but as a native community belonging to the Shipibo-Konibo people, they have lived in the Peruvian Amazon for centuries. As a native community, families share a common land which they organize and work collectively. A president or “Apu” is elected by the community to represent them, and decisions are also made collectively in community assemblies. Their traditional language is the Shipibo-Konibo which is learned as first language and in school they also learn Spanish.

Socioeconomic information and basic needs are described below:

Education in the communities

In the case of the interviewed families, more than 50% have incomplete high school education or less. What this indicates is that more than half of the families would be in limited conditions to be able to get paid and permanent jobs.

Table 4.2. Summary of education level in the relevant communities

Education level	Men	Women
Incomplete Elementary Education	29%	18%
Complete Elementary Education	18%	27%
Incomplete High School	24%	29%
Complete High School	23%	16%
Incomplete Higher Technical Education	0%	9%
Complete Higher Technical Education	5%	0%
Total	100	100

Access and use of basic services: Basic needs

In the study carried out, the analysis of the following indicators was made:

- Type of fuel for cooking
- Access and characteristics of water consumption
- Type of hygienic services
- Access and characteristics of electrical energy

Fuel for cooking:

70% maintain the use of firewood as the main source of energy for the use of their kitchen. Only 30% indicate that they use gas for energy in their kitchens.

Access and characteristics of water consumption:

65% of families have limited access to water service (outside the home and without proven or safe water treatment).

Hygienic services:

There is very limited access to drainage in these sectors, with 90% of families having alternative services for managing their waste, generating a public health problem.

Electric power:

Although 90% of the families confirmed that they had access to electricity, the conditions in several sectors are through a generator and only for time periods (30% of the total number of families).

Table 4.3. Summary of basic needs

Indicator	Unsatisfied	Satisfied
Type of fuel used	30%	70%
Access to electricity	30%	70%
Drinking water	65%	35%
Hygienic services	90%	10%

Economy- income

86% of the families identify themselves as small farmers and 60% identify that the income they generate is not enough income for their economic needs. The income range of the families is presented below:

Table 4.4. Range of family monthly income

Ranges		Frequency	Percentage	Valid percentage	Accumulated percentage
Valid	Less than 350 soles	35	39,8	42,2	42,2
	Between 350 to 500 soles	11	12,5	13,3	55,4
	Between 500 to 930 soles	16	18,2	19,3	74,7
	930 soles	14	15,9	16,9	91,6
	Between 930 to 1500 soles	7	8,0	8,4	100,0
	Total	83	94,3	100,0	
No answer		5	5,7		
Total		88	100,0		

As it can be observed in the table, 70% of the income of the families located in the area of the project is located in an interval between less than 350 soles per month to 930 soles per month, that is a less than the current minimum salary of the Peruvian government (Minimum Vital Remuneration established by the Peruvian government is 930 soles).

According to the National Institute of Statistics of Peru in 2020 it indicated that, “the Poverty Line is the monetary equivalent to the cost of a basic consumption basket of food and not food, which for 2020 amounts to S / 360 per month per inhabitant, the person whose monthly expenditure is less than S / 360 is considered poor; for a family of four the cost of a basic consumption basket is S /. 1,440 per month”. In this context, we have that many of the families (70%) are in a situation of vulnerability (monetary poverty).

4.1.2 Interactions between Communities and Community Groups (CM1.1)

At the start of the project no clear or significant interactions between the communities identified at section 2.1.8 have been recognized. However, within each community, interactions between groups exist, for example, among farmers who form associations to participate in support programs from public or private entities, or women that have an active role in the provision of social food programs in public schools or the collaboration in the community's "Mothers´ Club".

The relevant communities identified also share links with other neighboring rural settlements, that have not been prioritize, through family ties, the shared use of the health, education and other services, and recreational activities that occur during the weekend, such as football and volleyball games. These other rural settlements sometimes receive the name of expansions or annexes. Some examples are the rural settlement of "Ampliación Belén" next to Nuevo Belén, or the annexes "Jericó" and "Jerusalen" from San Antonio de Honoria.

4.1.3 High Conservation Values (CM1.2)

As communal land of the Shipibo-Konibo indigenous people, the following identified high social conservation value is described:

High Conservation Value	Shipibo-Konibo's (Nuevo Paraiso native community) ancestral land
Qualifying Attribute	Indigenous people maintain strong connections to their ancestral land and territory which holds great significance for their cultural, spiritual, social, and economic well-being. Their cultural practices and characteristics are directly linked to the attributes and history of their territory. In this regard, protecting the territory of the native community Nuevo Paraiso, which is adjacent to the project area, is critical to the livelihoods and preserving the traditional knowledges and the identity of the native community.
Focal Area	Land of Native community Nuevo Paraiso (outside of the project area)

4.1.4 Without-Project Scenario: Community (CM1.3)

In the without-project scenario, the projected deforestation of the project area would threaten the well-being of the communities by affecting the conditions that allow their reproduction and survival by affecting the regulation of water, reducing the capacity of the forest to regulate the temperatures near the communities, and reducing the mitigation capabilities of the forest to protect them from extreme weather events in the context of global warming and the current climate crisis. This situation would also make them more vulnerable to health problems produced by common pests in the region that cause illnesses such as dengue fever, food insecurity, and the lack of safe water.

Without the project, communities in the surroundings would also have less sustainable livelihoods alternatives, depending more in activities related to the extraction of wood and land trafficking for agriculture, which are the main deforestation risks in the area. In other words, the change of land use will occur due to the pressure of communities to develop subsistence activities, repeating what

happened in forests in nearby areas, compromising the wellbeing of the communities' future generations.

In this regard, because of the socioeconomic situation and the unsatisfied basic needs described in section 4.1.1, families or family members may consider relocating in search of livelihood opportunities generating ruptures in the social and family relationships. As it is pointed out in the results of the social diagnosis, a significant percentage of the population was not born in the communities in the surroundings of the project area, thus have weaker ties to the territory therefore more predisposed to move and continue with a vicious circle that negatively impacts the environment and maintain low quality of life levels in the population.

4.2 Net Positive Community Impacts

4.2.1 Expected Community Impacts (CM2.1)

The community impacts of the project have been identified based on ongoing consultations and constant informational meetings as described in section 2.3. As a result of this dissemination and consultation work, the following impacts have been identified.

Community group	Rural settlements (see section 4.1.1 list of the communities)
Impacts	- Conservation of the forests in the project area will benefit the surrounding community's well-being by conserving key ecosystem services in the region. - Improvement in the quality of life of the communities by strengthening their socioeconomic situation and their access to basic services.
Type of benefit, cost, or risk	- Direct and predicted social-environmental benefits in the project area are expected to be obtained through the activities of the project, in addition of the transfer of information, increased capacities, and the promotion of knowledge regarding conservation and the sustainable management of resources in the communities. - Direct and predicted socio-economic benefits in the identified communities that voluntarily accept to participate in the project activities that aim to improve their local livelihoods and access to basic services through health, education, sanitation or energy projects, trainings, and support in the development of sustainable production chains.
Change in well-being	- Positive change in well-being of the communities thanks to the conservation of the ecosystem services provided by the maintenance of the forest in the project area and the improvement of their capacities in sustainable activities. - Positive change in well-being in the communities identified in the surroundings of the project who voluntarily accept and benefit from the project´s activities.

Community group	Native community (see section 4.1.1 list of the communities)
Impacts	- Forest ecosystems in the community´s territory is less vulnerable to risks of deforestation and environmental crimes. - Conservation of the forests in the project area will benefit the surrounding community's well-being by conserving key ecosystem services in the region.

	- Improvement in the quality of life of the Native community by strengthening their socioeconomic situation and their access to basic services.
Type of benefit, cost or risk	- Monitoring and control strategies implemented in the project area will produce social and environmental benefit in territory of the native community of Nuevo Paraiso, which is adjacent to the project, preventing risks of deforestation and environmental crimes in the borders of both territories through cooperation and constant communication. - Direct and predicted social-environmental benefits in the HCVs in the project area are expected to be obtained through the activities of the project, strengthened by the transfer of information, increased capacities, and the promotion of knowledge regarding conservation and the sustainable management of resources in the communities. - Direct and predicted socio-economic benefits in the identified communities that voluntarily accept to participate in the project activities that aim to improve their local livelihoods and access to basic services through health, education, sanitation or energy projects, trainings, and support in the development of sustainable production chains.
Change in well-being	- Positive change in well-being thanks to the protection of the territories through cooperation and constant communication between the native community and BAM. - Positive change in well-being in The native community thanks to the conservation of the ecosystem services provided by the maintenance of the forest in the project area and the improvement of their capacities in sustainable activities. - Positive change in well-being in the native community who voluntarily accept and benefit from the project´s activities.

