

REDD PROJECT IN BRAZIL NUT CONCESSIONS IN MADRE DE DIOS, PERU



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Project Title	Brazil Nut REDD Project
Version	01
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Project Location	Peru, Madre de Dios
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Validation Body	AENOR

Project Lifetime	24 September 2009 – 31 December 2040; 31-years
GHG Accounting Period	01 January 2010 – 31 December 2040; 31-years
History of CCB Status	Project was first validated under CCB Standard on January 15, 2014 by SCS Global Services, obtaining the Gold level. But, as the project was not verified during 5 years, the project is being re-validated.
Gold Level Criteria	Community and Biodiversity Gold
Expected Verification Schedule	July, 2022

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1. SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

TABLE 1

Outcome or Impact Estimated by the End of Project Lifetime	Section Reference
1) Significantly reduced GHG emissions caused by deforestation in the Brazil nut forests of Madre de Dios (329,564 hectares) by implementing the only and unique large Brazil Nut Forest Conservation project.	5
2) Strengthen the organizational and management capacity of the Federation, its grassroots and members to ensure the sustainable and integrated management of forest concessions.	4
3) Provide commercial and operational support to increase income generated by the Brazil nut activity, improving the livelihoods of the community.	2
4) Contribute to improving community livelihood by fostering income streams in sustainable forestry activities within the Project Zone.	4

1.2 Standardized Benefit Metrics

TABLE 2

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
GHG emission reductions or removals	Net estimated emission removals in the project area, measured against the without-project scenario	Not applicable.	
	Net estimated emission reductions in the project area, measured against the without-project scenario	64.668.764 tCO ₂ e	3
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	100.297 ha	3

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*)

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
	For ARR ³ projects: Estimated number of hectares of forest cover increased in the project area measured against the without-project scenario	Not applicable	
Improved land management	Number of hectares of existing production forest land in which IFM ⁴ practices are expected to occur as a result of project activities, measured against the without-project scenario	329,564 ha	3
	Number of hectares of non-forest land in which improved land management practices are expected to occur as a result of project activities, measured against the without-project scenario	Not applicable	
Training	Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities	405 families directly (each one composed by 4.5 members in average)	4
	Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	150 concessions granted to women	4
Employment	Total number of people expected to be employed in project activities, ⁵ expressed as number of full-time employees ⁶	405 families directly (each one composed by 4.5 members in average)	4
	Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	150 concessions granted to women	4
Livelihoods	Total number of people expected to have improved livelihoods ⁷ or income generated as a result of project activities	405 families directly (each one composed by 4.5 members in average)	4

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

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

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

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

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

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
	Number of women expected to have improved livelihoods or income generated as a result of project activities	150 concessions granted to women	4
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	405 families directly (each one composed by 4.5 members in average)	4
	Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	150 concessions granted to women	4
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	N.A.	4
	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	N.A.	4
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	405 families directly (each one composed by 4.5 members in average)	4
	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	150 concessions granted to women	4
Well-being	Total number of community members whose well-being ⁸ is expected to improve as a result of project activities	405 families directly (each one composed by 4.5 members in average)	4
	Number of women whose well-being is expected to improve as a result of project activities	150 concessions granted to women	4

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.

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
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	329,564 ha	5
	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	11 mammals, 31 birds, 2 reptiles, 4 flora species	5

2. GENERAL

2.1 Project Goals, Design and Long-Term Viability

2.1.1 Project Proponent (G1.1)

TABLE 3

Organization name	Bosques Amazónicos SAC
Contact person	Jorge Cantuarias Falconi
Title	General Manager
Address	Av. Víctor Andrés Belaúnde 147 Vía Principal 123, Oficina 201 Edificio Real Uno San Isidro, Lima 27, Perú
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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

2.1.2 Project Objectives (G1.2)

CLIMATE OBJECTIVES:

- o Significantly reduce GHG emissions caused by deforestation and degradation in Brazil nut concessions of Madre de Dios.
- o Promote the development of natural climate solutions (conservation, reforestation, agroforestry when applicable) and sustainable forest management to maintain ecosystem integrity.

COMMUNITY OBJECTIVES

- o Strengthen the organizational and management capacity of the Federation and its members to ensure the sustainable and integrated management of forest concessions.
- o Provide commercial and operational support to increase income generated by the Brazil nut activity, improving the livelihoods of the community.
- o Contribute to improving community livelihood by fostering income streams in sustainable forestry activities within the Project Zone.

BIODIVERSITY OBJECTIVES

- o Guarantee and maintain the integrity of biological diversity and ecological processes in the Brazil nut concessions and the wider Project Zone.

2.1.3 Physical Parameters (G1.3)

Weather

The weather in the low forest of Madre de Dios is hot and humid most part of the year. During the winter (June - August), the rains stop and sporadic cold winds from the south of the continent can lower the temperature considerably to 10° C (Barthem et al. 2003). Throughout the year, the average monthly temperature ranges from 21° to 26° C, with a maximum of 40° C and a minimum of 4.5° C. The average annual rainfall in the low forest of Madre de Dios varies between 1,500 and 3,000 mm.

The Project Area is characterized by two types of climate, Sub-Humid and Hot and Humid and Hot, according to the Climate Map included in the Economic-Ecological Zoning of Madre de Dios (IIAP, 2009) that shows climatic conditions prevailing in the Region.

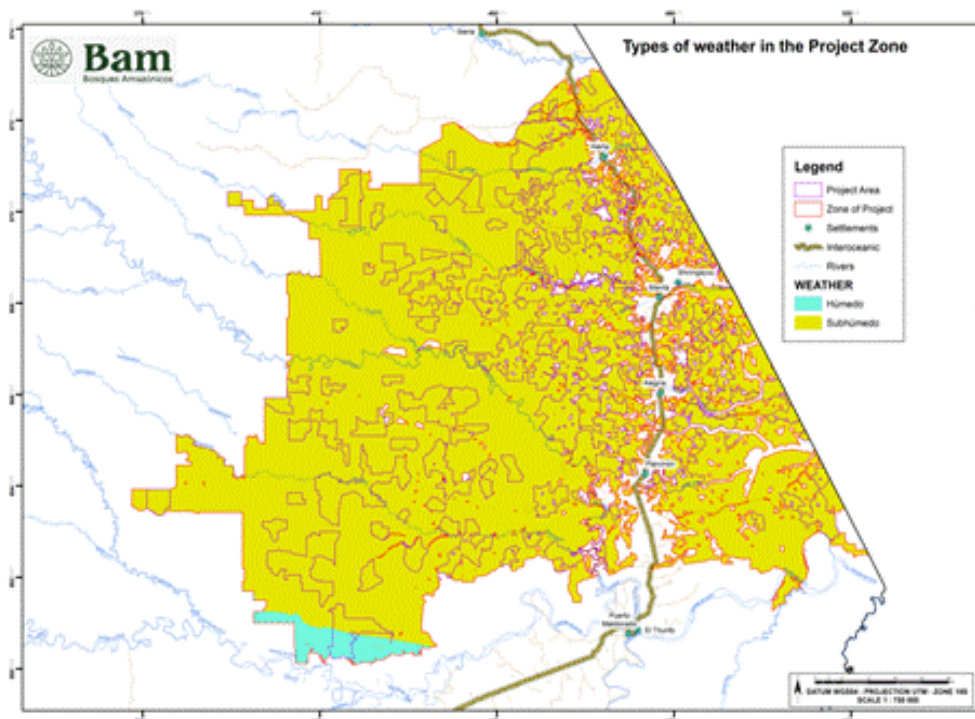
- o Sub-Humid and Hot

It covers the northeastern part of the Department, including 98% of the Project Area. The average annual temperature is 25°C, and it is moderately rainy.

