

THE JAGUAR AMAZON REDD PROJECT

Document Prepared By GREENOXX SC

Project Title	<i>The Jaguar Amazon REDD Project</i>
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Project Proponent(s)	<i>GREENOXX SC</i> <i>Silvia Gomez Caviglia</i> <i>silvia@greenoxx.com</i> <i>Plaza Independencia 753, Montevideo, Uruguay</i> <i>+5982 604 0869</i> <i>BOZOVICH GROUP</i> <i>Vittorio de Dea Peña</i> <i>vdede@bozovich.com</i> <i>Carretera a La Cachuela Km. 1.8, Tambopata, Madre de Dios, Perú</i> <i>51 989 067 284</i>
Prepared By	<i>GREENOXX</i>
Validation Body	<i>SCS Global Services. Contact Person: Christie Pollet-Young.</i> <i>E: info@scsglobalservices.com. T: +1-510-452-8000</i>
Project Lifetime	<i>01 January 2018 - 15 July 2041; 33 year lifetime</i>
GHG Accounting Period	<i>01 January 2018 - 31 December 2040; 33-year total period</i>
History of CCB Status	<i>No previous validations were carried out</i>

Gold Level Criteria	<i>Biodiversity Gold Level</i>
Expected Verification Schedule	<i>April 27th, 2020</i>

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DISCLAIMER

The JAGUAR REDD+ PROJECT is aware and supports the nesting process of projects baselines and national FREL, being conducted by the Peruvian Government led by MINAM. It implies that, even though the emissions reductions have been calculated for the first 10 years of the project life (until 2027), project partners intend to adopt the national information when it is available and is official and is compatible with the VERRA methodology used in this project. Up to now, all the official information available at this moment has been used. It includes forest loss data, monitoring methodology, stratification and carbon stocks in official forest strata.

It implies that projections used since 2021 are likely to be changed when and if the government of Peru announces a new FREL with a method for quota allocation at project level.

In that sense, project proponent has reviewed and confirms that current project is aligned with VERRA guidelines on nesting described in this link:

<https://verra.org/important-considerations-related-to-nesting-of-redd-projects/#esp>

1 SUMMARY OF PROJECT BENEFITS

This section highlights some of this project's important benefits. Section 1.1 (Unique Project Benefits) should be aligned with a project's causal model and is specific to this project. Section 1.2 (Standardized Benefit Metrics) is the same quantifiable information for all CCB projects. This section does not replace the development of a project-specific causal model or the monitoring and reporting of all associated project-specific impacts (positive and negative) that are described in Sections 2-5 of this document.

1.1 Unique Project Benefits

TABLE 1: UNIQUE PROJECT BENEFITS

Outcome or Impact Estimated by the End of Project Lifetime	Section Reference
1) Jaguar Conservation	
2) Brazil Nut Conservation	
3) Eco-tourism Initiative	

1.2 Standardized Benefit Metrics

For each metric, provide an estimate of the net benefit the project aims to achieve during the project lifetime. Insert "not applicable" where the metric does not apply and "data not available" where the metric does apply but there are no means of quantification. Estimations included below shall be substantiated in this document as denoted in the corresponding section reference.

TABLE 2: STANDARDIZED METRICS OF THE PROJECT

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	0	
	Net estimated emission reductions in the project area, measured against the without-project scenario	37,518,511	
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	92,093	
	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 occurred as a result of project activities, measured against the without-project scenario	183,015 hectares	
	Number of hectares of non-forest land in which improved land management practices are expected to occurred 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	293	
	Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	26	

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*)

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
Employment	Total number of people expected to be employed in project activities ⁵ , expressed as number of full-time employees ⁶	293	
	Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	26	
Livelihoods	Total number of people expected to have improved livelihoods ⁷ or income generated as a result of project activities	293	
	Number of women expected to have improved livelihoods or income generated as a result of project activities	26	
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	293	
	Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	26	
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	293	
	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	26	
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	293	
	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	26	

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
Well-being	Total number of community members whose well-being ⁸ is expected to improve as a result of project activities	293	
	Number of women whose well-being is expected to improve as a result of project activities	26	
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	183,015 hectares	
	Expected number of globally Critically Endangered or Endangered species ¹⁰ benefiting from reduced threats as a result of project activities ¹¹ , measured against the without-project scenario	24 fauna and 8 flora species are in IUCN list	

2 GENERAL

2.1 Project Goals, Design and Long-Term Viability

2.1.1 Summary Description of the Project (G1.2)

The project is located in Peru, in the south-east area of the Department of Madre de Dios, in the province of Tahuamanu (districts of Iñapari, Iberia and Tahuamanu). The project area (PA) comprises the consolidated Otorongo and Chullachaqui areas covering a total of 183,015 hectares. The coordinates of each forest concession that make up these consolidated projects are shown in Annex 1.

Map 1 shows the location of the project in Peru in the department of Madre de Dios, and the area of the project formed by the polygons of both consolidated.

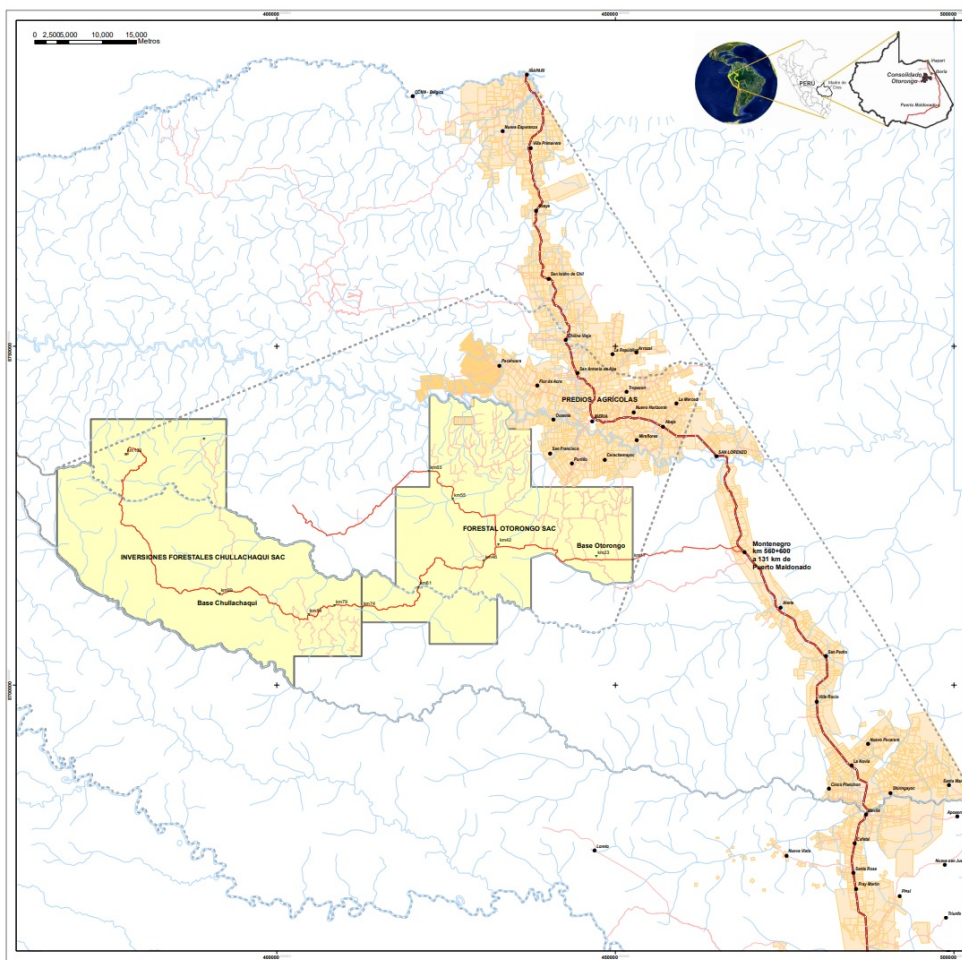
⁸ Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Livelihoods, Health, Education and Water), and may also include other benefits such as strengthened legal rights to resources,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

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

MAP 1: PROJECT LOCATION



Own elaboration

The project is based on the sustainable forest management of certified wood from the consolidated “Inversiones Forestales Chullachaqui SAC” and “Forestal Otorongo SAC” in the Province of Tahuamanu, department of Madre de Dios in southeast Peru.

Consolidated “Inversiones Forestales Chullachaqui” is managed by the company Inversiones Forestales Chullachaqui SAC, it is formed by the merge of 4 adjacent concessions, which have made the consolidation of the respective areas in order to optimize the sustainable use of forest resources and enter as a block to the Voluntary Forest Certification process. These companies are Empresa de Productos Forestales Iberia SAC, Inversiones Forestales Chullachaqui SRL, Forestal Purús SRL, Inversiones Yacaré SRL. Likewise, Consolidated “Otorongo”, managed by Forestry Otorongo SAC, is composed by six concessions and the companies are Forestal Otorongo SAC, Forestal portillo SRL “A” and Empresa Forestal David SAC. Both consolidated companies represent forestry companies that have signed permanent-production-forest concession contracts with the Peruvian State for a period of 40 renewable years initiated between 2002 and 2003, for an area of 183,015 hectares (81,238 hectares for Otorongo and 101,777 hectares for Chullachaqui). This contract grants legal rights over the area for both forest use and environmental services.

The Project Area is 183,015 hectares and is located 17 km from the interoceanic highway, the main transversal communication route between Peru and Brazil. In addition, the project area operates as part of the Vilcabamba-Amboró Biological Corridor, which would have an area of approximately 30 million hectares.

Within the project area, there are no native indigenous populations. In the towns of Alerta, Portillo, San Francisco and Oceania there are settlers dedicated to collecting Brazil nuts and eventually shiringa. A 100% of the people who extract Brazil nut through a work agreement in partnership with the Company live in Alerta. Peruvian legislation allows for the combination of timber harvesting activities and non-timber products. As a result, a Brazil nut Complementary Management Plan has been developed to develop its use, compatible with wood extraction, minimizing impacts. The company develops with the collectors meetings and exchanging proposals of mutual benefit (there are minutes of meetings developed).

The company strictly forbids hunting wild animals in its forest. This undoubtedly contributes to the fulfillment of some specifications described in the FSC certification standards, such as those established in principle 6 (criteria 6.2.2), in the Peruvian regulations (regulation of zoo-breeders and hunting grounds D.S: 018-92-AG; prohibition of hunting, transport, extraction and export D.S: 013-99-AG).

The Chullachaqui SAC Forest Investment Concession aims to promote the conservation of the forest and its resources through sustainable forest management. As part of the preventive measures, mechanisms such as low-impact logging or the design and construction of infrastructure that seeks to reduce the impact on habitats and trees of importance to wildlife are implemented, as well as the prohibition of hunting within the concession and raising awareness among workers about the importance of wildlife in the forest ecosystem. Logging operations directly impacts on the wildlife present in the forest, mainly due to the interventions and the noise generated. The presence of wildlife in forest ecosystems impacted by timber harvesting is important because of its positive influence on natural regeneration processes, which are key to the sustainability of the forest. The diversity of the tropical forest ecosystem is the basis for the richness of its natural resources and its use must be sustainable, without compromising the benefit to future generations.

The general objective of the company is to manage the extension of forest granted by the Peruvian State, improving the production of forest goods and services in a continuous and sustainable manner with an adequate long-term strategy for its implementation.

According to the PGMF 2016, the forest management system used in the concession is of the type "Polycyclic Entresaca", in which the standing mass is handled, trying to increase the proportion of commercial species in the forest without eliminating undesirable species. Trees that compete directly with trees of future harvest are mainly eliminated. Forest inventory data is used to review the cutting cycle (CC), minimum cutting diameter (DMC) and cutting intensity (IC), and then calculate the allowable annual cut volume (VCAP).

Project Objectives:

- *Climate Goal: Reduce the expected deforestation rate and the associated GHG emissions in the project area in the upcoming years*

- *Community Goal: Promote and consolidate a sustainable use of agrarian land increasing the family incomes without necessity to expand to new areas*
- *Biodiversity Goal: Protect the rich ecosystem that is home of many significant threatened species of fauna and flora*

2.1.2 Project Scale

TABLE 3: PROJECT SCALE

Project Scale	
Project	
Large project	X

2.1.3 Project Proponent (G1.1)

TABLE 4: GENERAL INFORMATION OF PROJECT PROPONENT

Organization name	Greenoxx Sociedad Civil
Contact person	Eng. Rocco Cheirasco
Title	Chairman & CEO
Address	Costa Rica 1661 of. 7; CP 11500; Montevideo, Uruguay
Telephone	+598 2604 08 69
Email	rocco@greenoxx.com ; ngo@greenoxx.com

Organization name	Greenoxx Sociedad Civil
Contact person	Eng. Silvia Gómez Caviglia
Title	Executive Vice-President
Address	Costa Rica 1661 of. 7; CP 11500; Montevideo, Uruguay
Telephone	+598 2604 08 69
Email	silvia@greenoxx.com ; ngo@greenoxx.com

2.1.4 Other Entities Involved in the Project

TABLE 5: GENERAL INFORMATION OF PROJECT PARTNER

Organization name	Consolidado Inversiones Forestales Chullachaqui SAC
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Contact person	Eng. Vittorio De Dea Peña
Title	Legal Representative
Address	Road to La Cachuela Km. 1.8, Tambopata, Madre de Dios, Peru
Telephone	+51 989 067 284
Email	vdedea@bozovich.com

Organization name	Consolidado Forestal Otorongo SAC
Contact person	Eng. Vittorio De Dea Peña
Title	Legal Representative
Address	Road to La Cachuela Km. 1.8, Tambopata, Madre de Dios, Peru
Telephone	+51 989 067 284
Email	vdedea@bozovich.com

2.1.5 Physical Parameters (G1.3)

CLIMATE

Santos (2017)¹² indicates that the climate of Madre de Dios is tropical: warm, humid and with annual rainfall over 1000 mm with an average temperature of 17°C to 20°C in the months of June and July and a maximum of up to 36°C in the months of December to March. It is occasionally presenting influences of cold air masses, which come from the southeast of the Americas, causing temperature declines, which reach up to 8°C and are locally known as "friaie". Likewise, it collects the data from the 1981-2015 period for the preparation of the precipitation map where a seasonal rainfall behavior is observed, where the largest accumulated are recorded between January to April and October to December, where the largest accumulated rainfall is in February. The months of reduced rainfall are between June and August. The basins of the Madre de Dios region have an average multi-year precipitation of over 1600 mm/yearly, with the basins CO, CP, IAL, IAA being the least humid, with average annual precipitation ranging from 1599.5 to 1793 mm.

The Department of Madre de Dios is characterized by three types of climate:

- a. Sub Humid and Warm. It includes the north-eastern sector of the department. It is characterized by presenting annual average temperatures of 25°C. Moderately rainy climate.

¹² Santos, D. Hydrological characterization of the Madre de Dios region. National Service of Meteorology and Hydrology of Peru (SENAMHI). Hydrology Department. December, 2017.

- b. *Humid and Warm. It includes the central and southwestern sector of the department. It is characterized by average annual rainfall of 2,000 mm. and average annual temperatures of 25°C. Rainy climate, dry winter, warm humid season.*
- c. *Very humid and Semi-warm. Includes the foothills of the eastern cordillera. It is characterized by an average annual rainfall of 2,300 mm. and average annual temperatures of 22°C. Very rainy climate with abundant rainfall, almost all year round.*

TABLE 6: TYPE OF CLIMATE IN MADRE DE DIOS

Types of Climate	Area (ha)	%
Sub humid and warm	3'687,543	43.3
Humid and warm	1'061,173	12.5
Very humid and semi-warm	3'769,680	44.3
Total	8'518,396	100.0

(IIAP, 2009)

HYDROLOGY

The Local Administration of Agua Maldonado (2010),¹³ states that the Madre de Dios Basin is the third largest in the country and is part of the large basins of the Madeira River, a tributary of the Amazon River. In Peruvian territory, it has an area of 111,933 km², which includes the Inter-basin Acre. The Madre de Dios Basin politically is within three regional governments; 96% extends over Madre de Dios, 32% in Puno and 12% in Cuzco. Nine sub-basins have been defined for the Madre de Dios Basin: Tambopata Basin, Inambari Basin, Las Piedras Basin, Tahuamanu or Orthon Basin, Alto Madre de Dios Inter-basin, Alto Madre de Dios Middle Inter-basin, Madre de Dios Middle Inter-basin, Madre de Dios Middle Lower Inter-basin and the Alto Acre Inter-basin¹⁴.

The Project is located in the Tahuamanu or Orthon Basin, presenting an area of 15,190.20 km² and a main channel length of 308.51 km, which is located between the provinces of Tahuamanu and Tambopata. The Tahuamanu River travels in a NW-SE direction and crosses the entire province of Tahuamanu. In this sector, its course is meandering presenting meanders and small lagoons. Present a regular width that varies from 150 to 180 m.

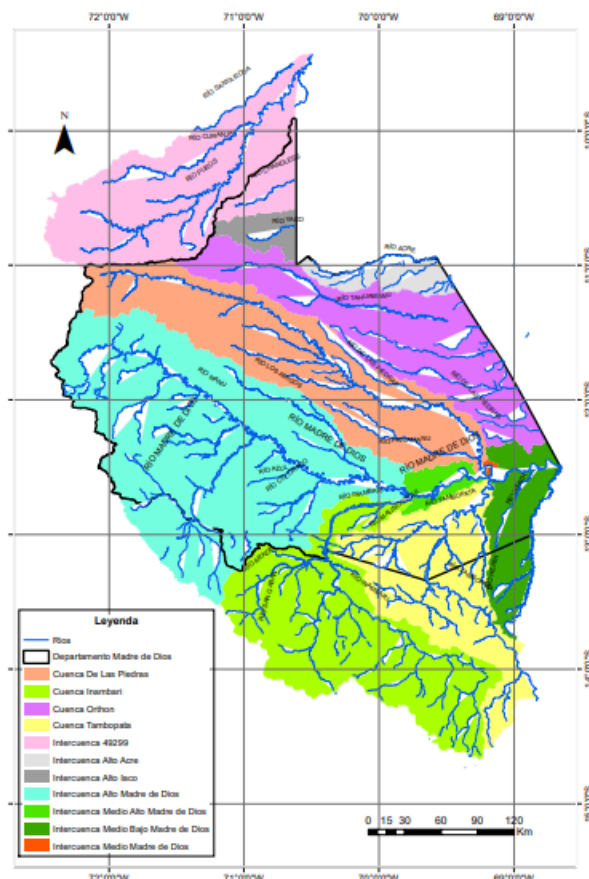
The Consolidated Otorongo borders the Tahuamanu River in the north, the river with the highest flow and navigable all year round. The Muymanu River passes through the concession and is navigable during the winter months (January-March). There are the Cocama and Titimanu gorges, tributaries of the Tahuamanu River which are short-distance and seasonal flows, conditioned to the winter season and the presence of rains in the summer.

¹³ Local Water Administration (ALA) Maldonado. Hydrological Diagnostic Study of the Madre de Dios Basin. Water Resources Conservation and Planning Department - Surface Water Area. 2010.

¹⁴ The Alto Acre Inter-basin belongs to the Purus Hydrographic Unit. For the purposes of the Study, it was considered to be within the Madre de Dios Basin.

In the consolidated Chullachaqui, the main rivers that pass through it are the Muymanu River located in the north and middle and the Manuripe River to the south and is a natural boundary with other concessions. The most important gorges are Buyuyo and Carbajal, since during rainy season they are navigable.

MAP 2. WATERSHEDS IN MADRE DE DIOS



Source: Senamhi, 2010

SOILS

Due to the constant arrival of new material from the Andean mountain range, Madre de Dios has relatively young and fertile soils compared to most of the Amazon. The mainland soils, which occupy approximately 80 percent of the department, are consistently sandier, more acidic, and less fertile than floodplain soils. While the appearance and texture of these soils vary greatly from place to place, the vast majority of soils in Madre de Dios fall into only two categories of the soil taxonomy system: Ultisols and Inceptisols.

At the regional level, soil varieties have been identified and classified according to their origin:

a) *Recent Rainfall Soils.* Very close to rivers, they occupy low flat-relief terraces that can withstand annual or sporadic flooding.

b) *Sub-recent alluvial soils.* They have originated from sub-recent quaternary deposits distributed in non-floodplated terraces, from flat to wave decline.

c) *Local colluvial soils.* Originated from thick materials derived from a mixture of alluvionic sediments and material from mountain formations.

(d) *Old alluvial soils.* Originated by ancient sediments due to the process of fluvial erosion, they have reached heights ranging from 15 to 40 or 50 m, forming the so-called medium and high terraces.

e) *Raised floors of waste materials.* These are soils that have originated in situ from sedimentary materials from the Tertiary and Quaternary periods (siltstones, sandstones, gravels) and that due to various phenomena have originated low and high hills. In the Manu National Park area, the majority of the study is made up of deep to very shallow soils, located in areas of rugged or very dissected relief, with slopes greater than 50 percent and whose main limitations are related to the rugged topography and very steep to extremely steep slopes, which increase erosion risks.

Taxonomically, the IIAP (2009) has identified five soil orders Entisols, Inceptisols, Histosols, Alphisols and Ultisols; of which it determined 8 suborders, 11 large soil groups. Edaphically, 58 soil series were identified, divided into 28 consociations and 18 soil associations, and a unit of miscellaneous areas has been recognized.

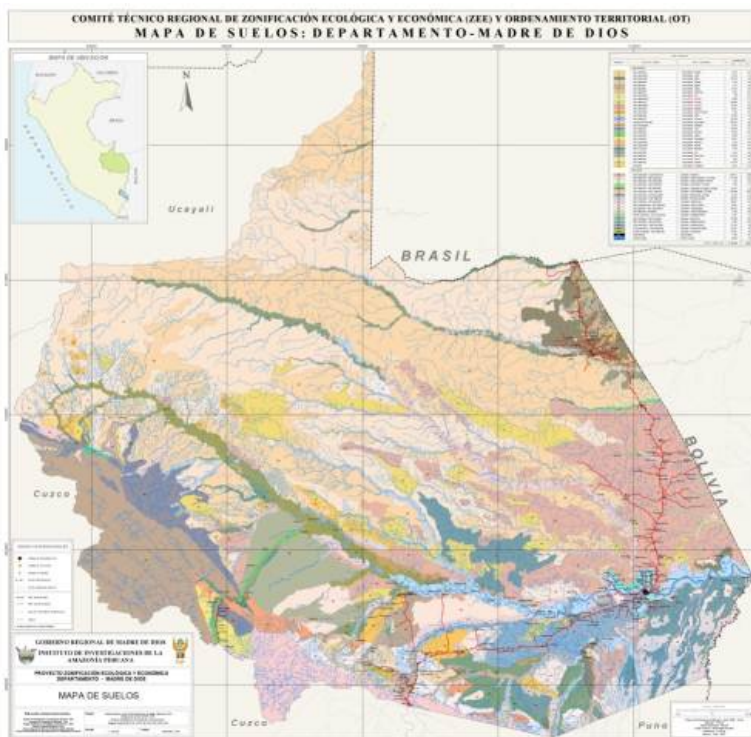
After the technical interpretation of the soils, the IIAP established, according to the Land Classification Regulation (D.S. N° 0062-75-AG), the following groups of Major Use Capacity. Table 7 below shows the Major Use Capacity Groups in the department of Madre de Dios.

TABLE 7: MAJOR LAND USE CAPACITY BY STRATA IN MADRE DE DIOS

Description	Area (Ha)	%
Lands Suitable for Clean Cultivation	570,613	6.70
Lands Suitable for Permanent Cultivation	1'055,358	12.39
Lands Suitable for Pasture	755,261	8.87
Land suitable for forestry production	4'001, 474	46.97
Protection Lands	2'035, 632	23.89
Water bodies	1,600	0.02
Urban Areas	98,682	1.16
TOTAL	8'518, 396	100.00

Source: IIAP (2009)

MAP 3: SOIL TYPES ACCORDING TO ECOLOGICAL ECONOMIC ZONING



Source: IIAP (2009)

TYPES OF VEGETATION

Madre de Dios has an area of natural forest of 8,102,917 hectares, which places it in third place in the country of departments with the greatest area of forest, after Ucayali and Loreto (CESVI, 2005).

According to the work carried out by IIAP in 2009, it was determined that the Madre de Dios department has 22 types of natural vegetation that contain at least 2,429 plant species (angiosperms and gymnosperms), including 869 genres and 172 families.

The most extensive types of vegetation are: Mixed communities of bamboo, or mixed pacaes, associated with trees scattered in hills (28.84 percent), dense semi-sumycifolium forests in hills (16.98 percent) and dense semi-sumycifolium forests in plains (15.42 percent).

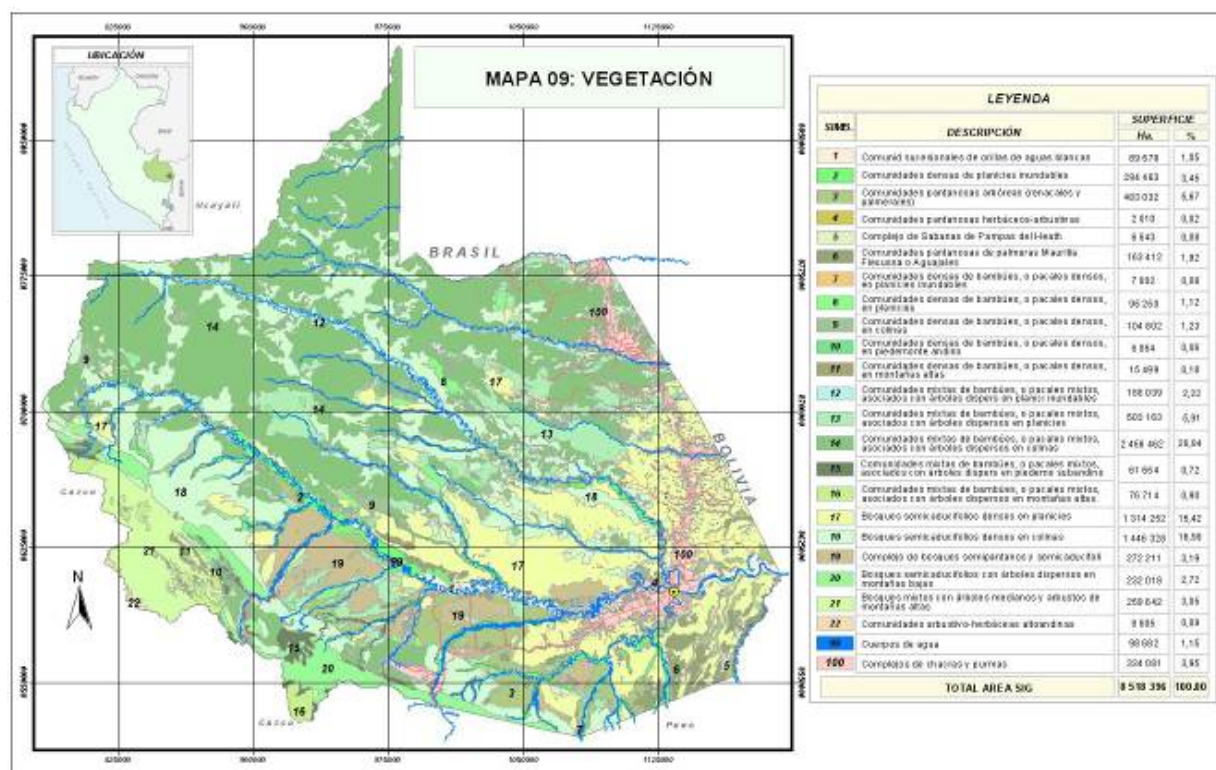
TABLE 8: VEGETATION UNITS IN MADRE DE DIOS

Code	Units of Vegetation	Area (ha)	%
1	Successional communities on the banks of white water	89,578	1.05
2	Dense floodplain communities	294,463	3.45
3	Tree swampy communities (Renacal and palm trees)	483,032	5.67
4	Herbaceous-arbaceous swamp communities	2,010	0.02
5	Pampas del Heath Savannah Complex	6,543	0.08

6	Swamp communities of <i>Mauritia flexuosa</i> or "aguajales" palms	163,412	1.92
7	Dense bamboo communities, or dense pacales, in floodplains	7,002	0.08
8	Dense bamboo communities, or dense pacales, in plains	95,250	1.12
9	Dense communities of bamboos, or dense pacales, on hills	104,802	1.23
10	Dense bamboo communities, or dense pacales, in the Andean foothills	5,054	0.06
11	Dense bamboo communities, or dense pacales, in high mountains	15,499	0.18
12	Mixed communities of bamboos, or mixed pacales, associated with scattered trees on flood plains	188,039	2.22
13	Mixed communities of bamboos, or mixed pacales, associated with scattered trees on plains	503,163	5.91
14	Mixed communities of bamboos, or mixed pacales, associated with trees scattered on hills	2'456,462	28.84
15	Mixed communities of bamboos, or mixed pacales, associated with scattered trees in the sub-Andean foothills	61,654	0.72
16	Mixed communities of bamboos, or mixed pacales, associated with scattered trees in high mountains	76,714	0.90
17	Dense semi-deciduous forests on plains	1'314,252	15.42
18	Dense semi-deciduous hill forests	1'446,328	16.98
19	Complex of semi-panorous and semi-deciduous forests	272,211	3.19
20	Semi-deciduous forests with scattered trees in low mountains	232,018	2.72
21	Mixed forests with medium trees and high mountain shrubs	259,642	3.05
22	High Andean shrub-herb communities	8,505	0.09
99	Water bodies	98,682	1.15
100	Complexes of farms and secondary forest	334,081	3.95
	Total	8'518,396	100.00

Source: IIAP, 2009

MAP 4: VEGETATION UNITS IN MADRE DE DIOS



Source: IIAP, 2009

In the project area, the three largest units identified are low hill forest with paca (36.16%), low hill forest with shiringa (32.39%) and low hill forest (17.37%).

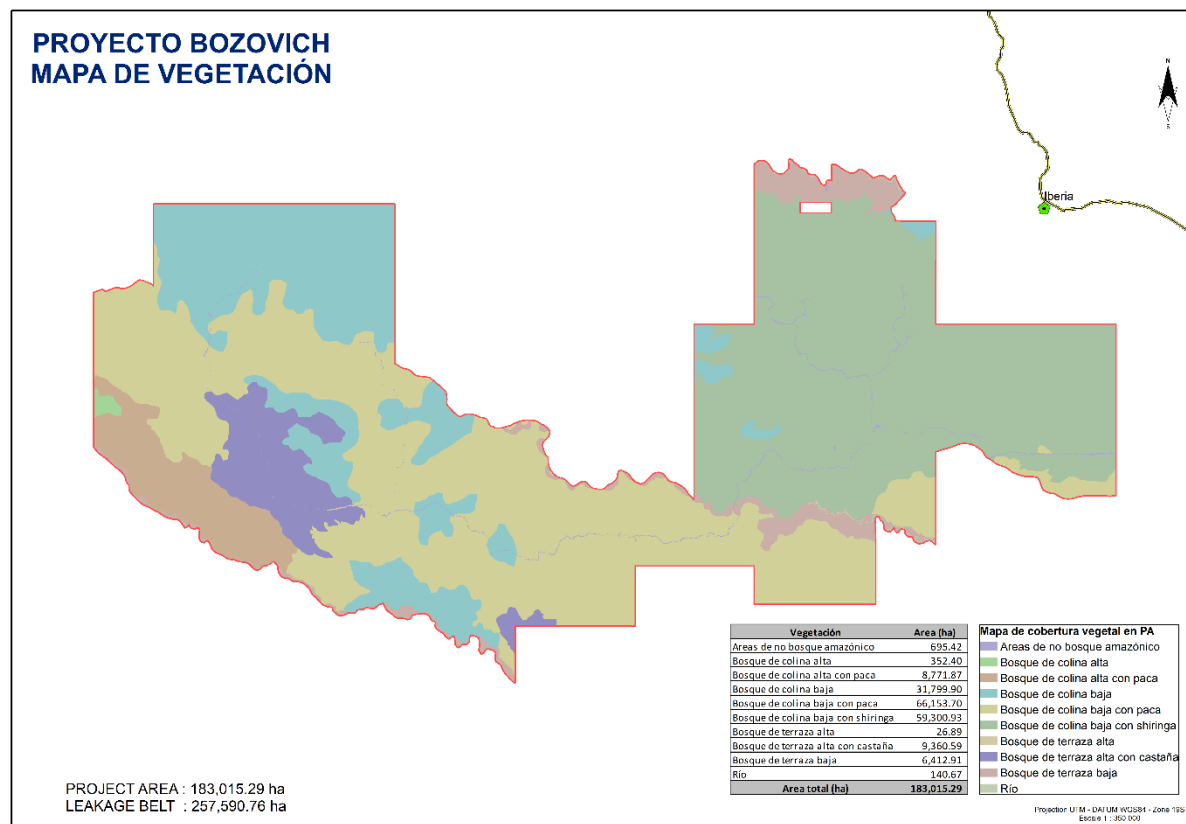
In the following table, we can see the different plant units within the project area. Map 5 shows the vegetation units within the project area.

TABLE 9: VEGETATION UNITS IN PROJECT AREA

Units of Vegetation	Area	%
Non-Amazon forest areas	695.42	0.37
High hill forest	352.40	0.18
High hill forest with bale	8,771.87	4.78
Low hill forest	31,799.90	17.37
Low hill forest with bale	66,153.70	36.16
Low hill forest with shiringa	59,300.93	32.39
High terrace forest	26.89	0.13
High terrace forest with Brazil nut	9,360.59	5.10
Low Terrace Forest	6,412.91	3.49
Water bodies	140.67	0.07

Total	183,015.29	100.00
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MAP 5: VEGETATION UNITS IN PROJECT AREA

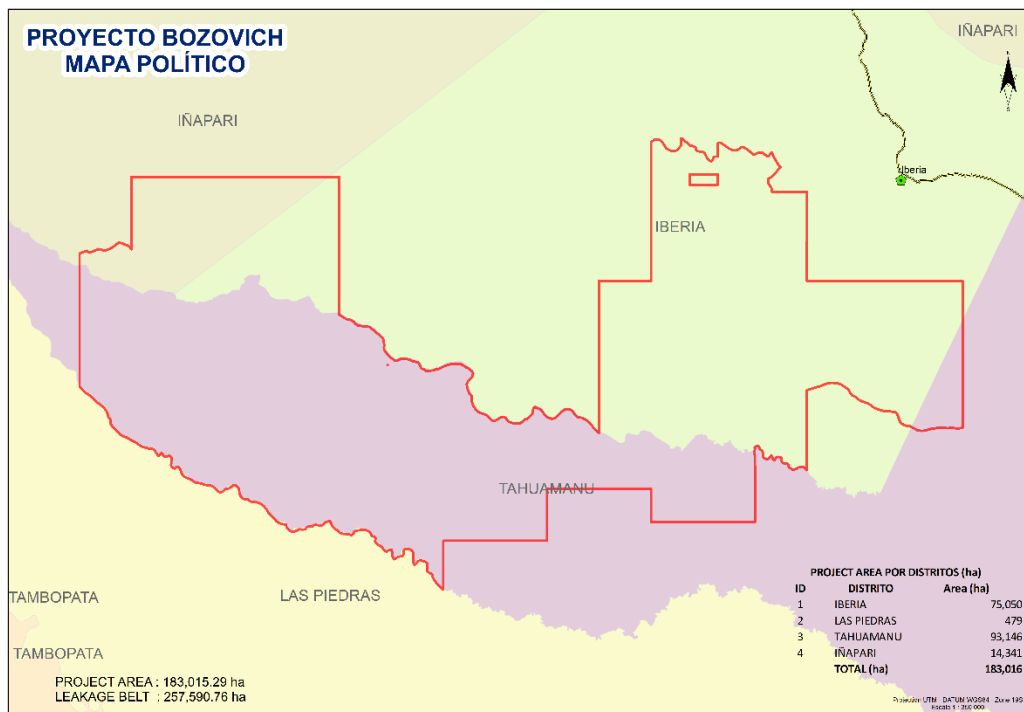


Own Elaboration

2.1.6 Social Parameters (G1.3)

The Project is mostly located within the Tahuamanu Province (99.74%) and to a lesser extent in the Tambopata Province (0.26%). Therefore, the characterization of the population will focus on the districts of Tahuamanu, as well as having the largest surrounding population closest to the project. With respect to the province of Tahuamanu, the project area has a greater extension in the district of the same name covering 93,145 ha (51%); it is followed by the District of Iberia with 75,050 ha (41%) and finally the District of Iñapari with 14,341 ha (7.8%) as can be seen in the following map.

MAP 6: LOCATION OF PROJECT AREA BY DISTRICT



The province of Tahuamanu covers approximately 21,196.86 km², which represents 24.85% of the surface area of the department of Madre de Dios, concentrating a population of 10,742 inhabitants (Source: INEI CENSO 2007).