4.2.2 Negative Community Impact Mitigation (CM2.2)

As mentioned before, communities and groups are informed that their participation in the project activities is completely voluntary, as they are indirect beneficiaries (they are not part of the project area). As there are no communities inside the project area, their participation doesn't include limiting their current land use or any significant opportunity cost. Nonetheless, for this section some possible negative impacts are described and the respective mitigation strategies.

Table 4.5. Negative impacts of The Last Habitat REDD Project

Negative impacts	Mitigation strategy
Institutional problems and conflicts involving communities or community groups	- Mechanism for dealing with complaints and suggestions. Within the mechanism, the project will be responsible for receiving all requests related to problems and/or conflicts between communities, community groups or the population in general associated with the project or impacted by it. - Constant dialogue and consultation through informational meetings with communities and communication with the legitimate representatives

Negative impacts	Mitigation strategy
	The constant meetings with communities and the identification of the legitimate representatives allow to collect the relevant inputs and interests to avoid possible social problems and manage adequately any emerging conflict. - Clear communication of project area and limits To prevent territorial or land conflicts related to the project, information about the area and limits is constantly shared and disclosed. In case of any doubt or concern, the project staff will program a field visit to confirm the exact location of the boundaries with the participation of the community and their leaders.

4.2.3 Net Positive Community Well-Being (CM2.3, GL1.4)

As explained in the previous section (see section 4.1.4) a scenario without a project where the communities do not have sufficient conditions (socioeconomic situation and the unsatisfied basic needs) to be able to develop and improve their living conditions. At the same time, in a scenario with a project (section 4.2.1), development opportunities increase, access and services for basic needs are improved (access to water, energy and others needs that the communities will prioritize during the development of the project). In addition, in a project that strengthens the conservation and sustainability of the territory, it will contribute to the territory of the Nuevo Paraíso native community having a support and ally for the monitoring of its territory (HCV identified in section 4.1.3).

Saying so, from the activities proposed to achieve the climate, biodiversity and community objectives that involve their participation, only positive impacts to well-being are anticipated.

In this sense, communities are predicted to increase their awareness and knowledge through workshops that promote conservation practices and sustainable forest management, among other topics. Moreover, project activities will be developed to improve their access to services and increase their income by supporting sustainable production chains, as opposed to the without project scenario in which communities remain in social and economic dynamics that push them to engagement in deforestation by change of land use activities while maintaining low quality of life levels.

4.2.4 High Conservation Values Protected (CM2.4)

The HCV mentioned in section 4.1.3 is the territory of the native community Nuevo Paraiso, which is outside of the project area, limiting to the northwestern border. Being one of the relevant communities identified in section 2.3, a relationship of constant communication and cooperation is established with them, aiming to safeguard the environment and improve their well-being. Due to its location next to the project, they will be indirectly benefited by the monitoring and control strategies that reduce pressures on their land, as opposed to a scenario with no project in which the agricultural frontier would start reaching their borders and they territory would be exposed to greater risks.

It is important to highlight that none of the project´s activities will negatively affect the territory of the native community of Nuevo Paraiso. On the contrary, the project is an ally to protect the existing environmental and social values.

4.3 Other Stakeholder Impacts

4.3.1 Impacts on Other Stakeholders (CM3.1)

The project, according to the proposed activities, does not present negative impacts within the other stakeholders group that were identified in Section 2.3. Being these the environmental institutions and regional authorities that aim to safeguard the forest and the communities in the region, they are completely aligned with the project objectives and purpose.

The relation with them is based on cooperation and joint work that enables the achievement of positive social and environmental results that go beyond the area of the project.

4.3.2 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)

As stated above, there are no negative impacts on the other stakeholders identified. Constant communication and coordination will be key to achieving mutual benefits and objectives.

4.3.3 Net Impacts on Other Stakeholders (CM3.3)

As stated above, there are no negative impacts on the other stakeholders identified. Constant communication and coordination will be key to achieving mutual benefits and objectives.

4.4 Community Impact Monitoring

4.4.1 Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

The designed monitoring plan identifies the communities, community groups and other actors that should be monitored, the variables that need to be monitored, the types of measurements and sampling methods, and the frequency of monitoring and reporting of each type and method. Monitoring and indicator activities are developed by the project's strategic lines (see Section 2.1.11).

The Project, for the community component, has the objective of generating positive impacts on the social well-being of the groups involved in the project.

These actions (and their impacts) require a system to review, collect, analyze, evaluate, and propose adjustments (if necessary) and systematize the progress, results and achievements of the planned objectives.

This monitoring plan presents, defines, and details the indicators, methodologies, techniques, and data collection schedules.

Table 4.6. Monitoring plan for the community component

Variables	Community Group	Indicators	Method	Frequency
Access to basic services and basic needs	Rural settlements and Native Community	# of programs, projects, activities implemented or in process of development.	Annual project report review	Annual
		# of benefited communities.		
		Change in access to basic services and needs	Survey	Biannual
		# of benefited Families		
		# of benefited in women		
Socio-cultural needs	Rural Settlements and Native Community	# of programs/projects, activities implemented.	Annual project report review	Annual
		# of benefited communities.		
		# of benefited Families		
		# of benefited in women		
Well - being	Rural Settlements and Native Community	Subjective well-being.	Surveys	Biannual
		% positive families perceptions about the Project activities		
Livelihood from sustainable activities promoted by the project	Rural Settlements and Native Community	# programs, projects, and activities developed.	Annual project report review	Annual
		# of benefited communities.		
		Change in income	Surveys	Biannual
		# of benefited Families		
		# of benefited in women		
Protection of indigenous people´s land and territory (HCV)	Native Community	Conservation perception	Survey / Interviews	Biannual
		% positive families perceptions about the Project activities		
Project support	Other stakeholders	# of joint and collaborative actions/plans/projects	Annual project report review	Annual

4.4.2 Monitoring Plan Dissemination (CM4.3)

Communities and stakeholders will be duly informed and consulted for the data collection stage of the monitoring plan. The results will be then disseminated in the periodic informational meetings, using summaries and other communication materials as mentioned in section 2.3. The summary of the annual project reports, which include monitoring results, will be publicly available on BAM´s website (www.bosques-amazonicos.com).

The success of the monitoring plan will reside in the participatory and coordinated work.

4.5 Optional Criterion: Exceptional Community Benefits

Not applicable. The project does not plan to get the Gold Community Level

4.5.1 Exceptional Community Criteria (GL2.1)

Not applicable.

4.5.2 Short-term and Long-term Community Benefits (GL2.2)

Not applicable.

4.5.3 Community Participation Risks (GL2.3)

Not applicable.

4.5.4 Marginalized and/or Vulnerable Community Groups (GL2.4)

Not applicable.

4.5.5 Net Impacts on Women (GL2.5)

Not applicable.

4.5.6 Benefit Sharing Mechanisms (GL2.6)

Not applicable.

4.5.7 Benefits, Costs, and Risks Communication (GL2.7)

Not applicable.

4.5.8 Governance and Implementation Structures (GL2.8)

Not applicable.

4.5.9 Smallholders/Community Members Capacity Development (GL2.9)

Not applicable.