- o Humid and Hot

It covers the south and southern western part of the Department, including 2% of the Project Area. The annual rainfall is 2000 mm and the average annual temperature is 25°C. This climate type is rainy, dry in winter and with a warm and humid season.

MAP 1. Weather Types in the Project Zone



Physiography

Madre de Dios has a quite heterogeneous physiography, as a result of the interaction of various factors such as the tectonic, climatic and the hydro-erosive processes that have acted on them. The following three vast landscapes can be identified:

- **Great vast alluvial plain:** composed by recent, growing sub and former sediments brought down by main rivers, are characterized for presenting relatively flat and slightly inclined topography (0%-8%).
- **Great hilly landscape:** characterized for presenting a wavy shape and strongly dissected surface, originated by the compression effects or by the erosive process they have been submitted to.
- **Great mountainous landscape:** characterized for presenting mountainous and rugged shapes of tectonic origins and steep to rugged slopes, with inclinations that vary from 25% to over 70%. Composed by folded structures, are unstable grounds in which landslides occur frequently.

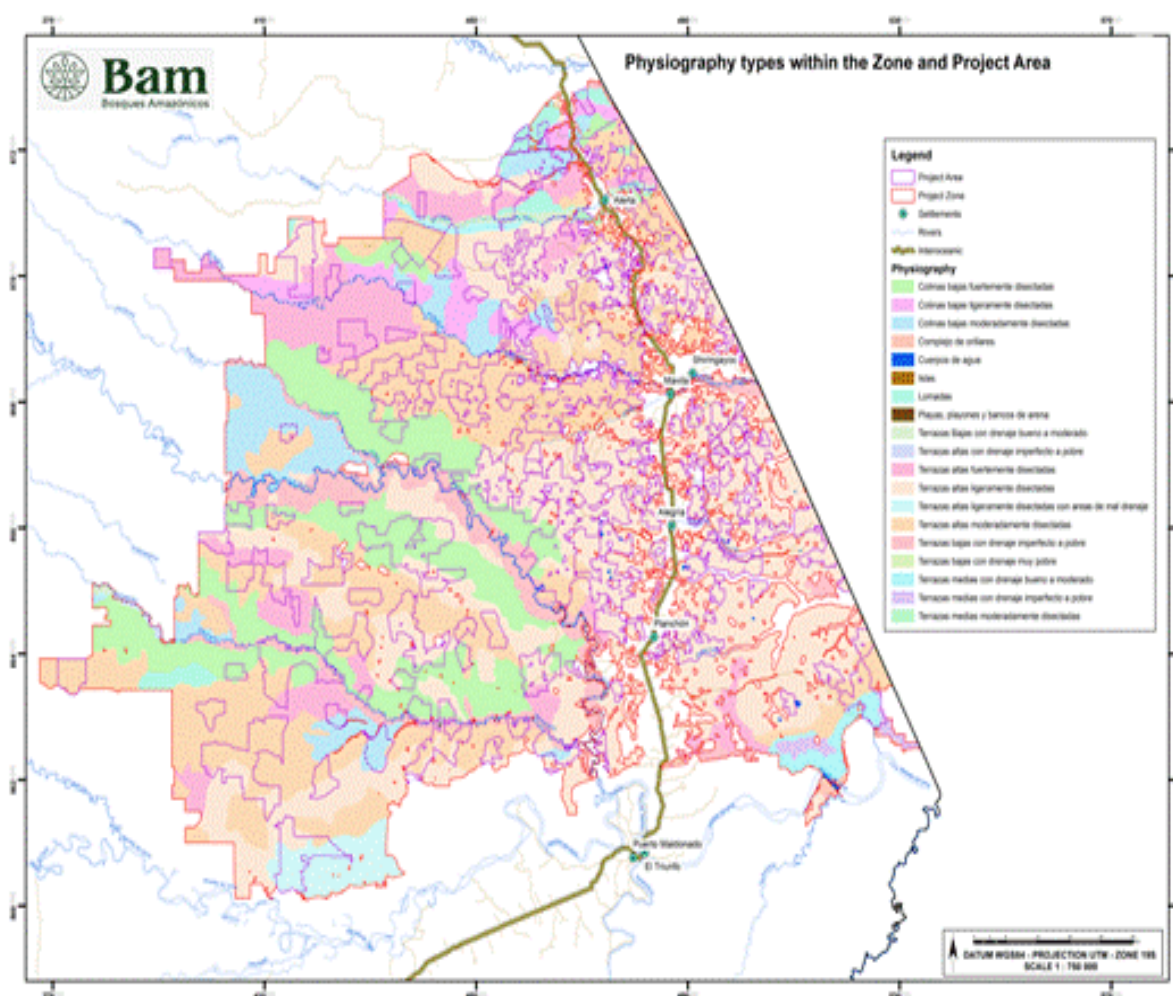
In turn, this classification was subdivided into 5 landscapes and 13 sub-landscapes, with which the Project Area was described. As can be seen in Table 1, the Slightly Dissected High Terraces and

the Moderately Dissected High Terraces are the most common physiography types in the Project Zone.

TABLE 4: Physiographic Units within the Project Zone

Physiographic units	Area (ha)	%
Slightly dissected High terraces	352 154.23	34.68
Moderately dissected High terraces	251 836.15	24.80
Highly dissected Low hills	134 394.83	13.24
Highly dissected High terraces	86 204.41	8.49
Low terraces with imperfect to poor drainage	54 063.75	5.32
Moderately dissected Low hills	51 922.47	5.11
Slightly dissected Low hills	22 312.16	2.20
High terraces slightly dissected with areas of poor drainage	18 674.39	1.84
Hills	11 667.01	1.15
Middle terraces with moderate or good drainage	10 219.45	1.01
Low terraces with moderate or good drainage	7 419.45	0.73
Water bodies	6 328.00	0.62
Middle terraces with bad to poor drainage	4 089.75	0.40
Middle terraces moderately dissected	2 176.54	0.21
Complex riverbank	1 218.28	0.12
High terraces with bad to poor drainage	552.04	0.05
Islands	41.22	0.00
Low terraces with very poor drainage	31.69	0.00
Beaches, river rock beaches and sandbanks	9.04	0.00
Total	1 015 314.8	100.00

MAP 2: Physiography types within the Project Zone and Project Area



Soils

There are three groups of soil in Madre de Dios:

- **Recent alluvial soil:** type of soil located near rivers and that continuously receive sediments. Generally, this soil is used for agriculture. However, poor drainage or hydromorphic and low fertility also characterize it.
- **Sub-recent alluvial soil:** type of soil originated from former river sediments due to undermining channels or orogenic and epirogenic movements. In general, they are deep soils, of a moderately refined texture, flat topography and slightly wavy, a drainage which may vary from good to imperfect to poor, of a natural very low fertility. These middle and high terraces have been dissected and deepened slowly due to pluvial erosion up to the point of forming, in many cases, low hills.
- **Residual soil:** type of soil that is originated on site based on Tertiary and Quaternary sedimentary materials (shale, limonite, sandstones and gravels), forming high and low hills