The spatial distribution of the province's population centers is generally located on both sides of the inter-oceanic road, the main communication route with the economic activities that take place there. Likewise, the district capitals generally have better facilities and services due to the use of natural resources, provision of services and others. The population centers of Iñapari, Iberia and San Lorenzo, because they are the current district capitals, show a greater development in infrastructure and services in relation to the other towns in their environment. In the province, there are populated centers like Nueva Esperanza, La Novia, Alerta, San Pedro and Chilina, which present a particular dynamic related to the rural activities of forest and Brazil nut extraction.

With respect to the study carried out (GOREMAD 2010), the population centers in the province of Tahuamanu have been differentiated by volume from the existing population, between:

- 150 - 300 inhabitants, comprising the towns of San Lorenzo, Shiringayoc, La Novia, San Pedro, Villa Rocío,
- 301 - 600 inhabitants, comprising the Flor de Acre population centers,
- 601 - 1000 inhabitants, includes the towns of Iñapari, Pacahuara, Alerta.
- 1001 - 6000 inhabitants, includes the population centers, Iberia.

Likewise, spaces with dispersed population (less than 150 inhabitants) have been identified among them: Bélgica, Villa Primavera, Chilina Vieja, Tropezón, Nuevo Pacarán and Santa María. Finally,

there are some populations that, depending on the physical and climatic conditions, are isolated as Oceania, San Francisco de Asis and Portillo. One of the causes is the difficulty of navigation that exists in the low season, on the other hand, in the rainy season, the routes of penetration and/or access are impassable, leaving these populations isolated and uncommunicated with the rest of the province.

POPULATION

For the region of Madre de Dios, the last census conducted (Census 2007) registered 109,555 inhabitants (0.40 percent of Peru's total population), composed of 54.31 percent men and 45.69 percent women. Of this population, 73.30 percent was located in urban areas and 26.70 percent in rural areas.

TABLE 10: POPULATION BY AGE GROUP BY DEPARTMENT/PROVINCES, GENDER AND URBAN/RURAL AREA

Department, Province, Urban and Rural area, gender and type of housing	Total	LARGE AGE GROUPS					
		Less than 1 Year	1 to 14 Years	15 to 29 Years	30 to 44 Years	45 to 64 Years	65+ Years
Department MADRE DE DIOS	109,555	2,489	31,934	34,671	24,380	13,178	2,903
Men	59,499	1,249	16,233	18,084	13,850	8,309	1,774
Women	50,056	1,240	15,701	16,587	10,530	4,869	1,129
URBAN	80,309	1,841	24,212	24,861	17,828	9,624	1,943
Men	41,875	922	12,306	12,225	9,492	5,819	1,111
Women	38,434	919	11,906	12,636	8,336	3,805	832
RURAL	29,246	648	7,722	9,810	6,552	3,554	960
Men	17,624	327	3,927	5,859	4,358	2,490	663
Women	11,622	321	3,795	3,951	2,194	1,064	297
Province TAMBOPATA	78,523	1,808	23,568	24,394	16,899	9,673	2,181
URBAN	65,444	1,514	19,887	20,375	14,130	7,932	1,606
RURAL	13,079	294	3,681	4,019	2,769	1,741	575
Province MANU	20,290	483	5,653	7,146	4,729	1,957	322

URBAN	7,261	185	2,391	2,160	1,725	695	105
RURAL	13,029	298	3,262	4,986	3,004	1,262	217
Province TAHUAMANU	10,742	198	2,713	3,131	2,752	1,548	400
URBAN	7,604	142	1,934	2,326	1,973	997	232
RURAL	3,138	56	779	805	779	551	168

Nominally registered population

Source: INEI - National Census 2007: XI of Population and VI of Housing

The Madre de Dios region is divided into three political-administrative provinces: Tambopata, Manu and Tahuamanu. The province of Tambopata has four districts: Tambopata, Inambari, Las Piedras and Laberinto; this province has 78,523 inhabitants (representing 71.67 percent of the total population of Madre de Dios) of which 52.76 percent are men and 47.24 percent are women. The province of Manu has four districts: Manu, Fitzcarrald, Madre de Dios and Huepetuhe; this province has a total of 20,290 inhabitants (representing 18.52 per cent of the total population of Madre de Dios) of which 57.27 per cent are male and 42.73 per cent are female. The province of Tahuamanu has three districts: Iñapari, Iberia and Tahuamanu; this province has a total of 10,742 inhabitants (representing 9.81 per cent of the total population of Madre de Dios) of which 60.03 per cent are male and 39.97 per cent are female.

The population of the project area totals 10,742, of which 62.51 percent is concentrated in the Iberia district, especially in the urban population center of the same name.

TABLE 11: POPULATION BY AGE GROUP BY PROJECT LOCATION DISTRICTS, GENDER AND URBAN/RURAL AREA

District and Gender	Total	%	LARGE AGE GROUPS					
			Less than 1 Year	1 to 14 Years	15 to 29 Years	30 to 44 Years	45 to 64 Years	65+ Years
District IÑAPARI	1,288	11.99	26	385	361	313	159	44
Men	711	55.20	11	183	207	175	110	25
Women	577	44.80	15	202	154	138	49	19
District IBERIA	6,715	62.51	124	1663	1964	1729	979	256
Men	4,049	54.45	72	852	1145	1149	672	159
Women	2,666	45.55	52	811	819	580	307	97

<i>District TAHUAMANU</i>	2,739	25.50	48	665	806	710	410	100
<i>Men</i>	1,688	61.62	20	329	469	496	300	74
<i>Women</i>	1,051	38.38	28	336	337	214	110	26
<i>TOTAL</i>	10,742	100	1,680	22,257	22,545	15,621	9,027	2,094
<i>%</i>	100.00		2.29	30.40	30.79	21.33	12.33	2.86

Source: Nominally registered population. Source: INEI - National Censuses 2007: XI of Population and VI of Housing.

One of the characteristics of the population of Madre de Dios and, therefore, of the project, is its high population mobility caused mainly by the expectation of working in mining (an expectation that is increasing due to the constant rise in the price of gold) and by the demand to take advantage of the region's forest and agricultural resources. At the departmental level, migration due to the expectation of working in mining or in the services and businesses that are sustained by this activity, are the main causes of the increase in population. Migrants enter Madre de Dios from other regions, mainly from the Andes.

TABLE 12: MIGRATION BY TIME PERIODS IN MADRE DE DIOS (in %)

<i>Period</i>	<i>Internal Migration</i>	<i>Output</i>	<i>Input</i>	<i>Net Migration</i>
2002-2007	4.2	6.3	21.1	14.8
1988-1993	3.9	13.1	21.7	8.6
1976-1981	9.1	2.3	-6.8	24

Source: Yamada 2010

This feature makes the Madre de Dios department (as part of Peruvian internal migration) ranked first in net migration in 2007. "The department that relatively attracted the majority of the population was Madre de Dios (in the Jungle), with a net migration balance of 14.8 percent (a very high rate of 21.1 percent, corresponding only partially offset by 6.3 percent departures)" (Yamada 2010).

TABLE 13: MIGRATION TO MADRE DE DIOS COMPARED WITH OTHER REGIONS (in %)

<i>Region</i>	<i>Internal Migration</i>	<i>Output</i>	<i>Input</i>	<i>Net Migration</i>
Madre de Dios	4.2	6.3	21.1	14.8
Lima	1.7	3.4	8.0	4.6

Tacna	8.1	5.7	10.2	4.5
Callao	0.0	8.7	13.1	4.4
Tumbes	2.0	6.7	9.6	2.9

Source: Yamada 2010

As of 2007, with the Madre de Dios department as the residence department, the following migration type data are available: 45.3 percent non-migrants, 28.6 percent of established migrants, 26.1 percent of migrants in the last five years, 50.6 percent of primary migrants, 35.6 percent of regular migrants and 13.8 percent of return migrants (2007 Census).

SOCIO-ECONOMIC PROFILE

By 2007, 39.3 percent of the country's population was in poverty, that is, had insufficient spending to purchase a basic consumption basket. Of the 39.3 percent of poor people in the country, 13.7 percent are extremely poor, that is, they have per capita spending below the cost of the basic food basket, and 25.6 percent are non-extreme poor, with per capita spending above the cost of the food basket, but below the value of the basic consumption basket.

The main indicators of poverty in the project districts are presented in the following table, showing that the Iñapari and Iberia districts have 26 per cent and 20 per cent of the much smaller rural population respectively compared to 54 per cent in Tahuamanu district. The Madre de Dios department has 27 percent rural population, and Peru has 24 percent.

This inequity is reflected and reinforced in the other indicators such as the population without water which is 6 percent for Iñapari and 14 percent for Iberia compared to 48 percent recorded for the district of Tahuamanu being an even higher percentage than that recorded for the department of Madre de Dios (20 percent) and Peru (23 percent).

The indicator of population without drainage or latrine is led by the district of Iñapari with 24 percent, followed by the district of Iberia with 10 percent close to 8 percent of the district of Tahuamanu. With respect to the indicator of population without electricity is 57 percent in the district of Tahuamanu, 37 percent in Iñapari and 24 percent in Iberia. The indicators for illiterate women, children aged 1-12 years and malnutrition rate for the three districts were close.

TABLE 14: KEY POVERTY INDICATORS IN MADRE DE DIOS BY DISTRICTS

POVERTY INDICATORS MADRE DE DIOS REGION - FONCODES DISTRICT POVERTY MAP 2006, WITH INDIC. ACT. WITH 2007 CENSUS

Province and district	Population 2007	% Rural Pop.	Quintile ¹⁵	% population without water	% population without drainage/letter	% population without electricity	% illiterate women	% children 0-12 years	Malnutrition rate Children 6-9 years
Peru	27'428,169	24		23	17	24	11	26	22
Madre de Dios	109,555	27	3	20	19	31	5	27	13
Prov. Tahuamanu	10,742	29	2	22	11	34	6	23	12
Iñapari	1,288	26	2	6	24	37	6	27	10
Iberia	6,715	20	2	14	10	24	6	23	12
Tahuamanu	2,739	54	2	48	8	57	7	22	12

Source: Poverty map 2006, FONCODES.

On the other hand, for the Madre de Dios region, in the 2005-2007 period, economic participation indicators such as the EAP (the economically active population (EAP) includes all persons of either sex who contribute their work to produce economic goods and services) were 72.0 per cent, 74.9 per cent and 78.1 per cent respectively. As an occupation category, the percentage of wage earners increased slightly (31.9 percent, 33.9 percent and 36.2 percent), and there was a notable increase in unpaid family workers (22.0 percent, 21.0 percent and 35.7 percent).

**TABLE 15: KEY ECONOMIC INDICATORS BY STATUS OF POVERTY IN MADRE DE DIOS
2005-2007**

Variables and Indicators	2005			2006			2007		
	Total	Poor	No Poor	Total	Poor	No Poor	Total	Poor	No Poor
<i>Participation in economic activity</i>									
Activity condition (%)	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
EAP	72,0	67,3	73,7	74,9	71,5	75,7	78,1	68,9	79,4
NO EAP	28,0	32,7	26,3	25,1	28,5	24,3	21,9	31,1	20,6
Occupation category (%)	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Employer	11,6	6,8	13,1	12,2	6,0	13,4	12,9	11,1	13,1

¹⁵ 1/: Quintiles weighted by population, where 1 = Poorest and 5 = Less Poor

<i>Salaried</i>	31,9	22,5	34,9	33,9	24,9	35,7	36,2	36,6	36,1
<i>Self-employed</i>	34,4	42,8	31,9	32,9	35,4	32,4	17,3	32,6	33,7
<i>Unpaid family worker</i>	22,0	28,0	20,1	21,0	33,6	18,5	35,7	19,7	17,0
<i>Economic sector (%)</i>	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
<i>Primary (%)</i>	35,7	56,7	29,2	32,6	64,1	26,3	38,6	63,3	35,6
<i>Secondary (%)</i>	5,3	4,2	5,7	6,8	4,4	7,3	8,9	5,1	9,4
<i>Tertiary (%)</i>	58,9	39,1	65,1	60,6	31,4	66,4	52,4	31,6	55,0
<i>Income and expenses</i>									
<i>Monthly per capita income (nuevos soles)</i>	353,0	144,9	445,7	435,0	173,5	507,8	480,5	196,5	533,0
<i>Monthly expense per capita (nuevos soles)</i>	313,2	145,0	388,2	373,8	156,3	434,3	404,9	164,6	449,3

Source: INEI-National Household Survey (ENAH) 2005-2007.

For the project districts, the 2007 Census records a district average of 58.01 percent occupied EAP and 1.49 percent, unoccupied ADP. The Madre de Dios region registers 52.43 percent of occupied EAP and 1.51 percent of unoccupied EAP. It is worth noting that this same census registers 22.27 percent (2,392 people) of non-EAP (non-EAP is the population of working age, but who, in the adopted reference period, did not carry out or seek to carry out any economic activity) for the province of Tahuamanu, being almost half of the regional average of 46.06 percent of non-EAP.

TABLE 16: ECONOMIC ACTIVITY OF THE POPULATION BY PROJECT LOCATION DISTRICTS

<i>Economic Activity of the Population (EAP)</i>	<i>Dist. Iñapari</i>		<i>Dist. Las Piedras</i>		<i>Dist. Tahuamanu</i>		<i>Madre de Dios</i>	
<i>Categories</i>	<i>Cases</i>	<i>%</i>	<i>Cases</i>	<i>%</i>	<i>Cases</i>	<i>%</i>	<i>Cases</i>	<i>%</i>
<i>Occupied EAP</i>	670	59.55	3,376	56.45	1,495	61.12	49,712	52.43
<i>EAP Unoccupied</i>	31	2.75	92	3.08	20	0.81	1,428	1.51
<i>No EAP</i>	424	37.70	1,037	40.47	931	38.07	43,668	46.06
<i>Total</i>	1125	100.00	5,981	100.00	2,446	100.00	94,808	100.00
<i>NSA</i>	163		734		293		14,747	

Source: INEI, 2007

This economic population is associated with various economic activities, mainly gold mining, traditional monoculture agriculture, timber and Brazil nut extraction, livestock and small animal husbandry. The population of the rural zone is mainly made up of former residents and migrants with more than fifteen years in the zone, dedicated to monoculture agriculture, hunting, fishing, Brazil nut gathering, wood extraction, and seasonal artisanal mining and small businesses (wineries, restaurants, bars, lodges, others) (Lourdes Fernández 2009).

In the Department of Madre de Dios, the Gross Domestic Product increased by 13.6%, mainly due to the growth of the activity of oil, gas, minerals and related services (25.6%), which represents 52.5% of the departmental GDP; and by the activities: construction (16.1%), telecommunications and other information services (10.3%), public administration and defense (8.3%), and lodging and restaurants with 5.8%. In particular, the extraction of minerals and related services in 2016 recorded an increase of 32.5% in the gross value added of the activity as compared with the previous year because of the greater production of gold ore in fine Grams of 38.0%. (INEI, 2017)

TABLE 17: GOLD PRODUCTION IN MADRE DE DIOS, 2015-2016

Product	Unit of measure	2015	2016	Var. (%)
Gold	Grs. F.	12 730,632	17 569,475	38.00

Source: INEI, 2017

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

MAP 7: REFERENCE REGION, PROJECT AREA AND LEAKAGE BELT

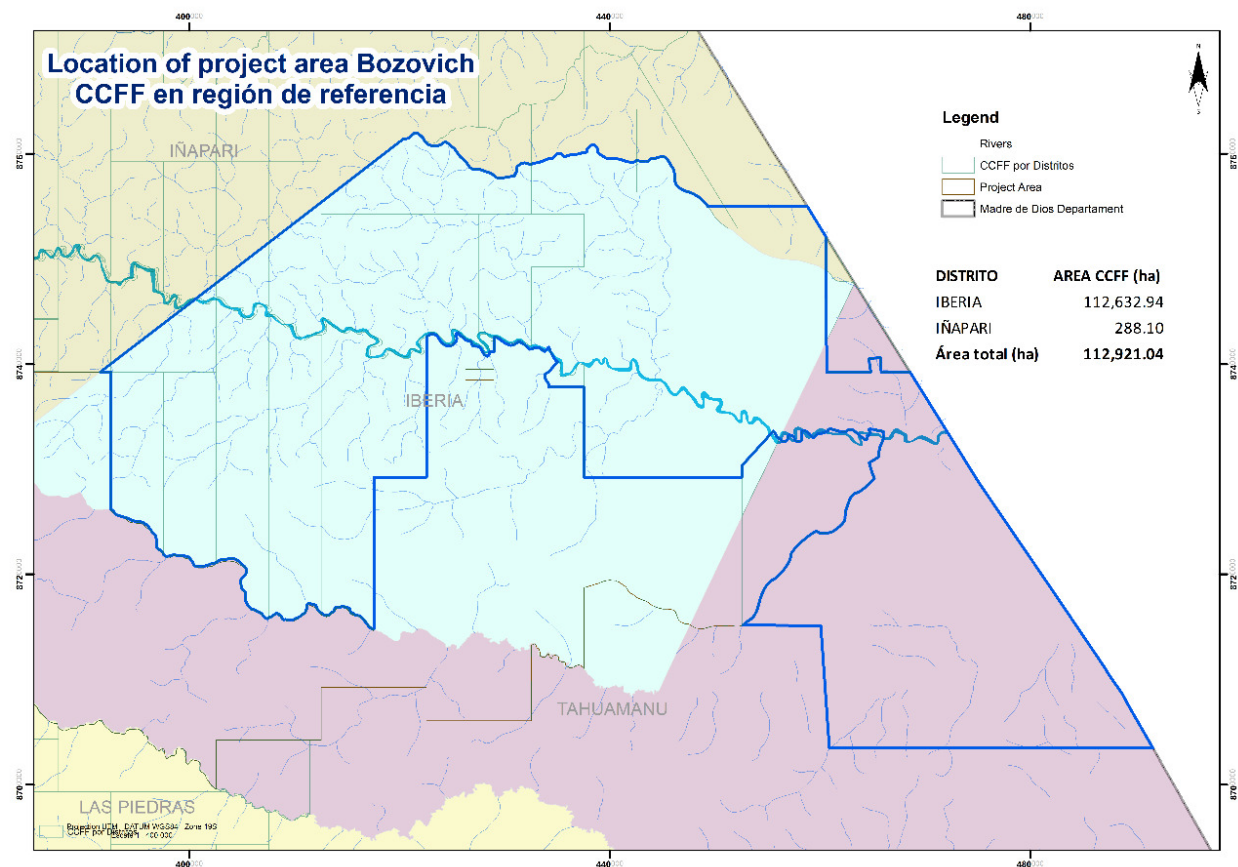


TABLE 18: PRESENCE OF HIGH CONSERVATION VALUES IN PROJECT AREA

HCV		Result
1	Significant concentrations of biodiversity values at global, regional or national levels	Present
2	Globally, regionally or nationally significant large forests on a landscape scale	Present
3	Forest areas within or containing rare, threatened or endangered ecosystems	Not present
4	Forest areas that provide basic ecosystem services in critical situations	Not present
5	Forest areas essential to meet the basic needs of local communities	Not present
6	Forest areas critical to the traditional cultural identity of local communities	Not present

Location of communities (identified in Section 2.1.9).

The geodetic coordinates of the polygon of the project area, leakage belt, reference region and key surrounding communities and towns are included in a KML file attached.

2.1.8 Stakeholder Identification (G1.5)

The process of stakeholders' identification is based on the consideration of following criteria:

- *Social relevance: especially neighbouring social groups (communities, producers, etc.)*
- *Technical relevance: especially entities who have a key role related with forests and forest resources*
- *Political relevance: especially administrative authorities at a local, regional or national level*
- *Economic relevance: here are included the type of actors that develop a similar activity than the project proponent and in the surrounding area as potential synergies may occur*

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

List all communities, community groups, and other stakeholders, including a description of how each stakeholder was identified and their relevance to project activities. For grouped projects, identify communities that may join the project. The Stakeholder Identification Table (see Appendix 1) may be used for this list if appropriate.

TABLE 19: STAKEHOLDER IDENTIFICATION TABLE

Stakeholder	Rights, Interest and Overall Relevance to the Project
Rural producers	<i>Right: They do not have the right to occupy forest concessions to install their crops or cattle. In Peru, almost all deforestation is illegal</i> <i>Interest: To get enough incomes for livelihood, mainly from their traditional activity, agrarian production</i> <i>Relevance: High because depending on how they produce crops, they may need or not to expand to new areas, mostly recently cleared forest areas</i>
Local municipalities	<i>Right: They have competences referred to land planning at its province or district level, among others</i> <i>Interest: To promote the development of their jurisdiction and welfare of their citizens</i> <i>Relevance: Depending on the point of view of the political party of the municipality, they may have different positions and actions with the forest. They are subject to pressure from citizens and migrants for new urban areas to live or develop agrarian activities.</i>
Religious community	<i>Right: They do not have the right to occupy forest concessions to install their crops or cattle. In Peru, almost all deforestation is illegal</i>

	<i>Interest: Because of their beliefs, they think the land is to be worked (what is understood as agrarian production) so they are expanding very quickly the agrarian frontier</i> <i>Relevance: Very relevant because they are putting a lot of pressure on neighboring forest areas</i>
SERFOR	<i>Right: The national forest authority is in charge to promote the sustainable forest management.</i> <i>Interest: To value the forest heritage and resources as a strategy for its conservation.</i> <i>Relevance: It could be a good partner for strategies to reduce forest loss rate in the project area and surrounding forests.</i>
Regional Government	<i>Right: The mission of the regional governments is to promote the sustainable integral development, promoting public and private investment, and employment, guaranteeing the rights and equal opportunities of its people, as indicated in the national and regional plans and programs.</i> <i>Interest: To attract private investment that creates local employment in order to achieve a good social environment than ensures interesting political capital</i> <i>Relevance: Many forest functions have been transferred from national government to regional entities as the Forest Directorate (GERFOR) so it plays a role (that may be a facilitator or an obstacle) in the development of forest concessions</i>
Forest concessions	<i>Right: They have the right to exploit sustainably their concession forest area.</i> <i>Interest: They are under growing pressure from deforestation drivers and illegal loggers so a positive experience as JAGUAR REDD PROJECT may be an incentive to develop similar projects</i> <i>Relevance: They can be good allies of the project as a model forest cluster can become a barrier of deforestation expansion</i>
Ministry of Environment	<i>Right: As the climate change authority, MINAM has the function to promote actions to reduce GHG emissions, including from land use change.</i> <i>Interest: The reduction of deforestation rate is key for MINAM to achieve its NDC targets but rules about how to share reductions between government and private sector is pending of definition.</i> <i>Relevance: Very high because it defines many of the rules key for REDD+ projects</i>
OSINFOR	<i>Right: It has the function to supervise and ensure the accomplishment of sustainable management of forest resources and punish crimes against forest heritage</i>

	<i>Interest: The conservation of forest heritage</i> <i>Relevance: High because it plays a key role in the surveillance and sanction to illegal activities that affect forest cover and forest resources</i>
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2.1.10 Sectoral Scope and Project Type

The current AFOLU project is classified as a REDD+ project, mainly a reduction of deforestation project. This is not a grouped project.

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

There are no jurisdictional REDD+ programs in Peru. In the following table, using The Project Activities and Theory of Change Table of Appendix 2, the JAGUAR REDD+ Project develops its production-protection approach based on three axes:

1. PRODUCTION COMPONENT

- 1.1. *Identification of productive projects in the surrounding communities. The projects will be selected in agreement with local settlements in order to ensure the appropriateness of the initiatives to be supported by the community groups who will implement and have the ownership on the initiatives.*
- 1.2. *Capacities strengthening of stakeholders organizations. The success of the productive initiatives depends on the strengthening of capacities. They include technical, entrepreneurial, organizational and commercial capacities, which are key to help them to achieve successful products.*
- 1.3. *Promotion of sustainable productive projects. With those two enabling conditions, this is the implementation of productive projects previously selected and trained. The training will be done simultaneously but a pilot scale and then, at this moment, it will scale up.*
- 1.4. *Implementation of research projects. As a complement to the productive activities, research is required to improve techniques, include new raw materials and processes and develop new byproducts for the market in order to maximize the value obtained from the productive activities.*

2. PROTECTION COMPONENT

- 2.1. *Design of a protection plan of the project area. An integrated protection plan of the boundaries of the forest concessions in order to diminish the risk of occurrence of illegal activities as land clearance, illegal logging, forest fires, among others. The plan should include the building or improvement of control infrastructure in key sites and a patrolling strategy by combined brigades.*
- 2.2. *Building / improvement of control and surveillance infrastructure. One of the components of the protection plan is the building of new infrastructure (control and surveillance posts) or the improvement of existing one.*
- 2.3. *Periodical patrolling. The objective of this patrolling is to identify anthropogenic actions that cause GHG emissions as deforestation for agrarian or settlement purposes or degradation as illegal logging.*
- 2.4. *Forest fire prevention patrolling. The difference between this patrolling and the previous one is that this one has the purpose to early detection of fires caused mainly by neighboring agrarian plots that could get out of control and affect within forest concession.*

- 2.5. Land demarcation, border maintenance and signaling. The 100% of concession borders will be earmarked with milestones. Those milestones will be periodically renewed to maintain in good quality and will be complemented with signaling indicating clearly to foreigners where the concession starts and what is forbidden to do inside it.
3. GOVERNANCE COMPONENT
- 3.1. Socialization of REDD+ project. Meetings with public and private stakeholders including municipalities, local leaders, producers' organizations, schools among others. The objective is to explain the role of REDD+ project and its positive impacts on different issues especially climate change.
- 3.2. Dialogues about environmental crimes and legal framework. The purpose of these meetings is to share and train about legal framework related to forests, emphasizing the types of environmental crimes and the sanctions associated to each one.

TABLE 20: THEORY OF CHANGE OF THE PROJECT

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
1.1 Identification of productive projects in the surrounding communities	XX of productive projects implemented in neighboring communities YY of workshops with ZZ of local families attendances WW of researches supported	X% of net incomes increased, measured in annual average per-capita incomes	Neighboring families dedicated to sustainable productive activities reduce the need to expansion of agrarian frontier	The development of sustainable sources of incomes for local population will reduce their need to clear new forest lands for unsustainable agrarian production
1.2 Capacities strengthening to stakeholders organizations				
1.3 Promotion of sustainable productive projects				
1.4 Implementation of research projects				
2.1 Design of a protection plan of project area	XX of new/improved control and surveillance sites YY of patrolling circuits per month 100% of borders of the concession with milestones	Y% of illegal activities/forest fires detected while they were occurring as a percentage of total detected cases	Reduction of illegal activities and uncontrolled forest fires	The enhancement of land surveillance will increase the risk for illegal activities to be captured and, in consequence, the costs of doing those illegal activities
2.2 Building / improvement of control and surveillance infrastructure				
2.3 Periodical patrolling				
2.4 Forest fire prevention patrolling				
2.5 Land demarcation, border maintenance and signaling				

3.1 Socialization of the REDD+ Project	XX of workshops with ZZ of local families attendances			An improved governance based on the dialogue with stakeholders will contribute to collaborative relationships with neighbors
3.2 Dialogues about environmental crimes and legal framework				

2.1.12 Sustainable Development

The project contributes to many international and nationally stated sustainable development priorities as:

- *SDG. The current project contributes directly with at least two of the Sustainable Development Goal, which are: SDG 15: Life of terrestrial ecosystems, specially forests and its biodiversity; and SDG 13: Action for climate, because it expects to reduce GHG emissions from forest cover change caused by deforestation, that the project expects to prevent or reduce significantly.*
- *Bicentennial Plan. This is a planning tool, developed by Peruvian Government, with the purpose to define the priorities for the coming 200 years of Peru Independence. It has six strategic axes, being the sixth "Natural Resources and Environment".*
- *Forest and Wildlife Law, approved in 2016, has the goal to promote the conservation, protection, increase and sustainable use of forest and wildlife heritage within national territory, integrating the management with the maintenance and enhancement of forest ecosystem services and other ecosystems. Clearly JAGUAR PROJECT is on the same line that this law.*
- *National Strategy on Forest and Climate Change: The National Strategy on Forest and Climate Change (ENBCC, as its acronyms in Spanish) is the Peruvian REDD+ Strategy. It includes eight strategic lines. One of them refers to the "increment of the value of natural forests" including the sustainable forest management (as JAGUAR PROJECT is).*
- *NDC. Peru has also updated its Nationally Determined Contributions as the country contribution to climate targets as established in Paris Agreement. One of the Mitigation Measures in the LULUCF sector is also "Sustainable Forestry Management" with a target of 4.1 million of hectares that the government commits to promote in order to achieve the management of the area.*
- *Axes to fight against deforestation. Launched by the Ministries of Agriculture, Environment and Energy, is based on four axes, one of them referred to "sustainable production".*

2.1.13 Implementation Schedule (G1.9)

TABLE 21: MILESTONES OF THE REDD+ PROJECT

Date	Milestone(s) in the project's development and implementation
2002	Issuing of forest concession contract
2011	Otorongo FSC Certification

2015	<i>Chullachaqui FSC Certification</i>
2017	<i>Agreement between Bozovich Group and GREENOXX</i>
2018	<i>Starting Date of GHG accounting period</i>
2020	<i>Expected first verification audit</i>
2021	<i>Nesting year</i>
2041	<i>Ending date of REDD+ project</i>

2.1.14 Project Start Date

January 1st, 2018 is the project start date in order to meet with a new forest cycle and to be comparable with official forest loss maps provided by MINAM, through GEOBOSQUES platform.

2.1.15 Benefits Assessment and Crediting Period (G1.9)

January 1st, 2018 is the project crediting period start date and it lasts until December 31, 2041, the previous year of the end of the concession contract, even though the same contract states that it is renewable automatically every 5 years.

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

There are no differences between the GHG emissions accounting, climate adaptive capacity and resilience, community, and/or biodiversity assessment and periods.

2.1.17 Estimated GHG Emission Reductions or Removals

TABLE 22: ESTIMATED GHG EMISSION REDUCTIONS

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
2018	1,590,115
2019	1,948,522

2020	2,352,616
2021	2,802,476
2022	3,298,101
2023	3,839,492
2024	4,426,648
2025	5,059,570
2026	5,738,259
2027.	6,462,712
<i>Total estimated ERs</i>	37,518,511
<i>Total number of crediting years¹⁶</i>	10
<i>Average annual ERs</i>	3,751,851

2.1.18 Risks to the Project (G1.10)

The Project has identified four major risks that must be faced in order to minimize the risk of occurrence and, if they happen, mitigate their impacts.

This analysis has been done using The Project Risks Table of Appendix 3 of VCS PD template and is presented below:

TABLE 23: PROJECT RISKS

<i>Identify Risk</i>	<i>Potential impact of risk on climate, community and/or biodiversity benefits</i>	<i>Actions needed and designed to mitigate the risk</i>
<i>Productive activities are not enough attractive to change the pattern of land use of agrarian neighbors</i>	<i>Negative impacts on climate benefits because producers will continue pressing for agricultural lands inside of project area</i>	<i>Design feasibility study and provide continuous technical assistance including accompanying commercial activities in order to access to improved and specialized markets with premium prices</i>

¹⁶ The project expects to issue credits until 2041 but the baseline has been estimated only for the first 10 years until 2027 and results since 2021 are provisional until the governmental nesting process is completed and new rules become valid.

<i>New migrants that are not part of the original beneficiaries of the REDD+ project will become new deforestation drivers as they do not participate in the project activities</i>	<i>Negative impacts on climate benefits because migrants won't receive the benefits of REDD+ projects and will search for lands inside of project area to settle and produce</i>	<i>Work jointly with authorities to a planning process of settlements of new migrants</i>
<i>Internal conflicts within local settlements</i>	<i>Negative impacts on community benefits as the conflicts will not allow to access to activities offered as part of REDD+ project. As a consequence of that, they will press on project area or leakage belt</i>	<i>Work jointly with local leaders and social specialists in order to understand the expectations, interests and power groups and networks inside local communities</i>
<i>Fires cannot be controlled because of dry seasons</i>	<i>Negative impacts on climate and biodiversity benefits because it will cause forest loss affecting fauna and emitting GHG</i>	<i>Incorporate scientific and research information in the forest fires patrolling strategy</i>

2.1.19 Benefit Permanence (G1.11)

Based on risk analysis, the measures proposed to guarantee the permanence of climate, community and biodiversity benefits are:

- Develop feasibility studies of products that will be produced with the support of REDD+ project in order to analyse previously if the activity is profitable enough to convince producers to dedicate to this activities instead of looking for new areas to produce conventional crops*
- Provide a permanent technical assistance to producers including marketing aspects as part of an strategy to access to premium markets*
- Support local and regional authorities urban planning process in order to reduce the risk of uncontrolled migration*
- Implement a diagnosis of local relationships inside each community as part of the strategy of sharing benefits and activities at an equitable way to minimize the risk of internal conflicts that affect the project development*
- Identify scientific sources of information related with intensity and location of forest fires and incorporate that information in patrolling strategy*

2.1.20 Financial Sustainability (G1.12)

Annex 1 shows the cash flow of the operation in two scenarios: with REDD+ project (incomes and activities) and without REDD+ projects. The results show that with the REDD+ project, the Net Present Value (NPV) increases from US\$ 1,852,573 to US\$ 5,047,540, which is an increment of 272.5%.

The financial analysis has been conservative as it is assuming incomes from carbon sales of US\$ 3 million in the first year and US\$ 1 million the next two years. This is because the first year, the verification process will include three vintages (2018-2020). It must be remembered that JAGUAR PROJECT has a partner as GREENOXX, who has a proven history of marketing success and presence in carbon markets.

The analysis has only included three years. Regarding timber sales, the assumptions are based on the many years of experience of BOZOVICH FOREST GROUP.

2.1.21 Grouped Projects

This is not a grouped project.

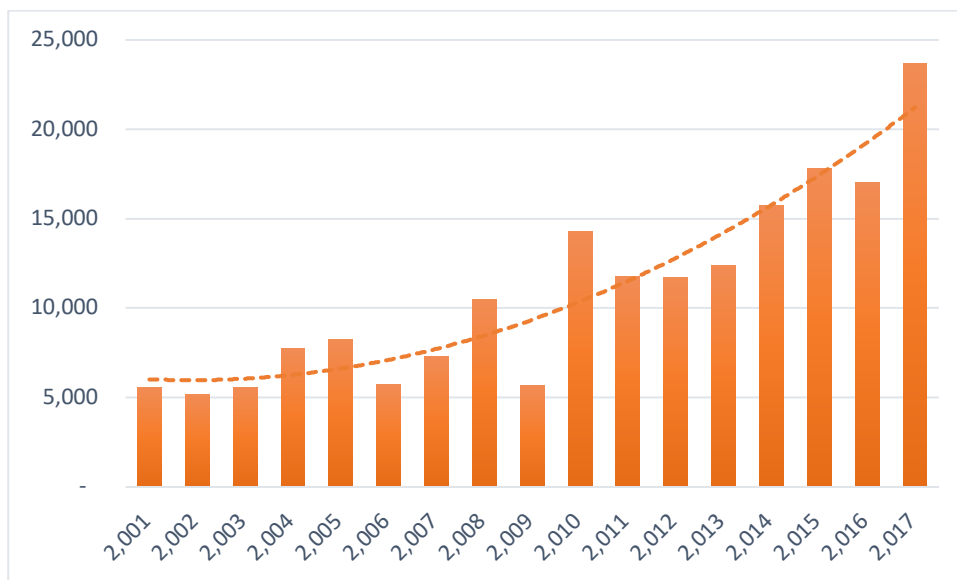
2.2 Without-project Land Use Scenario and Additionality

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

Madre de Dios was a pristine region and for this reason, it was the capital of the biodiversity until 2009, when the Interoceanic Highway was finally completely paved and the transportation cost reduced dramatically, increasing exponentially the internal migration from highlands of Peru.