5. BIODIVERSITY

5.1 Without-Project Biodiversity Scenario

5.1.1 Existing Conditions (B1.1)

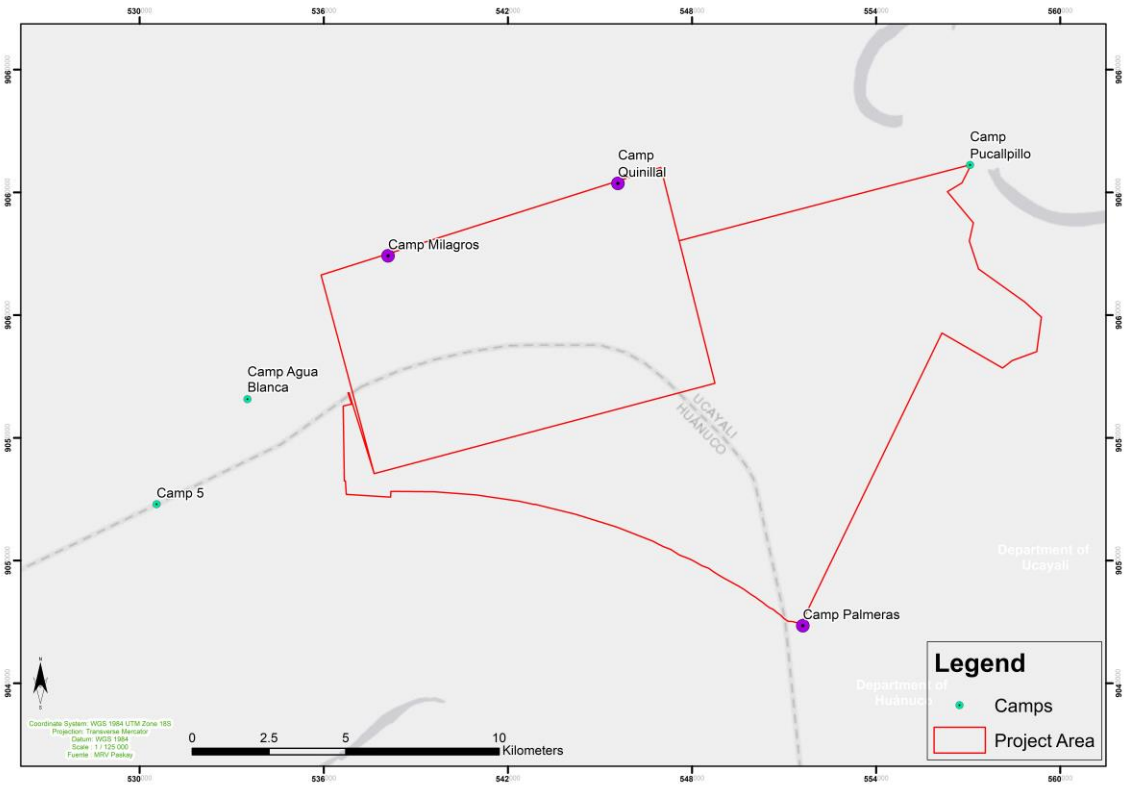
Peru is one of the seventeen megadiverse countries in the world, which together have 70% of the planet's biodiversity. The country's biodiversity is represented by a great variety of ecosystems,

species of flora and fauna, and genetic diversity, which have been contributing to global development and sustainability (MINAM, 2014b). The department of Ucayali contributes significantly to the country's biodiversity, since it has around 9,262,764 ha of forests, which are home to a great diversity of flora and fauna species. Research carried out has determined up to 1,600 species of flora found in the Sierra del Divisor National Park, with more than 377 species of fish, 402 amphibians, 82 species of reptiles, 782 species of birds and 257 species of mammals (DRBD-GOREU, 2017).

For the evaluation of the existing conditions within the project area, primary and secondary sources of information were reviewed. The methodology for the development of the biological baseline was the Rapid Assessment Program (RAP) proposed by Conservation International (2012). The field work was carried out in the dry season of 2021, in the month of October, in three selected forest areas of the project.

The three evaluated zones correspond to the Quinillal Camp (Zone 1), Milagros Camp (Zone 2) and Palmeras Camp (Zone 3), shown in Figure 5.1. A total sampling effort of ten effective days of evaluation with 201 hours and 112.3 kilometers was invested for assessing 4 main groups: mammals, birds, herpetofauna (amphibians and reptiles), flora. These groups were selected considering their ecological importance, ease of sampling, performance in biodiversity assessments, sensitivity to habitat alterations, taxonomic knowledge, and frequent use in the baseline, biological monitoring, and environmental impact studies.

Figure 5.1. Location of areas where biodiversity was assessed



Source: Inhouse elaboration.

The results show that, despite transformed surroundings, the project area is still a healthy ecosystem that holds a great biodiversity of flora and fauna species. A summary of each group is presented next, the assessment reports will be provided during validation (see folder SUPORTING EVIDENCE OF BIODIVERSITY SECTION).

Mammals

A total of 35 species, 20 families and 9 orders have been recorded in the three evaluation areas. The most important families for large and small non-flying mammals were Cebidae with 4 species of the order Primates and Dasyproctidae with 3 species of the order Rodentia. For small flying mammals, represented only by order Chiroptera, the 5 species found belonged to the family Phyllostomidae.

With respect to the dominance of larger and smaller non-flying mammals, the Milagros area presented the highest value (more than 0.85) compared to the other two area (less than 0.15), this parameter is inversely proportional to the Simpson index. That is mean the Quinillal y Palmeras are more diverse than Milagros. However, the Margalef index is higher in all zones.

Table 5.1. Species diversity and richness index for large and small non-flying mammals in the three study areas

Index	Quinillal	Milagros	Palmeras
Dominance (D)	<0.15	>0.85	<0.15
Specific richness (Margalef index)	4.16	4.26	3.54

The most frequent species in the study areas were: *Saimiri sciureus* and *Cebus apella* both of Primate order.

Birds

A total of 112 species, 35 families and 18 orders were recorded in the three evaluation areas. The most representative families were: Thamnophilidae, Tyrannidae and Thraupidae with 14,12 and 10 species, respectively. In the case of orders, almost 52% corresponds to the Passeriformes category.

According to the Simpson index, the Palmeras sampling zone presents the most diverse area with a value of 0.9657 compared to the Quinillal and Milagros zones. Likewise, the Margalef index indicates a high richness of bird species in the study area.

Table 5.2. Species diversity and richness index in the three study areas

Index	Quinillal	Milagros	Palmeras
Simpson_1-D	0.9386	0.9514	0.9657
Specific richness (Margalef index)	13.24	13.28	12.56

Regarding the beta diversity in birds, the Jaccard Index showed a high degree of similarity in the following sampled areas: Between Quinillal - Milagros an index of 20, between Quinillal and Palmeras 22.28 and finally between Milagros and Palmeras 21.83.

The most frequent species in the study areas were: *Brotogeris cyanoptera, Akletos melanoceps, Ramphocelus carbo, Pheugopedius genibarbis, Amazona farinosa, Cantorchilus leucotis, Aratinga weddellii, Orthopsittaca manilatus, Cacicus cela,* and *Trogon melanurus*.

Herpetology

The study area presented a total of 57 species, of which 28 belong to the Amphibia class, distributed in 7 families, and 29 to the Reptilia class, distributed in 15 families. A relative abundance of 428 individuals between amphibians and reptiles was found with an effort of 67 man-hours and 8 days of trapping with the methodology of Search for Visual Encounters and Fall Traps. *Leptodactylus petersii* and *Boana fasciata* were registered as the most abundant species with 77 and 46 individuals, respectively. Similarly, the most frequent species per sampling unit were *Boana fasciata* and *Anolis scypheus*, that were present in 27 (40.30%) and 20 (29.85%) of the 67 sampling units, respectively.

As a whole, the study area presented a Margalef index of 8.10 and Fisher's Alpha index of 14.7, which indicates a high diversity that reinforces the importance of conservation in the area. In relation to endemism, a comparison of the species recorded in the inventory with the list published by Aguilar et al. 2010, no endemic species were reported from Peru.

Likewise, in 2020, a specific study was carried out in the Quinillal, recording 42 species of which 23 belong to the Amphibian class, distributed in 7 families (Aromobatidae, Bufonidae, Dendrobatidae, Hylidae, Leptodactylidae, Microhylidae and Pipidae), and 19 to the Reptilia class, distributed in 10 families (Alligatoridae, Boidae, Colubridae, Dactyloidae, Elapidae, Phyllodactylidae, Scincidae, Sphaerodactylidae, Teiidae and Viperidae).

In the amphibian group, 364 individuals were recorded. The most abundant species were Leptodactylus leptodactyloides with 99 individuals (27.20%), followed by Scinax ruber with 41 individuals (11.26%) and Dendropsophus triangulum with 38 individuals (10.44%). In reptiles, 51 individuals were recorded; where the most abundant species were Gonatodes humeralis with 9 individuals (17.65%), followed by Ameiva ameiva with 8 individuals (15.69%) and Kentropyx pelviceps with 7 individuals (13.73%).

Flora

The areas of evaluation of the floristic component were carried out in the zones of Pucallpillo, Tupac Amaru and Macutay Lake that correspond to the sampling areas: Quinillal, Milagros and Palmeras respectively. These 3 areas are located in the low terrace forest types of the province of Coronel Portillo, in the districts of Calleria and Manantay.

In the floristic inventory, it was possible to register a total of 201 Individuals distributed as follows: 53 in Quinillal, 82 in Milagros and 66 in Palmeras. In the same way, 62 Species, 30 Genera, and 25 Families were found.

Table 5.3. Number of families and individuals in the study area

Zone	Quinillal	Milagros	Palmeras
Families	14	21	19
Individuals	53	82	66

This table shows a greater diversity in the number of families in the Milagros sampling area, with 21 families out of the 25 registered in the 3 sampling zones. Among the most representative families we have the Fabaceae (24.87%), Myristicacea (13.43%), Arecaceae (8.46%), Euphorbiaceae (6.96%), Malvaceae (5.97%), Lauraceae (4.97%) and Lecythidaceae (4.48%) families.