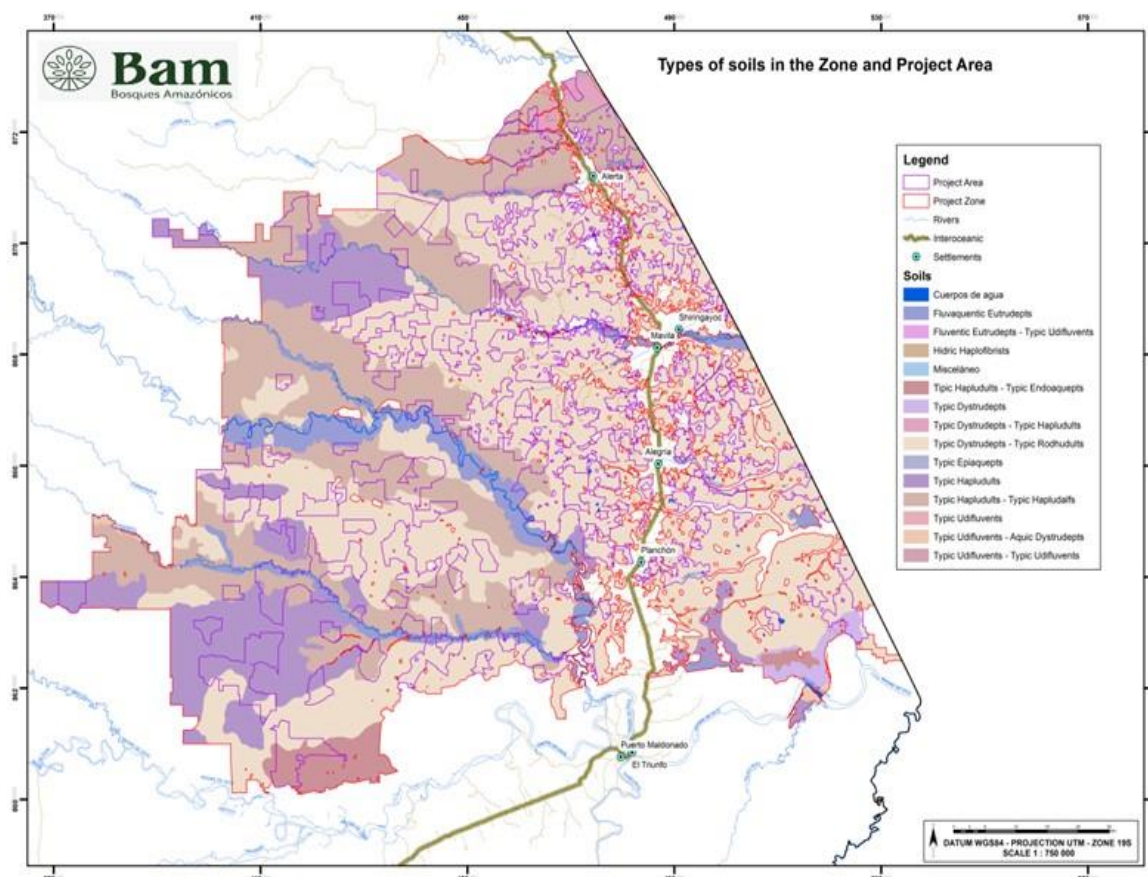
as a result of various phenomena and which is neighboring the highland mountainous system. The soils are generally moderately refined, deep to superficial and an abrupt topography, which gives it a moderate to high erosive potential.

Taxonomically, twelve types of soil were identified within the Project Zone, of which Typical Dystrudepts - Typical Rodhudepts and Typical Hapludepts- Typical Hapluudepts are the predominant ones as they cover 53% and 24% of the Project Zone, respectively. All types of soil are listed in Table 2, and their distribution inside the Project Zone and Project Area is shown in Map 5.

TABLE 5: Types of soil in the Project Zone

Types of soil	Area	%
Typical Dystrudepts - Typical Rodhudepts	537 668.46	52.96
Typical Hapludepts - Typical Hapluudepts	245 126.08	24.14
Typical Hapludepts	128 303.34	12.64
Fluvaquentic Eutrydepts	53 807.78	5.30
Typical Hapludepts - Typical Endoaqupts	21 697.53	2.14
Typical Dystrudepts	7 889.58	0.78
Water bodies	6 328.00	0.62
Typical Udifluvents - Typical Udifluvents	5 975.57	0.59
Typical Dystrudepts - Typical Hapludepts	5 518.47	0.54
Typical Udifluvents - Aquatic Dystrudepts	2 111.87	0.21
Fluventic Eutrydepts - Typical Udifluvents	550.29	0.05
Typical Epiaqupts	255.93	0.03
Typical Udifluvents	41.22	0.00
Hydric Haplofibrists	31.69	0.00
Miscellaneous	9.04	0.00
Total	1 015 314.8	100.00

MAP 2. Types of soils in the Project Zone and Project Area



Geology

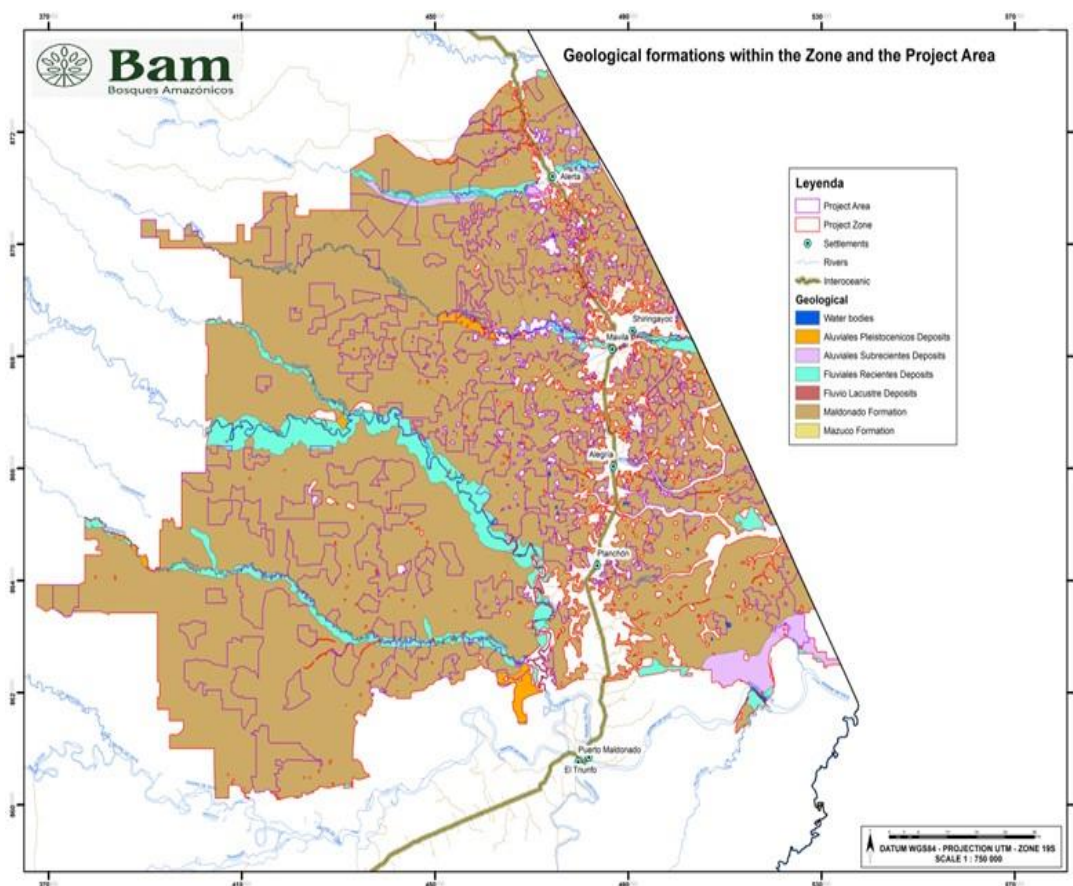
Madre de Dios is situated in the Madre de Dios-Beni depression at the foot of the Andes. Every year, rivers like the Alto Madre de Dios and the Inambari flow down from the Andes carrying millions of tons of newly eroded material to this depression. Due to this constant flow of new material, the superficial geology of the department is extremely young. All the terraces in the department that have been studied so far are less than 200,000 years old and some are only 30,000 years old. Below the surface lies a layer of the same alluvial material, 3-4 km thick, deposited during the last 20 million years.