This is the reason why Madre de Dios shows an exponential increase of the deforestation rate since that year as can be seen in following chart:

CHART 1: DEFORESTATION TREND IN MADRE DE DIOS (2001-2017)

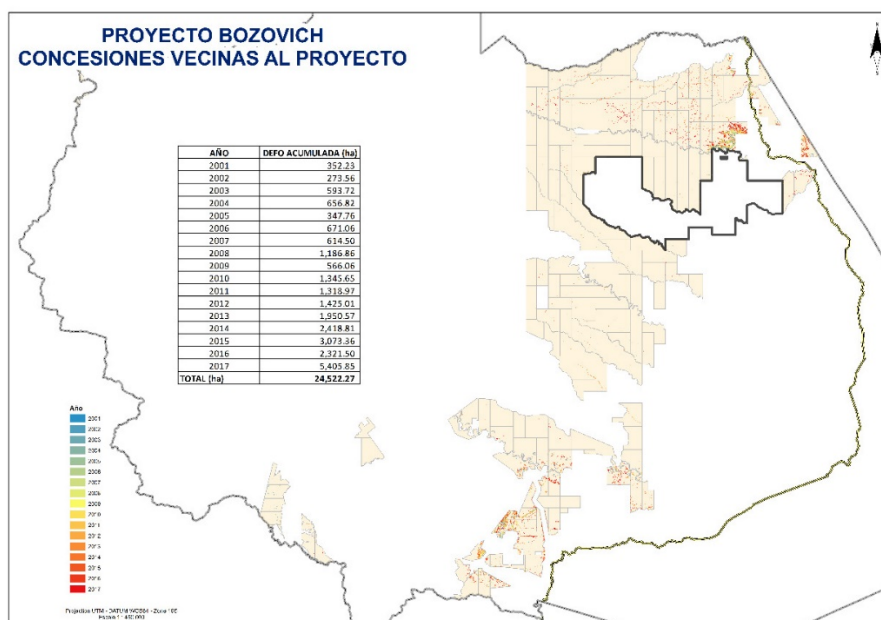


Source: GEOBOSQUES (MINAM)

Own elaboration

If we only take data since 2009, the slope of the trend is even higher. Migration is focusing on mining areas (in the south of Madre de Dios) and in agrarian activities (around both axes of IOH). Migration for agrarian purposes is putting a lot of pressure over forest concessions as may be seen in the map that shows all the timber concessions in Madre de Dios overlapped with deforested areas. Almost 25 thousands of hectares of timber concession have been deforested during this century (2001-2018), but 22% was lost only in the last year (2018) showing the growing threat that close forests face.

MAP 8: FOREST CONCESSIONS IN MADRE DE DIOS



As described in more detail in Community section 3.1.4), there are different settlements located in the surrounding areas to the concession. One of them, a religious community, is, according to the different interviews applied to local stakeholders (including the leaders of the other local communities), the most aggressive in terms of time dedicated to agriculture and agrarian frontier expansion. Newcomers may increase in the next years attracted by the lack of governance and the promotion of this activity by local authorities. It must be remembered that the major of the district is a member of this religious community.

The timber concession, basis of the REDD+ Project, was granted in 2002 but logging is a traditional activity in the zone since decades ago and BOZOVICH is a very well known family in the forest sector in Peru and also in Madre de Dios.

Without the REDD+ incomes, BOZOVICH will not be able to spend financial resources from its core business to implement a sustainable productive development program with families living in neighboring towns, now dedicated to agrarian production nor will be able to strengthen the patrolling system.

In that scenario, the most likely scenario is that agrarian production will enter into the forest concession as it is already happening in other smaller concessions that do not have the resources to protect as effectively as BOZOVICH has done until now theirs.

2.2.2 Most-Likely Scenario Justification (G2.1)

The most likely scenario described in 2.2.1 is proposed, based in two elements:

- Statistical data of increasing deforestation rate in similar type of land tenure, it means, other forest concessions, in the same administrative unit, Madre de Dios Region.

- *Expert opinions from a diverse range of stakeholders (community leaders, forest authorities, etc.) about the profile of each local settlement and the trends on land use*

2.2.3 Community and Biodiversity Additionality (G2.2)

Biodiversity is intrinsically connected with the climate targets. The reduction of GHG emissions from reduction of forest loss cause automatically the reduction of biodiversity loss as forests hosts many fauna and flora species that compose the rich biodiversity of the project area. This is described in more detail in the Biodiversity Section.

In the case of community additionality, the main positive impact will come from the support that BOZOVICH GROUP will bring to neighboring communities, through productive projects, organizational strengthening and enhanced governance. At this time, since 2002 when the concessions started operations, timber incomes did not generate enough profits to be invested in this type of activities. This is based on evidence of more than 18 years. As shown in the cash flow, these investments come from a fraction of expected carbon sales.

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

At this time, BOZOVICH nor GREENOXX plan to access to any type of market for biodiversity offsets nor community offsets. This can be reviewed in the cash flow where incomes are originated only from the timber and carbon sales.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

All the documentation referred to the REDD+ project, except sensitivity information (internal financial information as production costs, prices, clients, among others) will be available for public review, including communities and authorities, through two ways:

- *Through the web page of BOZOVICH, where a link with all the information about the REDD+ Project will be created and stored*
- *Through a focal point in BOZOVICH organizational chart of the Company, that will receive physically or via email, any request of information*

The available information includes the project document and periodical monitoring reports, including biodiversity, community and climate reports. Referred to reports, an option to be analyzed is the participation of some delegates of communities and authorities in a special field monitoring action to develop capacities and confirm outcomes obtained.

2.3.2 Dissemination of Summary Project Documents (G3.1)

In addition to previously described in 2.3.1, the project plans additional strategies to disseminate the information in a didactic manner:

- *Periodical meetings with families from surrounding settlements*
- *Working groups with community leaders and local authorities to evaluate the development of the project activities*
- *Publishing materials*

2.3.3 Informational Meetings with Stakeholders (G3.1)

A protocol for informational meetings with stakeholders will be developed during the first stages of the REDD+ project. The protocol will define, among others the following components:

- *A minimum of previous time for call the meeting, in order to ensure that interested may organize and plan with enough anticipation their participation in the meeting*
- *A diffusion through adequate communication channels as local radios, information in communal auditoriums among others to be defined in a consensus with local authorities and leaders*
- *Executive summaries will be prepared in a simple language that may be understood by rural families, printed and shared during meetings*
- *At least one meeting per year will be carried out and there will be space for participation of local leaders and authorities as a balance of the activities of the current year and the proposals and planning of activities of the coming year*

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

A qualitative methodology will be developed to estimate the potential costs, risks and benefits of the implementation of the REDD+ project.

As an example, the expected outputs could be some of these ones:

TABLE 24: COST-BENEFIT ANALYSIS OF EXPECTED OUTPUTS OF THE PROJECT

<i>Expected Output of the implementation of the REDD+ project</i>	<i>Qualitative Cost or Benefit</i>	<i>Quantitative Cost or Benefit</i>
<i>Increased governance and forest monitoring against illegal activities that affect the forest</i>		
<i>Productive activities and capacities development supported by REDD+ project</i>		
<i>Enhanced local governance and participatory processes</i>		

Conserved biodiversity and new rules to access to them		
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The participants will be organized by type of stakeholders so each group will identify the types of costs and/or benefits associated or caused by the core activities of the project (qualitative analysis). Based on this identification, the participants will try to quantify the magnitude of cost and/or benefit of each concept identified at a certain time-period.

TABLE 25: RISK ASSESSMENT OF EXPECTED OUTPUTS OF THE PROJECT

Expected Output of the implementation of the REDD+ project	Type of risk that may occur	Degree of occurrence of that risk
Increased governance and forest monitoring against illegal activities that affect the forest		
Productive activities and capacities development supported by REDD+ project		
Enhanced local governance and participatory processes		
Conserved biodiversity and new rules to access to them		

At a second moment, the same groups will identify the type of unexpected negative situations that can affect the occurrence of expected outputs and then, they will discuss and agree the approximate percentage of probability that each risk can happen.

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

As indicated in 2.3.3, local radios and publications in community public places (where assemblies are carried out for example) and through local authorities and community leaders will be the main communication methods to be used. This will be applied also in the CCB validation and verification processes.

The project will prepare executive summary of the project and the process and will share. Previously to the visit, informational meetings will be organized in order to get the communities and stakeholders prepared for the audit visit and the project itself.

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

Communities and other stakeholders will have the opportunity to identify and select their own leaders that will act as contact points with the auditors. This information will be provided to the audit team and, as soon

as a visit program is agreed, the agenda will be shared with these representatives. In any case, it should be with less than one week of anticipation.

Time must be separated for direct meetings between the audit team and these leaders, including local authorities. Those meetings may be joining different leaders in case time is limited for audit team. In the case, audit team does not speak Spanish, a translator will be considered for these independent meetings.

2.3.7 Stakeholder Consultations (G3.4)

Consultation with communities and other stakeholders has been done by collecting their expressions of interest about land use, which are reflected in a social diagnosis applied previously to the project design that is in the annexes. From this way, BOZOVICH considers that the consultation process has been accomplished.

The influence of communities and other interested parties has been given through the expression of their interests about land use, reflected in a social diagnosis carried out previously to the project design. This is the way how the company has included the interest of the surrounding communities in the design of the project.

As communities did not know the project, those previous meetings were useful to inform about the project and they showed interest in the project and presented their proposals to improve livelihood in their communities.

2.3.8 Continued Consultation and Adaptive Management (G3.4)

BOZOVICH GROUP has developed a feedback and grievance redress mechanism, which allows attending claims and suggestions. This system has been socialized between the surrounding communities and interested parties and, additionally, it has a permanent channel of communication with the company. The system ensures that any claim or suggestion is answered timely.

In addition, BOZOVICH GROUP proposes meetings every 2 months with the directives and partners of each neighboring community and meetings with the Technological Institute of Iberia, promoting sport activities and speeches for teamwork strengthening and trainings on environmental management and entrepreneurship.

2.3.9 Stakeholder Consultation Channels (G3.5)

Communication channels with surrounding communities and interested parties are open permanently. The company is in contact with their authorities and is informed about the changes in the Directives of the communities.

The company has developed introductory meetings with the presidents and directives with the neighboring communities. A permanent communication through social networks as WhatsApp groups with each neighboring community. During these meetings, parties discuss the development of potential joint activities.

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

Even though the interests of the communities and interested parties have been already considered in project design, the feedback process is permanent through the company's feedback and grievance redress mechanism.

The proposal is to develop participatory meetings with neighboring communities developing a space where they can make proposals of activities and they may participate in the execution of those activities.

2.3.11 Anti-Discrimination Assurance (G3.7)

The Project, through its institutional policy (ANNEX xx), specifically in Section IV: Social Monitoring Policies, openly expresses respect for the rights of the communities, inhabitants and local third parties that could be affected by the development of Project activities or that are located in the area of influence. Likewise, Section VI: Personnel selection, hiring, promotion and training policies emphasizes the hiring of both qualified and unqualified local labor that meets the requirements of the position, in the same direction as regards the acquisition of goods and services (Section VIII). This instrument is socialized both to workers, providers of goods and services, and to our clients.

2.3.12 Feedback and Grievance Redress Procedure (G3.8)

The feedback and grievance redress mechanism (FGRM) is a tool to provide stakeholders an opportunity to raise claims about not accomplishment of agreements, wrong implementation of actions and projects, inaccurate sharing of benefits, among others.

For this reason, the way in which it is applied is critical because if it includes a complex or expensive method, it will not be accessible to rural families that are mostly the typical stakeholders of the surrounding area of the project.

Based on those considerations, the proposed FGRM is as follows:

- *A FGRM interinstitutional committee will be created, composed by the following representatives:*
 - *A representative of the Project Proponent*
 - *A representative of the local municipalities*
 - *A representative of the local communities*
 - *A representative of the other stakeholders (neither municipalities nor communities)*
- *The committee will elect a president for a one-year period. It may be renewable.*

- *This committee will prepare a protocol for the implementation of FGRM, that will classify by issues the types of claims:*
 - *Depending on who is the entity that is being denounced: the project proponent, a third-party, one of the beneficiaries*
 - *Depending on what is the type of claim: an intentional misuse of funds; a bad quality good or service provided; a default in any of the terms agreed during the implementation of the project or in the current PD; another issue*
- *The protocol should specify the channels that any citizen may use to raise a claim. These channels should include, at least:*
 - *Through email*
 - *Through a claim box located in the company office*
 - *Through a formal letter addressed to the committee*
 - *By a direct communication with each member of the FGRM committee or in any informational meeting*
- *Claims may be anonymous, if the citizen prefers to do so.*
- *In any case, the procedure is based on five steps:*
 - *Step 1: The FGRM takes note of the claim within the next 3 days since the claim is received by any of the channels mentioned*
 - *Step 2: The FGRM convokes to both parts (in the case that the claim is not anonymous) within the next 7 days since it has taken note of the claim.*
 - *Step 3: During the meeting, both parts have the right to argue their point of view and share evidence that may prove their case.*
 - *Step 4: The FGRM takes a time of 7 days to evaluate the evidences and proofs and, if it is needed, they organize a field visit to develop a more solid idea of what has happened.*
 - *Step 5: The FGRM takes a decision by majority and communicates its decision to both parts, stores the file in the cloud and publish its decision in the webpage of the REDD+ project.*

At the end of the year, during informational meetings, the FGRM should have a time to present a summary of all cases received and how they were analyzed and justify its decisions. At that time, the FGRM members may continue or may be changed. Only the members of each group can take the decision about its representative.

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

As described in previous section (2.3.3 and others), the FGRM will be publicized by the same channels than other relevant information about the REDD+ project: the webpage, the local authorities and community leaders and public and community significant places or offices.

2.3.14 Worker Training (G3.9)

The Project's institutional policy (see annex xx) is to provide continuous training to workers, either individually or collectively, through workshops and talks based on specialized documents such as: forest

safety regulations, internal work regulations, policies, forest certification, controlled logging, reduced impact logging, and others considered necessary by the Board of Partners.

For example, Table 26 shows the training schedule and the topics addressed in 2019.

TABLE 26: TRAINING SCHEDULE 2019

	Tema de la capacitación 2019	Fecha	2019											
			Febrero	Marzo	Abril	Mayo	Junio	Julio	Agosto	Septiembre	Octubre	Noviembre	Diciembre	
1	Identificación de peligros - evaluacion de Riesgos	28/02/2019												
2	Tala Controlada	28/02/2019												
3	Manual de Resolucion de Conflictos/ Sistema de quejas	16/03/2019												
4	Equipos de Protección Personal	28/03/2019												
5	Seguridad Industrial	28/03/2019												
6	Reglamento Interno de Seguridad	10/04/2019												
7	AIR	12/04/2019												
8	Fauna silvestre y su conservación	12/04/2019												
9	Manejo adecuado de combustible	12/04/2019												
10	Cadena de Custodia	10/05/2019												
11	Manipulacion adecuada de Alimentos	17/05/2019												
12	Organización Internacional de Trabajo	14/06/2019												
13	Acuerdos y convenios suscritos por el Perú	21/06/2019												
14	legislación forestal vigente	21/06/2019												
15	Reglamento Interno de Trabajo	05/07/2019												
16	Certificacion Forestal FSC 100%	12/07/2019												
17	Manejo de Residuos	12/07/2019												
18	Manual de Resolucion de Conflictos	19/07/2019												
19	Prevencion de Incendios	25/07/2019												
20	Manual de Operaciones de Transporte	01/08/2019												
21	Manejo de Residuos - Contaminacion por Plastico	01/08/2019												
22	Bosques de alto Valor de Conservacion	13/09/2019												

2.3.15 Community Employment Opportunities (G3.10)

The forest management general plan and the environmental impact assessment states that specific quotas for neighboring local families are considered as a contingency measure to prevent social conflicts. This will include training in logging operations, organization of local population in a forest management committee, among others. It recognizes the importance for local families of Brazil nut forests. To collect the nuts, BOZOVICH signs an agreement to allow the Brazil nut harvesting and prepares a Complementary Plan for authorities' approval.

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

TABLE 27: LEGAL FRAMEWORK ON LABOUR ISSUES

Norm	Effective Date	Relevant articles demonstrating compatibility with the layout/implementation of the Project
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LEGISLATIVE DECREE 728 (TUO SUPREME DECREE 003-97-TR) PRODUCTIVITY AND COMPETITIVENESS LAW	March 28th, 1997	<i>This law promotes the massive access to employment through special programs and stimulates productive private sector investment. Furthermore, it improves levels of appropriate in the country so substances, as well as combating unemployment and underemployment. Finally, ensures job security and incomes of workers, while respecting the constitutional rules of job security.</i>
SUPREME DECREE 001-96-TR PRODUCTIVITY AND COMPETITIVENESS REGULATION	January 26th, 1996	<i>This regulation develops and specifies the objectives and tenets of Legislative Decree 728.</i>
LAW 29245 THIRD-PARTY SERVICES PROVIDER LAW	June 26th, 2008	<i>This law regulates private third-party services. Also regulates the cases comes from outsourcing, the requirements, rights and obligations, and penalties for companies that distort the use of this method for corporate engagement.</i>
SUPREME DECREE 006-2008-TR THIRD-PARTY SERVICES PROVIDER REGULATIONS	September 12th, 2008	<i>This regulation develops and specifies the objectives and tenets of Law 29245.</i>
TUO SUPREME DECREE 001-97-TR SENIORITY BENEFITS LAW	March 1st, 1997	<i>This law regulates compensation for length of service that has the quality of social benefit provision of contingencies that causes the cessation of work and promotion of workers and their families.</i>
SUPREME DECREE 004-97-TR SENIORITY BENEFITS REGULATION	April 15th, 1997	<i>This regulation develops and specifies the objectives and tenets of Supreme Decree 001-97-TR</i>
LEGISLATIVE DECREE 713 VACATION LAW	November 8th, 1991	<i>This law regulates the consolidation of the benefits provided by the existing labor laws.</i>
SUPREME DECREE 012-92-TR VACATION REGULATION	December 3rd, 1992	<i>This regulation develops and specifies the objectives and tenets of Legislative Decree 713.</i>

LAW 27735 HALF/END-OF-YEAR HOLIDAY BONUSES LAW	May 8th, 2002	<i>This law establishes the right of workers subject to the labor of the private sector to receive two bonuses in the year, among others.</i>
SUPREME DECREE 005-2002-TR HALF/END-OF-YEAR HOLIDAY BONUSES REGULATION	July 4th, 2002	<i>This regulation develops and specifies the objectives and tenets of Law 27735.</i>
LEGISLATIVE DECREE 892 PROFIT SHARING LAW	November 8th, 1996	<i>This standard regulates the right of workers to participate in the profits of companies that develop income-generating activities.</i>
SUPREME DECREE 009-98-TR PROFIT SHARING REGULATION	November 6th, 1998	<i>This regulation develops and specifies the objectives and tenets of Supreme Decree 009-98-TR.</i>
LEGISLATIVE DECREE 688 SOCIAL BENEFITS CONSOLIDATION LAW	5th, 1991	<i>This law regulates social benefits for workers.</i>
SUPREME DECREE 024-2001-TR SOCIAL BENEFITS CONSOLIDATION REGULATION	July 22nd, 2001	<i>This regulation develops and specifies the objectives and tenets of Legislative Decree 688.</i>
SUPREME DECREE 007-2002-TR LAW ON DAYS OF WORK, HOURS AND OVERTIME	July 4th, 2002	<i>This law regulates days of work, hours and overtime in benefit of workers and proceedings for Peruvian labor authority and registries in order to organize quality and quantity of work hours. Finally, it sets the maximum days and hours of work, including for night work, and regulate overtime.</i>
SUPREME DECREE 008-2002-TR REGULATION ON DAYS OF WORK HOURS AND OVERTIME	July 4th, 2002	<i>This regulation develops and specifies the objectives and tenets of Supreme Decree 008-2002-TR.</i>
LEGISLATIVE DECREE 25593 (TUO SUPREME DECREE 010-2003-TR) LAW ON COLLECTIVE LABOR RELATIONS	October 5th, 2003	<i>This law regulates union's freedom, i.e., all those relations through which workers can bargain collectively for better working conditions or otherwise.</i>

<i>SUPREME DECREE 011-92-TR REGULATION ON COLLECTIVE LABOR RELATIONS</i>	<i>October 14th, 1992</i>	<i>This regulation develops and specifies the objectives and tenets of Law on Collective Labor Relations.</i>
<i>LAW 28806 LABOR INSPECTION LAW</i>	<i>July 22nd, 2006</i>	<i>This law aims to regulate the labor inspection system, its composition, organization structure, powers and duties in accordance with Convention 81 of the International Labor Organization.</i>
<i>SUPREME DECREE 019-2006-TR REGULATION OF LABOR INSPECTION SYSTEM</i>	<i>September 1st, 2007</i>	<i>This regulation develops and specifies the objectives and tenets of Law 28806.</i>
<i>LAW 26636 PROCEDURAL LABOR LAW</i>	<i>June 21st, 1996</i>	<i>This law regulates all the judicial procedures that workers and employers need to do in order to access to justice.</i>
<i>SUPREME DECREE 039-91-TR INTERNAL REGULATION</i>	<i>December 30th, 1991</i>	<i>Every employer who employs more than 100 workers is required to have internal work regulations. The regulation must contain the main provisions of the labor regulations in force and will be approved by the administrative labor authority upon presentation. Workers who consider that the regulation violates legal or conventional provisions in force at the workplace may take legal action.</i>

TABLE 28: LEGAL FRAMEWORK ON HEALTH AND SAFETY ISSUES

<i>Norm</i>	<i>Effective Date</i>	<i>Relevant articles demonstrating compatibility with the layout/implementation of the Project</i>
<i>LAW 29783 HEALTH AND SAFETY LAW</i>		<i>This law aims to promote and organize safety and health in the workplace.</i>
<i>SUPREME DECREE 009-2005-TR HEALTH AND SAFETY REGULATION</i>	<i>September 28th, 2005</i>	<i>The regulation aims to promote a culture of risk prevention in the country. It counts with the participation of workers, employers and the State, who through social dialogue ensure the promotion, dissemination and enforcement of relevant legislation.</i> <i>This regulation on safety and health in the workplace establish minimum safety and health standards, enforcement responsibilities, and rights.</i>

MINISTERIAL DECREE 148-2007-TR REGULATION OF COMMITTEE FOR SUPERVISION OF SECURITY AND HEALTH AT WORK	May 25th, 2005	<i>This regulation creates a Committee for supervision and enforcement of security and health at workplace.</i>
LAW 26842 GENERAL HEALTH LAW	July 20th, 1997	<i>This law stipulates that those who lead or manage the extraction, production, transport and trade in goods and services has an obligation to take the necessary measures to ensure the protection of health and safety of workers and third parties on their premises.</i>
LAW 26790 SOCIAL SECURITY MODERNIZATION LAW	May 17th, 1997	<i>This law regulates the health and social security; it is founded on constitutional principles that recognize the right to welfare and guarantee free access to services by public, private or mixed. It takes place in a framework of equity, solidarity, efficiency and ease of access to health services.</i> <i>By this standard promotes efficient for occupational health and integration of efforts of the entities that provide health services, whatever their nature is.</i>
SUPREME DECREE 009-97-SA SOCIAL SECURITY MODERNIZATION REGULATION	September 8th, 1997	<i>This regulation develops and specifies the objectives and tenets of Law 26790.</i>
SUPREME DECREE 003-98-SA INSURANCE RISK WORK	April 14th, 1998	<i>This standard regulates occupational accident coverage and occupational diseases to workers employed and workers who have the quality of regular member of the social health insurance and work in a workplace in which the employing entity carries out its regular activities.</i>

2.3.17 Occupational Safety Assessment (G3.12)

The risks of the Project are limited to the forest harvesting carried out in each consolidated. In this regard, the internal regulations on occupational safety and health (annex xx) are in place.

This document serves to inform about the rules of conduct and procedures established to protect the physical and mental well-being of each worker, in accordance with the Safety Policy adopted by the Consolidated. It emphasizes the shared responsibility of both the employer and the workers in order to defend the life, health and physical integrity of the worker for his or her own interest and that of his or her family.

In 2017, the Occupational Safety and Health Committee (OSH) approves the internal regulations for Occupational Safety and Health. These regulations establish occupational safety and health standards for proper application and mandatory compliance by all company workers, third-party personnel, contractors, subcontractors, and visitors at any of the company's facilities.

This document is in accordance with Peruvian law as indicated in its legal framework and addresses relevant issues such as fire prevention and protection, protection of electrical machinery, equipment and engines, compressors and on security measures in the process of production, handling and transport of storage materials, security measures for the use of hoists, maintenance and repair, safety and health standards in operations, use of vehicles and the timely preparation of emergency responses.

On the latter, a contingency plan is made according to the nature of the risk, which is applied by the staff and conducted at the management level by the OSH committee and at the operational level by the brigade, such as: first aid, fire and evacuation. Staff selection and training for these brigades is carried out by the human resources (HR) team in collaboration with other organizational units that facilitate the participation of workers from their respective areas. For example, if a fire occurs, the brigade leader collects information on injuries and damages to open an investigation and propose corrective actions.

2.4 Management Capacity

2.4.1 Project Governance Structures (G4.1)

BOZOVICH has designed a specific governance structure for the conducting of JAGUAR REDD+ PROJECT. It is integrated with the organizational structure of forest operations of the company.

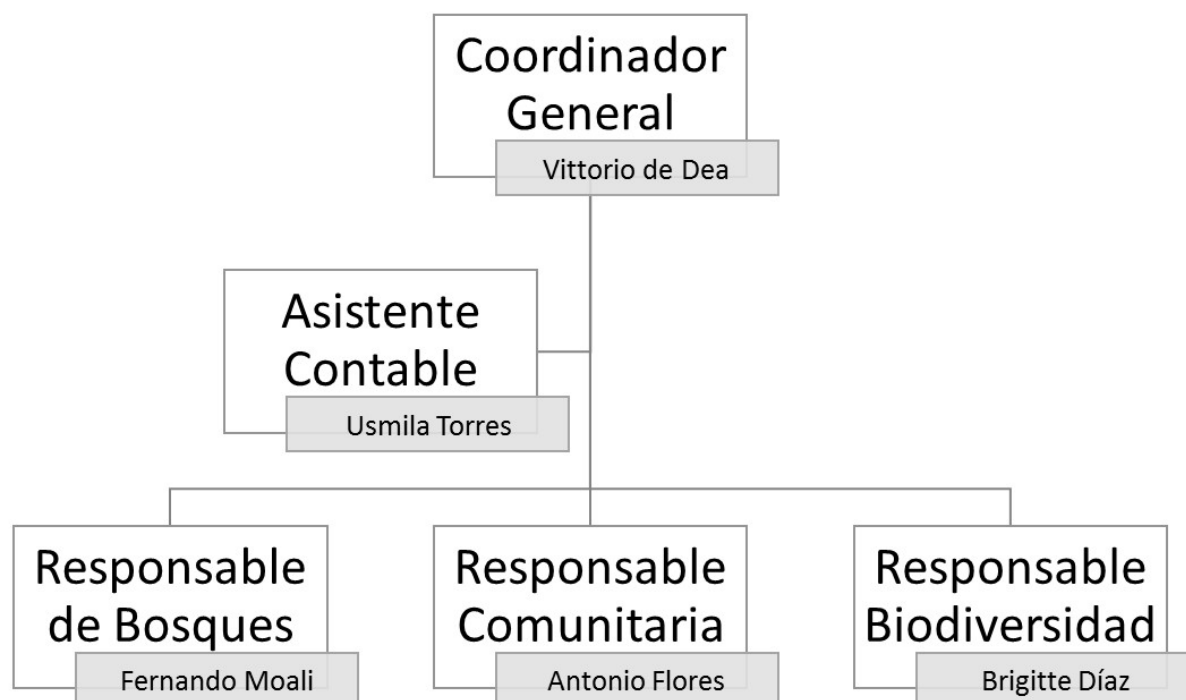
A general coordinator of the REDD+ project, leading a multidisciplinary team with three coordinators, each one related with each one of the components of the REDD+ project:

- *A coordinator of forest aspects*
- *A coordinator of community relationships*
- *A coordinator of biodiversity monitoring*

Each technical leader will organize its specific own team, according to needs and activities.

Complementing the technical team, an administrative assistant will provide general support to the implementation of REDD+ activities. The organizational structure is reflected in the following summarized chart:

CHART 2: BOZOVICH GOVERNANCE STRUCTURE FOR REDD+ PROJECT



2.4.2 Required Technical Skills (G4.2)

BOZOVICH GROUP has a multidisciplinary technical team that includes profiles for required skills for the REDD+ project, including community engagement, biodiversity assessment, carbon measurement and monitoring.

In annexes, the CVs of core personnel described in 2.4.1 are attached.

2.4.3 Management Team Experience (G4.2)

BOZOVICH has a large experience in the timber sector as they have been producing and exporting timber products for decades. It implies the implementation of Corporate Social Relationship activities, especially with surrounding population. As indicated in the FSC report, the high social standards are part of the permanent work of BOZOVICH. In 2002, the Peruvian Government granted these concessions but BOZOVICH has nearly 50 years in the forest sector:

(https://issuu.com/bozovich/docs/reportaje_mundo_empresarial_-_40_a_os)

It includes specific rules about labor conditions, training for local population in logging operations, ethical restrictions in the relationships of workers with local population, among others.

Regarding biodiversity activities, BOZOVICH also has many years of experience implementing a jaguar-monitoring plan as an index of biodiversity health and conservation.

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

On the other side, BOZOVICH is new in the carbon business and has no experience developing carbon projects, calculating GHG reductions and trading VCU. For this reason, BOZOVICH has established a partnership with GREENOXX, who has more than 16 years of experience in the carbon market and has developed previously this type of projects in REDD+ in Peru with FSC certified forest concessions.

Another partnership established by BOZOVICH is with the “Instituto de Educacion Superior Tecnologico Publico Iberia-Tahuamanu”. Through this partnership, students can work in the forest concession and can develop researches that are useful to increase the value of forests, by finding new species, new uses of known species, new technologies among others but also supporting the biodiversity monitoring plan.

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

The cash flow included in the annexes shows that the project is backed by the logging operations. As can be seen in Annex of Cash Flow, the annual gross incomes from timber sales are US\$ 9 million, while the expected incomes from carbon sales are US\$ 3 million, which represents an additional 33% of current incomes.

During the audit visit, auditors will have access to internal financial information that can demonstrate the financial health of BOZOVICH GROUP, including annual memories, sales history and commercial contracts.

On the other side, GREENOXX has also the necessary financial health to provide commercial support during the whole cycle of the project while the INSTITUTE, as it is a public entity; it does not have any risk of financial failure.

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

On 2020, with the support of United Nations Office against Drugs and Crimes (UNODC), BOZOVICH elaborated and approved its guidelines for anti-corruption policy.

These guidelines started identifying potential areas of corruption risks (legal, commercial, reputational) and their potential impacts. From this diagnosis, it designs mitigation measures, including annual public reports about how the guidelines were addressed.

These guidelines are also included in annexes.

2.4.7 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

Commercial Information as prices and clients for timber and carbon components must be considered sensitive and confidential. This includes the cash flow of the whole operations.

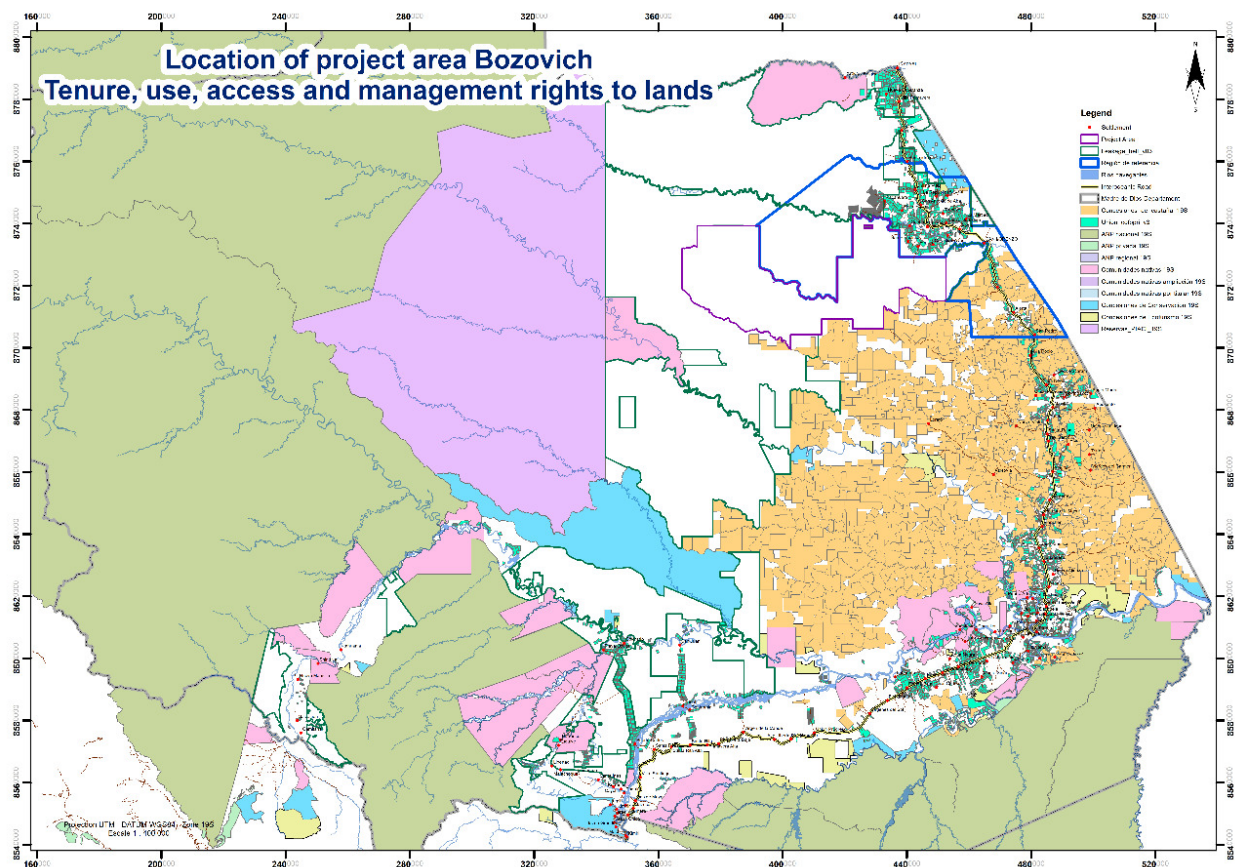
2.5 Legal Status and Property Rights

2.5.1 Statutory and Customary Property Rights (G5.1)

Madre de Dios is a region characterized by its pristine forests. A significant portion of its territory is legally protected with the creation of Natural Protected Areas while another significant portion of its territory has been granted as forest concessions. In the project zone, most of the areas are forest concessions (for timber purposes or for non-timber forest products as Brazil nuts and shiringa). In the adjacent areas to the Interoceanic Highway, agrarian plots (titled and non-titled) and settlements can be found.

In the northern part of the region, in the frontier with Bolivia, there is an indigenous community. There are more indigenous communities in the southern part of Madre de Dios, some of them very threatened by illegal mining that operates in the south of Madre de Dios.

MAP 9: LAND TENURE IN PROJECT ZONE



2.5.2 Recognition of Property Rights (G5.1)

*The Forestry and Wildlife Law No. 27308 and its regulations indicate that the management and use of forest resources in permanent production forests are carried out under public tender (40,000 ha) or public auction (10,000 ha) and that this award is for a period of 40 years renewable. Likewise, it specifies that the Concessionaire is directly responsible for the area but not for the subsoil. The timber forest concessions that make up each concession (Otorongo and Chullacchaqui) were awarded under the public tender modality and for their approval the General Forest Management Plans (PGMF) and the Annual Operating Plans (POA) were presented; as well as the payment for the right to use that is made to the State. It should be noted that each concession works as a large Concession, that is, it has only one PGMF and additionally can carry out the harvesting of other forest products, in this case Brazil nuts (*Bertholletia excelsa*) through a Complementary Plan (PC) presented to the competent authority. The contracts of each Consolidated with the State are detailed below and can be viewed in Annex xxx:*

- Consolidated Otorongo

1. 17-TAH/C-J-042-02
2. 17-TAH/C-J-043-02
3. 17-TAH/C-J-044-02
4. 17-TAH/C-J-017-02
5. 17-TAH/C-J-009-03
6. 17-TAH/C-J-003-03

- Consolidated Chullacchaqui

1. 17-TAH/C-J-040-02
2. 17-TAH/C-J-041-02
3. 17-TAH/C-J-045-02
4. 17-TAH/C-J-028-02

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

As already documented during FSC certification and other independent audits, there are not indigenous groups or traditional uses of forest resources that have been limited with the assignment of the forest concession. For this reason, no FPIC is needed.