Table 5.4. Species diversity and richness index in the three study areas

Zone	Quinillal	Milagros	Palmeras
Specific richness (Margalef index)	5.289	8.623	7.638
Fisher's Alpha index	14.11	29.11	26.26

Regarding the Margalef index, which estimates the biodiversity in a community based on the distribution of the individuals of the different species analyzed, it was determined that since all of them are greater than 5, this shows that they are areas with a high diversity of species, corroborating which are local where anthropogenic activities have not affected the richness in this type of forest.

In reference to the Fisher's Alfa index, which also establishes the richness in a given area by the number of individuals sampled, it was found that the Milagros area has the highest richness with a value of 29.12, followed by Palmeras with 26.26 and Quinillal with 14.11.

The Importance Value Index (IVI) was also determined in the study, allowing the evaluation of the "ecological weight" of each species within the corresponding forest type. Obtaining similar IVI for the indicator species suggests the equality or at least the similarity of the stand in its composition, structures, site, and dynamics. The evaluation in the 3 areas are as follows:

In the Quinillal area, it was possible to show that the five most representative forest species based on the Importance Value Index (IVI) are the *Virola calophylla* (11.38%), *Hura crepitans* (10.32%), *Virola Pavonis* (10.09%), *Ceiba pentandra* (9.30%) and *Garcinia brasiliensis* (6.05%). Which represent the following families: Myristicaceae, Euphorbiaceae, Malvaceae and Clusiaceae

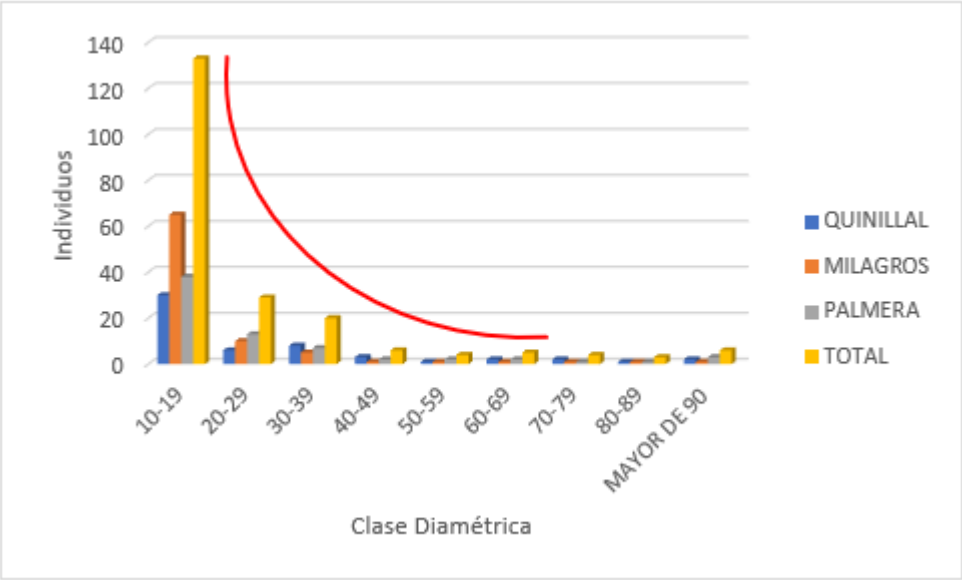
In the Milagros area, the five most representative forest species are *Sapium marmieri* (7.15%), *Yryanthera laevis* (6.37%), *Pourouma minor* (5.56%), *Apeiba membranacea* (5.25%) and *Terminalia amazonica* (4.69%). These species represent the following families: Euphorbiaceae, Myristicaceae, Urticaceae, Malvaceae and Combretaceae.

In the case of the Palmeras area, the five most representative forest species are *Eschweilera coriacea* (9.78%), *Hura crepitans* (9.69%), *Inga pezizifera* (8.96%), *Inga alba* (6.78%) and *Triplaris americana* (4.83%). Which represent the following families: Lecythidaceae, Euphorbiaceae, Fabaceae and polygonaceae.

In terms of floristic composition, the Quinillal and Milagros areas have greater similarity because they share 3 of their most representative families such as Euphorbiaceae, Myristicaceae, Malvaceae; and the three areas are shared by only one family like Euphorbiaceae.

Regarding the horizontal structure for the three sampling zones, values ranging from 10 cm to 120 cm in diameter at breast height (DBH) have been found, with an average of 65 cm DBH (figure No. ….). Being that the diameter classes with a greater number of registered individuals are found in the 10 – 19.9 cm classes with 135 trees, which is equivalent to 67.16%, and the 20 – 29.9 cm class with 32 trees (15.92%), both add up to 83.08%. of the total evaluated.

Figure 5.2. Histogram of diameter distribution in the 3 sampling areas



Source: Biodiversity assessment (Paskay, 2020)

It should be noted that the forests evaluated present an inverted "J" shaped distribution (above figure) characteristic of the behavior of the broadleaf forest species of the tropical humid forest in which a greater number of individuals in smaller diameter classes is observed, allowing a good natural regeneration of the species and guaranteeing the sustainability of the forest resource.

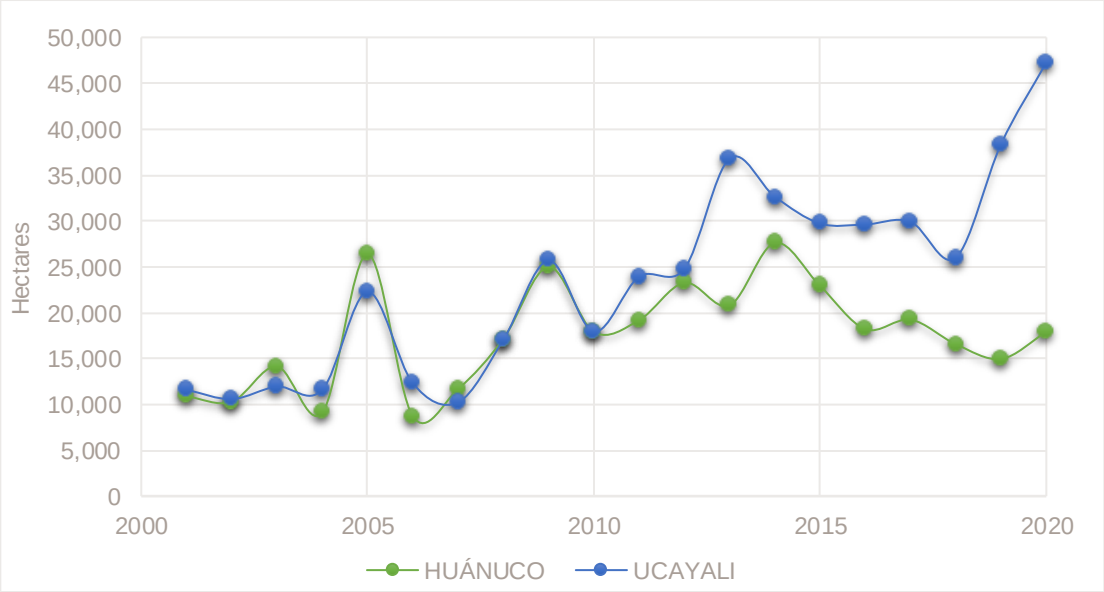
According to information from the forest inventory for the three sampling areas, the most abundant species are *Inga pezizifera* Benth and *Dialium guianense* (Aubl.) Sandwith.

Threads to biodiversity

The loss of forests in the Peruvian Amazon generates the fragmentation of ecosystems, affecting their structure and functioning, which can lead to habitat loss and cause the extinction of flora and fauna species (Aguila & Martinez, 2000), as well as the loss of the ecosystem services they provide. Currently, the main cause of forest loss in the region is the change in land use due to anthropic activity, mainly migratory slash-and-burn agriculture.

According to the information provided by the GEOBOSQUES platform from MINAM, 2,636,585 ha of forests have been lost between 2001-2020 in the Peruvian amazon, of which 17.8% corresponds to Ucayali and 13.3% to Huánuco, putting them in 2nd and 4th place in forest loss in the country, respectively.