The Maldonado geological formation predominates in the Project Zone, covering 91% of the total area. This formation is comprised of deposits of gravel, conglomerates and sandstone distributed along the plain land of Madre de Dios, lying in discordance with the Madre de Dios Formation. Table 3 shows the area of each type of geological formation located in the Project Zone and Map 6 shows these formations within the Project Zone and the Project Area.

TABLE 6. Types of geological formation in the Project Zone

Types of geological formation	Area	%
Maldonado formation	922 227.15	90.83
Recent fluvial deposits	63 845.11	6.29
On growing alluvial deposits	16 485.74	1.62
Pleistocene alluvial deposits	6 389.42	0.63
Water bodies	6 328.00	0.62
lacustrine fluvial deposits	31.69	0.00
Mazuco formation	7.74	0.00
Total	1 015 314.4	100

MAP 3. Geological formations within the Project Zone and the Project Area



Hydrography

Madre de Dios presents 11 hydrographic units, which are grouped in three great basins: the basin of the Madre de Dios River, the basin of the Tambopata River and the Acre¹² River Basin.

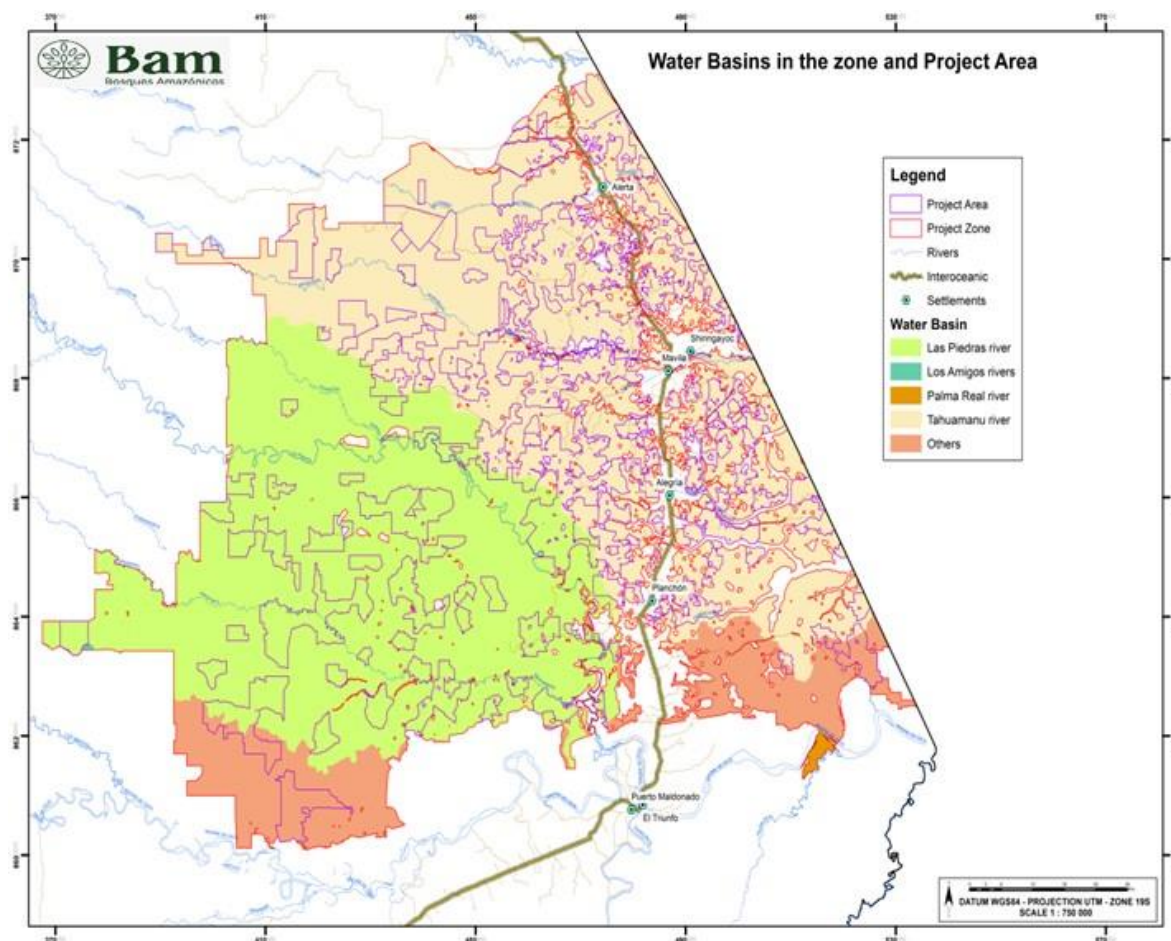
The project is located in the Madre de Dios River Basin, which occupies 66% of the Department and whose hydrographic-network main rivers are the Madre de Dios River (27.38%), the Tambopata River (19.03%) and Las Piedras River (12.45%). The Heath and Inambari Rivers also compose this basin.

- **Madre de Dios River:** It has an approximate length of 655km and passes through Peru, Bolivia and Brazil. The Madre de Dios River originates in the Pucara snow-capped mountain southeast of Paucartambo in the department of Cusco. The most important tributaries are: Colorado, Inambari, Tambopata and Heath Rivers to the right borderline and Manu and Las Piedras Rivers to the left borderline.
- **Tambopata River:** It has an approximate length of 402 km. It originates in the Carabaya Mountains (Puno). Its main tributaries are the Azata, Shenahuaja, Shehetapiti, Távara, Elías Aguirre, Malinowski Rivers, etc. The first populations used the Tambopata River for their entry and they settled on the river's bank, which caused the discovery of gold.
- **Las Piedras River:** It is approximately 500 km long. Its main tributaries are the Ceticoyacu, Chanchamayo, San Francisco, Lidia, Cariyacu, Pariamanu y Uपुरी Capu Tuari Rivers on the right borderline. The basin of the river of Las Piedras is sparsely populated and only some estates are isolated located in its banks.