2.5.4 Property Rights Protection (G5.3)

Concessions of timber products in forests of permanent production are contracts between the concession holder and the State. This contract defines by UTM coordinates (Zone 19L WGS 84) each concession belonging to the consolidated Otorongo and Chullacchaqui, thus protecting the right to use the surface within the area. The coordinates of the Consolidated are detailed below:

TABLE 29: COORDINATES OF PROJECT AREA

Consolidated Otorongo

Point	X	Y	Reference
V1	452,557	8,715,097	
V2	437,563	8,718,743	From V1 to V2: Cocama River or Sta Cruz
V3	437,561	8,711,044	
V4	432,534	8,712,939	From V3 to V4: Muymanu River
V5	432,558	8,706,061	
V6	422,557	8,706,061	
V7	422,557	8,709,251	
V8	412,548	8,709,253	
V9	412,547	8,714,619	
V10	417,557	8,714,619	From V9 to V10: Muymanu River
V11	417,557	8,729,249	
V12	422,557	8,729,249	
V13	422,557	8,742,595	
V14	428,591	8,741,203	From V13 to V14: Tahuamanu River
V15	429,002	8,741,203	
V16	429,010	8,742,538	
V17	435,037	8,740,215	From V16 to V17: Tahuamanu River
V18	434,216	8,737,823	From V17 to V18: Gorge N.N
V19	437,568	8,737,804	
V20	426,279	8,738,490	
V21	426,279	8,739,490	
V22	428,979	8,739,491	

V23	428,979	8,738,491	
V24	437,566	8,729,249	
V25	452,557	8,729,249	

Source: PGMF Otorongo (2018)

Consolidated Chullachaqui

Point	X	Y	Reference
V1	412548	8704241	
V2	402569	8704242	
V3	402569	8699534	From V3 to V4: Manuripe River
V4	382557	8709608	From V4 to V5: Manuripe River
V5	367557	8719141	
V6	367557	8731899	From V6 to V7: Muymanu River
V7	372557	8732250	
V8	372557	8739249	
V9	392557	8739249	
V10	392557	8725980	From V10 to V11: Muymanu River
V11	412547	8716142	

Source: PGMF Chullacchaqui (2018)

2.5.5 Illegal Activity Identification (G5.4)

Many illegal activities could affect project objectives. They are described in the following chart:

TABLE 30: ILLEGAL ACTIVITIES IDENTIFIED AND MITIGATION MEASURES

ILLEGAL ACTIVITIES	MITIGATION MEASURES TO BE TAKEN
--------------------	---------------------------------

<i>Illegal logging</i>	<i>An enhanced surveillance plan, including periodical patrolling and new control sites in rivers and access roads</i>
<i>Illegal hunting</i>	<i>An enhanced surveillance plan, including periodical patrolling</i>
<i>Illegal harvesting of non-timber forest products</i>	<i>Agreements with local families to allow in an organized and sustainable method the harvesting of nuts</i>
<i>Invasion</i>	<i>An enhanced surveillance plan, including periodical patrolling</i>
<i>Forest fires / clearance of areas</i>	<i>Monitoring Towers in key elevated points combined with monitoring and patrolling actions</i>

2.5.6 Ongoing Disputes (G5.5)

The concessions have been legally assigned to BOZOVICH group in forest areas that were being previously exploited by the same group based on previous forestry laws. The concession was granted in 2002 under the umbrella of the recently approved forestry law (in 2000), that changed completely how the forest was managed. With that law, the contract period extended to 40 years; the area was at minimum five thousands of hectares and the forest holder has the rights over all the resources existing in the granted territory. With the previous law, the right was only over a unique resource (in this case, the timber, while other person could have the right on other resources as nuts, for example). The period was shorter and the area was smaller. The changes were key to ensure the sustainability of forest management. However, BOZOVICH has a presence in the zone since many decades before the different changes in legal framework so no disputes are on the forest area.

2.5.7 National and Local Laws (G5.6)

The following is the current Peruvian legal framework applicable to the project. This legal framework comes from different levels of government and sectors, such as the central and regional government, the environmental and agricultural sectors, among others. The regulations included have been organized according to their subject matter (from general to specific) and scope (from national to regional).

TABLE 31: RELEVANT NATIONAL LEGAL FRAMEWORK

<i>Laws</i>	<i>Term</i>	<i>Content</i>
<i>The Constitution</i>	<i>October 31st 1993</i>	<i>It has a chapter that establishes the State's policy with respect to the environment and natural resources. Thus, it provides in article 66 that natural resources, both renewable and non-renewable, are the heritage of the Nation, and that an organic law establishes the conditions for their use and their granting to individuals. The concession grants its holder a right in rem, subject to that legal rule.</i>

		<i>With respect to environmental policy, article 67 of the Constitution recognizes the role of promoting the use of natural resources, affirming the State's commitment to developing possible mechanisms for the conservation and sustainable use of its biological diversity. Likewise, article 69 emphasizes the role of the State in promoting the sustainable development of the Amazon.</i>
<i>Law No. 28611 "General Environment Law"</i>	<i>October 15th, 2005</i>	<i>In Article VI of this Law, it stipulates that environmental management has as priority objectives to prevent, watch and avoid environmental degradation, and that when it is not possible to eliminate the causes that generate it, the corresponding measures of mitigation, recovery, restoration or eventual compensation are adopted. Likewise, article XI mentions that the design and application of environmental public policies are governed by the principle of environmental governance, which leads to the harmonization of policies, institutions, regulations, procedures, tools and information in such a way that it is possible for the effective and integrated participation of public and private actors in decision making, conflict management and consensus building, based on clearly defined responsibilities, legal security and transparency. On the other hand, Article 150 of the Law stipulates that those measures or processes that, on the initiative of the owner of the activity, are implemented and executed with the purpose of reducing and/or preventing environmental pollution and the degradation of natural resources, constitute conducts that can be rewarded with incentives.</i> <i>Article 92 of the law states that the State promotes the sustainable use of forest and wildlife resources, as well as the conservation of natural forests, emphasizing the principles of management and zoning of the national forest area, the management of forest resources, legal security in the granting of rights and the fight against illegal logging and hunting. It also promotes and supports the sustainable management of wild fauna and flora, prioritizing the protection of endemic and endangered species and varieties, based on technical, scientific and economic information and traditional knowledge.</i> <i>Article 94 of this Act states that environmental services include the protection of water resources, the protection of biodiversity, the mitigation of greenhouse gas emissions and scenic beauty, among others. In addition, while they generate benefits that are used without retribution or compensation, it establishes the need for the State to establish mechanisms to value, compensate and maintain the provision of these environmental services, seeking to achieve the conservation of ecosystems, biological diversity and other natural resources. This article ends by mentioning that the National Environmental Authority (Ministry of the Environment) promotes the</i>

		creation of financing, payment and supervision mechanisms for environmental services.
DL No. 1013 "Law for the Creation of the Ministry of the Environment"	May 15th, 2008	Through this standard, the Ministry of Environment is created, its scope of sectorial competence is established and its organic structure and its functions are regulated. The Ministry of Environment is the governing body of the executive branch of the environmental sector, which develops, directs, supervises and executes the National Environment Policy. The environmental sector includes the National Environmental Management System as a functional system, which integrates the National Environmental Impact Assessment System, the National Environmental Information System and the National System of Natural Areas Protected by the State. Among its functions is to develop and coordinate the national strategy against climate change and adaptation and mitigation measures, as well as supervise its implementation. It is also up to it to establish policies on environmental services prepare the inventory and establish mechanisms to value, reward and maintain the provision of environmental services, as well as to promote financing, payment and supervision thereof. Finally, it is up to him to promote the creation of financing, payment and supervision mechanisms for environmental services.
DS No. 12-2009-MINAM "National Environment Policy"	May 23rd, 2009	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,

		<i>emphasizing the importance of implementing systems of conservation of forests and protection of such as far as the degradation and deforestation.</i>
<i>DS No. 006-2009-MINAM "Accurate denomination and proper functioning of the National Commission for Climate Change in accordance with Legislative Decree No. 1013"</i>	<i>March 29th, 2009</i>	<i>The general function of the National Commission on Climate Change is to monitor the various public and private sectors involved in the issue, through the implementation of the United Nations Framework Convention on Climate Change, as well as the design and promotion of the National Climate Change Strategy, whose content should guide and inform national, sectoral and regional development strategies, plans and projects.</i>
<i>RM 104-2009-MINAM "Approves procedure for the assessment and authorization of Greenhouse Gas (GHG) emissions and carbon sequestration projects"</i>	<i>May 24th, 2009</i>	<i>With the approval of this procedure, the Ministry of the Environment proposes to promote the conservation of the environment, guaranteeing the sustainable use of natural resources in the framework of projects developed under the Clean Development Mechanism provided for in the Kyoto Protocol, forestry projects, projects to reduce emissions from deforestation and degradation (REDD) and programmatic CDM. The General Directorate of Climate Change, Desertification and Water Resources of the Ministry of the Environment is responsible for responding to project conformity.</i>
<i>DS No. 014-2011-MINAM "National Plan of Environmental Action" PLANAA - PERU 2011-2021</i>	<i>July 9th, 2011</i>	<i>It is an instrument of long term national environmental planning, which is formulated from a situational environmental diagnosis and from the management of natural resources, as well as from the potentialities of the country for the use and sustainable use of such resources; in the same way, it is based on the legal and institutional framework of the National System of Environmental Management. The fulfillment of the priority goals will contribute with the conservation and the sustainable use of the natural resources, the improvement in the environmental quality; and therefore, to improve the quality of life of our population. Goals are presented in the areas of water, solid waste, air, forest and climate change, biological diversity, mining and energy, and environmental governance. The goal in the area of Forests and Climate Change is that by 2021 the rate of deforestation in 54 million hectares of primary forests under various categories of land management will be reduced to zero, contributing, together with other initiatives, to reducing 47.5% of</i>

		<i>GHG emissions in the country, generated by changes in land use; as well as reducing vulnerability to climate change.</i>
<i>DS No. 011-2015-MINAM "National Strategy on Climate Change" update of DS No 086-2003-PCM</i>	<i>September 23rd, 2015</i>	<i>It is based on adaptation to the adverse effects and takes advantage of the opportunities imposed by climate change, laying the foundations for low-carbon sustainable development. The main objectives are for the population, economic agents and the state to increase awareness and adaptive capacity for action against the adverse effects and opportunities of climate change and; for the population, economic agents and the state to conserve carbon reserves and contribute to the reduction of GHG emissions. The means necessary for implementation are based on institutional and governance, public awareness and capacity building, scientific knowledge and technology, and financing.</i>
<i>Law 26839 "Law on the Conservation and Sustainable Use of Biological Diversity"</i>	<i>July 17th, 1997</i>	<i>It regulates the general framework for the conservation of biological diversity and the sustainable use of its components. It includes provisions for planning, inventory and monitoring, conservation mechanisms, rural and indigenous communities, and scientific and technological research. The Act establishes that the principles and definitions of the Convention on Biological Diversity govern its implementation and contains a title on protected natural areas, which is consistent with the provisions of Act No. 26834.</i>
<i>Law 26821 "Organic Law for the Sustainable Use of Natural Resources"</i>	<i>June 27th, 1997</i>	<i>It regulates the general framework for the sustainable use of natural resources, as they are part of the Nation's heritage.</i> <i>This law establishes that the natural resources maintained at their source, whether they are renewable or non-renewable, are part of the Nation's heritage. The fruits and products of the natural resources, obtained in the manner established in this Act, are the property of the holders of the rights granted over them. The rights over natural resources are granted to individuals through concessions, permits, and authorizations in accordance with the conditions established by the special rules for each resource. The special rules include the mechanisms for financial compensation to</i>

		<i>the State for the granting thereof, the maintenance of the right in force, the conditions for registration in the appropriate registry, and the possibility of assignment between individuals. This means that ownership, i.e. the ownership of the fruits and products obtained in accordance with this organic law, belongs to the holders of the rights granted over the areas where the natural resources providing them are located. The regulation for the grant of rights to private individuals for the use of natural resources, renewable and non-renewable, varies according to the nature of such resources.</i>
<i>DL No. 997 "Law on the Organization and Functions of the Ministry of Agriculture"</i>	<i>March 13th, 2008</i>	<i>The Ministry of Agriculture is the governing body of the agricultural sector and establishes the National Agricultural Policy, which is mandatory at all levels. Likewise, the Agrarian Sector includes the lands of agricultural use, of shepherding, the forest lands, the deserted lands with agrarian aptitude, the forest resources and their use; the flora and fauna; the hydric resources; the agrarian infrastructure; the activities of production, transformation and commercialization of crops and of breeding; and the services and activities linked to the agrarian activity such as the health, the investigation, the training, the extension and the transference of agrarian technology.</i>
<i>DL No. 1085 Establishes the Forest and Wildlife Resources Monitoring Agency"</i>	<i>June 28th, 2008</i>	<i>It created OSINFOR, which is responsible for supervising and overseeing the sustainable use and conservation of forest and wildlife resources, as well as the environmental services provided by the State through the various forms of use recognized in the Forestry and Wildlife Law and its regulations.</i>
<i>DS No. 030-2005-AG "Approve regulations for the Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in Peru"</i>	<i>July 10th, 2005</i>	<i>This standard is intended to regulate CITES provisions and establish the conditions and requirements for trade, trafficking and possession of species included in them CITES Appendices I, II and III. Its provisions are intended to ensure compliance with all the precepts of the Convention, with the purpose and to protect the species of wild fauna and flora threatened due to their intense trade. It was modified and updated by Supreme Decree No. 001-2008-MINAM where the Ministry of Agriculture (through SERFOR) and the Ministry of Production are designated as CITES Administrative Authorities Peru, to the Ministry of Environment as CITES Peru Scientific Authority.</i>

DS No. 009-2013-MINAGRI "National Forest and Wildlife Policy"	August 14th, 2013	<i>The National Forest and Wildlife Policy is a state policy that involves all levels of government and public and private actors, being mandatory for regional governments. The purpose is to contribute to the sustainable development of the country, through an adequate management of the National Forest and Wildlife Heritage, which ensures its sustainable use, conservation, protection and increase, for the provision of ecosystem goods and services, forestry, other ecosystems of wild vegetation and wildlife, in harmony with the social, cultural, economic and environmental interest of the Nation through five political axes: institutionalism and governance; sustainability; competitiveness; social inclusion and intercultural and; knowledge, science and technology.</i>
Law No. 29763 "Forestry and Wildlife Law" and its four Regulations	September 30th, 2015	<i>Aims to promote the conservation, protection, increase and sustainable use of forest and wildlife heritage within the national territory, integrating its management with the maintenance and improvement of forest and other wild vegetation ecosystem services, in harmony with the social, economic and environmental interest of the Nation; as well as to promote forest development, improve its competitiveness, generate and increase forest and wildlife resources and their value to society. The purpose of this Law is to establish the legal framework to regulate, promote and supervise forestry and wildlife activities in order to achieve their purpose. Article 13 creates the Forestry and Wildlife Service (SERFOR) as a specialized technical public body, being the National Forestry and Wildlife Authority. Likewise, the SERFOR is the governing body of the National System of Forestry and Wildlife Management (SINAFOR) and is constituted as its technical-normative authority at the national level, in charge of dictating the rules and establishing the procedures related to its scope. It coordinates its technical operation and is responsible for its proper functioning. With regard to its functions, Article 14 highlights paragraph e) To monitor compliance with the obligations of the rights granted under its jurisdiction and to sanction violations arising from its failure to comply, respecting the powers of the Forestry and Wildlife Resources Oversight Agency (OSINFOR), the Environmental Assessment and Monitoring Agency (OEFA), regional and local governments and other public bodies; paragraph g) Exercise the function of Authority of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in Peru for the specimens of the species of wild flora and fauna that reproduce on land, including all kinds of amphibians and emerging aquatic flora.</i> <i>Article 18 of the Forestry and Wildlife Resources Oversight Agency (OSINFOR) is responsible for supervising and monitoring the</i>

		sustainable use and conservation of forest and wildlife resources and the services provided by forest and other wild vegetation ecosystems, granted by the State through enabling titles regulated by this Act. The SERFOR and the regional and local governments, through their corresponding officials, compulsorily inform OSINFOR about the forest and wildlife management, the scope and status of the enabling titles granted, under administrative responsibility and without prejudice to civil and criminal liabilities. OSINFOR reaches in a timely manner all information that may be useful for the administration and control of forest and wildlife resources to the corresponding entity. In article 19, the regional government is the regional forestry and wildlife authority (ARFFS). Article 23. Forest and wildlife manager is the natural person with training and professional experience in the area that requires being managed and registered in the National Registry of Forest and Wildlife Regents, who formulates and subscribes to forest management or wildlife. He is responsible for directing the activities in application of the approved management plan, to guarantee the sustainability of the forest resource. It is jointly and severally responsible with the holder or holder of the enabling title of the veracity of the content of the management plan and its implementation, as well as the correct issuance of the forest transport guides. Article 29. Permanent production forests are established by ministerial resolution of the Ministry of the Environment, at the proposal of SERFOR, in category I and II forests, for the purpose of permanent production of wood and other forest products other than wood, as well as wildlife and the provision of ecosystem services. The State promotes the integrated management of these forests. To this end, the regional forestry and wildlife authority prepares, directly or through third parties, and approves the Master Management Plan containing, at a minimum, the identification of sites requiring special treatment to ensure the sustainability of harvesting, access routes, common roads and control points. Prior to its establishment, the State carries out the environmental impact assessment and consults the population that may be affected by its establishment.
DL No. 1085 "Law that creates the agency for the Supervision of Forest and Wildlife Resources"	June 28th, 2008	OSINFOR is attached to the Presidency of the Council of Ministers and constitutes a budgetary statement. It is the entity in charge, at the national level, of supervising and monitoring the use and conservation of forest and wildlife resources, as well as environmental services from the forest, for their sustainability, in accordance with the national policy and strategy for integrated management of natural resources and the policies on environmental services established by the Ministry of the Environment, within the

		<i>scope of its competence. OSINFOR's competencies do not involve Natural Protected Areas, which are governed by their own Law.</i>
<i>DS No. 007-2013-MINAGRI "Regulation of Organization and Functions of the National Forest and Wildlife Service - SERFOR"</i>	<i>July 18th, 2013</i>	<i>It is the national forestry and wildlife authority, which exercises its powers and functions at the national, regional and local levels, is subject to the regulatory framework on the subject and acts in accordance with national policies, plans and objectives, constituting the governing body of the National System of Forestry and Wildlife Management, hereinafter SINAFOR, and its technical-normative authority, responsible for issuing regulations and establishing procedures related to the area of its competence.</i>
<i>DS No. 018-2015-MINAGRI "Regulation for Forest Management"</i>	<i>September 30th, 2015</i>	<i>The regulation aims to promote the conservation, protection, enhancement and sustainable use of the forest heritage, integrating its management with the maintenance and improvement of forest and other wild vegetation ecosystem services. This applies to the different natural or legal persons, of public or private law, linked to the management of forests and wildlife, to the sustainable use of forest resources, to the services of the ecosystems of wild vegetation and to the forest and other forestry and related activities, throughout the national territory.</i>
<i>Law No. 29263 "Law on Ecological Crimes"</i>	<i>October 2nd, 2008</i>	<i>Law that modifies the penal types of ecological and environmental crimes and typifies their aggravated figures, such as illegal trafficking of protected wild flora and fauna species, illegal trafficking of aquatic species of protected wild flora and fauna, illegal extraction of aquatic species, depredation of protected flora and fauna, illegal trafficking of genetic resources, crimes against forests and forest formations, among other related crimes.</i>

TABLE 32: RELEVANT REGIONAL LEGAL FRAMEWORK

<i>Laws</i>	<i>Term</i>	<i>Content</i>
<i>Law No. 27783 "Law on the Bases of Decentralization"</i>	<i>July 17th, 2002</i>	<i>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, management and</i>

		<i>regulation of economic and productive activities in their scope and level, corresponding to the different sectors, including the environmental sector.</i>
<i>Law No. 27867 "Organic Law of Regional Governments"</i>	<i>November 19th, 2002</i>	<i>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.</i> <i>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.</i>
<i>Regional Ordinance 007- 2009- GRMDD/CR17</i>	<i>February 17th, 2009</i>	<i>Approves Opinion No. 003-2009-GOREMAD/CAMAYA establishing the Technical Commission on Climate Change in the Madre de Dios Region, which is responsible for proposing short-, medium- and long-term measures to raise awareness among the population and for establishing plans and programs to prevent a worsening of the conditions affecting the region's Amazon region, within the framework of the regional governments' responsibilities for the sustainable management of natural resources and the improvement of environmental quality and for the preservation and protection of regional reserves and protected natural areas Later modified by Regional Ordinance 005-2010-GRMDD/CR, where the name is changed to Technical Commission for Adaptation and Mitigation to Climate Change in the Madre de Dios region.</i>
<i>Regional Ordinance 032- 2009-GRMDD/CR</i>	<i>December 4th, 2009</i>	<i>Approves Ecological and Economic Zoning of Madre de Dios at macro level at a scale of 1:250,000 as a basic instrument of territorial planning, for the implementation of development policies, programs, public and private investment projects that lead to the achievement of sustainable development of the department.</i> <i>Identifies the Ecological and Economic Units from which the most appropriate use is defined for each space.</i>

¹⁷ This ordinance has not been published in the Diario Oficial El Peruano to date.

		<i>This means identifying areas with an agricultural, livestock, forestry, fishing, mining, energy, protection, biodiversity conservation, ecotourism, urban-industrial, and so on.</i> <i>The Ecological and Economic Zoning of Madre de Dios establishes 20 productive zones, including 14 agricultural production zones and 4 forest production zones and other associations. All of them make use of agriculture, agroforestry, tourism, conservation, reforestation and research. These areas are graphically represented on the map of Ecological and Simplified Economic Zoning.</i>
<i>Regional Ordinance 001-2012-RMDD / CR (August 26th, 2010) modifies Regional Ordinance 011-2010-GRMDD / CR</i>	<i>July 7th, 2012</i>	<i>The Regional Environmental Commission (CAR) of the region of Madre de Dios is created, in attention to the Legislative Decree N°1013, Law of Creation, Organization and Functions of the Ministry of the Environment; being constituted, like the instance of environmental management, in charge to coordinate and to arrange the regional environmental policy, promoting the dialogue and the agreement between the sectors public, private and civil society, articulating its environmental policies with the Ministry of the Environment.</i>

2.5.8 Approvals (G5.7)

In annex 2, the forest management plans approved by the Forest Regional Authority that establishes that BOZOVICH has all the required approvals to exploit commercially to forest resources and forest ecosystem services in the Project area as described in legal analysis of 2.5.7.

2.5.9 Project Ownership (G5.8)

In annex 2, the concession contracts signed with the State that establishes that BOZOVICH has clearly the legal rights to access to the forest resources and forest ecosystem services in the Project area as described in legal analysis of 2.5.7.

2.5.10 Management of Double Counting Risk (G5.9)

The project does not seek to commercialize carbon reduction units in other program, system or market, except the voluntary market and through VERRA platforms. In the case that a national regulation requires some change in this decision, BOZOVICH will communicate and retire the carbon reduction units appropriately.

2.5.11 Emissions Trading Programs and Other Binding Limits

The GHG emission reductions and removals generated by the project will not be used for compliance under such programs or mechanisms. Forest and Wildlife Law clearly states that the rights that are assigned to enabling titles forest holders (as timber forest concessions) include the right to benefits from environmental services, including the forest carbon storage.

2.5.12 Other Forms of Environmental Credit

The project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates.

2.5.13 Participation under Other GHG Programs

The project is not registered, nor is seeking registration under any other GHG programs. It is not discarded that in the future, this will be evaluated as an alternative. The project expects to be registered in the Peruvian National GHG Registry.

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 is not allowed and will not be practiced. All the sales, including the type of market or standard used for the transaction, will be uploaded in the webpage of the project proponent (without publishing sensitivity information of the sale).

3 CLIMATE

3.1 Application of Methodology

3.1.1 Title and Reference of Methodology

VM006

Methodology for Carbon Accounting for Mosaic and Landscape-scale REDD Projects

Version 2.2 - 17 March 2017 - Sectoral Scope 14.

3.1.2 Applicability of Methodology

TABLE 33: METHODOLOGY CONDITIONS OF APPLICABILITY ASSESSMENT

VM0006		YES / NO
GENERAL	Each parcel in the discrete project area must meet all applicable conditions.	
ELIGIBLE LAND ¹	The land in the project area consists of either a contiguous area or multiple discrete parcels of the project area.	The Project area is a continuous forest polygon, composed by multiple small concessions consolidated.
	Comply with an internationally accepted definition of forest.	The PA is a forest concession granted by Peruvian State. It covers more than 183 thousands of hectares of forest land
	Qualify as a forest for a minimum of 10 years prior to the project start date.	It has been a concession since 2002
	The project area should be deforested or degraded in the absence of the REDD project activity.	Surrounding forest concessions and forest areas are already being deforested by the expansion of agrarian frontier.
	Deforestation and degradation should be of a mosaic nature.	The rural property in Peru is very small and the agrarian production is mainly caused by small-scale agriculture (less than 5 ha explains more than 90% of Amazon forest loss according to the ENBCC)
CAUSES OF DEFORESTATION AND FOREST DEGRADATION ²	Conversion of forestland to farmland for subsistence agriculture.	The main driver of deforestation is agrarian production of neighboring communities, mainly Arca Pacahuara. They combine subsistence production with commercial production.

	Conversion of forest lands into settlements.	New settlements are likely to occur within the Project area even though they are not allowed. Recent history proves this type of land occupation practices.
	Conversion of forestland into infrastructure, including new roads.	Agrarian neighbors request and obtain municipality support to build new roads.
	The felling of timber for commercial sale (e.g. timber planks or posts for commercial sale).	
	The logging of wood for local businesses and household uses.	
	Collection of wood for commercial sale of firewood and charcoal.	
	Collection of wood for local domestic and industrial energy needs (e.g. cooking, home heating, tobacco curing, brick making).	
	Livestock in the forests.	
	Removal of vegetation from the understory (e.g. collection of thatch grass for roofing and bedding materials from livestock, shrubs and small trees for thatch fences).	
	Forest fires to the extent that they are not part of the dynamics of natural ecosystems (e.g. hunting-related forest fires, honey harvesting, and intentional dismantling of land with a high fuel load).	
ELIGIBLE PROJECT ACTIVITIES ³	Strengthening the land tenure and forest governance situation.	The theory of change is based on a production-protection approach that states that the governance strengthening must be combined with productive development. As described below, the Project includes activities related to enhancement of surveillance and control
	Support the development and implementation of sustainable forest and land use management plans.	Enhancement of forest management actions, including research activities

		Demarcating forest, tenure and property boundaries; promote forest protection through patrolling of forests and forest boundaries; promote social inclusion and administration in local communities; facilitating social fencing through capacity-building; and create mechanisms to alert law enforcement authorities to forest invasion. Fire prevention and firefighting activities, including building firewalls, reducing fuel loads, prescribed burning, education to minimize fires caused by intent, support for fire brigades, water tanks, fire guards and communication systems.	Land demarcation and patrolling are also considered in the activities and a socialization of environmental crimes. Fire prevention is considered too.
		Reduce wood consumption and/or increase energy efficiency by introducing wood stoves or brick ovens and curing equipment.	Not considered
		Creation of alternative sources of fuelwood through agroforestry, management of forest plots and introduction/intensification of other renewable and non-fossil fuel based energy sources (such as solar energy)	Not considered
		Sustainable agricultural intensification on existing agricultural land. - Development of local enterprises based on sustainably harvested non-timber forest products (NTFPs), such as honey, medicinal plants, etc.	Bozovich will extend its social work with neighbouring communities by supporting sustainable productive projects related with agrarian crops and other innovative products with local families
OPTIONAL ACTIVITIES	ASSISTED NATURAL REGENERATION (ANR) ⁴	They should take place on degraded land where no previous NRA activity has taken place.	No assisted natural regeneration is included between the activities
		Areas that were forest at the beginning of the project, but were deforested during the project's accreditation period, are eligible.	
		NRA activities consist of thinning, removal of invasive species, enrichment planting and coppicing.	
		If harvesting takes place or is planned in areas where NRA activities take place, this area should be considered as an area under harvest.	
		Area of NRA activities: deforested area/year - natural regeneration/year.	

EXPLOITATION ⁶		<i>Specify the size and location of the NRA's area of activity.</i>	
		<i>The harvesting plan and harvesting activities should follow the guidelines of the Best Management Practices (BMP) of the country or jurisdiction, if such guidelines exist.</i>	
		<i>The harvest plan should describe procedures to protect soil, water, and residual trees in the harvest area and provide documentation of the presence/absence of any threatened or endangered species at the site, the potential impacts on the species, and the mitigation measures to be employed.</i>	
		<i>The harvest plan must describe the biophysical sustainability of the harvesting practices.</i>	
		<i>At minimum, the biophysical sustainability must be demonstrated by ensuring that the net removal of biomass from harvesting is less than the net increment of the biomass in the forest.</i>	
		<i>Where possible, the project proponent should use criteria and indicators such as from International Tropical Timber Organization (ITTO) to assess the sustainability of harvesting practices.</i>	
		<i>In addition, it is recommended to obtain sustainability certification from third parties, such as the Forest Stewardship Council or the Sustainable Forestry Initiative.)</i>	<i>The whole area is certified under FSC standard since 2011.</i>
¹ Not applicable to organic soils or peatlands. ² and ³ You must submit one or more of the activities. ² None of the above factors should be of a planned nature. ² If deforestation is occurring for a specific factor as a result of planned forest conversion activities, then that factor should be excluded from the analysis. ⁴ and ⁵ You are only eligible if all activities are completed.			

3.1.3 Project Boundary

Define the project boundary and identify the relevant GHG sources, sinks and reservoirs for the project and baseline scenarios (including leakage if applicable).

TABLE 34: SOURCES, SINKS AND RESERVOIRS

Source		Gas	Included?	Justification/Explanation
Baseline	AGB	CO2	X	<i>In this type of non-flooded forests, the main source of GHG emissions is burn of biomass from deforestation</i>
		CH4		
		N2O		
		Other		
	BGB	CO2	X	<i>In this type of non-flooded forests, the main source of GHG emissions is burn of biomass from deforestation</i>
		CH4		
		N2O		
		Other		
Project	AGB	CO2	X	<i>In this type of non-flooded forests, the main source of GHG emissions is burn of biomass from deforestation</i>
		CH4		
		N2O		
		Other		
	BGB	CO2	X	<i>In this type of non-flooded forests, the main source of GHG emissions is burn of biomass from deforestation</i>
		CH4		
		N2O		
		Other		

3.1.4 Baseline Scenario

The REDD+ project is located in Madre de Dios Region, which is one of the Amazonian Regions with the highest deforestation rate growth, growing exponentially since 2009, when the paving of Interoceanic Highway was completed.

Thanks to this, the cost of transportation of products reduced dramatically and the time to go from Puerto Maldonado (Madre de Dios) to Cusco declined from 3 days to 14 hours. Thanks to this and with the rise of gold price, migration to Madre de Dios from highlands increased drastically and the migrants, mainly dedicated to agriculture in their towns of origin, searched for lands to settle and do the same activities as they did traditionally.

Migrants do not have knowledge nor experience for harvesting, processing, storing and trading forest products. For these reason, and taking advantage of the weak governance, migrants search or obtain illegally from land traffickers, recently cleared forestlands for live and produce.

The following chart shows the increasing of deforestation in Madre de Dios, which multiply four times in the current century as was presented in chart 1.

Based on that, the most likely scenario is an increase in deforested areas in the baseline scenario. To estimate the projected rate, it is necessary to define an appropriate area with similar characteristics in terms of political, administrative, social, and geophysical and land tenure aspects.

BOZOVICH forest timber concessions are located in Tahuamanu Province, mostly in Iberia and Tahuamanu districts.

For this reason, the reference region is focused on those districts and has been built including the whole remaining area of Iberia district (as the focus from deforestation comes from that district) while the difference is covered by part of Tahuamanu district. It must be remembered that the reference region must be at least 250,000 hectares.

BOZOVICH forest timber concessions are located in Tahuamanu Province, mostly in Iberia and Tahuamanu districts:

TABLE 35: PROJECT AREA LOCATION, BY DISTRICTS (IN %)

District	Area	%
Iberia	75,050	41%
Las Piedras	479	0%
Tahuamanu	93,146	51%
Iñapari	14,341	8%
	183,016	

While, the reference region is distributed as follows:

TABLE 36: REFERENCE REGION LOCATION, BY DISTRICTS (IN %)

District	Area	%
Iberia	148,530	59%

Tahuamanu	102,008	41%
	250,538	

After defining the Reference Region, we have estimated, from the official source (<http://geobosques.minam.gob.pe/geobosque/view/perdida.php>), the annual forest loss in the area of the Reference Region since 2001.

As recommended by the most prestigious standards, the historical reference period must be at least the 10 most recent years so the projection is based on the period 2008-2017.

The annual forest loss in the area of the Reference Region since 2001. Data is shown below:

TABLE 37: FOREST LOSS IN REFERENCE REGION

Year	Forest loss in RR (ha)
2,001	536
2,002	484
2,003	567
2,004	966
2,005	1,065
2,006	816
2,007	714
2,008	1,904
2,009	676
2,010	1,137
2,011	1,271
2,012	804
2,013	1,428
2,014	2,111
2,015	2,426

2,016	2,888
2,017	3,659

We have compared the five most typical mathematical equation:

- Linear
- Polynomial
- Logarithmic
- Exponential
- Power

The criteria for this comparison is the squared R (R^2), which measures the degree of accuracy and is used to predict future forecasts, which is what we need to know what will be the deforestation in the reference region in the coming years.

The results show that the polynomial equation is the best predictor considering the available data.

The results in squared R (R^2) for each type of equation is as follows:

TABLE 38: SQUARED R BY TYPE OF EQUATION

Type of Equation	R^2
Linear	0.6139
Polynomial	0.9074
Exponential	0.5374
Logarithmic	0.3266
Power	0.2837

CHART 3: TYPE OF EQUATIONS FOR REFERENCE REGION

Linear	Exponential
--------	-------------



By using the chosen equation ($67.681 x^2 - 496.84 x + 1957$), where x = year, the next step was projecting to the first 10-years crediting period years (2018-2027).

Then, with the results obtained, we extrapolate the data to the project area by multiplying by a factor obtained by dividing the (project area / reference region area).

Where project area is 181,582 ha while reference region area is 250,538, so the fraction is 0.72.

To extrapolate from hectares to tons of CO₂e, we also have used the official information about emission factor; the eco-zones of Ministry of Environment. The whole project area and reference region is located in the Eco-zone “Selva Baja”, which have an average stock of CO₂e of 514.1 tCO₂e/ha. This can be verified in the official FREL submission of Peru to UNFCCC¹⁸.

By using the chosen equation ($67.681 x^2 - 496.84 x + 1957$), where x = year, the next step was projecting to the first 10-years crediting period years (2018-2027).

TABLE 39: PROJECTED FOREST LOSS FOR REFERENCE REGION

		2018 (year 11)	2019 (year 12)	2020 (year 13)
Reference Region	Hectares	4,681	5,741	6,936
	tCO ₂ e	2,406,739	2,951,594	3,566,039

Then, with the results obtained, we extrapolate the data to the project area by multiplying by a factor obtained by dividing the (project area / reference region area).

$$\text{Emissions in Project Area} = \text{Emissions in Reference Region} \times \frac{\text{Project Area}}{\text{Reference Region Area}}$$

Where project area is 181,582 ha while reference region area is 250,538, so the fraction is 0.72. Based on this analysis, the results for the project area is:

TABLE 40: PROJECTED FOREST LOSS FOR PROJECT AREA

		2018 (year 11)	2019 (year 12)	2020 (year 13)
Project Area	Hectares	3,393	4,161	5,027
	tCO ₂ e	1,744,326	2,139,219	2,584,548

To extrapolate from hectares to tons of CO₂e, we also have used the official information about emission factor; the eco-zones of Ministry of Environment. The whole project area and reference region is located in the Eco-zone “Selva Baja”, which have an average stock of CO₂e of 514.1 tCO₂e/ha. This can be verified in the official FREL submission of Peru to UNFCCC¹⁹.