Figure 5.3. Historical forest loss in Huánuco and Ucayali between 2001-2020

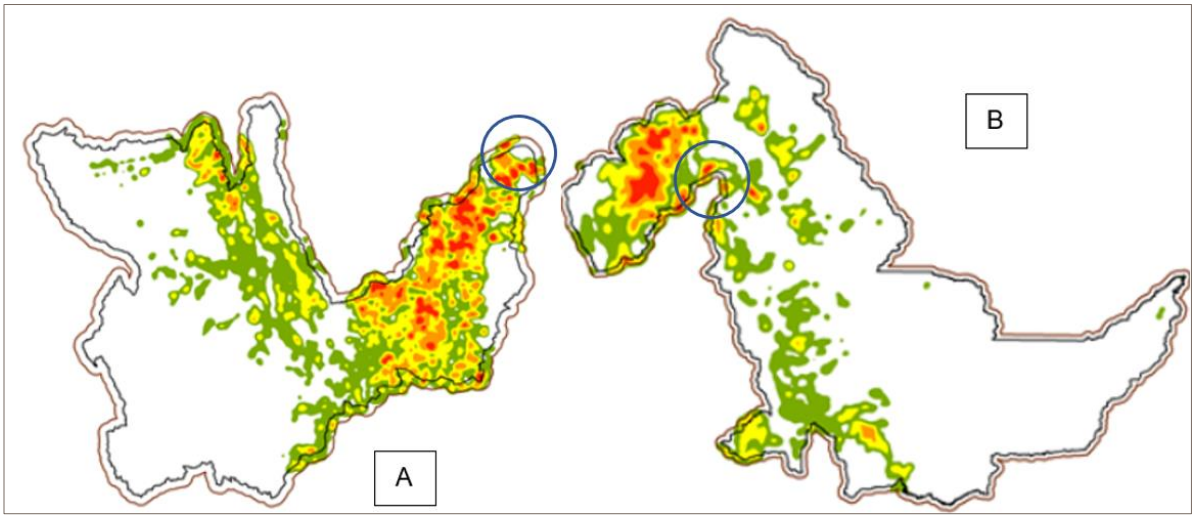


Source: GEOBOSQUES – MINAM.

The most concerning fact regarding the future conservation of the natural ecosystems in the project area is the intensity of deforestation (and probable degradation) near it. The project area is one of the last patches of continuous forests near the city of Pucallpa. Because of this location, most areas were easily accessible for the establishment of settlements and the development of agricultural and cattle raising activities, mainly. Figure 5.4 shows that the project area is within a major hotspot[35] of deforestation and Figure 5.5. presents the forest, non-forest and forest loss landscape surrounding the project area.

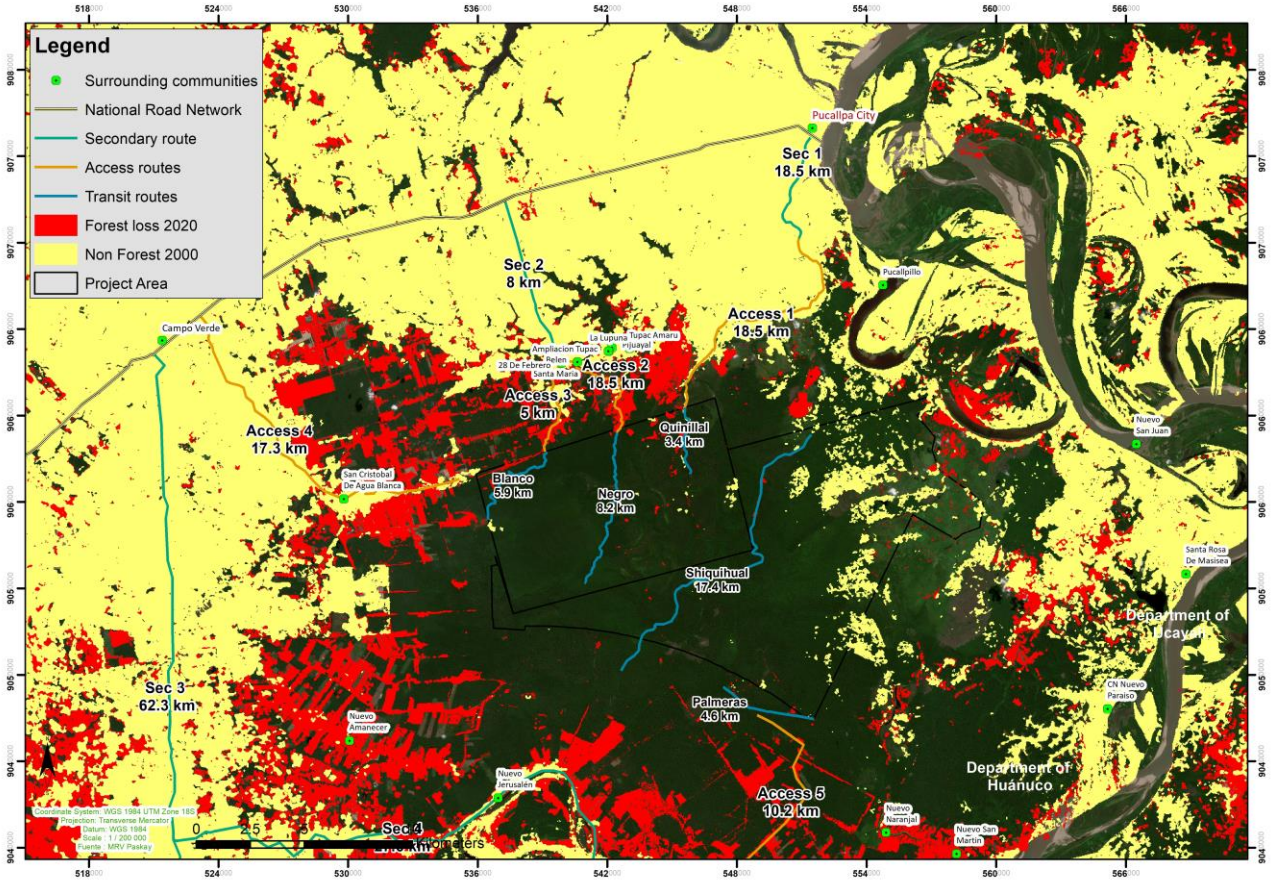
[35] The zone of Campo Verde – Honoria, depicted in Figure 5.4, has long been stablished as a permanent hotspot of deforestation in the country. Other permanent hotspots are the Federico Basadre Highway in the Padre Abad province (Ucayali) and the Interoceanic Highway in Madre de Dios (GEOBOSQUES).

Figure 5.4. Concentration of forest loss in Huánuco (A) and Ucayali (B)



Source: Modified from GEOBOSQUES – MINAM. The blue circles indicate the Project area location. The reddish tones indicate more concentration of deforestation, while the green ones, less.

Figure 5.5. Forest loss (2001-2020) and non-forest areas in a wider landscape around the project area



Source: GEOBOSQUES. Inhouse elaboration.

The removal of forests for the implementation of agro-industrial crops and pastures for cattle raising, will derive in the consequent elimination of the native flora especies and the destruction of the habitat, affecting most of the fauna species.

The species identified during the assessment were contrasted against the national and international datasets of conservation status. At a national level, an official list of endangered wildlife[36] species was updated through the Supreme Decree DS N°004-2014-MINAGRI[37], which considers three threat categories: Critically Endangered (CR), Endangered (EN) and Vulnerable (VU); and two preventive categories: Near Threatened (NT) and Not Enough Data (DD).

In the global context, the International Union for Conservation of Nature (IUCN), considers the following categories: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient, (DD) and Not Evaluated (NE). Species listed in the CR, EN and VU categories are considered “endangered”.

In addition, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) includes in its appendices those species that have suffered some change or drastic decrease in their populations due to excessive hunting or trade in their derived products. CITES is an international agreement between governments, which aims to ensure that international trade in specimens of wild animals and plants does not constitute a threat to their survival. Each appendix includes:

- Appendix I: Endangered species that are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulations so as not to further jeopardize their survival and will be authorized only under exceptional circumstances.
- Appendix II. Take into consideration the following:

  a) Includes all species that, while not currently in danger of extinction, could become so unless trade in specimens of those species is subject to strict regulation to prevent use incompatible with their survival.
  b) Those other species not affected by trade, which must also be subject to regulation to allow effective control of trade in the species referred to in subparagraph a).

- Appendix III. It contains those species proposed by any of the member countries for a special regulation because they are in a situation of danger or threatened within their jurisdiction. Cooperation between the States parties is necessary to protect these species and achieve adequate control of their trade. So far, Peru has not requested the CITES Secretariat to include any species of wildlife in Appendix III.

The list of species with some degree of thread per each group are presented next.