In the Project Zone, there are four sub-basins: Las Piedras, Los Amigos, Palma Real and Tahuamanu. The Tahuamanu River runs over the north limit of the Project Area. To the south, from east to west, Muymanu and Manuripe Rivers run by the Mavila village. Further south Las Piedras River and its tributary, the Pariamanu River, run by. To the south and parallel to limits of the project runs the Madre de Dios River. (See map 4)

MAP 4: Water Basins in the Project Zone and Project Area

¹² Environmental Baseline Study of the Basin of Madre de Dios River. 2010. Project Baseline of Rivers Basin. Ministry of Environment (MINAM)



Types of Vegetation

Natural forests cover an area of 8,102,917 hectares in Madre de Dios, which ranks as the third department in the country with the largest forest area after Ucayali and Loreto.¹³

The Instituto de Investigaciones de la Amazonía Peruana (IIAP), in coordination with the Regional Government of Madre de Dios (GOREMAD), did the Ecological Economic Zoning (ZEE) for the entire Madre de Dios Region in 2009. According to the ZEE's Thematic Vegetation Map, the Region presents 22 types of natural vegetation, containing at least 2,429 species of plants (angiosperms and gymnosperms), including 869 genera and 172 families.

The most widespread types of vegetation in the Project Zone are: Semi-Deciduous Dense Forests in Plains (58.11%), Semi-Deciduous Dense Forests in Hills (14.16%), and Mixed Bamboo Communities or Mixed Pacales Associated with Scattered Trees in Plains (9.87%). Similarly, these units are the most representative of the Project Area, occupying 69%, 11% and 10% respectively.

The vegetation units of the PZ and PA are shown in the following table and map:

¹³ CESVI, 2005. "Model of sustainable use of forest and the concessionaire companies" Progress and challenges in the province of Tahuamanu, Madre de Dios

TABLE 7. Vegetation units in the Project Zone and Project Area

Vegetation Units	Project Zone		Project Area	
	Ha	%	Ha	%
Dense semi deciduous forests in the plains	590 017.59	58.11	212 050.80	68.68
Dense semi deciduous forests in the hills	143 722.70	14.16	32 868.47	10.65
Mixed communities of bamboos or mixed pacionales associated with scattered trees in the plains	100 252.82	9.87	30 656.36	9.93
Mixed communities of bamboos or mixed pacionales associated with scattered trees in the hills	69 703.85	6.87	13 381.90	4.33
Dense communities of bamboos or dense pacionales in the plains	12 320.27	1.21	5 562.52	1.80
Arboreal swampy communities	44 240.25	4.36	4 808.63	1.56
Semi swampy and semi deciduous forests complex	18 674.43	1.84	4 604.90	1.49
Dense communities of bamboos or dense pacionales in the hills	6 870.01	0.68	1 694.93	0.55
Mixed communities of bamboos or mixed pacionales associated with scattered trees in flood plains	6 347.76	0.63	1 353.71	0.44
Dense communities of flood plains	14 973.47	1.47	864.70	0.28
Water bodies	6 328.00	0.62	849.40	0.28
Successional communities of White water shores	1 227.32	0.12	36.48	0.01
Dense communities of bamboos or dense pacionales in flood plains	636.09	0.06	24.23	0.01
Complex of deforested and agricultural lands	0.28	0.00	0.28	0.00
Total	1 015 314.8	100.0	308 757.31	100.0

Bam
Bosques Amazónicos

Vegetation units in the zone and Project Area

Legenda

- Project Area
- Project Zone
- Roads
- Urban development
- Settlements

Vegetation

- Bosques semicaducifolios densos en costas
- Bosques semicaducifolios densos en planicies
- Complejo de bosques semipermanentes y semicaducifolios
- Complejo de chequer y yumbes
- Comunidades densas de bambúes, o pastos densos, en costas
- Comunidades densas de bambúes, o pastos densos, en planicies
- Comunidades densas de bambúes, o pastos densos, en planicies inundables
- Comunidades densas de planicies inundables
- Comunidades mixtas de bambúes, o pastos mixtos, asociada con árboles dispersos en costas
- Comunidades mixtas de bambúes, o pastos mixtos, asociada con árboles dispersos en planicies
- Comunidades mixtas de bambúes, o pastos mixtos, asociada con árboles dispersos en planicies inundables
- Comunidades pantanosas arborescentes (maracayes y palmarales)
- Comunidades sucesionales de orillas de aguas dulces
- Blue bodies

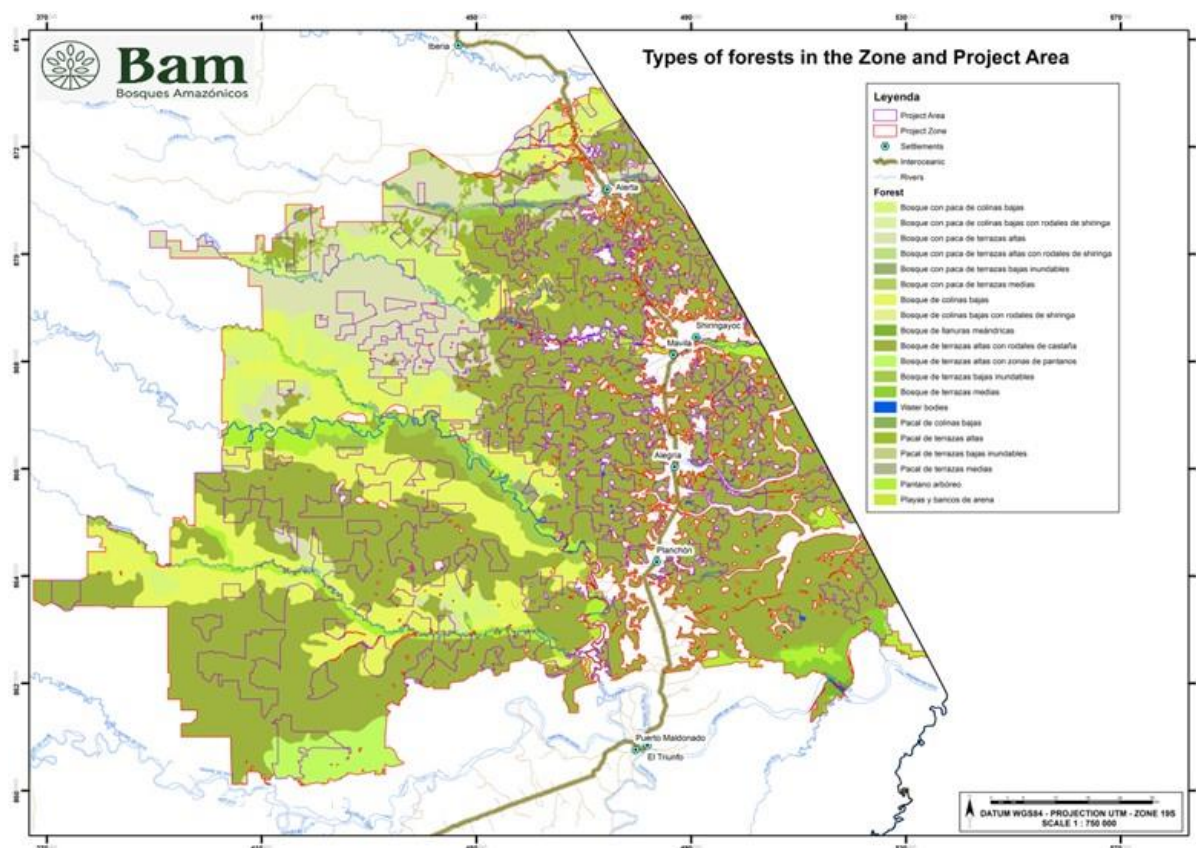
DATUM WGS84 - PROJECTION UTM - ZONE 19S
SCALE 1 : 750 000

By using the Thematic Forest Map of the ZEE, we have identified nineteen types of forests inside the Project Zone of which three are predominant: High Terrace Forests with Brazil Nut Stands (57%), Low Hill Forests (14%) and High Terrace Forests with Bamboo (9.6%). Similarly, there are seventeen types of forest inside the Project Area, where the most representative ones are the three types already mentioned covering 67.9%, 10.7% and 9.8%, respectively. All types of forest within the Project Area and Project Zone can be observed in Table 8 and Map 6.