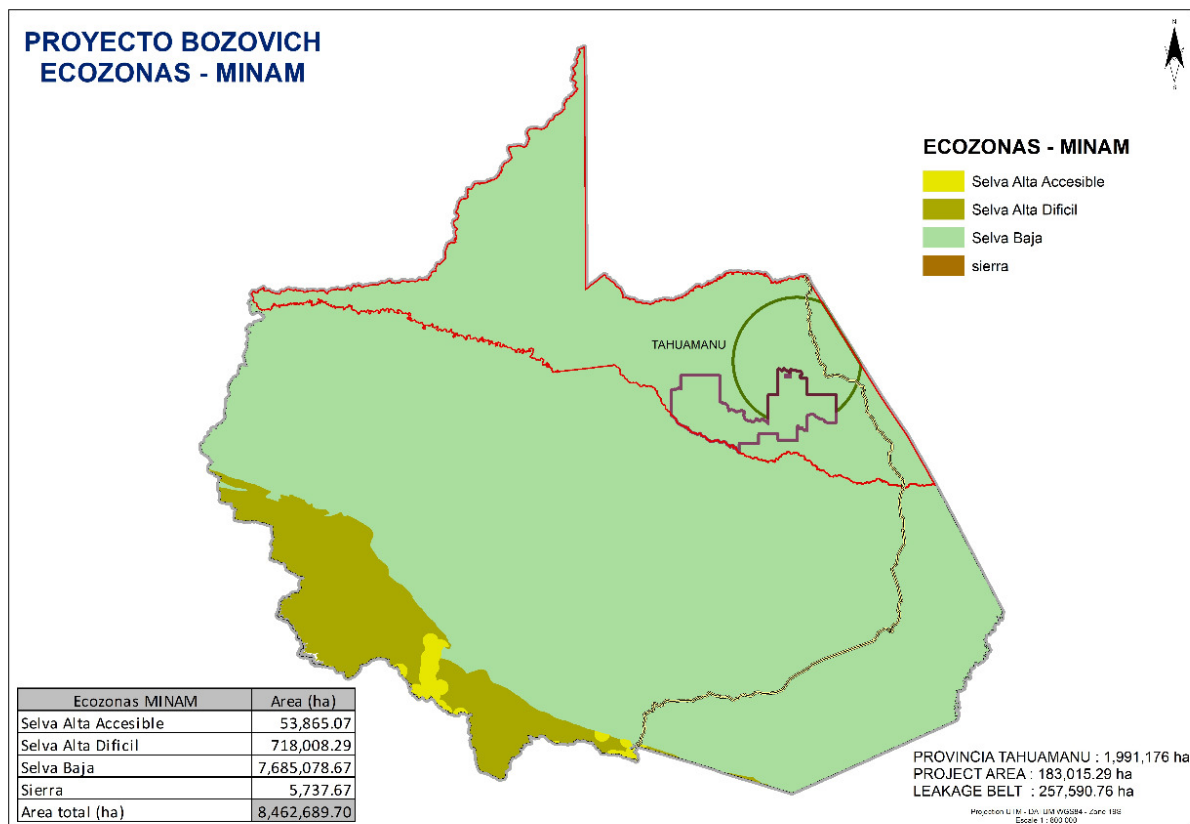
MAP 10: FOREST ZONE IN PROJECT AREA AND REFERENCE REGION

¹⁸

https://redd.unfccc.int/files/2015_submission_frel_peru_es.pdf

¹⁹

https://redd.unfccc.int/files/2015_submission_frel_peru_es.pdf



3.1.5 Additionality (solo falta esto)

Demonstrate and assess the additionality of the project, in accordance with the applied methodology and any relevant tools, taking into account of the following:

Where a project method is applied to demonstrate additionality and the procedure in the applied methodology or tool involves several steps, describe how each step is applied and clearly document the outcome of each step. Indicate clearly the method selected to demonstrate additionality (e.g., investment analysis or barrier analysis in the case of the CDM Tool for the demonstration and assessment of additionality). Where barrier analysis, or equivalent, is used to demonstrate additionality, only include the most relevant barriers. Justify the credibility of the barriers with key facts and/or assumptions and the rationale. Provide all relevant references.

Where a performance method is applied to demonstrate additionality, demonstrate that performance can be achieved to a level at least equivalent to the performance benchmark metric.

Where the methodology applies an activity method for the demonstration of additionality, use this section to demonstrate regulatory surplus (only) and include a statement that notes that conformance with the positive list is demonstrated in the Applicability of Methodology section, above.

Provide sufficient information (including all relevant data and parameters, with sources) so that a reader can reproduce the additionality analysis and obtain the same results.

To develop this section, we have applied the “tool for the demonstration and assessment of additionality in VCS agriculture, forestry and other land use (AFOLU) project activities” (VT 0001). Version 3.0 from February 2012, Sectoral Scope 14.

STEP 1: IDENTIFICATION OF ALTERNATIVE LAND USE SCENARIO

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

The most credible land use in the without project scenario is the expansion of agrarian frontier from rural producers living in the surrounding settlements. This assumption is based on the empirical evidence registered by forest cover monitoring module IMMCB), in charge of PNCB-MINAM.

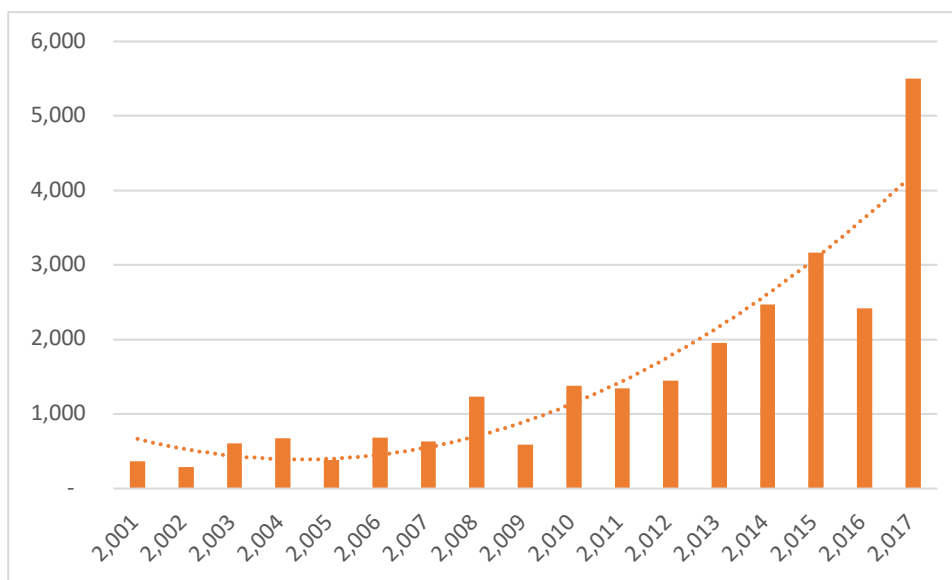
As can be seen in following table, deforestation in other forest concessions shows an increasing deforestation rate in a land tenure class that is the same category that the project area: a timber forest concession.

TABLE 41: DEFORESTATION IN MADRE DE DIOS FOREST CONCESSIONS (IN HA/YEAR)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
366	287	607	676	385	686	631	1,233	590	1,381	1,348	1,444	1,958	2,469	3,164	2,418	5,505

The data shows an exponential growth rate of deforestation so it is likely to assume that the project area will face a similar situation in the absence of the implementation of the project with the carbon incomes.

CHART 04: DEFORESTATION IN MADRE DE DIOS FOREST CONCESSIONS (IN HA/YEAR)



More details on the threat that the project faces may be found in Community Section.

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

Even though the land use change in areas whose main capacity is the forest production is forbidden, the empirical evidence shows that current traditional practices prevails and it is being more and more intensive on time. Many forest concessions in Madre de Dios are not feasible anymore because they were forced to reduce their forest production area because of the deforestation and illegal logging. Data presented in table 41 supports this assumption.

Sub-step 1c. Selection of the baseline scenario

The baseline scenario is a growing deforestation rate caused by an expansion of agrarian frontier.

STEP 2: INVESTMENT ANALYSIS

In the financial analysis, attached as Flujo de Caja, the NPV reduces from US\$ 5.047.540 (in the project scenario) to US\$ 1.852.573 in the without project-scenario. This implies that without the incomes from carbon sales, BOZOVICH will not be able to fund and implement the project activities that are key to reduce the deforestation rate that is expected according to baseline projections within project area. According to the same cash flow, the estimated required budget for the same analysis period for project activities is US\$953.700. In the case that those activities would have implemented with BOZOVICH funds (but without carbon incomes), the NPV would have reduced to US\$ 1.133.873, which is below the benchmark of the company.

Therefore, the company, without the incomes from carbon sales, will not implement the activities needed to prevent growing deforestation rate with the subsequent impact on the loss of forest area at the rates established in the baseline scenario registering the progressive and proportional reduction of its harvestable area and timber incomes. So, the NPV in the without project scenario will continue reducing through the years as is observed in surrounding forest concessions.

STEP 4: COMMON PRACTICE ANALYSIS

*No similar practices as the ones proposed by the project proponent as project activities specifically designed to reduce deforestation rate by change the pattern of land use and offering alternative sustainable economic incomes to neighboring rural families. Only other VCS REDD+ projects implement this type of activities successfully but the tool clearly states that this type of initiatives must be excluded in this mapping. For this reason, and following the methodological tool, the project is clearly **additional**.*

3.1.6 Methodology Deviations

No deviations are considered at this moment.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions

STEP 1: SELECT SPACIAL BOUNDARIES

Project area is the sum of forest concessions Otorongo and Chullachaqui

STEP 2: DESCRIBE SPATIAL BOUNDARIES OF THE DISCRETE PROJECT AREA PARCELS

The KML of the project is attached to the PD.

STEP 3: SELECT A VALID REFERENCE REGION

As described in 3.1.4, the reference region meets the attributes indicated in the methodology. It is over 250,000 ha. There is not biased because it is located in the same districts than the project area (and in very similar proportions). It does not include areas with restricted access and the forest cover is largely higher than 15% of total reference region area.

As can be seen in map, the drivers of deforestation are similar in reference region and project area, as both are geographically close between them. These are mainly expansion of agrarian frontier, mostly for corn production for regional market. Elevation and slope, among other components of landscape configuration confirm the similarities between both areas. Finally, land tenure in both cases is composed by forest concessions and agrarian plots and a few urban areas.

STEP 4: DATA SOURCES

Project only works with official information of the country. In this case, as Peru has only developed a methodology and systematic data series for deforestation, the project has only considered this activity as part of the REDD accounting. When Peru completes the methodological process for measuring degradation, the project will add this activity enhancing the significance of measurements. The methodology for generating the data may be reviewed in the webpage of MINAM²⁰.

STEP 5: DEFINE LULC CLASSES AND FOREST STRATA

Based on the same criteria, we have worked with the official stratification used by the Government of Peru, which are the eco-zones. In this case, in the project area and reference region, the whole area corresponds to the eco-zone "Selva Baja" so there is only one forest stratum. For LULC classes, as there are not official categories, we have worked with the stratification proposed by a REDD+ project, already validated, and implemented in Madre de Dios too. This project proposes four LULC classes.

STEP 6: LAND TRANSITIONS BETWEEN LULC CLASSES / FOREST STRATA

From the same source for determining the LULC classes, we have used the percentages used in that PD for each land transition, which are:

TABLE 42: LAND TRANSITIONS

²⁰ <http://geobosques.minam.gob.pe/geobosque/view/index.php>

LULC classes \ Forest strata	Cropland	Pastures	Infrastructure
Selva Baja	41.26%	51.79%	5.94%

STEP 7: MAP ACCURACY ASSESSMENT AND DISCOUNTING FACTOR DETERMINATION

According to table 6 of the methodology, the number of images is 10, which implies that no discount is applied at this level. On the other side, the accuracy attained for that classification was 71% so the discount factor that corresponds to $u_{classification}$ is 0.75. Meanwhile, according to the methodology, the number of time points available in biomass inventories is one, so, as recommended by the methodology, for the first verification, the $u_{stratification}$ must be 0.75.

STEP 8: ASSESS THE RELATIVE IMPORTANCE OF DEFORESTATION DRIVERS

A set of equations (EQ1 to EQ10) to determine the absolute annual carbon loss per driver. In the case of the project, there are only three deforestation drivers and one degradation driver, commercial logging so we have used EQ1, EQ2 and EQ3 (which are similar) for deforestation drivers and EQ4 for degradation driver.

$$L(1) = CF \cdot \sum_{i=1}^{nrStrata} \left(\Delta area_{cropland,baseline}(i) \cdot (OM(i) - OM(cropland)) \right) \quad [EQ1]$$

$$L(4) = CT_{baseline} \cdot \rho_{wood} \cdot BEF_2 \cdot CF \quad [EQ4]$$

Based on the assumptions, described in attached Excel file, we obtain the following table:

TABLE 43: EMISSIONS IN PROJECT AREA IN BASELINE SCENARIO (in tons of C)

	Conversion of forestlands to:			Commercial Logging L(4)	TOTAL
	Croplands L(1)	Pastures L(2)	Infrastructure L(3)		
2018	184,162	237,450	28,258	14,912	464,782
2019	225,854	291,205	34,655	11,316	563,030
2020	272,871	351,827	41,870	57,191	723,758
2021	325,213	419,314	49,901	27,806	822,234
2022	382,879	493,667	58,750	27,806	963,102
2023	445,871	574,885	68,415	27,806	1,116,978
2024	514,188	662,970	78,898	27,806	1,283,861
2025	587,829	757,920	90,197	27,806	1,463,753
2026	666,796	859,735	102,314	27,806	1,656,652

2027	751,088	968,417	115,248	27,806	1,862,559
TOTAL	4,356,751	5,617,389	668,506	278,062	10,920,709

STEP 9: MOBILITY OF EACH DEFORESTATION DRIVERS

The deforestation drivers are in all the cases rural families, locals or migrants, so the access to production areas are mostly with motorcycles. In the case of commercial logging, which is done by the same company, they have trucks for the transportation of timber.

STEP 10: DETERMINE AND CALCULATE EMISSION FACTORS

We have taken official data from Peruvian Government for emission factor of forest stratum "Selva Baja" and for emission factor of LULC, we have collected from the REDD+ project previously mentioned. Data is presented in Table 43.

TABLE 44: CARBON STOCK IN LULC CLASSES AND FOREST STRATUM

Forest stratum / LULC classes	tC/ha
Forest stratum "Selva Baja"	140.21
LULC Class: cropland	8.66
LULC Class: pastures	5.08
LULC Class: infrastructure	0

Based on those data, we can calculate the emission factor for all the transitions, by using EQ26:

$$EF_{AGL}(CS1 \rightarrow CS2) = \frac{44}{12} \cdot (C_{AGL}(CS2) - C_{AGL}(CS1)) \quad [EQ26]$$

As allowed by the methodology, non-CO2 gases are omitted and it is the same for other pools (dead wood, soil organic carbon).

TABLE 45: EMISSION FACTOR PER TYPE OF LAND TRANSITION

Forest stratum →	LULC class	tCO2/ha
Selva Baja	Cropland	482.35
Selva Baja	Pastures	495.47
Selva Baja	Infrastructure	514.10

STEP 11: CALCULATE TOTAL RATES OF DEFORESTATION AND DEGRADATION IN THE PROJECT AREA

By using the Beta regression proposed by the methodology, the results are as follows:

TABLE 46: BETA REGRESSION

		Beta regression describes the relationship between time and deforestation rate in reference region during reference historical period [ha/year]	Project area [ha]	Reference Region [ha]	Deforestation in project area in baseline scenario [ha/year]
-10	2008	1,528	181,582	250,538	1,108
-9	2009	1,234			895
-8	2010	1,076			780
-7	2011	1,053			763
-6	2012	1,165			844
-5	2013	1,413			1,024
-4	2014	1,796			1,302
-3	2015	2,314			1,677
-2	2016	2,968			2,151
-1	2017	3,757			2,723
1	2018	4,681			3,393
2	2019	5,741			4,161
3	2020	6,936			5,027
4	2021	8,267			5,992
5	2022	9,733			7,054
6	2023	11,334			8,215
7	2024	13,071			9,473
8	2025	14,943			10,830
9	2026	16,950			12,285
10	2027	19,093			13,838

Regeneration is not significant and is omitted.

STEP 11: CALIBRATE AND VALIDATE A SPATIAL MODEL

As described in Chart 3, a statistical analysis was done to compare which is the most accurate statistical equation based on historical reference region deforestation data and the polynomial equation was chosen. In the case of degradation from commercial logging, the information is based on the official information of volume logged per year in the project area and the average was extrapolated for the coming years (2021-2027). This information is also described in more detail in the Excel file attached.

3.2.2 Project Emissions

As explained before, there are two sources of emissions in baseline scenario:

- From deforestation for croplands, pastures and infrastructure
- From degradation for commercial logging

The assumption of effectiveness is presented in the following table:

TABLE 47: EFFECTIVENESS OF PROJECT ACTIVITIES IN TERMS OF EMISSIONS REDUCTION

Source of Emissions	Effectiveness
Deforestation	100%
Degradation	0%

In the case of degradation, the effectiveness is assumed as 0% because the commercial logging is done by the same project proponent, BOZOVICH GROUP, and it is already being done at a sustainable way. The proof is that the concessions are already FSC certified, which guarantees the sustainable forest management that includes the logging operations. Therefore, there are no plans to diminish the volume harvested as it already did when the FSC certification was obtained.

On the other side, the project proponent expects that the activities proposed in the theory of change reduce the whole pressure and threat on project area as they are focusing on creating alternative income sources for surrounding families with the objective to change the pattern of land use.

As a conclusion, the emission in project scenario are similar to emissions in baseline scenario from degradation activity associated to commercial logging:

TABLE 48: PROJECT EMISSIONS

	tCO2
2018	54,677
2019	41,491
2020	209,700
2021	101,956
2022	101,956
2023	101,956
2024	101,956
2025	101,956
2026	101,956
2027	101,956
TOTAL	1,019,561

3.2.3 Leakage

Describe the procedure for quantification of leakage emissions in accordance with the applied methodology. Include all relevant equations, and explain and justify all relevant methodological choices (e.g., with respect to selection of emission factors and default values).

First of all, we need to determine what types of drivers are the ones that the project has to deal with. As explained before, the main threat comes from surrounding settlements than are related with agrarian production. According to the methodology, it classifies as geographically constrained drivers.

To estimate the emissions from this type of leakage, we must use the following equations:

$$\Delta D_{LK,DF}(t) = RelativeLeakageImpact_{DF}(t) \cdot D_{projectArea,baselineScenario,DF}(t) \quad [EQ81]$$

$$\Delta D_{LK,DG}(t) = RelativeLeakageImpact_{DG}(t) \cdot D_{projectArea,baselineScenario,DG}(t) \quad [EQ82]$$

Where $D_{projectArea,baselineScenario}(t)$ is the expected deforestation within the project area in the baseline scenario and $RelativeLeakageImpact(t)$ is the expected percentage of displacement of this deforestation outside the project area, to the leakage belt.

$$\begin{aligned} &RelativeLeakageImpact_{DF}(t) \\ &= \sum_{d=1}^{nrCDrivers} leakage_{constrained}(d) \\ &\cdot RelativeDriverImpact_{DF}(t, d) \end{aligned} \quad [EQ83]$$

$RelativeLeakageImpact$ is the aggregated sum of the leakage cancellation rates of each driver, which is a complex formula, that depends on the effectiveness of the project activities to effectively change the pattern of land use instead of simply displace the current unsustainable pattern outside the project area.:

$$\frac{\Delta area_{cropLand,project} - \Delta area_{cropLand,allowed}}{\Delta area_{cropLand,baseline} - \Delta area_{cropLand,allowed}} \quad [EQ85]$$

The calculations are present in the Excel Spreadsheet attached.

3.2.4 Net GHG Emission Reductions and Removals

Describe the procedure for quantification of net GHG emission reductions and removals. Include all relevant equations. For AFOLU projects, include equations for the quantification of net change in carbon stocks.

Provide the ex-ante calculation (estimate) of baseline emissions/removals, project emissions/removals, leakage emissions and net GHG emission reductions and removals in the table below.

For data and parameters monitored, use estimates. Document how each equation is applied, in a manner that enables the reader to reproduce the calculation. Provide example calculations for all key equations, to allow the reader to reproduce the calculation of estimated net GHG emission reductions or removals.

TABLE 49: NET GHG EMISSIONS REDUCTIONS

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (Tco ₂ e)	Estimated leakage emissions (Tco ₂ e)	Estimated net GHG emission reductions or removals (Tco ₂ e)
Year 1: 2018	1,711,600	54,677	66,808	1,590,115
Year 2: 2019	2,071,848	41,491	81,835	1,948,522
Year 3: 2020	2,661,187	209,700	98,871	2,352,616
Year 4: 2021	3,022,268	101,956	117,836	2,802,476
Year 5: 2022	3,538,788	101,956	138,731	3,298,101
Year 6: 2023	4,103,003	101,956	161,555	3,839,492
Year 7: 2024	4,714,913	101,956	186,309	4,426,648
Year 8: 2025	5,374,518	101,956	212,992	5,059,570
Year 9: 2026	6,081,819	101,956	241,604	5,738,259
Year 10: 2027	6,836,814	101,956	272,146	6,462,712
Total	40,116,758	1,019,560	1,578,687	37,518,511

3.3 Monitoring

3.3.1 Data and Parameters Available at Validation

Data/parameter [EA1]:	CF
Data unit:	[Mg C (Mg DM) ⁻¹]
Description:	Carbon fraction of dry matter in wood
Sources of data:	Default value of 0.5 (IPCC GPG-LULUCF 2003)
Measurement procedures:	
Any comment:	

Data/parameter [EA2]:	E
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Data unit:	[-]
Description:	Average combustion efficiency of the aboveground tree biomass
Sources of data (*):	The project proponent must use project-specific measurements where available. Where such measurements are not available, the following data sources may be used in the order described below. - Regionally valid estimates from recognized, peer reviewed sources - Estimates from Table 3.A.14 of IPCC GPG LULUCF - If no appropriate combustion efficiency can be used, use the IPCC default of 0.5
Measurement procedures:	
Any comment:	

Data/parameter [EA3]:	P
Data unit:	[-]
Description:	Average proportion of mass burned from the aboveground tree biomass.
Sources of data:	GPG-LULUCF Table 3A.1.13
Measurement procedures:	
Any comment:	

Data/parameter [EA4]:	GWP _{CH4}
Data unit:	[-]
Description:	Global Warming Potential for CH ₄
Sources of data:	GWP values shall be derived from sources specified by the VCS rules
Measurement procedures:	
Any comment:	

Data/parameter [EA5]:	ER _{CH4}
Data unit:	Proportion
Description:	Emission ratios for CH ₄
Sources of data:	Table 3A.1.15 in IPCC GPG-LULUCF 2003
Measurement procedures:	IPCC default value of 0.012

Any comment:	
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Data/parameter [EA6]:	sc ₁
Data unit:	[-]
Description:	First shape factor for the forest scarcity equation; steepness of the decrease in deforestation rate (greater is steeper).
Sources of data:	Statistical fitting procedure. Using remotely sensed forest cover data in heavily deforested areas close to the project area such as neighboring provinces, states or countries
Measurement procedures:	Use procedure from Section 8.1.5.4
Any comment:	

Data/parameter [EA7]:	sc ₂
Data unit:	[-]
Description:	Second shape factor for the forest scarcity equation; relative deforested area at which the deforestation rate will be 50% of the initial deforestation rate.
Sources of data:	Statistical fitting procedure. Using remotely sensed forest cover data in heavily deforested areas close to the project area such as neighboring provinces, states or countries
Measurement procedures:	Use procedure from Section 8.1.5.4
Any comment:	

Data/parameter [EA8]:	wwf(ty)
Data unit:	[-]
Description:	Fraction of carbon in harvested wood products that are emitted immediately because of mill inefficiency for wood class <i>ssee</i> . This can be estimated by multiplying the applicable fraction to the total amount of carbon in different harvested wood product category.
Sources of data:	The default applicable fraction is 24% and 19% respectively for developing and developed countries (Winjum et al. 1998).
Measurement procedures:	
Any comment:	Any new updates from locally generated results can be used instead of the default values.

Data/parameter [EA9]:	slp(ty)
Data unit:	[-]
Description:	Proportion of short lived products
Sources of data:	Default values are 0.2, 0.1, 0.4 and 0.3 respectively for wood class <i>sspe</i> , i.e., sawnwood, wood-based panel, paper and paper boards and other industrial round woods as described in Winjum et al. (1998).
Measurement procedures:	
Any comment:	Any new updates from locally generated results can be used instead of the default values. The methodology assumes that all other classes of wood products are emitted within 5 years.

Data/parameter [EA10]:	fo(ty)
Data unit:	[-]
Description:	Fraction of carbon that will be emitted to the atmosphere between 5 and 100 years of harvest for wood class <i>sspe</i> .
Sources of data:	See Table 19 Winjum et al. 1998)
Measurement procedures:	
Any comment:	Any new updates from locally generated results can be used instead of the default values

Data/parameter [EA11]:	$\rho_{\text{wood},j}$
Data unit:	[Mg DM m ⁻³]
Description:	Average basic wood density of species or species group <i>RR</i>
Sources of data:	GPG-LULUCF Table 3A.1.9 or published data/literature.
Measurement procedures:	
Any comment:	When no species-specific or species-group specific densities are available, an average representative density may be used for all species or species groups.

Data/parameter [EA12]:	BEF ₂
Data unit:	[-]
Description:	Biomass expansion factor for converting volumes of extracted round wood to total aboveground biomass (including bark).
Sources of data:	IPCC GPG LULUCF Table 3A.1.10 or published data from scientific peer reviewed literature

Measurement procedures:	
Any comment:	

Data/parameter [EA13]:	EF _{rice,max}
Data unit:	[kg CH ₄ ha ⁻¹ day ⁻¹]
Description:	Maximal emission factor for methane
Sources of data:	By default, an emission rate of 36 kg CH ₄ ha ⁻¹ day ⁻¹ must be used, which is 25% greater than the maximal value found in a review study comparing 23 studies of CH ₄ fluxes in rice fields (Le Mer and Roger, 2001). The project proponent may use a smaller emission rate if it can be demonstrated from empirical data or other supporting information such as published data that the rate remains conservative for the project conditions.
Measurement procedures:	
Any comment:	Only to be included if rice production is increased as a leakage prevention measure.

Data/parameter [EA14]:	NCV _{biomass}
Data unit:	[TJ (Mg DM) ⁻¹]
Description:	Net calorific value of non-renewable biomass that is substituted.
Sources of data:	0.015 TJ (Mg DM) ⁻¹ IPCC default value.
Measurement procedures:	
Any comment:	

3.3.2 Data and Parameters Monitored

Sizes, areas, and transitions

Data/parameter [MN1]:	size _{projectArea} , size _{leakageArea} , size _{referenceRegion} , size _{referenceForest}
Data unit:	[ha]
Description:	Size of project area, leakage area, reference region, and forest area in the reference region
Sources of data:	Project design
Measurement procedures:	

Frequency of monitoring:	size _{projectArea} and size _{leakageArea} may be adjusted during crediting period per the rules for grouped projects and updated at verification, but only for the additional instances that were added after the project start date
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN2]:	$\Delta \text{area}_{\text{projectAreaEAH}, \text{projectScenario}}(t, i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>ii</i> within the project area, excluding ANR and harvest areas, under the project scenario during year <i>ss</i> . [ha yr ⁻¹]. Section 8.2.3
Sources of data:	Remote sensing analysis
Measurement procedures:	Follow the procedures described in Section 8.2.3
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN3]:	$\Delta \text{area}_{\text{projectAreaEAH}, \text{BaselineScenario}}(t, i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>ii</i> within the project area, excluding the ANR area, and harvest areas, under the baseline scenario for year <i>ss</i> .
Sources of data:	Land-use change modeling
Measurement procedures:	Follow the procedures described in Section 8.1.5.4
Frequency of monitoring:	At least once before every baseline. For added instances, may be recalculated at verification.
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN4]:	$\Delta \text{area}_{\text{projectAreawithANR}, \text{BaselineScenario}}(t, i)$
Data unit:	[ha yr ⁻¹]

Description:	Hectares undergoing transition <i>ii</i> within the leakage area under the project scenario for year <i>ss</i> .
Sources of data:	Land-use change modeling
Measurement procedures:	Follow the procedures described in Section 8.1.5.4
Frequency of monitoring:	At least once before every baseline update. For added instances, may be recalculated at verification.
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN5]:	$\Delta \text{area}_{\text{leakageArea, BaselineScenario}}(t, i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>ii</i> within the leakage area under the project scenario for year <i>ss</i>
Sources of data:	Remote sensing analysis
Measurement procedures:	Follow the procedures described in Section 8.1.2.4. In case emissions reductions/removals from avoided degradation are included, this parameter will provide the data required to calculate the activity data to estimate the emissions from both deforestation and forest degradation.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN6]:	$\Delta \text{area}_{\text{leakageArea, BaselineScenario}}(t, i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>ii</i> within the leakage area under the baseline scenario during year <i>ss</i>
Sources of data:	Land-use change modeling
Measurement procedures:	Follow the procedures described in Section 8.1.5.4
Frequency of monitoring:	Once every baseline update. May also be updated at the time of instance inclusion that requires new leakage area.
QA/QC procedures to be applied:	

Any comment:	
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Data/parameter [MN7]:	$\Delta \text{area}_{\text{historical}}(\text{CS}_1 \rightarrow \text{CS}_2, t_1 \rightarrow t_2)$
Data unit:	[ha yr ⁻¹]
Description:	Area of transition from LULC class or forest stratum 1 to 2 from time 1 to 2 during the historical reference period
Sources of data:	Remote sensing analysis
Measurement procedures:	Calculate based on the remote sensing-based classification and stratification procedures detailed in Section 8.1.2
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN8]:	$\text{RFRGrate}(\text{CS}_1 \rightarrow \text{CS}_2)$
Data unit:	[yr ⁻¹]
Description:	Relative annual forest cover increase and regeneration factor for the transition from class or stratum 1 to 2.
Sources of data:	Remote sensing analysis
Measurement procedures:	Calculate based on the remote sensing-based classification and stratification procedures detailed in Section 8.1.2. Multiply with 100 to obtain a forest cover increase and regeneration rate in percentage per year.
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	It can be used for producing baseline transition matrix for new instances to be added into the project area.

Data/parameter [MN9]:	$\text{area}_{\text{historical}}(\text{CS}_1, t_1)$
Data unit:	[ha]
Description:	Total area of LULC class or forest stratum 1 at time 1
Sources of data:	Remote sensing analysis
Measurement procedures:	Calculate based on the remote sensing-based classification and stratification procedures detailed in Section 8.1.2
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	

Any comment:	
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Data/parameter [MN10]:	$Area_{biomassloss}(i)$
Data unit:	[ha yr ⁻¹]
Description:	Total annual area of LULC class <i>i</i> that was cleared for creating firebreaks
Sources of data:	Records of implemented activities or management plan
Measurement procedures:	
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN11]:	$Area_{firebiomassloss}(i)$
Data unit:	[ha yr ⁻¹]
Description:	Annual area of forest stratum <i>i</i> that was cleared by using prescribed burning
Sources of data:	Records of implemented activities or management plan
Measurement procedures:	
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN12]:	$Area_{firebiomassloss,ANR}(t,i)$
Data unit:	[ha]
Description:	Area of biomass removed by prescribed burning within ANR stratum <i>ii</i> during year <i>ss</i>
Sources of data:	Records of implemented activities
Measurement procedures:	Only to be included if ANR activities are implemented.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN13]:	$\text{Area}_{\text{projectAreaWithANR,ProjectScenario}}(t, i)$
Data unit:	[ha]
Description:	Amount of land on which ANR activities are planned under the project scenario for year ss and in stratum ii
Sources of data:	Records of implemented activities
Measurement procedures:	Only to be included if ANR activities are implemented.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN14]:	$\text{Area}_{\text{harvest}}(t, i)$
Data unit:	[ha]
Description:	Area of forest in harvest stratum ii that is harvested at time ss .
Sources of data:	Project Description or Forest/Harvest Management Plan
Measurement procedures:	
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN15]:	$\text{Area}_{\text{projectAreaWithHarvest,ProjectScenario}}(t, i)$
Data unit:	[ha yr ⁻¹]
Description:	Size of strata ii within the project area with harvest activities during year ss under the project scenario.
Sources of data:	Remote sensing analysis
Measurement procedures:	Follow the procedures described in Section 8.1.5.4
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN16]:	$Area_{projectAreaWithHarvest,BaselineScenario}(t, i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>ii</i> within the harvest areas under the baseline scenario during year <i>ss</i> .
Sources of data:	Land-use change modeling
Measurement procedures:	Follow the procedures described in Section 8.1.5.4
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN17]:	$BetaReg_{DF}(t)$ and $BetaReg_{DG}(t)$
Data unit:	[ha yr ⁻¹]
Description:	Beta regression model describing the relationship between time and deforestation/degradation rate in the reference region during the historical reference period.
Sources of data:	Historic forest degradation and deforestation modeling
Measurement procedures:	Procedure described in Section 8.1.5.1 or similar approach from peer-reviewed scientific literature.
Frequency of monitoring:	At least once every baseline update
QA/QC procedures to be applied:	
Any comment:	

Locations, Descriptions, Qualitative, and Social Data

Data/parameter [MN18]:	Area under agricultural intensification
Data unit:	[ha]
Description:	Size of the area of agricultural intensification separated for each agricultural intensification measure
Sources of data:	Participatory rural appraisals
Measurement procedures:	Calculate based on areas of cropland in the leakage and project areas
	Only to be included if agricultural intensification activities are implemented.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	

Any comment:	
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Data/parameter [MN19]:	Yields under agricultural intensification
Data unit:	[Mg ha ⁻¹]
Description:	Harvested yield for agricultural intensification practices
Sources of data:	Participatory rural appraisals
Measurement procedures:	Only to be included if agricultural intensification activities are implemented.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data on Drivers and Actions

Data/parameter [MN20]:	CFW _{baseline}
Data unit:	[m ³ yr ⁻¹]
Description:	Annual volume of fuelwood gathering for commercial sale and charcoal production in the baseline scenario
Sources of data (*):	1. Participatory rural appraisals 2. Recent (<10 yr) literature in the reference region 3. Recent (<10 yr) literature in an area similar to the reference region
Measurement procedures:	If emission reductions from avoided degradation were excluded due to insufficient accuracy, in which case $U_{classification} = 0$, and emission reductions from fuel-efficient woodstoves are included, CFW _{baseline} may only be measured using the first option, social assessments.
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN21]:	DFW _{baseline}
Data unit:	[m ³ yr ⁻¹]
Description:	Annual volume of fuelwood gathered for domestic and local energy in the baseline scenario

Sources of data (*):	- Participatory rural appraisals - Recent (<10 yr) literature in the reference region - Recent (<10 yr) literature in an area similar to the reference region
Measurement procedures:	If emission reductions from avoided degradation were excluded due to insufficient accuracy, in which case $U_{classification} = 0$, and emission reductions from fuel-efficient woodstoves are included, $DFW_{baseline}$ may only be measured using the first option, social assessments.
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN22]:	$DFW_{project}$
Data unit:	$[m^3 yr^{-1}]$
Description:	Biomass (dry matter) of fuelwood collected by project participants under the project scenario.
Sources of data (*):	- Participatory rural appraisals - Recent (<10 yr) literature in the reference region - Recent (<10 yr) literature in an area similar to the reference region
Measurement procedures:	If emission reductions from avoided degradation were excluded due to insufficient accuracy, in which case $U_{classification} = 0$, and emission reductions from fuel-efficient woodstoves are included, $DFW_{baseline}$ may only be measured using the first option, social assessments.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN23]:	$DFW_{allowed}$
Data unit:	$[m^3 yr^{-1}]$
Description:	Biomass (dry matter) of allowed fuelwood collection in the project area under the project scenario. This amount is typically fixed in a management plan. $[m^3 yr^{-1}]$
Sources of data (*):	Forest management plan
Measurement procedures:	

Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN24]:	VG _{baseline}
Data unit:	[m ³ yr ⁻¹]
Description:	Biomass (dry matter) of understory vegetation extraction by project participants under the baseline scenario. [Mg DM yr ⁻¹]
Sources of data (*):	1. Participatory rural appraisals 2. Recent (<10 yr) literature in the reference region 3. Recent (<10 yr) literature in an area similar to the reference region
Measurement procedures:	Calculate by multiplying the number of households involved in extraction of vegetation with the average annual extraction rate by household for different vegetation types
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN25]:	VG _{project}
Data unit:	[Mg DM yr ⁻¹]
Description:	Biomass (dry matter) of understory vegetation extraction by project participants under the project scenario.
Sources of data (*):	1. Participatory rural appraisals 2. Recent (<10 yr) literature in the reference region 3. Recent (<10 yr) literature in an area similar to the reference region
Measurement procedures:	Calculate by multiplying the number of households involved in extraction of vegetation with the average annual extraction rate by household for different vegetation types
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN26]:	VG _{allowed}
Data unit:	[Mg DM yr ⁻¹]

Description:	Biomass (dry matter) of allowed as understory vegetation extraction under the project scenario. This amount is typically fixed in a management plan
Sources of data (*):	Forest management plan
Measurement procedures:	
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN27]:	$CT_{baseline}(h, j, ty, t)$
Data unit:	$[m^3 yr^{-1}]$
Description:	Annually extracted volume of harvested timber round-wood for commercial on-sale under the baseline scenario during harvest h by species j and wood product class ty during year t
Sources of data (*):	1. Participatory rural appraisals conducted by the project proponent. 2. Recent (<10 yr) literature in the reference region 3. Recent (<10 yr) literature in an area similar to the reference region 4. Recent (<10 yr) non peer-reviewed reports by local organizations
Measurement procedures:	
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN28]:	$CT_{allowed}$
Data unit:	$[m^3 yr^{-1}]$
Description:	Annually allowed volume of harvested timber round-wood for commercial on-sale under the project scenario
Sources of data (*):	Project document and/or management plan
Measurement procedures:	
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	

Any comment:	Estimate volume for mixture of species
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Data/parameter [MN29]:	$CT_{\text{project}}(h, j, ty, t)$
Data unit:	$[m^3 \text{ yr}^{-1}]$
Description:	Annually extracted volume of harvested timber round-wood for commercial on-sale inside the project area under the project scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):	Project design, surveys, statistical records.
Measurement procedures:	
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN30]:	$DT_{\text{baseline}}(h, j, ty, t)$
Data unit:	$[m^3 \text{ yr}^{-1}]$
Description:	Annually extracted volume of timber for domestic and local use, round wood under the baseline scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):	1. Participatory rural appraisals conducted by the project proponent 2. Recent (<10 yr) literature in the reference region 3. Recent (<10 yr) literature in an area similar to the reference region 4. Recent (<10 yr) non peer-reviewed reports by local organizations
Measurement procedures:	
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN31]:	DT_{allowed}
Data unit:	$[m^3 \text{ yr}^{-1}]$
Description:	Annually allowed volume of harvested timber round-wood for domestic and local use under the project scenario

Sources of data (*):	Project document and/or management plan
Measurement procedures:	
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	Estimate volume for mixture of species

Data/parameter [MN32]:	$DT_{\text{project}}(h, j, ty, t)$
Data unit:	$[m^3 \text{ yr}^{-1}]$
Description:	Annually extracted volume of timber for domestic and local use, round wood inside the project area under the project scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):	Project design, surveys, statistical records.
Measurement procedures:	
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	

Data/parameter [MN33]:	$\text{Contribution}_{\text{DF}}(d)$ and $\text{Contribution}_{\text{DG}}(d)$
Data unit:	[-]
Description:	Relative contribution of driver i respectively to total deforestation and forest degradation.
Sources of data:	Calculated using procedure described in 8.1.3.
Measurement procedures:	
Frequency of monitoring:	At least once before baseline update.
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN34]:	$\text{RelativeDriverImpact}_{\text{DF}}(t,d)$ and $\text{RelativeDriverImpact}_{\text{DG}}(t,d)$
Data unit:	[-]
Description:	Relative impact of the geographically unconstrained driver cc at time ss of the crediting period respectively on deforestation and forest degradation.
Sources of data:	Calculated using procedure described in 8.2.2.