[36] For Peruvian legislation, wild fauna resources are non-domesticated animal species that live freely and specimens of domesticated species that due to abandonment or other causes are assimilated in their habits to wildlife, except for species other than amphibians that are born in marine and continental waters that are governed by their own laws (Forestry and Wildlife Law 27308), however, the biological definition has a broader meaning.
[37] Decreto Supremo Nº004-2014-MINAGRI (midagri.gob.pe)

Table 5.5. Mammal species present in the project area according to their category of threat or national/international protection

N°	Scientific Name	Common Name	DS N° 004-2014	CITES (Appendix N°)	UICN
1	*Saguinus fuscicollis*	Mono Pichico	-	II	LC
2	*Saimiri sciureus*	Mono Fraile	-	II	LC
3	*Saimiri boliviensis*	Mono Fraile boliviano	-	II	LC
4	*Aotus nigriceps*	Mono Musmuqui Negro	-	II	LC
5	*Alouatta seniculus*	Mono coto	VU	II	LC
6	*Panthera onca*	Otorongo	NT	I	NT
7	*Leopardus pardalis*	Tigrillo	-	I	LC
8	*Lontra longicaudis*	Nutria	-	I	NT
9	*Tapirus terrestris*	Sachavaca	NT	II	VU
10	*Pecari tajacu*	Sajino	-	II	LC
11	*Bradypus variegatus*	Perezoso de tres dedos	-	II	LC

Legend: LC = Least Concern; NT = Near threatened; VU = Vulnerable.

Regarding birds, 274 species (96% of recorded species) are not considered globally threatened with extinction by national legislation and IUCN, however, the populations of 141 of these birds are decreasing. Likewise, according to the Field Report on the rapid evaluation of biodiversity carried out by CORBIDI in March 2020 in the Quinillal area, it is reported that 36 species of birds are included in CITES Appendices of which 34 are in Appendix II and only *Jabiru mycteria* and *Falco peregrinus* are included in Appendix I, which generally includes the species that are most endangered, but which means that their trade is heavily regulated.

Table 5.6. Bird *species present in the project area according to their category of threat or national / international protection*

N°	Scientific Name	Common Name	DS N° 004-2014	CITES (Appendix N°)	UICN
1	*Jabiru mycteria*	Jabiru	NT	I	LC
2	*Falco peregrinus*	Halcon peregrino	NT	I	LC
3	*Myrmoborus melan*urus	Hormiguero de cola negra	NT	-	VU
4	*Setophaga striata*	Reinita Estriada	-	-	VU
5	*Conothraupis speculigera*	Tangara Negra y Blanca	-	-	NT

In 2020, the assessment carried out in the Quinillal area found 42 species, of which 23 amphibians and 19 reptilia. A total of 5 species were categorized within CITES Appendix II, corresponding to one species of the amphibian and 2 species of the reptilia classes, which are shown in next table.

Table 5.7. Conservation status of the Amphibia and Reptilia class

N°	Class	Scientific Name	Common Name	D.S.004 - 2014	CITES (Appendix N°)	IUCN
1	Amphibian	*Ameerega hahneli*	Rana dardo venenosa	-	II	LC
2	Reptilia	*Caiman crocodilus*	Caiman blanco	-	II	LC
3		*Epicrates cenchria*	Boa arcoiris	-	II	LC
4		*Dracaena guianensis*	Camaleón rojo/dracaena	-	II	LC
5		*Tupinambis teguixin*	Iguana Negra, tegues de la selva	-	II	LC

The conservation status of 44 forest species is in the Low Risk (LC) category, according to the IUCN (2023), and the forest species *Manilkara bidentata* is in the Vulnerable conservation category (VU) and *Ceiba pentandra* is in the Near threatened (NT) according to D.S. No. 043-2006-AG. In addition, a revision was made in the red book of endemic plants of Peru by León et al (2006)[38] finding the *Piper arboreum* is an endemic species reported only in the Loreto region. Therefore, it is probably the first record for the Ucayali region.

Table 5.8. Conservation status of the forest species in the project area according to their category of threat or national/international protection

N°	Scientific Name	Common Name	DS043-2006-AG[39]	León et al, 2006*	IUCN**	CITES
1	*Handroanthus serratifolius*	Tahuarí	VU	-	EN	II
2	*Ceiba pentandra*	Ceiba, Huimba, Lupuna blanca	NT	-	LC	-
3	*Manilkara bidentata*	Quinilla colorada	VU	-	LC	-
4	*Piper arboreum*		-	LO	-	-

* Red list endemic species in Peru (2016); LO= Loreto
** Updated data 2023

5.1.2 High Conservation Values (B1.2)

The entire project area is considered a high conservation value as it is a remaining patch of different types of forests that sustain endemic and threatened species. The screening of especifc High Conservation Values areas was performed, which is a desk exercise that uses the six definitions of species diversity, landscape level ecosystem or mosaics, ecosystems and habitats, system services, community need and cultural values of HCVs to characterize the environmental and social aspects of HCVs. Screening considers the likelihood of HCV presence, identifies threats to those HCVs, and indicates which values most urgently need to be addressed through discussions and follow-up actions.

[38] León, et al (2006). El Libro Rojo de las Plantas Endémicas del Perú. Revista Peruana de Biología. Universidad nacional Mayor de San Marcos. Facultad de Ciencias Biológicas. Volumen 13. Número 2. Especial. Lima-Perú.
[39] Decreto Supremo N°043-2006-AG. https://www.gob.pe/institucion/osinfor/normas-legales/792195-043-2006-ag-aprueban-categorizacion-de-especies-amenazadas-de-flora-silvestre

High Conservation Value	Aguajales
Qualifying Attribute	The project area has 4,162.3 ha of flooded alluvial forest dominated by "Aguaje" palms (*Maruritia flexuosa*), called *Aguajales*. Other palm trees species present in the area are: "Cashapona" *(Socratea exorrhiza)*, "Huacrapona" *(Iriartea deltoidei)*, "Huasaí" *(Euterpe precatoria)*, "Huicungo" *(Astrocaryum murumuru)*, "Inayuga" *(Attalea maripa),* "Pona" *(Iriartea sp.),* "Ungurahui" *(Oenocarpus bataua)*, among others. It represents a high potential for non-timber resources in the area, as well as habitats for the herpetofauna and some large mammals such as "Sachavaca". At a larger scale, these ecosystem was declared a Fragile Ecosystem in the Huánuco region (through Executive Management Resolution N° 00004-2020-MINAGRI-SERFOR-DE), for the North Honoria zone, where part of the project is located. There is much interest in conserving these wetlands in the province of Puerto Inca, in which endangered species of flora and fauna have been found. Among them, the "Red Howler Monkey" (*Alouatta seniculus*), "Woolly Monkey" (*Lagothrix lagotricha*), "Red Deer" (*Mazama americana*), "Otorongo" (*Panthera onca*) and "Sachavaca" (*Tapirus terrestris*). It also presents a biological corridor of the "Otorongo".
Focal Area	The *Aguajales* areas within the area of influence of the project.

5.1.3 Without-project Scenario: Biodiversity (B1.3)

As already mentioned, without the project implementation there would be a massive land-use change in the project area for the establishment of commercial crops and pastures for cattle raising. This translates in the elimination of most of the natural habitats, impacting the wildlife as well as the ecosystem services provided.

Other external risks exist, such as deforestation for smaller-scale agriculture and new settlements, and degradation due to illegal logging and the unsustainable harvest of other forest resources.

In short, the project area would be easily absorbed by the land-use trends of the surroundings, facilitated by the increased access and proximity of the major city of Pucallpa.

5.2 Net Positive Biodiversity Impacts

5.2.1 Expected Biodiversity Changes (B2.1)

The biodiversity inventories carried out in the project area have made it possible to identify species of flora and fauna that are in threat categories by national legislation, CITES and IUCN. In this scenario,

the project seeks to protect threatened and vulnerable species to maintain the ecological system and the ecosystem's food chain, avoiding the loss of species.

An important indicator of the positive impact of the project is the care and maintenance of water bodies and HCVs, so that wildlife continues to use these spaces and fulfill its ecological role. Among the species sighted we have the "Neotropical Otter" *(Lontra longicaudis)*, "Otorongo" *(Panthera onca*), "Spectacled Caiman" *(Caiman crocodilus)*, and "Sachavaca" (*Tapirus terrestris)* as priorities due to their threat status.

The project has identified the importance of carrying out research studies prioritizing the potential of forest resources and local biodiversity, including the establishment of monitoring plots in the two most representative types of forests (low terrace and aguajales) to learn about the dynamics of the main forest species and their carbon storage. Also, having identified the main threatened species, conservation and monitoring studies will be carried out.

Biodiversity Element	Flora
Estimated Change	Conservation of the flora species and forest cover present in the project area.
Justification of Change	Carry out periodic monitoring and establish permanent plots in the two most important types of forests in the study area. Establish agreements with local universities to carry out studies on the dynamics and conservation of forest and forest species within the project area, in this way knowledge will be generated that contributes to the academy and to providing solutions to the company on more precise data in the carbon measurements or on the main species of flora and fauna identified in the project.