Forest Units	Project Zone		Project Area	
	Ha	%	Ha	%
High terrace forest with Brazil nut stands	579 765.55	57.1	209 784.76	67.94
Low hill forests	142 952.93	14.08	32 343.16	10.48
Terrace Forests with Bamboo	97 522.79	9.61	30 241.11	9.79

Low hills with bamboo (paca) forest	66 349.15	6.53	11 068.55	3.58
Swamp trees	44 240.53	4.36	4 808.90	1.56
High terrace forest with swamp areas	18 674.43	1.84	4 604.90	1.49
Low flood terrace forest	14 973.36	1.47	864.70	0.28
Bamboos of high terraces	11 840.93	1.06	5 377.87	1.74
Mid terrace forest	10 252.04	1.01	2 266.04	0.73
Low hills with bamboo (paca) forest and Hevea stands	3 354.70	0.33	2 313.35	0.75
High terrace with bamboo forest with Shiringa stands	1 065.43	0.10		-
Forests with Pacas of low floodable terraces	6 347.87	0.63	1 353.71	0.44
Forests with Pacas of middle terraces	1 664.60	0.16	415.26	0.13
Low hill forests with Hevea stands	769.77	0.08	525.31	0.17
Meandering plain forests	1 218.28	0.12	36.48	0.01
Water bodies	6 328.00	0.62	849.40	0.28
Bamboos of low hills	6 870.01	0.68	1 694.93	0.55
Bamboos of low flooded terraces	636.09	0.06	24.23	0.01
Bamboos of low flooded terraces	479.34	0.05	184.65	0.06
Beaches and sandbanks	9.04	0.00		-
Total	1 015 314.8	100.00	308 757.30	100.00

MAP 6. Types of forests in the Zone and Project Area



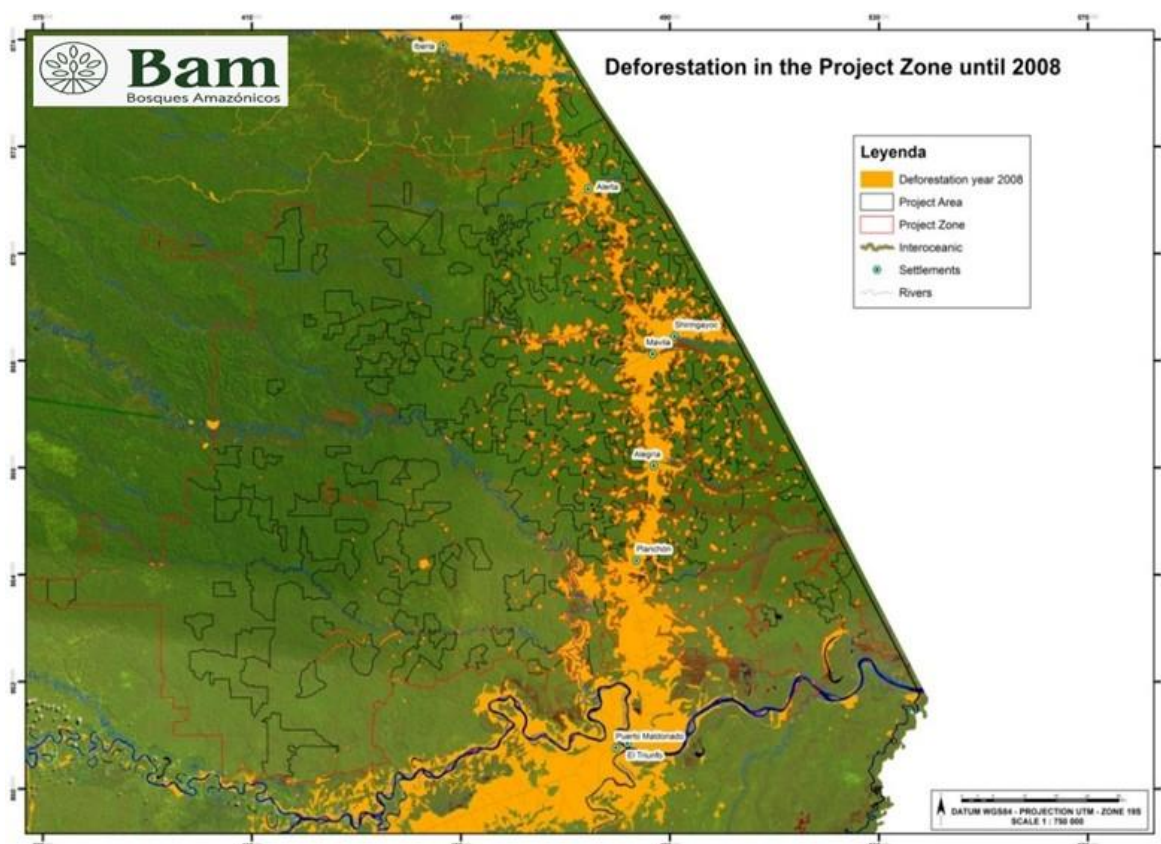
Condition of the Vegetation in the Project Area

The Project Area includes forests that have been subject to constant recollection of Brazil nuts; therefore, the integrity of these forests as an ecosystem has been maintained. Since year 2000, the Brazil nut concessionaires present their Forest Management General Plan and their Annual Operational Plan. For the sustainable use of timber resources, they also present Complementary Plans.

As seen in the Forest Types Map from ZEE, IIAP identified intervened-deforested areas. In the Map 10 that shows the satellite image of year 2008 of the Project Zone, these poles of deforestation become evident especially in the nearby areas of the Interoceanic Highway, and sidings. It can be clearly observed how the opening and improvements of this highway increase the areas of deforestation.

According to the deforestation model, deforestation will increase significantly over the Project Area and Project Zone. The REDD Project is probably the only alternative for the conservation of these forests.