Measurement procedures:	
Frequency of monitoring:	At least once before baseline update.
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN35]:	$\text{leakage}_{\text{unconstrained}}(d)$
Data unit:	[-]
Description:	Leakage cancellation rate for avoiding deforestation/degradation from geographically unconstrained drivers.
Sources of data:	Valid sources to substantiate a smaller leakage rate include social assessments, scientific literature, and reports from civil society or governments. Sources have to be reliable and based on scientific methods and a good statistical design.
Measurement procedures:	
Frequency of monitoring:	At least once before baseline update.
QA/QC procedures to be applied:	
Any comment:	Unless a lower rate can be justified, a default rate of 100% must be used.

Data/parameter [MN36]:	$\text{effectiveness}(a, d)$
Data unit:	[-]
Description:	Effectiveness of every project activity a in decreasing any driver of deforestation d relative to that driver's contribution to deforestation and forest degradation,
Sources of data:	Relevant academic literature or documented expert opinion.
Measurement procedures:	
Frequency of monitoring:	At least once before baseline update.
QA/QC procedures to be applied:	
Any comment:	The $\text{effectiveness}(a, d)$ factor represents the maximal effectiveness during the crediting period.

Data/parameter [MN37]:	$\Delta A_{\text{rice I}}$
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Data unit:	[ha]
Description:	Annual increase in harvested area of rice due to leakage prevention measures.
Sources of data:	Project design decision
Measurement procedures:	Only to be included if rice production is increased as a leakage prevention measure.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN38]:	$t_{\text{flooded,max}}$
Data unit:	[days yr ⁻¹]
Description:	Maximal period of time a field is flooded
Sources of data:	Participatory rural appraisals or expert opinion
Measurement procedures:	Only to be included if rice production is increased as a leakage prevention measure.
Frequency of monitoring:	At least once before baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN39]:	GR_{baseline}
Data unit:	[-]
Description:	Number of grazing animals of type <i>aa</i> within the project boundary baseline
Sources of data:	1. Local agricultural records 2. Social assessments conducted by the project proponent
Measurement procedures:	Calculate by multiplying the number of animals taking into account different types of grazing animals.
Frequency of monitoring:	At least once before baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN40]:	GR_{allowed}
Data unit:	[-]

Description:	Number of grazing animals of type g allowed for grazing within the project boundary in the project scenario
Sources of data:	Project management plan
Measurement procedures:	Calculate by multiplying the number of animals taking into account different types of grazing animals.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN41]:	Fuelwood(t), Fuel(t)
Data unit:	[m ³ yr ⁻¹ HH ⁻¹]
Description:	Average annual volume of biomass fuel consumed by households in the absence of the project activity in year <i>ss</i> for cooking purpose.
Sources of data:	Social assessments results or wood energy statistics applicable to the project
Measurement procedures:	
Frequency of monitoring:	At least once every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN42]:	$HH_{non-CFE}(t)$
Data unit:	[-]
Description:	Total number of household in the project area that collect biomass fuel from the project area and do not use CFE in year <i>t</i>
Sources of data:	Social assessments results or wood energy statistics applicable to the project
Measurement procedures:	<i>Ex-post</i> , this value must be obtained from socio-economic survey.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN43]:	η_{old}
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Data unit:	[-]
Description:	Efficiency of the project cookstoves or appliances.
Sources of data:	Default value of 0.10 for three stone stove or conventional stove that lacks improved combustion air supply mechanism and flue gas ventilation systems i.e., without a grate as well as a chimney; for rest of the systems 0.2 default value may be used.
Measurement procedures:	Measured using representative sampling method or based on referenced literature values. Use weighted average values if more than one type of systems are used. If measured, the procedure must comply with the Water Boiling Test (WBT) based on VITA 1985 – the 'International Standards'.
Frequency of monitoring:	At least once every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN44]:	η_{new}
Data unit:	[-]
Description:	Efficiency of the baseline cookstoves or appliances.
Sources of data:	1. Values obtained from the manufacturer of the stove. 2. Calculated from field testing using ISO standards.
Measurement procedures:	Measured using representative sampling method or based on referenced literature values. Use weighted average values if more than one type of systems is used.
Frequency of monitoring:	• If the stoves used are manufactured by a recognized company that is still in business and provides a warranty for the stoves stated life, then the monitoring must be done during every baseline update. • If the manufacturer does not provide any warranty or the manufacturer of the stove is no longer in the business, then the efficiency must be monitored annually using the water boiling test (WBT) protocol carried out in accordance with national standards (if available) or international standards or guidelines as specified in the latest version of Approved CDM Methodology – AMS.II.G. <i>Energy efficiency measures in thermal applicants of non-renewable biomass</i>. Biennial monitoring (i.e. monitoring once every two years) may be chosen, if the project proponent are able to demonstrate that the efficiency of the cook stove does not drop significantly as compared to the initial efficiency of the new device, over a time period of two years of typical usage. • Finally, if the conservativeness of the used efficiency can be demonstrated, the monitoring frequency can be once every baseline update. Demonstration of the conservativeness must be based on historical efficiency data for the type of stoves showing how efficiency declines from the initial efficiency level through the life of the stoves

	and the lowest efficiency value must be used for that type of stove.
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN45]:	$U_{CFE}(t)$
Data unit:	[-]
Description:	Fraction of cumulative usage rate for technologies in project scenario in year t.
	[-]
Sources of data:	Social assessments or wood energy statistics applicable to the project
Measurement procedures:	Cumulative adoption rate and drop off rate revealed by usage surveys [-].
Frequency of monitoring:	Annual
QA/QC procedures to be applied:	
Any comment:	

Data/parameter:	$DF_{LeakageCFE}(t)$
Data unit:	[-]
Description:	Leakage discount factor applicable to GHG emissions reduction benefits from CFE activities [-]
Sources of data:	1. Social assessments or wood energy statistics applicable to the project. 2. Default value of 0.95 following AMS.II.G CDM methodology.
Measurement procedures:	Leakage related to the non-renewable biomass saved by the project activity must be assessed based on surveys of users and the areas from which woody biomass saved under the project by non-project households that previously used renewable energy or efficient appliances must be considered. If this leakage assessment quantifies an increase in the use of non-renewable biomass, that is attributable to the project activity, then biomass used in the baseline must be adjusted by a factor ($DF_{LeakageCFE}$) to account for the leakage.
Frequency of monitoring:	Annual
QA/QC procedures to be applied:	
Any comment:	If the default value of 0.95 is used, no survey is required.

Data/parameter	$E_{f_{non-CO_2, fuel}}, E_{f_{CO_2, fuel}}$
Data unit:	[t CO ₂ TJ ⁻¹]
Description:	Respectively, non-CO ₂ emission factor of the fuel that is reduced and CO ₂ emission factor for the substitution of non-renewable biomass by similar consumers.
Sources of data:	Social assessments or wood energy statistics applicable to the project
Measurement procedures:	Emission factor can include a combination of emission factors from fuel production, transport, and use. Both CO ₂ and Non-CO ₂ of the fuel such as emissions factors for charcoal can be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal production ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent emission factor of wood.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN48]:	$E_{f_{forest}}$
Data unit:	[t CO ₂ e]
Description:	Emission factor related to leakage.
Sources of data:	1. If comprehensive national-level statistics on biomass densities are available, $E_{f_{forest}}$ must be calculated based on the average biomass of the country. 2. If local data is not available. Sources of the data allowed are (1) academic research papers and (2) studies and reports published by the forestry administration or other organizations, including the FAO's Forest Resource Assessment reports, (3) the upper range of biomass in the GPG-LULUCF (2003) Table 3A.1.2.
Measurement procedures:	
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data on Organic Matter and Carbon Densities

Data/parameter [MN49]:	$OM_o(i)$
Data unit:	[Mg DM ha ⁻¹]
Description:	Plant-derived organic matter of LULC class or forest stratum i in pool o . [Mg DM ha ⁻¹]
Sources of data:	Field measurements using sampling plots in forest strata or LULC classes.
Measurement procedures:	The average biomass stock density in applicable organic matter pools: aboveground tree – $OM_{AGT}(i)$, aboveground non-tree – $OM_{AGNT}(i)$, lying dead wood – $OM_{LDW}(i)$, standing dead wood $OM_{SDW}(i)$, belowground $OM_{BG}(i)$, and soil organic matter $OM_{SOM}(i)$
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be Applied:	Follow uncertainty deduction procedures described in methodology. Re-measure plots by independent teams.
Any comment:	Summed across multiple pools and divided into $OM_{plant}(i)$ and $OM_{soil}(i)$

Data/parameter [MN50]:	Proportion _{DF} (d) and Proportion _{DG} (d)
Data unit:	[-]
Description:	Proportion of the gradual carbon loss that leads to deforestation or forest degradation, respectively, due to driver d
Sources of data:	Estimate using the procedure detailed in Table 9.
Measurement procedures:	
Frequency of monitoring:	At least once before every baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN51]:	$C(t,i)$
Data unit:	[Mg C ha ⁻¹ yr ⁻¹]
Description:	Carbon stock density at time t in stratum i .
Sources of data:	Estimate within the biomass inventory plots
Measurement procedures:	
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	Used in estimating change in carbon stock density such as in ANR areas.

Data/parameter [MN52]:	$f_{allometric} (y)$
Data unit:	Equation
Description:	Allometric relationship to convert a tree metric such as DBH or tree height into biomass
Sources of data (*):	1. Allometric equations developed by the project proponent 2. Allometric equations developed locally by groups other than the project proponent 3. Allometric equations developed for forest types that are similar to the ones in the project as found in found in Tables 4.A.1. and 4.A.2. of the GPG LULUCF
Measurement procedures:	
Frequency of monitoring:	May be updated at baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN53]:	$F_{belowground} (y)$
Data unit:	Equation
Description:	Relationship between aboveground and belowground biomass, such as a root-to-shoot ratio
Sources of data (*):	1. A relationship calculated from destructive sampling data obtained within the project area 2. A relationship obtained from the local/national studies that closely reflect the conditions of the project activity 3. Standard root-to-shoot ratios as found in Table 4.4 of the IPCC GPG-LULUCF 2003
Measurement procedures:	
Frequency of monitoring:	May be updated at baseline update
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN54]:	$C_{harvest}(t,i)$
Data unit:	Mg C ha ⁻¹

Description:	Biomass carbon stock density at time t in stratum i in harvested areas.
Sources of data:	Field inventory
Measurement procedures:	Generic procedure is described in Section 8.1.4.4. Estimate must be made from plots located areas where harvesting takes place.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	Carbon stocks in harvested strata must come from sampling. It may be necessary to include additional plots in harvested strata for a precise estimation of carbon stocks. The exact measurement of aboveground and below tree carbon must follow international standards and follow IPCC GPG LULUCF 2003. These measurements are explained in detail in CDM approved methodology AR-AM0002 <i>Restoration of degraded lands through afforestation/reforestation</i> .

Data/parameter [MN55]:	$C_{e,inventory, harvest(t,i)}$
Data unit:	[-]
Description:	Combined error in estimate of average biomass stock density in harvest areas in stratum i at time t .
Sources of data (*):	Field inventory
Measurement procedures:	Generic procedure is described in Section 8.1.4.4. Estimate must be made from plot located in areas where harvesting takes place.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	Uncertainty estimate in carbon stocks in harvested strata must come from sampling of plots in harvested areas.

Data/parameter [MN56]:	$C_{e,inventory, ANR(t,i)}$
Data unit:	[-]
Description:	Combined error in estimate of average biomass stock density in ANR areas in stratum ii at time ss .
Sources of data (*):	Field inventory
Measurement procedures:	Procedure is described in Section 8.2.5.3.
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	

Any comment:	Uncertainty estimate in carbon stocks in harvested strata must come from sampling of plots in ANR areas.
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Data/parameter [MN57]:	$u_{\text{classification}}$
Data unit:	[-]
Description:	Discounting factor for NERs from avoided deforestation, based on the accuracy of classification, i.e. dividing land into broad land use types.
Sources of data:	
Measurement procedures:	Section 8.1.2.7
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN58]:	$u_{\text{stratification}}$
Data unit:	[-]
Description:	Discounting factor for NERs from avoided degradation, based on the accuracy of stratification, i.e. dividing forest into individual forest biomass classes. Section 8.1.2.7
Sources of data:	
Measurement procedures:	Section 8.1.2.7
Frequency of monitoring:	At least once before verification
QA/QC procedures to be applied:	
Any comment:	

Data/parameter [MN59]:	$u_{\text{transition}}(i)$
Data unit:	[-]
Description:	Discounting factor for the emission factor for the transition from LULC class or forest stratum 1 to class 2 according to the uncertainty of the biomass inventory.
Sources of data:	
Measurement procedures:	Section 8.1.2.4.3
Frequency of monitoring:	At least once before verification

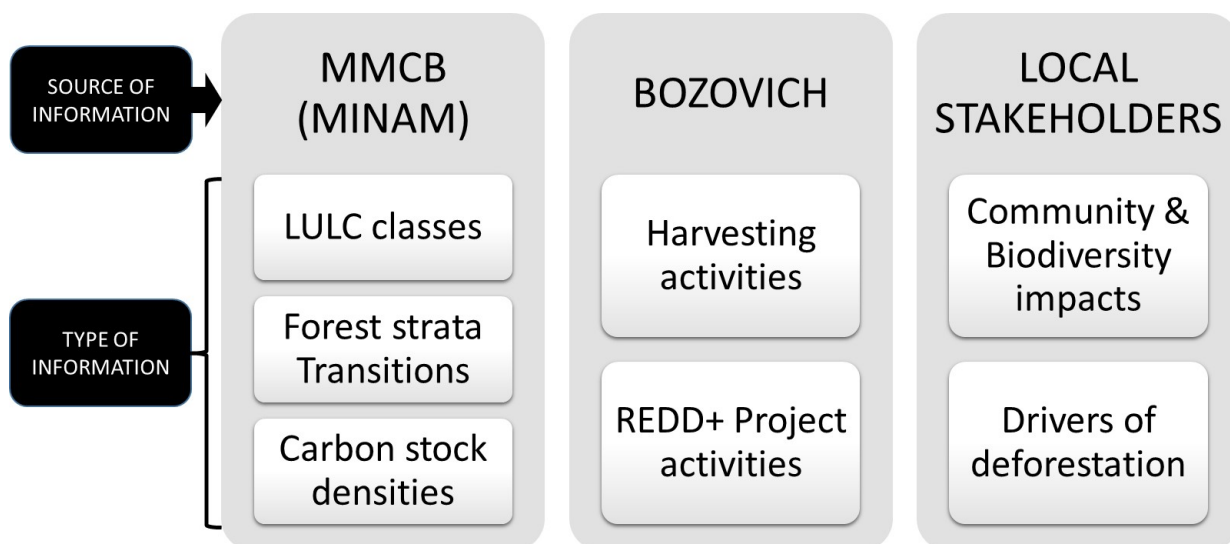
QA/QC procedures to be applied:	
Any comment:	

3.3.3 Monitoring Plan

As described in previous section, the monitoring plan must consider following issues:

- Drivers of deforestation, project activities and emissions sources related to REDD+ project activities inside and outside of the project area
- LULC class and forest strata transitions in the project area, leakage area, and reference region using remote-sensing technologies, and validated with ground-truthing data.
- Carbon stock densities in LULC classes and forest strata.
- Carbon stock in long-lived wood products.
- Natural disturbances.
- Monitoring of harvesting activities.

CHART 5: SOURCES OF INFORMATION BY TYPE

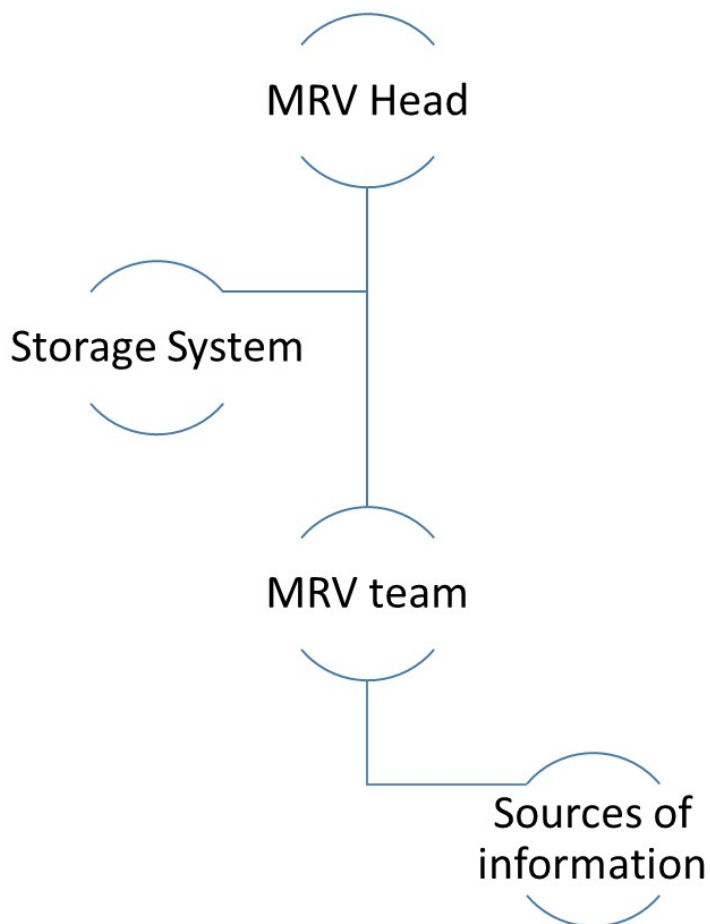


ORGANIZATIONAL STRUCTURE

Bozovich will implement a MRV Department composed by a head and an undetermined number of specialists, depending on the intensity of information that needs to be monitored, specially to monitor the community and biodiversity impacts and the REDD project activities.

The MRV will have two types of storage: a physical storage in BOZOVICH offices and in a safe platform in the cloud, being MEGA the platform that is being explored.

CHART 6: MONITORING INSTITUTIONAL ARRANGEMENTS



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

Describe how the monitoring plan, and any results of monitoring undertaken in accordance with the monitoring plan, will be disseminated and made publicly available on the internet. Describe the means by which summaries (at minimum) of the monitoring plan and results will be communicated to the communities and other stakeholders.

3.4 Optional Criterion: Climate Change Adaptation Benefits

Complete this section (3.4) if the project seeks to be validated to the Gold Level for climate change adaptation benefits. If not applicable, state so and leave this section blank.

3.4.1 Regional Climate Change Scenarios (GL1.1)

Identify likely regional or sub-national climate change and climate variability scenarios and impacts and identify potential changes in the local land use scenario due to these climate change scenarios in the absence of the project.

3.4.2 Climate Change Impacts (GL1.2)

Describe how current or anticipated climate changes are having or are likely to have an impact on the following in the project zone and surrounding regions:

- *Community well-being.*
- *Biodiversity conservation status.*

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

Based on the causal model described in response to G1.8, describe measures needed and designed to assist communities and biodiversity to adapt to the probable impacts of climate change.

4 COMMUNITY

4.1 Without-Project Community Scenario

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

There are four settlements that must be considered in this section to evaluate the impacts of project activities

- *Carachamayoc*
- *San Francisco*
- *Portillo*
- *Arco Pacahuara*

General Information:

There are some common aspects between the first three communities:

- *Language: Spanish*
- *Origin: Regional*
- *Economic activities: agriculture, cattle ranching, bird breeding, small-scale logging in their own agrarian plots*
- *Local authorities (President):*

- Carachamayoc: Roberto Carlos Maguina
- San Francisco: Manuel Rojas
- Portillo: Martin Alberto Cuchitineri Jimenez
- *Public services and entities: No schools and medical centers. The closest town with these services is Iberia.*
- *Population (number of families):*
 - Carachamayoc: 103
 - San Francisco: 38
 - Portillo: 60

Specific information of each settlement:

1. Carachamayoc

It is a settlement association mostly dedicated to agriculture and bird breeding and at a lower scale to cattle ranching for self-consumption and trading in local market (Iberia). They also do small-scale logging but people do not talk about this activity openly.

Other authorities:

- *President: Roberto Carlos Maguina. It is its second term. He lives in Iberia. He has a restaurant and is the supplier of lunches to a local school.*
- *Treasurer: Eduardo Aguilar*
- *Secretary: Gloria Aspajo*
- *Vice Major: Also Gloria Aspajo, who is a very influent person in the zone. She took office on May 6, 2018.*

Population:

One hundred and three families are considered part of Carachamayoc, even though they do not have an official book of members, so they do not know exactly how many men and women are in the community but they know that most are men and the property titles are mostly registered on behalf of men.

Less than 10 families live not permanently in the area. Their walls and floors are wooden and ceilings are calamines (90%) or a type of bamboo called shapaja (10%). Most of the families are from Iberia (95%), the capital of province of Tahuamanu, while the other 5% comes from Cusco, Chiclayo and other Amazonian cities.

Accessibility and other communication services:

Carachamayoc is located 2.5 km from Iberia City. There is a float road between the two towns. An improvement of this neighborhood road has been approved by Special Project Madre de Dios (PEMD) and is expected to be concluded for the first semester of 2018.

The camp that will be built for this project may be transferred to the community to be used as a communal site when the project ends.

Two mobile phone companies operate in the area: Bitel and Movistar

Public services:

There is not electric light. The directive plans to request for a grant of solar panels.

There is no connection to drinking water system. Families use river water or water eyes

The disposals are eliminated through latrines. They have not heard about other technologies for waste management. Solid disposals are burnt.

Families use firewood for cooking.

Productive activities:

The main crops are corn, rice, banana and yucca

Logging is also practiced in the community but they do not practice sustainable forest management techniques neither agroforestry.

There is not a land zoning in the community neither soil analysis to know the potential and aptitude of them for each specific crop.

Monthly average income is between 300-400 soles

Education

Most of the population has not completed high school. There are no schools in Carachamayoc. Children has to go to Iberia for primary school and high school. Even though that, there are only three community members that have university and technician studies. A business administrator, a lawyer and a dental technician.

Health

As in education, there are no medical centers in the community so they depend on the medical post of Iberia.

The most common diseases within kids and adults are bronchia-respiratory diseases. Dengue is also a very frequent and dangerous disease and, at a lesser degree, the leishmaniasis.

2. San Francisco

It is the less populated settlement of the surrounding area. It is located at the north-east of the Concession. It is a landowners association dedicated to agrarian and logging activities in their private plots.

Other authorities:

- *President: Manuel Rojas*
- *Vice Major: Juan Chavez*
- *Teacher of Dos de Mayo Primary School: Julio Alvarado*

The board will change soon

Population:

Thirty-eight families are considered part of San Francisco, even though they do not have an official book of members, so they do not know exactly how many men and women are in the community but they know that most are men and the property titles are mostly registered on behalf of men.

Around 4-5 families live permanently in the community. Their walls and floors are wooden and ceilings are calamines (90%) or a type of bamboo called shapaja (10%). Most of the families are from Iberia (95%), the capital of province of Tahuamanu, while the other 5%, coming from Cusco, Chiclayo and other Amazonian cities, have purchased lands.

Around 15-18 members have titled their plots. The others are new members. The average size of each plot is 30 hectares but some of them have plots of 60 hectares.

Organization:

San Francisco is not registered as a legal association in SUNARP (national authority of properties registry)

Nor they have RUC (the tax individual number) but they are interested about the implications of registering.

They are associated to the Agrarian Federation of Tahuamanu

Accessibility and other communication services:

San Francisco is located 4.6 km from Iberia City. There is a float road between Iberia and Puerto Portillo. After crossing the bridge over Tahuamanu River and walking 3.4 km, San Francisco is located.

San Francisco authorities are surprised with the approval and execution by PEMD of a neighbor road to Carachamayoc considering that San Francisco was very active and is populated by more families.

Public services:

There is not electric light.

There is no connection to drinking water system. Families use river water or water eyes

The disposals are eliminated through latrines. They have not heard about other technologies for waste management. Solid disposals are burnt.

Families use firewood for cooking.

Productive activities:

They used to cultivate rice until two years ago. Since then, production of banana and corn (around 1-3 hectares per family) has increased for sale.

No land zoning in the community nor soil analysis to determine the more appropriate crops to each type of soil

No logging, agroforestry or similar sustainable techniques

Family monthly average income is between 300-400 soles

Education

There are no schools in San Francisco. Children has to go to Iberia for primary school and high school.

Health

As in education, there are no medical centers in the community because people do not live in the town. They use Iberia Post.

3. Portillo

It is a settlement association mostly dedicated to agriculture, cattle ranching and small-scale logging from their own plots. They cover 4000 ha, but, according to its authorities, only 30% of that area have made "improvements" as defined by Agrarian Directorate, which is equivalent to slash and burn to replace forest by a crop or grazing.

Authorities:

- *President: Martin Alberto Cuchitineri Jiménez (he transferred the charge to Gabriel Contreras.)*
- *Attorney: Roger Contreras*
- *Voice: José Gabriel Contreras*

Population:

The first families came here between 50-60 years ago. Currently, there are around 60 families, considered as partners of this sector. Even though that, the authorities interviewed consider that only 15 families are active. They do not have an official book of members, so they do not know exactly how many men and women are in the community but they know that most are men and the property titles are mostly registered on behalf of men. Around 10 families live permanently in the area. Walls and floor are wooden and ceilings are 90% of calaminas and 10% of shapaja.

Around 95% of people is born in Iberia while the other 5% is migrant and has purchased their plots.

Land tenure types:

Approximately 30% of the plots are titled but they are still waiting for a re-measurement of their plots. Compared with Carachamayoc, Portillo has a lower percentage of titled plots but a higher production.

The average size of each plot is 32 hectares, but the largest plot is 60 hectares, as in the neighboring settlements.

As said before, the total area is 4000 hectares.

Organization:

Portillo is not registered as a legal association in SUNARP

Nor they have RUC but they are interested about the implications of registering.

They are also members of the Agrarian Federation of Tahuamanu

Accessibility and other communication services:

Portillo is located 3.5 km from Iberia City. There is a float road between Iberia and Puerto Portillo. After crossing the bridge over Tahuamanu River, Portillo is located through the same walk from Carachamayoc.

Portillo authorities are also surprised with the approval and execution by PEMD of a neighbor road to Carachamayoc considering that Portillo has a higher production and is populated by more families. Based on that, they plan to talk directly with PEMD managers and the constructors to pay them on Sundays and holidays to work on the improvement of their own road.

Public services:

There is not electric light.

There is no connection to drinking water system. Families use river water or water eyes

The disposals are eliminated through latrines. They have not heard about other technologies for waste management. Solid disposals are burnt.

Families use firewood for cooking.

Productive activities:

They cultivate corn (1-3 ha) and at a lesser degree, banana and yucca (0.25 ha).

Cattle ranching is important. Each member has between 10 to 120 hectares of pastures, with around 10 to 150 animals.

They harvest timber but they do not do sustainable forestry management neither agroforestry nor other sustainable techniques

No land zoning in the community nor soil analysis to determine the more appropriate crops to each type of soil

Family monthly average income is between 300-400 soles

Education

Most of members of Portillo do not have completed the high school. There are no schools in San Francisco. Children has to go to Iberia for primary school and high school, even though there was a primary school but it was closed because of the insufficient number of students.

Health

As in education, there are no medical centers in the community because people do not live in the town. They use Iberia Post.

4. Arca Pacahuara:

It is a religious community from the "Israelitas del Nuevo Pacto Universal" faith, which is politically represented by FREPAP (Peruvian Agrarian and Popular Front) political party. The current mayor of Iberia, Gustavo Mamani, was elected by this party and is member of the community.

They have a total area of 6000 hectares but they have a formal requirement to the Regional Agrarian Directorate for 26,000 new hectares to expand their cultivation area. This request is under dispute because the requested area is overlapping with other land rights as forest concessions, especially two forest concessions, who accuse Arca Pacahuara to invade their forest concession for their agricultural activities.

They are migrants from the Andes. They are around three thousands of inhabitants and growing. Considering that the electoral universe of Iberia is 3,668 persons, it is clear that this community is key to define the policy decisions in this district. This also explains why they receive the benefits from many public investments and projects. In 2017, they have been supported with a water and drain connection project by S/. 11 million.

Because of its aggressive agrarian practices, they do not have remaining forests in their land so they are always looking for new lands to expand their crop plans. They produce around 30 hectares per family, principally corn that is sold to Granjas Amazonicas S.A. There are around 600 hectares of corn established, 400 of them are already in production. If they are not controlled, they can grow forever, affecting neighboring forests. Their current production only represents 10-15% of annual demand of Granjas Amazonicas, even though they are its main suppliers. According to specialists, expanding their agrarian frontier is always profitable.

Concessionaries as Federico Rios, among others, are in a legal conflict with this community because they have invaded his forest concession.

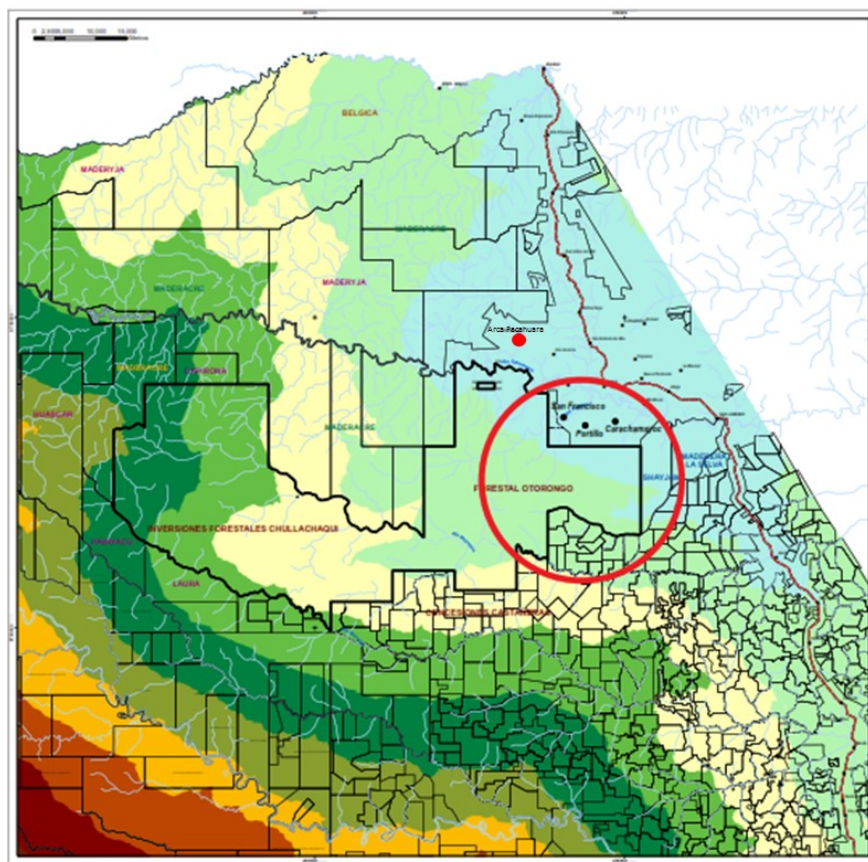
According to specialists as the Eng. Ernesto Vargas, from the Forest and Wildlife Directorate of Iberia, the people from this community "has an unstoppable expansion. The Inter-oceanic Highway created many new opportunities for migrants searching lands. Pacahuara continues inviting new migrants. The invasions are permanent and everything goes unpunished. Because they have their own governing system, we must be very careful. They burn forest and they need every time more area. They are the main suppliers of Granjas Amazonicas. They have the mandate to work in agriculture and produce. At 4:30am, they start to wake up: "brothers, let's work". At 5:15am, you start listening the motorcycles driving along. The expansion and titling

is a problem now. Foresters have the agriculture as the main driver of deforestation. It does not matter for them if protection forests are destroyed. It is a latent enemy. They claim land constantly”.

As can be concluded from the analysis in this section, Arca Pacahuara is the main threat to adjacent forest.

In the following map, the four communities described below can be found. Three of them are very close to Forestal Otorongo, in the north-east border of the concession, while Arca Pacahuara, in the northern border of the concession, even though is further away from the concession, has a higher rate of expansion as can be seen later.

MAP 11: SURROUNDING COMMUNITIES LOCATION



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

Communities characterized in previous section combine partnership and conflict relationships. As described in that section, Portillo, San Francisco and Carachamayo, even though there are some differences and conflicts between them for access to benefits from public services, they use to be together when they demand excessive preference with Arca Pacahuara. There are many cultural and religious differences between the first three communities and Arca Pacahuara.

Other stakeholders in the area may be loggers and Brazil nut harvesters. Even though this is an area with a large tradition of logging activities, there have not been loggers in the project area. On the other hand, with the Brazil nut harvesters, the relationship is very good and they are allowed to harvest the BN. They are hired by the project proponent to do this work.

The relationship between the project proponent and neighboring settlements are positive.

4.1.3 High Conservation Values (CM1.2)

TABLE 50: COMMUNITY HCV

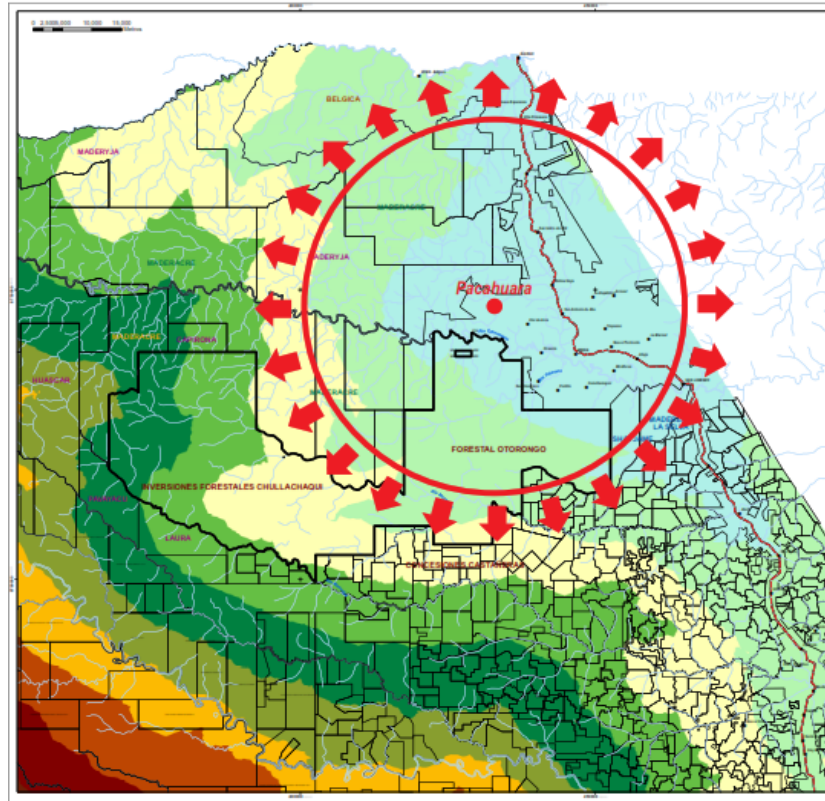
High Conservation Value	Significant concentration of global/national/regional biodiversity values at Forestal Otorongo and Chullachaqui Forest Investments. Large forests at landscape scale, significant at a global/national/regional level.
Qualifying Attribute	Both concessions are the habitat of Caoba (<i>Swietenia Macrophylla</i>) and Jaguar (<i>Panthera Onca</i>), which are included in all the Peruvian regional and national lists of conservation status.
Focal Area	These two species are spread alongside all the concessions. In the case of Jaguar, this hunting is completely forbidden within the concessions and this is monitored periodically. In the case of flora, in addition to the reduced impact logging (RIL), used in the concessions and an environmental impact assessment is carried out, we take in consideration the yearly Caoba (<i>Swietenia Macrophylla</i>) Non-Detriment Finding (Dictamen de Extracción No Perjudicial – DENP), prepared by Peruvian Scientific Authority of CITES. This allows the conservation and restoration of key species as seedlings and future harvesting. Bozovich Group works with a minimum cutting diameter over the legally required level. In addition, we do EIA, we train personnel and local families and we have a permanent monitoring system of the impacts of the operations.