Biodiversity Element	Fauna
Estimated Change	Conservation of species
Justification of Change	Establish trap cameras to monitor local fauna at strategic points and thereby establish conservation criteria for the main species of fauna within the project area. Also, periodic assessments to the 3 groups of fauna established in the baseline (mammals, birds and herpetofauna). The results will inform on the biodiversity richness and presence of the species, specially of the threatened ones.

5.2.2 Mitigation Measures (B2.3)

The project will not generate negative impacts on biodiversity. The activities described above in section 5.2.1, under the premise of managing and conserving the forest biological diversity and wildlife of the ecosystem, seek to establish conditions to reduce the threats that generate risks in the project area.

To this end, monitoring and surveillance will be implemented to reduce deforestation and forest degradation, strengthening inter-institutional alliances with control entities and local surveillance committees.

The project will establish campaigns to educate the local population on the threat of biodiversity loss on the species that are most vulnerable, explaining to them that if their pressure continues, the species could disappear and, in the future, they will no longer be able to feed on them. Hunting activities should be restricted only for local consumption and not for commercial activities that promote the extinction of the species and generate an ecological problem from the point of view of the trophic system.

5.2.3 Net Positive Biodiversity Impacts (B2.2, GL1.4)

The project seeks to maintain fauna populations in their natural conditions, avoiding the loss of species.

The project will strengthen the capacities and generation of knowledge of the importance of biological diversity in flora and fauna to local residents and neighbors to strengthen control and surveillance of the project area, against coca growers, illegal loggers and agents that have been causing the loss of forest cover and consequently loss of biodiversity.

The project will implement studies to evaluate the flora and fauna and determine their conservation status, thereby obtaining real evidence to inform forest actors (regional, local government) to invest with funds that help promote sustainable projects in the region.

5.2.4 High Conservation Values Protected (B2.4)

No HCV Forest will be affected by the project. Once the most representative forests (low terrace and aguajales) and water bodies within the project area have been identified, periodic monitoring of these areas will begin, implementing a surveillance committee and articulating efforts with local committees. In this way, the maintenance of the HCVs will be guaranteed and disturbances that could alter the wild fauna of the area will be avoided.

5.2.5 Species Used (B2.5)

The project will not introduce exotic species in the established area.

Once the deforested areas are identified through satellite images and the loss of forest cover is verified, the project will promote the recovery of the areas with the installation of forest plantations with native species of ecological and economic interest, in order to rehabilitate the soils and integrate the biological corridors for the fauna, due to the fragmentation of the forest caused by the openings.

According to the inventory carried out in 2012 to value the forests in the project area, the following high-value commercial species were identified, among them: Cedro (*Cedrela odorata*), Estoraque (*Myroxylon balsamun*), Ishpingo (*Amburana cearensis*), Shihuahuaco (*Dipteryx odorata*) and Tahuarí (*Tabebuia serratifolia*). Those of medium commercial value we can mention: Huayo sugar (*Hymenaea oblongifolia*), Cachimbo (*Cariniana decandra*), Capirona (*Calycophyllum spruceanum*), Copaiba

(*Copaifera officinalis*), Huayruro (*Ormosia amazónica*), among others. These two groups could be prioritized in afforestation and reforestation campaigns in deforested areas.

5.2.6 Invasive Species (B2.5)

Not applicable. No exotic species will be used.

5.2.7 Impacts of Non-native Species (B2.6)

Not applicable.

5.2.8 GMO Exclusion (B2.7)

Not applicable. GMO species will not be used to reduce GHG emissions.

5.2.9 Inputs Justification (B2.8)

Not applicable.

5.2.10 Waste Products (B2.9)

The project will implement the REDD mechanism (avoided planned deforestation - APD) of the AFOLU sector and in a complementary manner will develop other activities related to afforestation, reforestation, and revegetation (RVV) and improved forest management (MFI) generating low negative impacts.

In the activities of inventory, monitoring and surveillance of the area, the following recommendations will be taken, the project will implement a protocol in which all containers, wrapping or waste must be removed from the project area, in the tours by the residents and the specialists of the project, all waste or residues (batteries, plastics, cans, paper, etc.) will be collected and placed in public or private collection centers for treatment or, if necessary, be taken to the city.

Likewise, the burning of inorganic waste will be prohibited, and silos will be built for sanitation and organic waste services.

At the end of the activities in the camp, the staff will close the silos and collect all the waste to later be deposited in the collection centers.

It is totally forbidden to dump organic or inorganic waste into watercourses so as not to alter the chemical conditions of the water and may affect hydrobiological resources and fauna in general.

5.3 Offsite Biodiversity Impacts

5.3.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Measures (B3.2)

No negative impacts on biodiversity are expected outside the Project area.

5.3.2 Net Offsite Biodiversity Benefits (B3.3)

Benefits	In Project zone	Outside Project zone
Wildlife refuge area	Forest conservation activities will not generate negative impacts within the project area, local residents will be trained in forest management of timber and non-timber forest resources (aguaje) as a measure for biodiversity conservation.	The control and monitoring activities in the project area could cause the displacement of deforestation and degradation agents to spaces outside the project, which is why the conservation of primary and aguajal forests in the area of influence will also be promoted, promoting an ecological connectivity that allows the balance of the ecosystem through indicator species that present a good state of conservation
Connectivity	Monitoring and vigilance will allow the conservation of primary forests and aguajales, since they are ecosystems that house a large number of wildlife species and are of great importance in the local ecosystem.	The protection and conservation of primary and aguajales forests in the project area allows the maintenance of large areas of standing forest outside the project, where threatened species that inhabit these premises are also home. Among the species we can mention: Nutria (*Lontra longicaudis*), Otorongo (*Panthera onca*), Cocodrilo (*Caiman crocodilus)* and Sachavaca (*Tapirus terrestres*).

5.4 Biodiversity Impact Monitoring

5.4.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

In the following table, the variables, methods, and periodicity of the monitoring are shown. Also, the indicators that will be used to present the period results are identified.

Table 5.9. Monitoring plan elements for the biodiversity component

Variable	Indicators	Method	Who measures	When
Flora (forest)	Species richness (n° of species, families, and genera)	Gentry plot	BAM with scientific organizations	Biannual
	Importance value index (IVI)			
	Biodiversity Index (Shanon-Wiener index			

Variable	Indicators	Method	Who measures	When
	and/or Fisher's alfa parameter)			
	Endangered species (presence)			
Large mammals	Species richness (n° of species, families, and genera)	Transects and complementary methods such as camera traps, mist nets and traps	BAM with scientific organizations	Biannual
	Species accumulation curves			
	Endangered species (presence)			
	Key indicator species (presence)			
Birds	Species richness (n° of species, families, and genera)	Counting point	BAM with scientific organizations	Biannual
	Species accumulation curves			
	Endangered species (presence)			
	Key indicator species (presence)			
Herpetofauna	Species richness (n° of species, families, and genera)	Transects	BAM with scientific organizations	Biannual
	Species accumulation curves			
	Endangered species (presence)			
	Key indicator species (presence)			

Regarding the "key indicator species" indicator, it includes the trigger species selected in Section 5.5.2:

- "Tahuari amarillo" (*Handroanthus serratifolius)*
- "Black-tailed antbird*" (Myrmoborus melanurus)*

5.4.2 Biodiversity Monitoring Plan Dissemination (B4.3)

The diffusion will be carried out through periodic information campaigns (annually) on the results of the biological monitoring plan in the project area, with the participation of the majority of the local inhabitants and surrounding native communities and recorded in signed minutes to record of the activities carried out.

The workshops will be aimed at explaining the importance of conserving HCVs, bodies of water and wetlands as priority spaces, using a methodology that is easy to understand and very didactic (mainly based on photos and images), accompanied by primers and/or newsletters. diffusion.

Dissemination through BAM website will also be considered, where photos and images of the main species of flora and fauna that are being conserved within the project area and their importance in the local ecosystem will be shown.

5.5 Optional Criterion: Exceptional Biodiversity Benefits

The project is intended to be validated at Gold Level for its exceptional biodiversity benefits, as described in this section.

5.5.1 High Biodiversity Conservation Priority Status (GL3.1)

The biophysical characteristics of the project area provide some high conservation values (HCVs) linked to biodiversity, either as ecosystems or as threatened species.

a) Bosque Aluvial Inundable - Honoria Norte, whose location includes the Selva Maestra property. In 2020, it was selected as a Fragile Ecosystem[40] of the Huánuco region according to Resolution RDE N° D 0004-2020-MINAGRI-SERFOR-DE[41]. As such, it was incorporated into the Sectorial List of Fragile Ecosystems, based on evaluations, technical studies, and available scientific information.