MAP 7. Landsat-7 2008-year satellite image of the Project Area and Zone



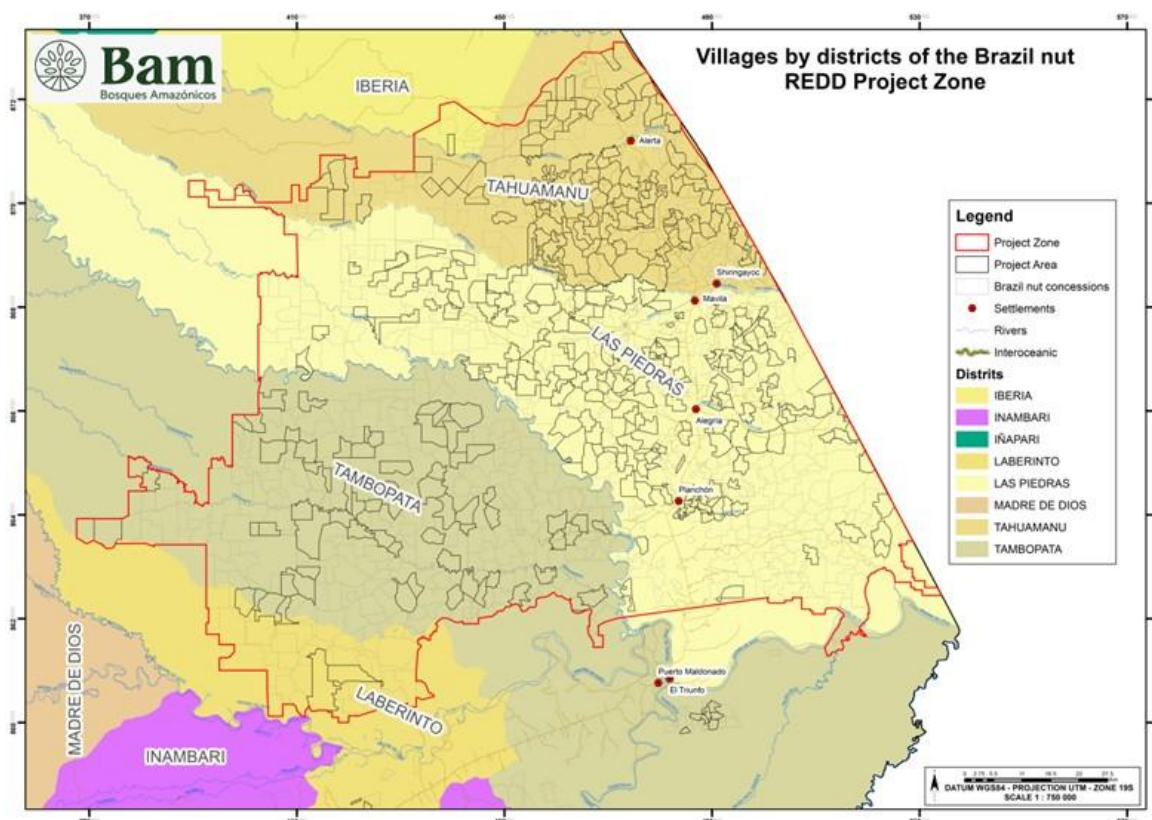
2.1.4 Social Parameters (G1.3)

Local populations in the Project Zone are mainly composed of people engaged in economic activities such as Brazil nuts collection and commercialization, timber extraction and alluvial mining, as well as agriculture, livestock, services and local employment. These communities are located in the main population centers, housing associations and other types of scattered settlements.

Villages and Population

The most important villages of the Project Zone are located along the South Interoceanic Highway - stretch 3, which is the sector between Puerto Maldonado and Iberia. These villages are politically circumscribed to the districts of Tahuamanu (Tahuamanu province) and Las Piedras (province of Tambopata), all of them in the Madre de Dios region.

MAP 8. Villages by Districts within the Project Zone



At the beginning of the project six villages¹⁴ were identified within the Project Zone. The total population registered (census of 2017)¹⁵ in terms of villages, accounts for 6 584 inhabitants, out of which 53.5% were males and 46.5% were females. It must be noted that, in the case of the scattered population, the population registered for the entire district was considered; therefore, it is a referential quantity.

TABLE 9. Villages and Population by gender in the Project Zone

Districts, Villages and Population (by Gender) Located in the Project Zone						
District	Populated centers	Population	Male	%	Female	%
Las Piedras	CCPP Urb. Las Piedras (Planchón)	1297	684	52.7	613	47.3
Las Piedras	CCPP Urb. Mavila	1454	758	52.1	696	47.9

¹⁴ The category of villages (or population centers) and scattered population used by the Census 2007, has been ordered by the Law on Territorial Organization and Position No. 27795. With this norm, the Peruvian government has established those population groups with more than 150 inhabitants as Villages.

¹⁵ For the department of Madre de Dios, the last census (Census 2017) recorded 141 070 inhabitants (0.4% of the total population of Peru), composed of 52.3% men and 47.7% women. Of this population, 82.8% are located in urban areas and 17.2% in rural areas.

Las Piedras	CCPP Urb. Alegría	1882	1030	54.7	852	45.3
Tahuamanu	CCPP Urb. Alerta	1143	607	53.1	536	46.9
Tahuamanu	CCPP Rural La Novia	446	241	54.0	205	46.0
Tahuamanu	CCPP Rural Shiringayoc	362	204	56.4	158	43.6
TOTAL		6,584	3,524	53.5	3060	46.5

In-house elaboration. Source: Populated centers, Census 2017- INEI

The population by age group has a distribution that has high incidence of children and youth. In addition, the majority of the population by gender is male; however, an important presence of young females was identified. It should be stressed that the population younger than 15 years old represents 33.4% of the total population.

TABLE 10. Total population by large age groups in the Project Zone of the districts included in the Project Zone

District and Age	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 and more
Las Piedras	12 644	278	4 001	3 243	2 815	1 857	450
Tahuamanu	2 865	51	852	725	644	491	102
Total	15 509	329	4 853	3 968	3 459	2 348	552
%	100	2.1	31.3	25.6	22.3	15.1	3.6

In-house elaboration. Source: INEI - national census 2017: XI of population VI of housing (population nominally registered)

Socio-economic profile

The main poverty indicators for the Project Zone are shown in Table 17. It is important to note that the districts included in the Project Zone (Las Piedras and Tahuamanu) present the following characteristics:

- o The rural population is 54% of the total population.
- o 40% and 48% of population without water, respectively.
- o 56% and 57% of the population without electricity, respectively.

TABLE 11. Main indicators of poverty in the Brazil nut REDD in the Project Zone

Madre de Dios Poverty Indicators – IDH 2018, National Census 2017									
Province and district	Population 2017	% Rural population	Quintile 1/	% Population without water	% Population without drainage /latrine	% Population without electricity	% Illiterate women	% Children 0-12 years old	Human development index
Peru	31 237 385	19		19	21	10	13	23	0.5891
Madre De Dios	141 070	17	3	26	38	15	13	27	0.5797
Las Piedras	12 644	13	2	36	55	19	15	30	0.5211
Tahuamanu	2 865	100	2	23	50	24	15	29	0.5621

In-house elaboration. Source: FONCODES Poverty Map

In terms of labor force in the project Zone, the Census of 2007 registered 45.1% and 61.1% of employed labor force and 1.5% and 0.8% of unemployed labor force, in the districts of Las Piedras y Tahuamanu, respectively. It must be noted that the Census 2017 also registered 31.9% and 30.3% of non-labor force in the same districts (where the “non-labor force” is the population at age to work but who during the adopted reference period, failed to engage in or pursue an economic activity).

The labor force is linked to diverse economic activities: gold mining, mono-crop traditional agriculture, logging and Brazil nut extraction, livestock and breeding of small animals. The population of the rural areas is mainly formed by former inhabitants and migrants with more than 15 years in the area, who are dedicated to monoculture agriculture, hunting, fishery, Brazil nut recollection, wood extraction, and seasonal artisanal mining and little businesses (stores, restaurants, bars, inns, others) (Lourdes Fernandez 2009).