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

The scenario of the project area is very concerning without project intervention. According to interviewed specialists, more than 80% of Forestal Otorongo concession is under risk to be lost by the expansion of Arca Pacahuara activities. When it happens, they will continue expanding to the other concessions as Chullachaqui.

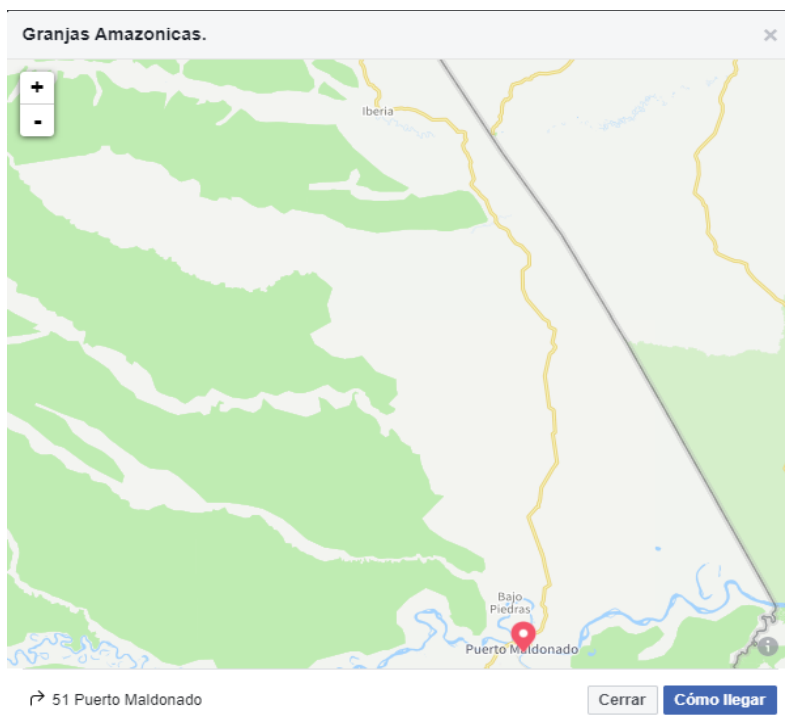
This can be seen in the next map, which extrapolates the expected area of expansion:

MAP 12: ESTIMATED FRONTIER EXPANSION OF PACAHUARA RELIGIOUS COMMUNITY



It is reasonable to think that the expansion will move mostly to south because the market demand for its main product, corn, Granjas Amazonicas, is located in Puerto Maldonado.

MAP 13: DISTANCE TO CORN MARKETS



It is likely the same scenario, but at a lower scale, for the other three communities and maybe new migrants can fund new settlements.

4.2 Net Positive Community Impacts

4.2.1 Expected Community Impacts (CM2.1)

The Jaguar Amazon REDD+ Project will have significant positive impacts on neighboring communities of the project. The expected impacts of the Project on communities are:

- *Increased incomes*
- *Increase of high quality employment (safer labour conditions than traditional logging)*
- *Enhanced skills on forest management and forest certification*
- *Biodiversity conservation (and access allowance to natural resources)*
- *Maintenance of biological connectivity*

On the other side, there are potential negative impacts as:

- *Limited access to families that used to practice unsustainable use of natural resources (logging, hunting and, in general, overexploitation of forest and wildlife resources)*

As part of its corporate responsibility, Bozovich Group will prepare and diffuse a Communication Protocol to key stakeholders, explaining the expected impacts that the project will bring to neighboring communities and how they can organize and develop a joint plan to take these opportunities and to deal with the negative impacts and how to offer alternatives to compensate those impacts. At this moment, Bozovich Group has

developed a “Handbook for Conflict Resolution”, which is a basis and an input for the Communication Protocol.

4.2.2 Negative Community Impact Mitigation (CM2.2)

The only identified negative impact is a ban to unsustainable use of natural resources within the forest concession. These practices are not legally allowed but are traditionally done by local families. Even though, Bozovich Group indicates that there were not families inside the project area, the ban will affect the accessibility to natural resources, which is a source of incomes, food or any other input for livelihood.

Bozovich Group will not only give preferences to local families to work in the company operations, but will also support them with training and seed capital to start small enterprises as fish farming and wildlife husbandry. By doing this, families will be able to access to the same level of proteins and nutrients without affecting the biodiversity of the zone.

According to the “Directiva para la contratación de personal” (Labor hiring Guidelines), the company will publish the call for new workers at least during the first 8 days exclusively in the surrounding settlements. Only if there were not applicants that meet the requirements and nobody is chosen, the company will launch a new process expanding the call to the settlements located in the province, again for other 8 days, at minimum.

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

Based on previous analysis, the project expects to generate a positive net impact on surrounding communities. The different aspects or dimensions that will be permanently modified by the project are not equivalent in nature and cannot be adequately compared. For this reason, we plan to monitor the net impact of the project on communities in each type of impact:

As explained before, the type of impacts identified are:

INCOMES + SKILLS + ACCESS TO NATURAL RESOURCES

Income:

- *Positive (from increased employment, economic chains, sale of natural resources, and others)*
- *Negative (from limited access to unsustainable use of natural resources)*

Skills:

- *Positive (number of trainings received by workers and other members of the communities)*

Access to natural resources:

- *To be estimated (volume of natural resources harvested for self-consumption)*

4.2.4 High Conservation Values Protected (CM2.4)

The HCVs present within the project area will not be affected because the activities of the project will not have incidence over those HCV indicators as “Significant level of concentration of biodiversity value at a global, regional or national level” or “Large and significant, at a landscape scale, forests at a global, regional or national level”. It is the same scenario in both concessions.

4.3 Other Stakeholder Impacts

4.3.1 Impacts on Other Stakeholders (CM3.1)

TABLE 51: IMPACTS OF THE PROJECT ON OTHER STAKEHOLDERS

Stakeholder	Type of impact	Level of impact	Description
Municipality	+	Low	<i>The impact is positive but low as the concessions are two of the largest companies in the district so their taxes are significant in the municipality income scheme</i>
Forestry and Wildlife Technical Authority	+	High	<i>The impact is positive and high because the presence of the concessions is not only a source of income for the Authority but a success example, not only in the district but in the region and in the whole country too.</i>
Brazil nut concessions	0	Medium	<i>As explained before, the area has Brazil nut trees inside so the company has made agreements with BN concessionaries to allow them to harvest the BN pods. It is important to highlight that the BN harvesting, as it is a Non Timber Forest Product, is the typical sustainable production model. The impact is medium and neutral because the presence of the company does not imply any restriction to the BN activity.</i>
Agricultural Producers	-	High	<i>The main deforestation driver in the surrounding forest area is, in words of the Director of DRA, the migration in search of new lands for agrarian use, even though it is not allowed.</i>

			<i>The presence of the company blocks the intention of migrants to expand their agricultural crops to these forests.</i> <i>As there is a risk that they displace to other forest areas, the project plans to train in alternative sustainable activities.</i>
<i>Cattle ranchers</i>	-	<i>High</i>	<i>Similar to the previous stakeholder.</i>
<i>Timber concessions</i>	+	<i>High</i>	<i>There are many dimensions of the impact between timber concessions: the price of the timber, the open and shared maintenance of roads, the competition on processing services, etc.</i> <i>According to our assessment, the impact is positive because a successful timber concession increases the probability of success to neighbors as they act as a cluster, increasing the competitiveness of the value chain and the lessons learned.</i>
<i>Suppliers of goods and services in the timber value chain</i>	+	<i>High</i>	<i>It is doubtless that the Bozovich Group is a major engine of local economic dynamic, creating direct and indirect employment as food suppliers, transportation services, and timber processing services, among others.</i>
<i>Academic and research entities</i>	+	<i>High</i>	<i>The company offers unique opportunities for local students and teachers to do practices and researches within and around the forest concessions. This is reflected in the Cooperation Agreements signed between the concession and a Technological Institute of the vicinity.</i> <i>Thanks to these Agreements, students and graduated may do pre-professional practices and researches, adequate to national educational requirements. Even more, the concessions offer training, hosting and food, and access to raw data collected during the many years of the presence in the area, which is invaluable for their thesis, researches and as experience for their future professional life. It is a win-win scheme.</i>

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

The main strategy of Bozovich to mitigate the negative impacts is composed by many of the actions described below, including training in alternative economic opportunities and link with educational institutes. It is clear that the company itself is not in charge of forest conservation and control of migrants activities. This is a responsibility of municipalities, regional government and forest authority. The company is responsible for caring the forests within the concession. Said that, the activities that are part of the strategy are:

- *In the short term, create alternative economic activities for local families and alternative methods for own production than can ensure the food security of the rural families*
- *In the medium term, strengthen applied and professional capacities in students to promote a sustainable use of forest resources*

4.3.3 Net Impacts on Other Stakeholders (CM3.3)

Similarly, to what was developed in section 4.2.3, the impacts on other stakeholders may be grouped in the same following categories with the difference that the sources of each impact come from a different stakeholder and activity:

INCOMES + SKILLS + ACCESS TO NATURAL RESOURCES + GOVERNANCE

- *Income:*
 - *Positive (taxes, employment, sale of inputs, sale of natural goods and services, etc.)*
 - *Negative (ban to unsustainable use of natural resources, ban of agrarian frontier expansion)*
- *Skills:*
 - *Positive (students and graduated supported)*
- *Access to natural resources:*
 - *To be determined (self-consumption of natural resources, agrarian productivity and surface)*
- *Governance:*
 - *Positive (managed forestland)*

4.4 Community Impact Monitoring

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

A monitoring plan will be carried out by the project proponent as described in the following charts and graphs:

TABLE 52: COMMUNITY MONITORING MATRIX

Variable	Communities	Method	Frequency	Comments
<i>Family incomes</i>	<i>Portillo</i> <i>Carachamayoc</i> <i>San Francisco</i> <i>Arca Pacahuara</i>	<i>Focus Group</i>	<i>Annual</i>	<i>This variable will be progressively built by determining the sources of income, the percentage of members that access to each type of income, the average area, yield and production, the percentage of total production sold in markets and the average price received.</i> <i>In addition, the average cost of the whole production chain will be obtained for each type of source of income.</i>
<i>Trainings received</i>	<i>Portillo</i> <i>Carachamayoc</i> <i>San Francisco</i> <i>Arca Pacahuara</i>	<i>Focus group</i>	<i>Annual</i>	<i>The number of trainings received by category (related with logging operations or with alternative sustainable economic activities) will be counted and the percentage of families that have accessed to these trainings.</i>
<i>Basket of forest goods harvested</i>	<i>Portillo</i> <i>Carachamayoc</i> <i>San Francisco</i> <i>Arca Pacahuara</i>	<i>Focus group</i>	<i>Annual</i>	<i>A basket of all goods and services that families obtain from the surrounding forests, estimating the average amount harvested per year per family and calculating the average cost of each product (or its substitute) that the family will have to pay in case they cannot get it from the forest.</i>

The number of families that will be part of the focus group in each community will be statistically determined by keeping proportionality between gender, age, size of farmer and other relevant criteria. This will be determined lately.

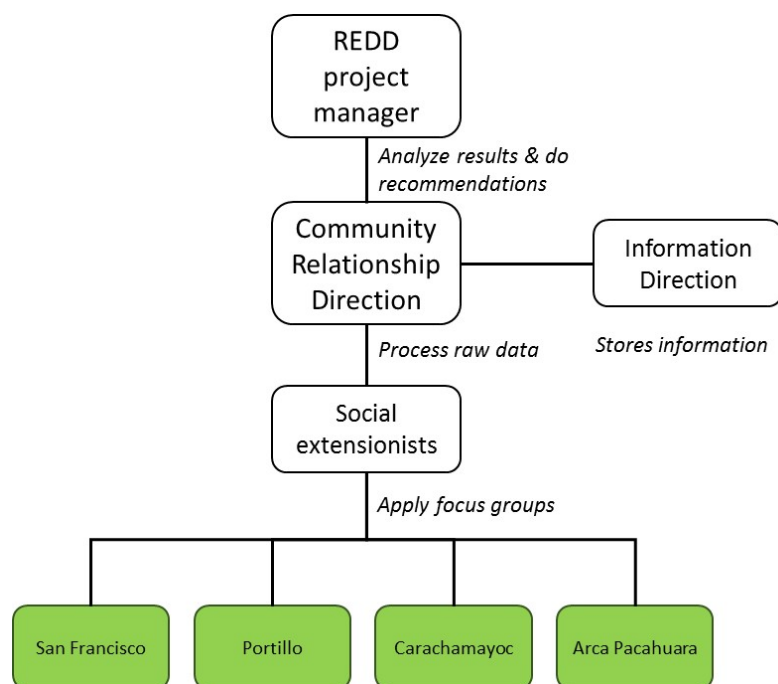
There are different scenarios than may occur, including mixed impacts as the following ones:

- Net positive impact in some indicators but net negative impact in other indicators
- Net positive impacts in some communities but net negative impacts in other communities

Results will be segregated and highlighted not only by community but also by gender and size of farmer in order to evaluate if the project may access to gold level thanks to their exceptional (positive) impacts on vulnerable groups as women and small farmers. There are no indigenous communities with the influence area of the project.

Finally, the following graph shows the role of different areas of the company that will be in charge of the implementation of the current plan:

CHART 7: COMMUNITY AREA INTERNAL STRUCTURE



4.4.2 Monitoring Plan Dissemination (CM4.3)

The monitoring plan and the annual monitoring reports will be accessible in the webpage of the Bozovich Group so any interested may access not only to processed results but also to raw data that was the basis to establish the final results, only protecting the confidentiality of the families that have participated in the focus groups.

Nevertheless, there will be another ways of sharing these results with stakeholders.

- An annual meeting leaded by the general manager of Bozovich Group will be conducted with the leaders and authorities of the four communities to socialize and discuss the results obtained, comparing them with results from previous years, analysing which variables have improved and which have diminished. This analysis should end with recommendations and agreements to make adjustments in the relationship between the company and the communities.
- An annual meeting leaded by the general manager of Bozovich Group with other stakeholders (forest authorities, municipalities, technical institutes, among others) to analyse the same results and obtain recommendations of improvements.

Every 10 years, a book with the main impacts of the REDD project on community and biodiversity variables will be published.

4.5 Optional Criterion: Exceptional Community Benefits

4.5.1 Exceptional Community Criteria (GL2.1)

In 2018, Peru has and Human Development Index (IDH) of 0.750, positioning as the 89° country in the world and is located in the group of high human development countries group. For this reason, the exceptional community criteria GL2.1 is not applicable for the current project. In addition, local families do not have consuetudinary rights to forest areas because those areas have been legally assigned to Bozovich Group for 40 years and, according to the company, surrounding communities are not traditional but in most cases, composed by migrant families so they do not have traditional rights and practices related with the forest area.

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

As briefly described in section 4.3.2, the project expects to produce net positive impacts in the short and long terms.

- *In the short term, by creating alternative economic activities for local families and alternative methods for own production than can ensure the food security of the rural families*
- *In the medium term, by strengthening applied and professional capacities in students to promote a sustainable use of forest resources*

The design of the monitoring plan allows monitoring and determining if the project is contributing to generate net positive impacts in both time horizons. The short-term impact will be demonstrated by monitoring the family incomes by sources while the mid-term impacts will be determined by measuring the skills developed and how those skills become in concrete labor opportunities or new economic activities.

This will be differentiated by gender, age and size of farms.

4.5.3 Community Participation Risks (GL2.3)

As mentioned throughout the whole Project Document, the main risk of the project is a reduction in the incomes of local families caused by a ban to expansion of agrarian frontier toward the forest area of the concession thanks to the effective territorial protection measures. Another risk is related to the reduction of access to other non-traded forest resources (firewood, hunting, fishing, etc. for self-consumption).

To compensate these risks, the project has design specific measures to create alternative activities that provide monetary and non-monetary benefits. This will include technical assistance to increase the productivity of agrarian crops and farming, the promotion of alternative activities as fish farming and production of wild animals.

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

TABLE 53: IMPACTS ON VULNERABLE COMMUNITY GROUPS

<i>Community Group 1</i>	<i>Community families with plots of less than 1 hectare</i>
<i>Net positive impacts</i>	<i>Within local communities, families may be divided by size of their agrarian plots. According to different studies, in the Amazon, families with less than one hectare dedicated to productive activities cannot obtain enough incomes to maintain their minimum subsistence level. These groups may be considered vulnerable or marginalized.</i> <i>The monitoring plan will focus and include this variable (size of plot) as an information to be collected. This will allow to measure if the project is creating net positive impact on this vulnerable group and to propose specific special measures addressed to these group of families.</i>
<i>Benefit access</i>	<i>In case there are specific reasons why this group is under represented in the focus groups carried out by the company, other special methods to ensure their participation will be evaluated and applied. Limited access to free time for participating in focus group meetings or cost of transportation are some of the potential reasons that will cause this hypothetical under representation in focus groups.</i>
<i>Negative impacts</i>	<i>In case the results of monitoring analysis conclude that this group is being negatively affected or is accessing at an inferior level (compared with the share of this group of families in the total of families of each community) to the benefits of the project, special additional measures will be designed to revert this situation.</i>

4.5.5 Net Impacts on Women (GL2.5)

Similarly, to the analysis of vulnerable group described in section 4.5.4, women will also receive a similar analysis in order to ensure an adequate representation in meetings and access to benefits and opportunities offered by the company.

In both cases, in the next year report of when the hypothetical negative impact has been identified, this situation must have been reverted.

4.5.6 Benefit Sharing Mechanisms (GL2.6)

As the project proponent is the legally assigned forest concession part of Bozovich Group, no benefit sharing mechanism is mandatory. However, as part of the strategy to ensure the reduction of pressures on forests and the risk of leakage to neighboring forest areas, many activities, described throughout this document, are being implemented.

Those activities and investments will be jointly defined and prioritized by the company and the four neighboring communities. At the end of annual meeting mentioned in section 4.4.2, a document with the main agreements will be signed by both parts, indicating the timeframe when these agreements will be implemented. Optionally, a commission may be created to do a follow up to the implementation of these agreements.

After discounting all the costs of monetizing the emissions reductions units (VCUs) (including certification and commercialization costs), a percentage of the net benefits obtained by the current project will be invested yearly. This percentage initially is determined in X% and may be adjusted by the project proponent but in any case it may be lower than Y% and higher than Z%.

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

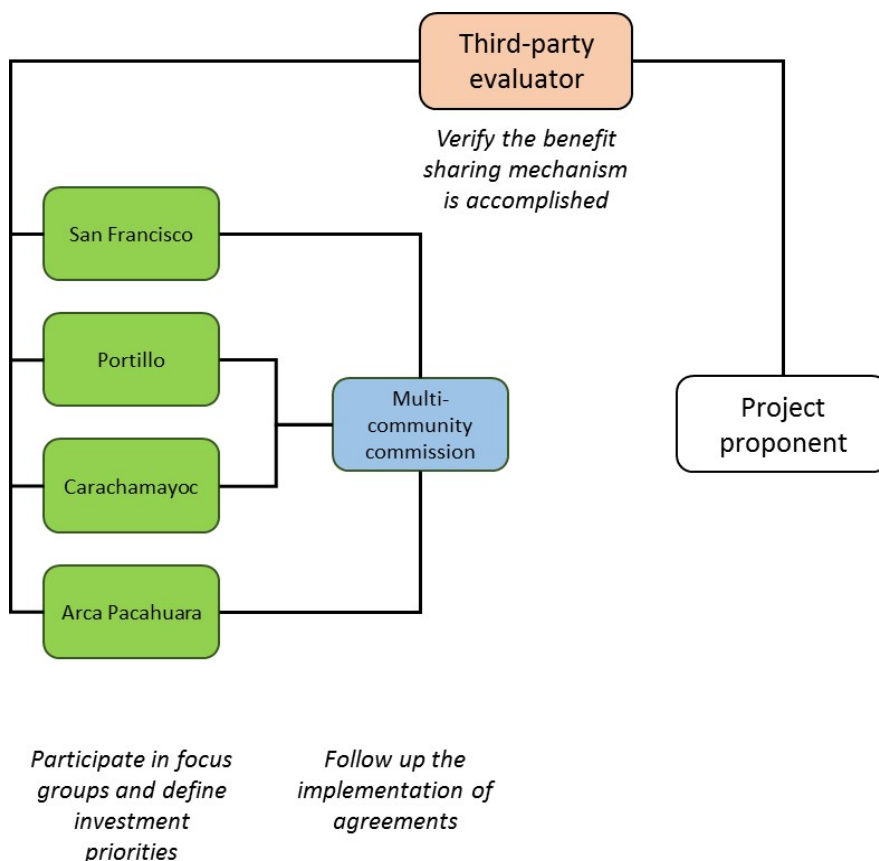
Related with previous section, Bozovich Group will share, keeping the confidentiality of the buyers of the VCU, the gross and net incomes and costs obtained with the sale of VCUs in order to ensure that the benefit-sharing proposal is being strictly accomplished. Optionally, this will be auditable. An independent third-party, mutually agreed by both parties will be defined to play this role. This information must not be shared by the communities to third parties without written authorization of Bozovich Group.

Didactic materials will be prepared to explain in a simple clear way what are the benefits and costs of these innovative business line (carbon credits). If needed, a formal evaluation process will be carried (exams) to ensure that there is an adequate understanding of the issue by community families, leaders and authorities.

4.5.8 Governance and Implementation Structures (GL2.8)

A chart explaining the different roles and relationship between the communities and project proponent is included in section 4.4.2. In addition to that, and according to other roles and stakeholders may be better understood in the following graph:

CHART 8: COMMUNITY RELATIONSHIPS INSTITUTIONAL ARRANGEMENTS



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

This is also mentioned in previous section. The monitoring design has a specific focus on skills enhancement and guarantees that information collected will allow confirming that all vulnerable groups will not be marginalized from these benefits.

5 BIODIVERSITY

5.1 Without-Project Biodiversity Scenario

5.1.1 Existing Conditions (B1.1)

Madre de Dios is a region recognized worldwide for its high biological diversity (Voss & Emmons, 1996), which is why it has been awarded the title of Biodiversity Capital of Peru. It is estimated that one of the "Pleistocene Refuges" of the planet is located in this Department and 50% of the diversity and endemism is found at the country level. A large part of this biological diversity is represented in its Natural Protected Areas. Since 1973, with the creation of Manu National Park to date, six Natural Protected Areas (NPAs) have been created in the department, some of which are shared with other regions. The following units make up the department's PNA system: Manu National Park, Manu Reserved Zone, Bahuaja-Sonene National Park, Alto Purús National Park, Tambopata Candamo National Reserve, Amarakaeri Communal Reserve and Purús Communal Reserve. Together, these areas cover 3'784,081 ha representing 44.6 percent of the department's territory. (IIAP, GOREMAD, 2009) and this percentage continues to increase due to new protected areas such as the Indigenous Reserve in Voluntary Isolation, Tourism Concessions, Conservation Concessions and also private Conservation Areas.

Kometter (2003)²¹ conducted vegetation characterization studies in the department of Madre de Dios. According to their classification, the forests in the project have the following characteristics:

- *Low Hill Forest (BCb): The forest is established on areas that have a tectonic origin but that have also been shaped by water erosion, having accentuated the ruggedness of its topography, presenting slopes that can reach up to 70%, likewise the relative height to which the elevation of these hills can reach is up to 80 m. This type of forest presents subtypes such as forests of different vigor, forest with paca, pacal and associations have been found with Shiringa.*
- *High Hill Forest (BCa): The physiography on which this type of forest develops presents undulations with elevations that can reach up to 200 m of relative height; the slopes that they present are of moderate to strong, reaching up to 100%. This type of forest presents subtypes such as forests of different vigor, forest with bales and pacal.*
- *Low Terrace Forest (BTb): This forest develops on land located generally after the alluvial flood zone, with a relative height above river level of less than 10 meters, relatively flat with some depressions, regular to bad drainage. This type of forest has subtypes such as forests of different vigor, forest with bales and pacal.*
- *High Terrace Forest (BTa): Generally located around second order rivers or streams. In some areas of the study area, they are found in the highest parts forming a kind of plateau. They have flat to slightly undulating topography, slopes ranging from 0 to 8%, no drainage problems, and are made up of old alluvial materials. This type of forest presents subtypes such as forests of different vigor, forest with bales and pacal, and also associations with Brazil nut were found.*

The project presents a considerable extension of moderately conserved forest, and its existence as a concession is considered the only barrier to the protection of populations of species of wild flora and fauna. Because of its size (more than 180,000 hectares), it is key to the connectivity of large mammals.

²¹ Mapping and Forest Assessment of the Permanent Production Forest of the Department of Madre de Dios.

According to the threat categories of the Ministry of Agriculture, 16 mammalian species with some degree of threat are registered in the Madre de Dios region (Supreme Decree 034-2004/AG). Mammals such as the choro monkey (*Lagothrix lagotricha*) are at risk, although previously widely distributed in the region but with sparsely dense populations in areas of high and primary forest, now threatened by their vulnerability to intervention and alteration of their habitat and their quoted meat, such as hunting trophy and exotic pet (Aquino and Encarnación 1994); the river wolf (*Pteronura brasiliensis*), the pacarana (*Dinomys branickii*), distributed throughout the Amazon basin but with more records on the river Madre de Dios. In a vulnerable situation we have spider monkey or machisapa (*Atels chamek*), a resident of dense and lush forests or primary forests, this species is affected by hunting pressure and deforestation (Aquino and Encarnación 1994).

The yauje (*Dasyprocta kalinowskii*), the flag or bear flag (*Myrmecophagatridactyla*), the giant armadillo (*Prionomys maximus*), the tapir (*Tapirus terrestris*) are also widely distributed within the Madre de Dios region, threatened by the high pressure of subsistence hunting, among human settlements. For the water mouse (*Neusticomys peruviansis*) and Laval bat (*Thyroptera lavalii*), habitat loss is the biggest threat (Pacheco 2002). Among other important species we have the bush dog (*Speothos venaticus*), widely distributed in the Amazon basin but very rare to observe (Solari et al., 2006), also the short ear dog (*Atelocynus microtis*), all these Amazonian canids are categorized within CITES I.

The mammals most sensitive to hunting pressure, which requires more awareness-raising actions, are sachacow and primates. Because they have long gestation periods and slow development, high hunting pressure leads to a rapid decline in their populations. Compared to primates, Saxins and Huangans, they have a better response to the decline in their populations, making them less sensitive to intense hunting pressure.

The project area has attributes of high biological and ecological value, maintains important wildlife species, diversity of natural landscapes, and the unique beauty of the colpas. The richness and diversity of species is linked to the diversity of habitats and the abundance of food, a fundamental element to guarantee the stability of animal populations.

Biodiversity studies conducted in the project area, as part of the Forest Stewardship Council (FSC) Standard certification of forest management, found several species of threatened wildlife. The degrees of threat of the species found were updated with respect to Supreme Decree 004-2014-MINAGRI, if they are considered CITES species and on the IUCN red list. These will be detailed below:

TABLE 54: WILDLIFE SPECIES WITH SOME DEGREE OF THREAT

Common Name	Scientific Name	D.S. N°004-2014-MINAGRI	CITES ²²	IUCN ²³
Mammals				
Agoutis	<i>Dasyprocta</i> sp.			
Red squirrel	<i>Sciurus pyrrhinus</i>	Insufficient data		

²² <https://speciesplus.net/species>

²³ <https://www.iucnredlist.org/>

Common Name	Scientific Name	D.S. N°004-2014-MINAGRI	CITES ²²	IUCN ²³
Spider Monkeys	<i>Ateles paniscus</i>	Vulnerable	II	
White Monkey	<i>Cebus albifrons</i>		II	LC
Huasa Monkey	<i>Saimiri sciureus</i>		II	LC
Monkey preserve	<i>Alouatta seniculus</i>	Almost threatened	II	LC
Monkey Martin				
Black Monkey	<i>Cebus (sapajus) paella</i>		II	LC
Little monkey	<i>Saguinus fuscicollis</i>		II	LC
Stump monkey	<i>Cebus (Plecturocebus) Moloch</i>		II	LC
Bear flag	<i>Myrmecophaga trydactila</i>		II	VU
Puma	<i>Puma concolor</i>	Almost threatened	I	LC
Otorongo	<i>Panthera once</i>	Almost threatened	I	NT
Sachavaca	<i>Tapirus terrestris</i>	Almost threatened	II	VU
Wild pig	<i>Tayassu (Pecari) tajacu</i>		II	LC
Huangana	<i>Tayassu pecari</i>	Almost threatened	II	VU
Ashy Deer	<i>Mazama gouazoubira</i>			LC
Red Deer	<i>Mazama Americana</i>	Insufficient data		DD
Birds ²⁴				
Harpy Eagle	<i>Harpia harpyja</i>	Vulnerable	I	NT
Tatatau	<i>Daptrius (Ibycter) americanus</i>		II	LC
Paujil	<i>Mitu tuberosum</i>	Almost threatened		LC
Tinker Bell Kettle	<i>Pipile cumanensis</i>	Almost threatened		LC
Trumpeter	<i>Psophia leucoptera</i>			NT

²⁴ For this list, DS034-2004-AG is still used because a part has not been published.

Common Name	Scientific Name	D.S. N°004-2014-MINAGRI	CITES ²²	IUCN ²³
Aurora	<i>Ara severus</i>	Vulnerable	II	LC
Macaw	<i>Ara macao</i>	Vulnerable	I	LC
Panguana	<i>Crypturellus undulates</i>		I	LC
Partridge	<i>Tinamus sp.</i>			
Paucar				
Reptiles ²⁵				
Motelo	<i>Geochelone (Chelonoidis) denticulata</i>	Danger	II	VU
Black Caiman	<i>Melanosuchus niger</i>	Vulnerable	I	LR

Source: PGMF Otorongo, PGMF Chullacchaqui

Of the mammal species found in the assessment, two species are found as Vulnerable: the Otorongo (*Panthera onca*) and Huangana (*Tayassu pecari*) on the IUCN list and on the CITES I and II list respectively.

The Otorongo, or Jaguar (*Panthera Onca*), is found at the top of the food chain pyramid and its existence is an unavoidable sign of the health of the surrounding ecosystem in which it lives.

When the Spanish arrived in America, the Jaguars inhabited the forests from Northern California to Patagonia. Today their range has been considerably restricted, having become extinct in much of the tropical region.

The jaguar is hunted for its valuable skin, despite being a forbidden activity, which reaches high prices on the international market. In the 1960s alone, more than 20,000 jaguar skins were exported to the United States. Europe is also in the areas of destination of these skins at high prices, which causes the decline of the population of this animal.

It should be noted that, except for man, the wild jaguar is the only predator capable of controlling populations of large herbivores, such as deer, tapirs and wild pigs. Unlike what happens in the African plains or the northern temperate forests, in the Amazon the amount of prey is reduced in relation to the extension of the forest, so the otorongo must resort, in much of its diet, to small animals such as rodents, turkeys, partridges, lizards, snakes, monkeys and sloths.

As for the species of wild flora, it is detailed below:

TABLE 55: LIST OF HARVESTABLE FOREST SPECIES UNDER THREAT

²⁵ For this list, DS034-2004-AG is still used because a part has not been published.

Common Name	Scientific Name	DS 043-2006-AG	CITES	IUCN
Huicungo	<i>Astrocaryum carnosum</i>	NT		VU
Huicungo	<i>Astrocaryum huicungo</i>	NT		
Ishpingo, Cumaru de Cheiro	<i>Amburana cearensis</i>	VU		EN
Cedar, White Cedar, Tall Cedar	<i>Cedrela fissilis</i>	VU		VU
Red Cedar	<i>Cedrela odorata</i>	VU	III	VU
Huimba Colorada, Lupuna	<i>Chorisia integrifolia</i>	NT		
Ceiba, Huimba, Lupuna	<i>Ceiba pentandra</i>	NT		LC
Mashonaste, Amarillo, Tulpay	<i>Clarisia racemosa</i>	NT		LC
Copaiba	<i>Copaifera paupera</i>	VU		LC
Quinilla Roja	<i>Manilkara bidentata</i>	VU		
Itahuba	<i>Mezilaurus itauba</i>	VU		
Tahuarí	<i>Tabebuia incana</i>	VU		
Tahuarí, Asta de Venado, chonta	<i>Tabebuia serratifolia</i>	VU		
Mahogany	<i>Swietenia macrophylla</i>	VU	II	VU

Source: PGMF Otorongo, PGMF Chullacchaqui

According to INRENA's legal norm DS. 043-2006-AG, which approves the categorization of threatened species of wild flora in Peru, 10 species of trees with commercial value present in the consolidated Chullacchaqui are considered Vulnerable (VU) and five species are considered Near Threatened (NT). According to CITES, mahogany (*Swietenia Macrophylla*) is listed under CITES II and red cedar (*Cedrela Odorata*) is listed under CITES III.

Two species of high social and ecological value are also present: the Brazil nut (*Bertholletia excelsa*) and the shiringa tree (*Hevea brasiliensis*), which is extracted for its fruits and resins. Although these two species do not have IUCN or CITES conservation categories, they are strictly protected by the State, which grants them rights as concessions for Brazil nut or shiringa harvesting to develop complementary harvesting activities. It should be noted that the slashing and burning of Brazil nut trees was declared a closed season for an indefinite period by Ministerial Resolution N°0729-81-AG-DGFF; and then the prohibition of slashing and burning of Brazil nut trees was decreed in Supreme Decree N°044-2002-AG.

Other forest species of diverse importance are the aguajales where some palm species are located such as Shapaja (*Attalea phalerata*), Huasai (*Euterpe precatoria*), Huicungo (*Astrocaryum sp*) and aguaje

(*Mauritia flexuosa*). These palms are part of the diet of many wild animal species (Bodmer 1993), as are sapote (*Matisia cordata*), charichuelo (*Rheedia floribunda*), almendro (*Geoffroya striata*), chimicua (*Pseudolmedia laeviata*), congona (*Brosimum* sp), shimbillo (*Inga ruiziana*) and uvilla (*Pourouma cecropiaefolia*).

5.1.2 High Conservation Values (B1.2)

TABLE 56: BIODIVERSITY HCV

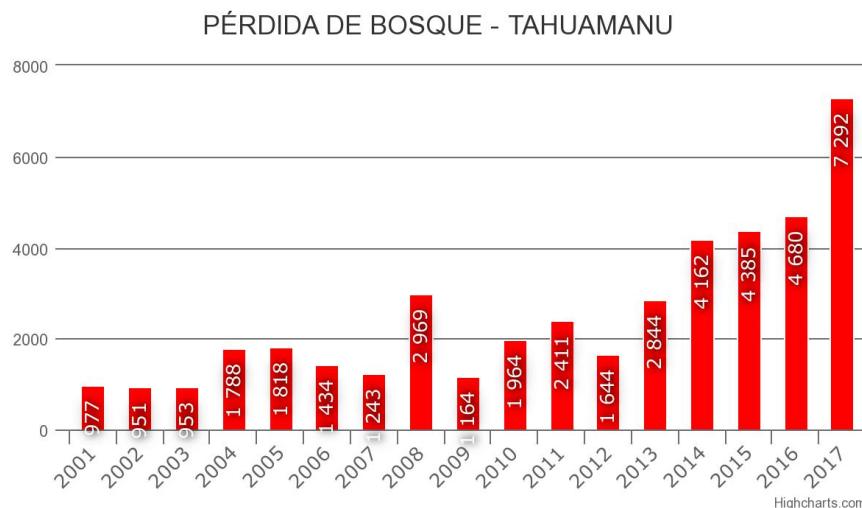
High Conservation Value	Otorongo or Wild Jaguar (<i>Panthera onca</i>), a threatened species according to all existing classification criteria.
Qualifying Attribute	As a result of the protection measures, the project area is home to a population of jaguars more concentrated than the surrounding forest areas. Nearly 40 different wild species of this endangered species have been identified in the concession area.
Focal Area	The project area covers approximately 185,000 hectares under the FSC-certified sustainable forest management system between the Manuripe, Muymanu and Tahuamanu river basins, at the northeastern tip of the Madre de Dios region.