   It is in a flooded alluvial plain, surrounded by the "aguajales" areas, which mainly provide ecosystem services of water and erosion regulation. The towns of Tierra Roja (south of Selva Maestra), among others located around the project area, use these benefits for consumption and rice crops from the "Garzal" stream (micro-watershed of the Pachitea River), which has its headwaters on Selva Maestra's property, as well as other tributaries that originate in the project area and are part of the Manantay micro-basin (Ucayali River basin). In this way, the project activities, by conserving the extensive area of forest cover, will preserve most of the temporary streams and creeks that benefit the local communities in the surrounding area.

b) Threatened species: biological assessments carried out in the project area have recorded one specie in the endangered category (EN) under the IUCN Red List, the "Tahuarí" (*Handroanthus serratifolius*), that is classified as Vulnerable (VU) according to national legislation (DS 004-2014 MINAGRI) and is included in the Appendix II of CITES. Among the Vulnerable (VU) category of the IUCN Red List, there were found the "Sachavaca" (*Tapirus terrestris*), categorized as Near Threatened (NT) in national classification; and the "Black-tailed antbird" (*Myrmoborus melanurus*). Mammals in the Red List Near Threatened (NT) category include the "Otorongo" (*Panthera onca*), "Machin blanco" (*Cebus albifrons*), and the "River otter" (*Lontra longicaudis*). Finally, the "Monkey friar" (*Saimiris boliviensis ssp peruvianus*) is registered as a species endemic to Peru.

[40] According to the definition established in the National Forestry and Wildlife Policy, fragile ecosystems are those ecosystems with unique characteristics or resources with low resilience (capacity to return to their original conditions), and unstable in the face of anthropogenic (human) impacting events that produce profound alterations in their structure and composition. The condition of fragility is inherent to the ecosystem and only manifests itself under disturbance conditions. It is established that the greater the fragility, the greater the need for ecosystem protection.

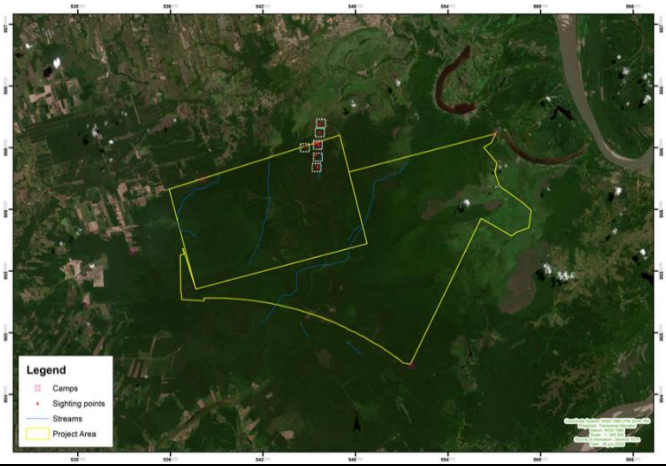
[41] Resolución de Dirección Ejecutiva N.° D0004-2020-MINAGRI-SERFOR-DE - Normas y documentos legales - Servicio Nacional Forestal y de Fauna Silvestre - Plataforma del Estado Peruano (www.gob.pe)

Due to their characteristics, large mammals such as "Otorongo" or "Sachavaca" that mostly behave as "umbrella" species, occupy and roam very large areas to cover their food and habitat requirements. Hence, it is very likely that they can disperse outside the project area and use them as migration routes or important temporary refuge, either because of threats and pressures from nearby areas or because these are part of biological corridors connecting national and regional conservation areas where these 2 species have also been reported (El Sira Communal Reserve and Imiría Regional Conservation Area) that are very close to the project area.

5.5.2 Trigger Species Population Trends (GL3.2, GL3.3)

Trigger Species	"Tahuari amarillo" (*Handroanthus serratifolius)*
Population Trend at Start of Project	Endengered (EN) species under the UICN Red List, classified as Vulnerable (VU) according to Peruvian legislation and in Annex II of CITES. This species is one of the most vulnerable to logging in Amazonian forests due to its low natural density and low growth rates. At both CITES COP 18 and COP 19 regarding the proposed amendments to the Appendix II listing of the genus *Handroanthus*, the decline in its natural populations because of the demand for timber is stated. *H. serratifolius* is classified as globally "endangered" on the IUCN Red List of Threatened Species, with a declining population trend because it is threatened by international trade and is projected to experience a population decline of at least 50% over the next 100 years. Although the population size of *H. serratifolius* is considered large, given its wide distribution, it is decreasing (inventory in the State of Pará, Brazil, found 0.2 and 0.4 trees/ha with DBH equal to or greater than 50 cm). Likewise, in a study in Brazil they evaluated that natural regeneration, after exploitation, would not be sufficient to restore the structure of its original population and concluded that sustainable management of the genus *Handroanthus* requires a combination of enrichment plantings and conduction of the natural regeneration of the species in exploited areas. In Peru, in recent decades, *H. serratifolius* has been introduced in the market as the preferred wood for roofing. Taking into account that in November 2022, CITES approved the inclusion of species of the genus *Handroanthus* in Appendix II, within 24 months, the National Forestry Authority - SERFOR approved (RESOLUTION OF EXECUTIVE DIRECTION N° D000040-2023-MIDAGRI-SERFOR-DE) the "Action Plan for the adequate implementation of the inclusion of Shihuahuaco (genus *Dipterix*) and Tahuari (genus *Handroanthus*) in CITES Appendix II, years 2023 and 2024", which presents 6 Components to be implemented by SERFOR. One of them is the Population Assessment component whose tasks are referred to compile information and generate databases of nine species of *Handroanthus*, developing studies to provide scientific evidence on the status of the populations. In the flora evaluation carried out in the project area, only one individual with a DBH equal to 10 cm was recorded in the

	Palmeras sector, with a density of 10 trees/ha in the low terrace forest type.
Without-project Scenario	Deforestation and illegal logging for commercial purposes in the area are the main threats to the species, and a lack of continuous presence at several key access points to the project area makes it difficult to control unwanted entries and events.
With-project Scenario	The reinforcement of surveillance and patrolling of the boundaries, the improvement of infrastructure and logistics in the 4 camps installed, will allow the protection of the species, ensuring natural regeneration processes in their habitats within the project area. These activities will be successful to the extent that they are also articulated with groups of loggers from neighboring local communities, working on conflict resolution issues and supporting them in developing technical skills in sustainable productive activities within their remaining forests.

Trigger Species	"Black-tailed antbird" (*Myrmoborus melanurus)*
Population Trend at Start of Project	The black-tailed antbird (*Myrmoborus melanurus*) is a small insectivorous bird which moves in pairs, weighing little more than 20 grams, very little known and of reduced distribution. Its habitat is a type of forest with scrub (varzea) associated with nearby water bodies. There are no studies about its population size, diet, and many other aspects of its biology. However, some extrapolations can be made to estimate minimum population sizes, using other phylogenetically close species for approximate estimates; therefore, it can be assumed that the territories of *M. melanurus* should be between 2 and 4 ha, depending on the quality of the vegetation. When conservately considering territories of 5 ha, only 50 ha of habitat are required to support 20 adult individuals (10 breeding pairs). From the field work carried out, it can be assured that there is considerably more habitat within the project area. Only in the Quinillal sector (see map), where two biodiversity assessments were conducted, the species was recorded on 16 occasions in 5 and 7 days of evaluation in the wet and dry season, respectively (year 2020 and 2021). 

	It can be affirmed that there are more than 30 individuals in the project area, considering that almost 50% of the area corresponds to flooded forests, a preferred habitat for the species.
Without-project Scenario	It's extremely small and uneven geographic distribution suggests a small overall population compared to other species of antbirds (family Formicariidae). Its seasonally flooded forest habitat is particularly threatened by human activity, as areas near rivers are the access points for populations and traditionally productive areas because of the sediment disposal from seasonal flooding, which makes them suitable for agriculture. Deforestation, forest degradation and forest fires promote the loss of suitable habitats for the survival and reproduction of the species, which prefers dry seasons that coincide with the peak of agricultural fires by farmers living around the project area. These actions damage the biological processes and causes strong disturbances to the populations.
With-project Scenario	Biological monitoring and evaluations of the species will provide information on the reproductive biology and movement of the species to take actions for the conservation of the species' habitat. In addition, fire control tasks in the dry season in coordination with local people to establish a communication strategy for early warnings and mitigation of the spread of fire in areas where land is being prepared for agricultural crops.