High Conservation Value	The entire area of the project, due to its large area of more than 185,000 hectares
Qualifying Attribute	Key area for the connectivity of species, especially large mammals and the hydro biological processes involved; there are sites of great importance to wildlife such as: collps, avocados, pacaes, marshland, Brazil nut, river-dwelling, streams and lowlands. In addition, the Consolidated respects the 25-50-metre fiscal straw as a buffer area for watercourses, thus maintaining hydro biological processes and limiting their pollution.
Focal Area	The project area covers approximately 185,000 hectares under the FSC-certified sustainable forest management system between the Manuripe, Muymanu and Tahuamanu river basins, at the northeastern tip of the Madre de Dios region.

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

In the no-project scenario, the forest loss trend of Tahuamanu province would be the most likely scenario that would occur in the project area. The following chart shows that, since 2012, deforestation in Tahuamanu province has grown exponentially, having increased almost five times in just five years.

CHART 9: FOREST LOSS IN TAHUAMANU PROVINCE



Being the main threat to biodiversity, the fragmentation and loss of habitat due to the advance of the agricultural frontier, agricultural and mining activity among the main ones.

The expansion of the agricultural frontier is caused by the continuous and accelerated pressure on the lands on both sides of the Southern Inter-Oceanic Highway (IOS) mainly by Andean migrants. They replicate traditional slash-and-burn practices, deforesting areas covered with forest, to carry out clean agriculture or intensive grazing. It is estimated that the change in land use for agriculture is growing at an annual rate of 1.29% in reduction of primary forest and 0.66% of secondary forest. Likewise, the implementation of pastures for cattle raising registers the highest annual growth rate, reaching 3.51% in reduction of secondary forest and grasslands.

In the CDC-SZF-INRENA study (2007), in section 3 of the IOS, which includes and surrounds our project area, it refers to agricultural activity (farming and livestock activities) as the main source of deforestation, representing 94.2%; agriculture 3.37% and the rest is a result of infrastructure. Likewise, the habilitation and maintenance of the IOS brings with it indirect impacts on the surrounding forests; these impacts according to Dourojeanni (2006) would be

- Deforestation, by legal and illegal agriculture in soils without agricultural aptitude.
- Forest degradation, due to forest extraction without management and replacement. The harvested species of cedar and mahogany represent 90% of the volume exploited, most of which is illegal. Myers (1980) estimates that for every m³/ha exploited, the farmers who subsequently invade the areas destroy approximately 1/5 ha of forest.
- Increased risks of forest fires (natural causes or induced fires resulting from slash-and-burn practices)

- *Illegal hunting, for trade in meat, hides and skins and trafficking in live animals.*
- *Reduction of environmental services of the forest (water cycle, CO2 fixation, etc.).*
- *Loss of biodiversity and extinction of species, and the invasion of protected areas. This will result in the reduction of the landscape and tourist value of these ecological niches.*

Informal mining recorded, according to our calculations, a growth rate of 3.62% per year. This increase is stimulated by the international price of gold and the lack of control mechanisms and tax inspection, which allows all mining activity to be informal, becoming a serious environmental and social threat in continuous expansion.

Mining in Madre de Dios is carried out with heavy machinery and dredging in the rivers, which produces negative impacts such as the alteration of surface water quality due to land removal; the dumping of chemicals, oils, lubricants and fuels that puts aquatic fauna at risk; direct destruction of flora and fauna, alteration of biodiversity, and alteration of the habitat due to the movement of vehicles and heavy machinery.

The area is ecologically balanced. The species and habitat communities in the forest are inherently stable, but could be susceptible to alteration if there is a drastic modification of the environment with changes in land use or indiscriminate logging.

5.2 Net Positive Biodiversity Impacts

5.2.1 Expected Biodiversity Changes (B2.1)

TABLE 57: EXPECTED BIODIVERSITY CHANGES

<i>Biodiversity Element</i>	<i>Otorongo or wild Jaguar (Panthera onca)</i>
<i>Estimated Change</i>	<i>Maintenance and increase of the jaguar population</i>
<i>Justification of Change</i>	<i>The maintenance of the concession forest and the adjacent forest are the main factors that will allow this change to be generated, as a consequence of the fact that this is a project based on selective and low-impact logging management, allowing natural regeneration and the growth and reproduction of unharvested individuals.</i> <i>This allows for the conservation of almost intact forest cover, while guaranteeing the conservation of innumerable associated flora and fauna species, among them the Otorongo, an umbrella species at the top of the food chain pyramid.</i> <i>The forest thus maintains its rhythms and cycles in a similar way to how it developed thousands of years ago, maintaining its</i>

	processes, and where species that are indicators of the health of ecosystems register healthy and growing populations (as is the case with top predators such as the Otorongo, the harpy eagle or the giant otter) and where other species that are highly sensitive to human presence (tapirs, deer, mountain pigs, paujiles and turkeys) maintain healthy populations. It is also worth mentioning that in the concession area, complementary activities to the sustainable use of the forest are carried out, among them, the monitoring of fauna through the "Jaguar Project", which is being carried out for the monitoring and evaluation of the populations of wild jaguars, implemented by Ph, D. Mathias Tobler of the San Diego Zoo, using a set of camera traps in different areas of the habitat of these felines. The images captured have allowed the identification of about 40 different specimens of wild Otorongos or Jaguars, an unusually high number, one of the largest recorded in the world. One of the factors of this high population density would be related to the proliferation of prey (deer, capybara, tapirs, and wild pigs, among others) in the forest tracts unrelated to human disturbance.
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<i>Biodiversity Element</i>	<i>136 species inventoried with timber potential</i>
<i>Estimated Change</i>	<i>Sustainable forest management with FSC certification and Chain of Custody (CoC) certification.</i>
<i>Justification of Change</i>	<i>The project is based on selective and low-impact logging management (a total of 9 species out of 200 growing in one Ha are harvested with higher standards than those required by Peruvian legislation), by dividing the area under sustainable forest management into a total of 20 cutting plots, which will be harvested annually (one part each year) and at a certain intensity of harvesting (the design considers a cutting cycle every 20 years, resulting in less than one tree per Ha being harvested every 20 years), allowing natural regeneration and the growth and reproduction of unharvested individuals. A great diversity of species (136) with timber potential has been inventoried.</i> <i>The methodology includes the approval of a General Forest Management Plan and the preparation of the Annual Operating Plan, which begins with a forest inventory, in which the variety and quantity of potential species to be harvested is recorded. This makes it possible to know the number of individuals of each species that are suitable for harvesting, and the approximate volume of wood that they will generate, which makes it possible</i>

	to calculate and control, among other things, the total volume of wood to be harvested. This makes it possible to identify the seed trees (approximately 20% of the total number of individuals to be harvested) that are kept in the forest, guaranteeing the production of seeds and ensuring the survival of the species and favoring their natural regeneration. Felling is done by directing the fall and minimizing damage to the surrounding vegetation, so that the clearings left in the forest are of similar dimensions to those created by the natural fall of the trees. This favors regeneration since the entry of light into the clearings triggers the growth of seedlings that remained in a dormant state under the shade of the parent tree. This allows the conservation of the forest cover almost intact, guaranteeing in turn the conservation of innumerable species of associated flora and fauna. To this end, the project has trained personnel, created infrastructure and adapted the processes necessary to obtain the Sustainable Forest Management Certification - FSC 100% - guaranteeing an environmentally sustainable, socially inclusive and economically viable model. It also has certification of its Chain of Custody (CoC), which guarantees that the product it sells reaches the customers respecting the traceability processes and the three pillars of sustainability (environmental, social, and economic). In this way, the forest maintains its rhythms and cycles in a similar way to how it developed thousands of years ago, maintaining its processes, and where the species that indicate the health of the ecosystems register healthy and growing populations.
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5.2.2 Mitigation Measures (B2.3)

There are no expected negative impacts on biodiversity as a result of the implementation of the project activities.

The company has implemented a number of measures to maintain natural patterns and processes and avoid fragmentation. These measures include: voluntarily limit mahogany logging (Swietenia macrophylla), because it is endangered, regularly conduct timber and wildlife inventories to better understand the forest ecosystem, implement small impact measures to limit the potential impacts of activities, logging based on scientifically sound reconstitution rates for the main timber species, increasing the minimum diameter of short above the legally required diameter, tree protection seedlings and trees considered important for wildlife. The use of reduced impact techniques to minimize momentary interference caused by extraction

operations. Rare logging is not carried out or very large clear, so there is no fragmentation of forest resources.

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

The current good condition of wildlife within the Consolidated Area is apparently due to the prohibition of hunting, the implementation of reduced impact harvesting techniques, surveillance and control actions, and process monitoring and continuous staff training.

Despite the fact that hunting pressure is very low or almost non-existent and the control mechanisms carried out by both concessions, the availability of roads and trails used for timber extraction within the concession area and the proximity to the IOH will facilitate access by illegal hunters. Continuous and permanent patrols are needed throughout the area to ensure that no illegal hunting activity takes place within the concession area, an objective that should be achieved only through carbon finance.

On the other hand, fauna monitoring through the "Jaguar Project," which is being carried out to monitor and evaluate the populations of wild otorongos or jaguars. Nearly 40 different specimens of otorongos have been identified, an unusually high number, one of the largest recorded in the world.

It should also be noted that the Project contemplates other complementary activities for the sustainable use of the forest, such as:

- a. Sustainable use of Brazil nuts, through a participatory partnership scheme with a group of organized local people (about 40 families from the localities in the area of influence) through a low-impact harvesting activity, under rules of behaviour consistent with the custody of the forest, care of the environment and water flows. By consolidating the collection carried out, and being in charge of marketing, the Project has obtained better dividends that benefit the extractors.*
- b. Production of charcoal, using the residues of the sawing activity, allowing the disposal of waste in the field, and reducing the pressure of cutting standing species for charcoal in other areas.*
- c. The acquisition of private land allows the development of an ecotourism project aimed at birdwatchers, naturalists and wildlife lovers, which harmonizes environmental conservation with income generation for its management and sustainable use.*

5.2.4 High Conservation Values Protected (B2.4)

Demonstrate that no HCVs related to biodiversity are mutually affected by the project.

Targeted and low-impact logging does not adversely affect any HCV, but sustainable harvesting favors the conservation of almost intact forest cover, while ensuring the conservation of countless species of associated flora and fauna as well as of jaguar and other endangered species, which were shown in a table above.

The study carried out by Toddler, et al. (2018) within FSC-certified concessions to evaluate the Jaguar population in Guatemala and Peru. I determine, within the Consolidated Otorongo, a population density of Jaguars of 4.5 individuals per 100 km² and emphasizes that this data is comparable only with protected natural areas. Concluding that the intensity of forest harvesting in the consolidated, the same system used in the consolidated Chullachaqui, adequately protects the Jaguars and thus other species; and that extraction has a positive impact on the diversity and abundance of certain species. Furthermore, states that certified concessions allow connectivity between protected areas and natural forest; this is due to the absence of hunters in concessions as a measure to protect the biodiversity that inhabits them.

In this regard, the high conservation values identified for the project such as the area per se of more than 180 thousand hectares and the jaguars are not affected by the harvesting activities.

5.2.5 Species Used (B2.5)

According to the General Forest Management Plan of both Consolidated, the following species are planned to be harvested. It also specifies the Minimum Cutting Diameters (MCD) that these species must reach in order to be considered for harvesting. It should be noted that the MCDs stipulated below are larger than those established by the current regulations in most cases.

TABLE 58: HARVESTABLE SPECIES

N°	COMMON NAME	SCIENTIFIC NAME	DMC (cm)	CHULLACHAQUI	OTORONGO
1	Ana Caspi	<i>Apuleia leicarpa</i>	41	X	X
2	Huayo sugar	<i>Hymenaea sp</i>	51	X	X
3	Bolaina	<i>Guazuma crinita</i>	41		X
4	Cachimbo	<i>Cariniana decandra</i>	41	X	X
5	Mahogany	<i>Swietenia macrophylla</i>	75	X	X
6	Capirona	<i>Calycophyllum spruceanum</i>	41	X	X
7	Catahua	<i>Hura crepitans</i>	60	X	X
8	Catuaba	<i>Qualea sp</i>	41	X	
9	Cedar	<i>Cedrela odorata</i>	65	X	X
10	Copaiba	<i>Copaifera reticulate</i>	56	X	X
11	Cumala	<i>Virola sp</i>	46	X	X

12	Estoraque	<i>Myroxylon balsamum</i>	41	X	X
13	Huayruro	<i>Ormosia sp</i>	46	X	X
14	Caspian Macaw	<i>Sumira rubescens</i>	41	X	X
15	Huima	<i>Ceiba pentandra</i>	51	X	X
16	Ishpingo	<i>Amburana cearensis</i>	56	X	X
17	Itauba	<i>Mezilaurus itauba</i>	41		X
18	Lupuna	<i>Chorisia integrifolia</i>	64	X	X
19	Machinga	<i>Brosimum alicastrum</i>	41	X	X
20	Mashonaste	<i>Clarisia racemosa</i>	41	X	X
21	Misa	<i>Eschwilera sp</i>	41	X	X
22	Moena	<i>Aniba sp</i>	46	X	X
23	Cane Stick	<i>Crepidospermum goudotianum</i>	41	X	X
24	Pashaco	<i>Schizolobium sp</i>	51	X	X
25	Pumaquiro	<i>Aspidosperma macrocarpon</i>	53	X	X
26	Quillobordon	<i>Aspidosperma subincanum</i>	38	X	X
27	Quinilla	<i>Manilkara bidentata</i>	41	X	X
28	Requia	<i>Guarea trichiloides</i>	46	X	X
29	Shihuahuaco	<i>Dypteryx odorata</i>	51	X	X
30	Tahuari	<i>Tabebuia serratifolia</i>	46	X	X
31	Tornillo	<i>Cedrelinga catenaeformis</i>	61	X	
32	Zapote	<i>Quararibea cordata</i>	41	X	X

Of these species, mahogany and cedar are the only ones that require a special permit for harvesting because they are species listed in Appendix II and III of CITES. In Art. 130. of FFS Law No. 29763 the CITES Management Authority approves the annual export quota of mahogany (*Swietenia macrophylla*) including the export of sawn wood, plywood or veneer sheets in accordance with the CITES annotation of the species.

The export quota is established for as long as this species is considered in CITES Appendix II and is defined on the basis of the recommendations of a non-detriment finding by the CITES Scientific Authority, and takes into account performance studies, among other relevant information. The general guidelines for the export quota are defined by supreme decree with the endorsement of the Ministers of Agriculture and Environment.

5.2.6 Invasive Species (B2.5)

The forestry management used in both consolidations is of the type of entresaca polycyclic, i.e., it exclusively manages the mass on foot favoring the growth of commercial species without eliminating undesirable species. In addition, this system allows forest dynamics to continue as it allows for several periods of years of rest in the previously exploited area. Therefore, there would be no possibility of the area being affected by invasive species.

5.2.7 Impacts of Non-native Species (B2.6)

Not applicable.

5.2.8 GMO Exclusion (B2.7)

Not applicable.

5.2.9 Inputs Justification (B2.8)

Not applicable.

5.2.10 Waste Products (B2.9)

The Consolidated companies have a Waste Management Manual, which refers to all technical operating activities involving segregation, handling, storage, transport, treatment, final disposal or any other technical operating procedure used from generation to final disposal.

The waste was identified as: hazardous, non-hazardous, the main waste produced during the wood harvesting process is detailed below.

TABLE 59: WASTE PRODUCED BY LOGGING ACTIVITY

Source	Waste	Kind
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<i>Kitchen Dining room</i>	<i>leftover food</i>	<i>Organic</i>
	<i>Plastic bottles</i>	<i>Common</i>
	<i>Uncontaminated cans</i>	<i>Common</i>
	<i>Glass bottles</i>	<i>Common</i>
<i>Offices</i>	<i>Waste paper</i>	<i>Common</i>
	<i>Cardboard</i>	<i>Common</i>
	<i>Ink cartridges, toners</i>	<i>Dangerous</i>
	<i>Batteries</i>	<i>Dangerous</i>
<i>Camping Installation</i>	<i>Cable waste</i>	<i>Dangerous</i>
	<i>Rests of plastics</i>	<i>Dangerous</i>
<i>Bedrooms</i>	<i>Papers</i>	<i>Common</i>
	<i>Plastics</i>	<i>Common</i>
	<i>Textile remains</i>	<i>Common</i>
<i>Workshops</i>	<i>Used oils</i>	<i>Dangerous</i>
	<i>Contaminated rags and wipes</i>	<i>Dangerous</i>
	<i>Hydrocarbon Remnants</i>	<i>Dangerous</i>
	<i>Metal residues</i>	<i>Common</i>
	<i>Used filters</i>	<i>Dangerous</i>
	<i>Used gloves</i>	<i>Dangerous</i>
<i>All</i>	<i>Medical Services</i>	<i>Dangerous</i>

Waste management covers the following aspects:

- *Waste minimization, under the principle of reduction, recovery, reuse and recycling*
- *Waste segregation, hazardous and non-hazardous (organic or common)*
- *Storage of waste, organic waste in metal containers and transported to the burial pool areas, and waste not suitable for burial will be transported to the external landfill.*
- *Handling of waste, organic waste is classified if it comes from the kitchen (biodegradable waste pits) or from bathrooms and showers (treated by a system of bio digesters or by*

- organic filters); common waste is put in recycling containers, hazardous waste requires handling with personal protective equipment and is put in the corresponding containers.
- Collection system: Waste is transferred from the different places where it is generated to the temporary waste storage area in the camps, which must be covered.
 - Disposal of waste in permanent, sanitary and environmentally safe places.
 - Training of personnel to ensure the correct application of the plan.

In addition to those mentioned above, in the sawing phase, waste is produced that is used in the production of charcoal, allowing the disposal of waste in the field, and the reduction of logging pressure on standing species for charcoal in other regions. The production obtained in twenty furnaces at a rate of 1.5 cycles per month generates a volume of more than 90 metric tons of coal per month, which is destined to the local market and cities in southern Peru (Cusco, Arequipa and Puno).

5.3 Offsite Biodiversity Impacts

5.3.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Measures (B3.2)

TABLE 60: NEGATIVE OFFSITE BIODIVERSITY IMPACTS AND MITIGATION MEASURES

Negative Offsite Impact	Mitigation Measure(s)
Increased deforestation pressure for the purpose of extending the agricultural and livestock frontier in the areas adjacent to the concession.	Workshops on management of crops of interest, controlled burns, agroforestry systems, environmental crimes, etc. to adjacent communities.
Increasing illegal logging of high commercial forest species in areas adjacent to the concession	Greater control on the entry and exit of third parties using the Concessions' transport routes as a transit zone to other areas.
Loss of biodiversity due to increased illegal hunting of wildlife in areas adjacent to the concession	Greater control over the entry and exit of third parties who use the Consolidated transport routes as a transit zone to other areas. Workshops and preparation of informative documents (trptychs, brochures, etc.) on the importance of wildlife to adjacent communities.

5.3.2 Net Offsite Biodiversity Benefits (B3.3)

Under the principle of adaptive management, unmitigated off-site impacts on biodiversity will be identified during the course of the project and strategies and activities to reduce negative impacts generated by the project will be reassessed.

The measures adopted will focus mainly on continuously training the local population on the benefits and appropriate use of the forest resources through informative and educational talks.

On the other hand, although there has been an increase in the pressure of deforestation for the purpose of expanding the agricultural and livestock frontier in the areas adjacent to the concession, this has contributed to the high population density of otorongos or wild jaguars in the concession area, which has become a refuge area because it is a space with minimal human disturbance.

5.4 Biodiversity Impact Monitoring

5.4.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

The Environmental Management Strategy²⁶ considers an Environmental Management Plan that identifies and characterizes all the measures that will be carried out to prevent, mitigate and/or correct the identified environmental impacts. With respect to the biodiversity component, the following is detailed.

TABLE 61: ENVIRONMENTAL MONITORING PLAN

²⁶ Environmental Impact Study Semi detailed (EIS-sd), Category II, Consolidated Otorongo (2018) and EIS-sd Chullacchaqui (2018)

Impact Description	Environmental Control Measures	Monitoring Measures	Frequency	Responsible
Total loss of vegetation cover	Efficient road network planning and building roads with the precise and appropriate technical specifications, avoiding unplanned deforestation.	Evaluate the dimensions of roads and collection yards in strategic locations.	Once a year in dry season	Operational Sub-Management
Habitat destruction and alteration for threatened or endangered species. Nesting sites, collpas, etc.	Avoid destruction and alteration of habitat of endangered or endangered species	Supervision of compliance with what is established. A report will be issued with UTM coordinates of the wildlife sightings and burrows found, which will be submitted to the Regional Natural Resources and Environmental Management Office at the end of the harvest.	Once a year in dry season	Operational Sub-Management
Altered connectivity	On the roads maintain forest canopy contact points for the movement of wildlife	Review the existence and number of forest canopy contact points on roads.	Once a year in dry season	Operational Sub-Management
Partial loss of vegetation. Destruction of unplanned and naturally regenerating trees. Invasion of herbaceous or	Use of controlled logging techniques in the opening of roads. Use of controlled felling to avoid the fall of unplanned trees. Selective cutting of vines. Efficient planning of trailing roads to open the least amount of forest. ~~Selective cutting of lianas~~	Evaluate areas with a greater presence of canopy opening, due to the effect of exploitation. Evaluate the existence of fallen trees not foreseen by the effect of harvesting.	Once a year in dry season	Operational Sub-Management
Loss of genetic resources and structure of harvested species	The minimum cutting diameter and cutting intensity shall be respected. A minimum of 10% of seed trees will be left (regulation by the forest authority) which will be marked during the census.	Sampling plots to determine the resilience of the forest, do not cut trees below the DMC. Number of existing seed trees.	Once a year in dry season	Operational Sub-Management
Reduction of wildlife populations by poaching. Displacement of fauna	Hunting ban. Control and sanctions inside and outside the forest concession. The trucks will not transport people outside the concession. Drivers and their assistants are prohibited from hunting and transporting animals. Denunciation to the forest authority of people who are caught hunting. Promote the functioning of the Forest Management Committee to control poaching.	Wildlife Monitoring	Once for harvest	Operational Sub-Management
Illegal logging	Signposting, boundary maintenance, systematic patrolling and monitoring, promotion of the functioning of the Forest Management Committee and permanent communication with the forest authority	Carry out patrols in areas most prone to illegal logging. The list of the duly accredited consolidated forestry Custodians shall be presented in the end-of-harvest report of each GWP.	Permanently	Operational Sub-Management

In the General Forest Management Plan (PGMF), the evaluation of the state of conservation of wildlife for each consolidated is presented as an approach to the methodology for wildlife monitoring.

The strata (habitats) identified that derive from the vegetation map are aguajal (swamp), lowlands or floodable forests, forests associated with Brazil nut groves and forests associated with pacaes (a type of woodland). The transects covered three of the four habitats.

Monitoring includes night and daytime animals, and the data is collected using the method of transecting, which consists of traversing transects (tracts) established in the study areas with distances not less than 4 km linear during the day and night in order to make direct (seen and heard) sightings of animals or by signs of their presence (footprints, traces or smells). In addition, booby-traps will be used along the transects, in places with footprints, small collpas, swimmers, fruits. Each single group or animal is counted as a register, taking care to count the same group or animal seen by several observers more than once.

We estimate the abundance per taxonomic group based on the number of records during the inventory. We classify abundance in descending order into five classes: abundant, more common, common, less common, rare. Animals that were not registered were classified as "expected"²⁷. These are broad categories and take into account the expected abundance of the animal concerned and whether the records are based on actual observations or secondary evidence:

- *Abundant: describes commonly observed species or where secondary evidence is very common, such as footprints.*
- *More common: describes species that are sometimes observed or whose secondary evidence is common.*
- *Common: refers to animals that are not difficult to observe or whose secondary evidence is normally present in the area, but not as extensively as the "most common" species.*
- *Less common: is a category that includes species that are not normally common but are recorded more than once.*
- *Rare: is used for species that are rarely observed but that were registered at least once.*

The cabinet contrasts the information with the specific richness of the zone or list of species, determines presence-absence, absolute and relative abundance and relative frequency.

For the flora, you have the field instruction for the exploratory forest inventory. The design of the inventory is systematic, with lines and parcels equidistant from each other. The parcels are rectangular, 20 meters wide by 700 meters long. The beginning and end must be marked with a stake and the first 5 and the last 5 trees must be marked with a numbered plate. The numbering is independent on each plot and the plates will be placed at 1.3m height and with a north orientation.

The subplots must be marked only to delimit them and to evaluate the regeneration. In the case of 2x2m subplots, a biodegradable pyola may be used to delimit the square. In the case of trees, the following data shall be taken: common name, CAP measurement, palm trees and regeneration, height estimate (total and commercial), fire quality. With regard to regeneration, the fustals shall be measured on 10x10m subplots, the latizals on 5x5m subplots and the jumps on 2x2m subplots.

In the Forestry Plan for the use of the PCA. Permanent Evaluation Plots (PPE) are established with the objective of evaluating the growth and yield of species.

We will use the methodology outlined in the document "Guide for the Installation and Evaluation of Permanent Sampling Plots" (BOLFOR; PROMABOSQUE 1999).

The main objective of the methodology developed is to obtain information about the response of the forest to the exploitation of the forest. The plots will be installed and measured before harvesting and will be remedied once harvesting is complete. Successive measurements will be made every three years, for a minimum period of 12 years, starting from the year in which the first plot was installed. For each of the cutting intensities determined with the species of interest the aim is to ensure their sustainability, therefore, it is necessary to obtain the following information for each of the species to be favored:

- *Abundance and Dominance, will allow us to know: usable mass, usable future potential and population behaviour*

²⁷ With regard to the list of threatened species in the area.

- Recruitment and mortality rates, the regeneration capacity of the species of interest and the probability that such regeneration will establish itself as the usable mass in the future.

These two criteria are determined in intervened PCAs, establishing in this case a baseline of the presence of species of interest below 10 cm in diameter inside the plot after harvesting, in order to evaluate the response of these species to the actions taken. During the inventory, the name of the species and the category to which it belongs are specified.

Twenty permanent evaluation plots of one ha each will be installed (recommended for UMs with areas of 100,000 ha). The distribution will be random in the area of the PCA to be exploited. Measurement will be done before and after harvesting and then every 3 years.

Once the sampling plots are installed, the diameter of each of the individuals found for the species under study will be measured triennially, in each diameter class.

- Diametric increase, this measurement will be taken at the height of the DAP
- Fruiting diameter, Refers to the diameter that defines the productive maturity of the tree, the same that must ensure the reproductive capacity of the species. It is measured 1.30 m from the ground.

The forest management system being sought must be designed in such a way that it makes the sustainability of these species (commercially desired species) viable, i.e. the values to be taken into account in the procedure to be followed must not influence the resilience of the forest in a negative way.

In the cases of mahogany (*Swietenia macrophylla*) and cedar (*Cedrela odorata*), the considerations are different, since both are under a category of threat in the CITES and IUCN lists, being defined as critical species of high conservation interest.

Although the species "Ishpingo" (*Amburana cearensis*) is only considered as threatened in the IUCN list, the decision to use it or its characteristics must be evaluated according to the same analysis made for the previous case.

In addition, with respect to the High Conservation Value Forests, the "Guide for the identification of High Conservation Value Forests (HCVFs) in Peru" elaborated by CFCPERU (FSC Initiative - Peru) is used as a basis.

Consolidated Otorongo:

AVC1. Significant concentrations of biodiversity values at global, regional or national level and at the Chullacchaqui Consolidated:

HCV1: Significant concentrations of biodiversity values at global, regional, or national levels

HCV2: Globally, regionally or nationally significant large landscape scale forests and the proposal for actions to conserve areas of importance for wildlife are:

- Identify and geo-reference the areas of importance for wildlife in the concession.
- Monitor spaces of importance for wildlife in the concession.

This monitoring should include the following:

1. *Training concession personnel to monitor areas of importance for wildlife.*
2. *Obtain relevant information on the spaces of importance for wildlife according to the corresponding format.*
3. *Elaborate a database with the information generated, which should be dynamic and able to be updated eventually.*
4. *Analyse the information generated during monitoring.*
5. *Interpret the information for decision making to achieve conservation of areas of importance for wildlife.*
6. *Respect spaces of importance to wildlife during the implementation of the AOP.*
7. *Lay out the routes for the extraction roads at prudential distances from the spaces that are used by the wildlife.*
8. *Do not approach mammal clay licks on the ground more than 100 m away.*
9. *Identify the nests of species such as macaws (*Ara spp*) and harpy eagles (*Harpia harpyja*) so as not to cause negative impacts when approaching them.*

5.4.2 Biodiversity Monitoring Plan Dissemination (B4.3)

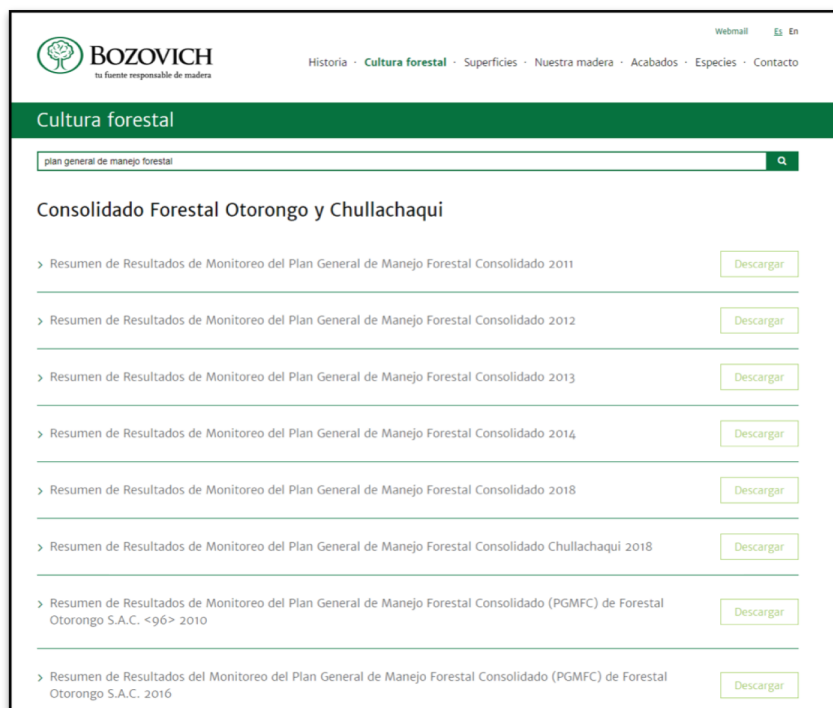
The results of the Monitoring and High Conservation Value Forest (HCVF) assessments and related documentation are uploaded to the official Bozovich²⁸ website for dissemination. This is shown in the following figure and the online address is <http://www.bozovich.com/cultura-forestal/>

Moreover, in the case of FSC certification, as part of its public announcements on its official page for Peru, which is <https://pe.fsc.org/es-pe>

For the dissemination with the surrounding communities, it is carried out through the social manager, through informative workshops and meetings with representatives and residents.

CHART 10: BOZOVICH WEBPAGE

²⁸ Bozovich Company is in charge of the commercialization of the wood extracted from the Consolidated Otorongo and Chullacchaqui.



5.5 Optional Criterion: Exceptional Biodiversity Benefits

5.5.1 High Biodiversity Conservation Priority Status (GL3.1)

In the flora and fauna study carried out to obtain FSC certification for both consolidated species, the presence of Ishpingo (Amburana cearensis) was found to be the only exploitable commercial species listed as Endangered by the IUCN (2019).

The project may obtain the Gold Level for exceptional biodiversity benefits thanks to the fact of being a high biodiversity conservation priority status because the project zone meets the criteria of hosting an UICN Red List endangered species, Panthera Onca (in the near threatened category), in a population of at least 40 individuals.

5.5.2 Trigger Species Population Trends (GL3.2, GL3.3)

TABLE 62: TRIGGER SPECIES

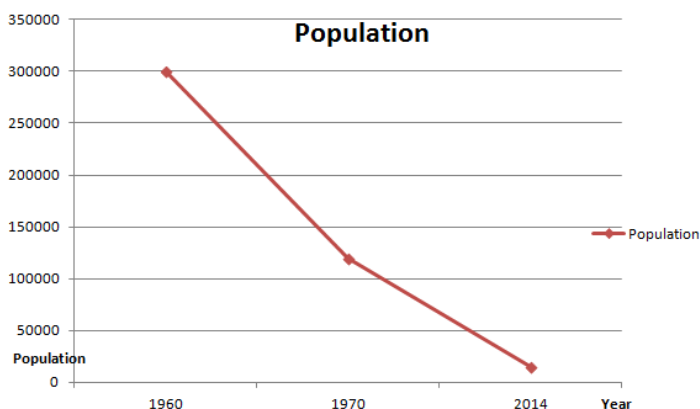
Trigger Species	Jaguar (Panthera onca)
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**Population
Trend at Start of
Project**

Yet today, jaguars have been almost eliminated from the United States and populations in Central and South America are falling because of habitat destruction, trophy hunting and conflict with humans.

Jaguars are listed as “Near Threatened” on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species. Although they still exist in countries such as Arizona and Mexico, the species only inhabits 40% of their original, historical range (Panthera Inc, 2014). In the mid-1800s, the jaguar population extended from Southern Brazil north to Central America, and along west coasts of Mexico. Jaguars could be found in the southwestern United States, and as far north as the Grand Canyon in Arizona (Tony Davis, 2013). There was an estimated 400,000 jaguars roaming in the wild. In the 1960s and 1970s, approximately 18,000 jaguars were killed each year (Panthera Inc, 2014). By 1996, the jaguar population was almost completely eliminated from the United States. Only four jaguars sighted in New Mexico and Arizona established that the population still inhabited the U.S, and the jaguar is now listed as an endangered species in these areas by the U.S. Fish and Wildlife Service. Today it is estimated that only 15,000 jaguars remain in the wild, and have been protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1973 (Tony Davis, 2013).

As number of jaguars has drastically declined in the past 150 years, the pattern of growth exhibited by the species is exponential decay. The birth rates of the jaguars are declining as their death rates are increasing, and this is causing their numbers to steadily decline.



With 22,000 jaguars in its territory, Peru is the second country in South America with the largest number of jaguars after Brazil; however, this figure is half of what should be registered, according to the corporate sustainability program Conexión Jaguar.

	<i>According to international research, it is estimated that for every 100 square kilometers of protected areas in the Amazon there are 4.5 jaguars, and in unprotected areas the number is reduced by half.</i> <i>The threats to jaguar survival are increasing. Illegal trade and poaching have increased in recent years due to a growing demand for their tusks in the Asian market. This situation, coupled with the loss of its habitat, is accelerating the risk of extinction for the species.</i> <i>A bleak outlook for the region's largest cat. For this reason, Peru has asked CITES to recognize the jaguar as a flag species of the American countries where it lives and to adopt special measures to protect it.</i> <i>Describe recent population trend in the project zone at the start of the project. Estimate numbers, if possible</i>
<i>Without-project Scenario</i>	<i>As can be seen from the information presented, there are no accurate statistics on the jaguar population in the Americas or in Peru. However, what all researchers agree on is the fact that this population is decreasing at an alarming rate as a consequence of the effects on its habitat and the fragmentation of the biological corridors that this species requires for its survival.</i> <i>As can be seen in the adjacent areas, the loss and degradation of the forests is increasing with the consequent negative impact on the jaguar population and pushing this population towards the protected forests of the project area.</i>
<i>With-project Scenario</i>	<i>The study by Tobbler²⁹ et al (2018) within the Consolidated indicates that the population density of the Jaguar (4.5/100km²) is comparable to data from natural protected areas. These measurements were made through camera traps placed in strategic locations within the forest and extraction roads. The Jaguar is an indicator of the good condition of the forest, its presence alone would demonstrate that the ecological processes of the forest are optimal and that the logging carried out does not generate a negative impact on biodiversity but on the contrary is a bridge for the transit of countless species, improving the connectivity between natural protected areas and the project.</i>

²⁹ Tobbler, et al. (2018) Do responsibly managed logging concessions adequately protect jaguars and other large and medium-sized mammals? Two case studies from Guatemala and Peru. Biological Conservation 220 (2018) 245-253

APPENDICES

APPENDICES

Appendix 1: Stakeholder Identification Table

Developed in Section 2.1.9

Appendix 2: Project Activities and Theory of Change Table

Developed in Section 2.1.11

Appendix 3: Project Risks Table

Developed in Section 2.1.18