For the population of the districts of Las Piedras and Tahuamanu, the two most important economic activities are mining (47.6% and 30.3% of the population) and agriculture, livestock, hunting and forestry (10.1% and 35.4% of the population).

TABLE 12. Main activities by group for the districts of the Project Zone

Activity according to grouping	Dist. Las Piedras		Dist. Tahuamanu	
Categories	Cases	%	Cases	%
Exploitation of mines and quarries	1 002	47.6	453	30.3

Agriculture, livestock, hunting ,and forestry	212	10.1	529	35.4
Not specific economic activity	179	8.5	128	8.6
Manufacturing industry	32	1.5	80	5.4
Transportation, storage, and communication	130	6.2	47	3.1
Retail commerce	175	8.3	1	0.1
Other activities*	377	17.9	257	17.2
Total	2 107	100.0	1 495	100.0
NSA :	3 384		1 244	

In-house elaboration. Source: INEI – CPV 2007

*Agglomerates diverse activities like services, wholesome trade, financial intermediation, fishing, etc.

Brazil nut concessionaires

The main population groups in the Project Zone are conformed by Brazil nut families (families dedicated to the brazil-nut activity). The “Castañeros” are the Brazil nut concessions holders who have celebrated concession contracts with the Peruvian state for 40 years (renewable). Hence, the Castañeros and their families have total access to their areas (concessions) permanently, being especially present in the area during the Brazil nut collecting season (“Zafra”).

Within the Project Zone there are 1,037 Brazil nut concessionaires¹⁶, of which 405 are associated to the Project and make up the Project Area. In order to define the socio-economic profile of the BN population, BAM conducted a diagnostic study¹⁷ of the BN sector at the beginning of the project in which it was possible to define and collect information on socio-economic indicators of relevance to the project, described next:

Population, age, gender and housing

- **Gender:** According to a random selection of 356 project members, 71.3% concessionaires are male and 28.7% are female.

¹⁶ Up to July 2010, by the Regional Directorate of Forestry and Wild Fauna

¹⁷ Diagnóstico Socio-Económico del Concesionario Castaño de Madre de Dios. October 2010, Bosques Amazónicos. In the present document, we will refer to it as *Diagnóstico Castaño* for practical reasons. The methodology applied included interviews to 109 BN concessionaires, whom constitute the 10% of the total of BN concessionaires in Madre de Dios. Said interviews were implemented randomly, without distinction in gender or age, in the different sectors with greatest relevance defined by a high degree of BN population on them (Alerta, Mavila, Alegría, Planchón and Puerto Maldonado). It was a priority to have at least 25% of interviews directed to woman concessionaires.

- **Age:** 30.5% of concessionaires are more than 60 years old (meaning that a third of them are seniors. The age factor defines many aspects of the BN activity, especially the availability of family workforce.
- **Civil Status:** From the interviews, it is possible to identify that 48% of concessionaires have a couple, but are not married, while 12% are widowed or divorced. Additionally, 96% of them have children, in an average of 5 per family, which is a high family burden. Of these children, 4 out of 5 have more than 15 years, indicating the extent and antiquity of the Castañeros family network.
- **Housing:** The concessionaires were inquired after how many people lived in their house and how many bedrooms it had, obtaining the following results:

TABLE 13. Overcrowding in Housing

Rooms per House	1	2	3	4	5	6	Total
Housing residents	18	31	27	17	11	5	109
Total residents per room	50	116	135	93	59	24	477
Average residents per room	2.8	3.7	5.0	5.5	5.4	4.8	4.4

In-house elaboration. Source: Diagnóstico Castañero, October 2010 - BAM

The 95% of concessionaires own their houses. The majority of houses (80%) were constructed with wood, as occurs in rural areas. Even so, it is important to mention that 12% were made with concrete.

The restrooms consist mainly on pit latrines made by the own concessionaires (81%). The water is supplied by the public system in many cases (61%); however, in some sectors as Paríamanu and Alegría, the water is obtained from rivers and streams.

Productive activities of the BN Sector

A research made by IIAP in 2006¹⁸ states that in Madre de Dios, Brazil nut activity is an important income source for 6,500 families, in a direct or indirect way. An estimated 15,000 to 20,000 people are linked to the extraction of this resource, which represents 22% of the total population of Madre de Dios region. 57% of the BN concessions are located near highways and the 43% are accessed through rivers.

The Brazil nut activity has a long history, recording its exploitation since middle of last century. According to the survey, the oldest BN harvesters are those who have worked since the 1950s. Between years 1970-1999 many BN harvesters initiated their activity (74%). Those who entered

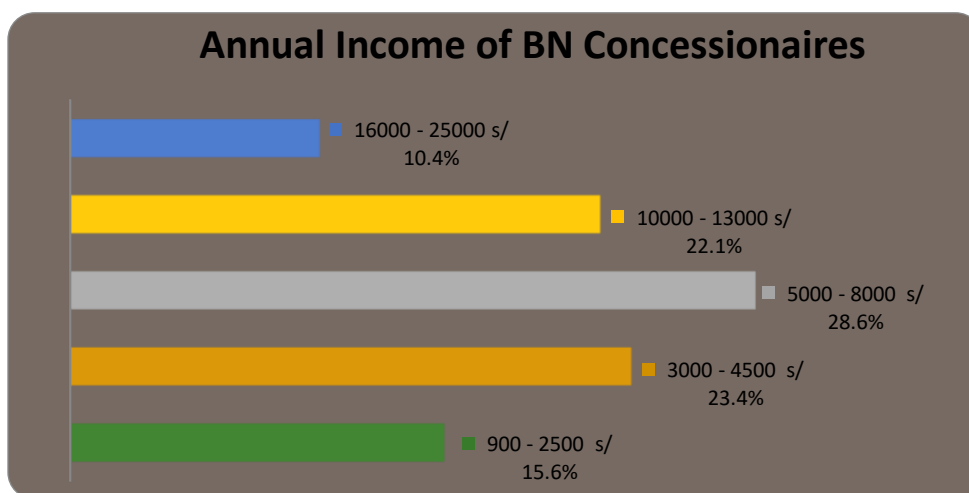
¹⁸ Evaluación Económica de la Extracción de Castaña (*Bertholletia excelsa* H.B.K) – Departamento de Madre de Dios. (Working paper). Luis Álvarez Gómez and Sandra Ríos Torres. Programa de Ordenamiento Ambiental - IIAP. Iquitos Peru. 2006.

after year 2000 did so under the formalization process through forest concessions; they represent the youngest group in the region.

A study made by FAO in 2007¹⁹ states that this activity generates an average of 67% of the concessionaire's annual gross income, equivalent to US\$ 6,410.0 dollars per year or US\$ 534.2 dollars per month. Revenues were estimated based on the volume of peeled nuts sold at the 2006-zafra price (7.0 – 9.0 soles/kg). However, the study notes that the average family has 6 members, meaning that a monthly income per person is US\$ 89.0 dollars; much less than the country's minimum wage (US\$ 260 dollars/month approximately).

The survey shows that the concessionaires' profits range from S/. 900.0 to S/. 25,000.0 soles/year (or US\$ 320.0 – US\$ 8,928.0 dollars approx.). This makes a simple average of S/. 7,204.2 soles/year (or US\$ 2,573 dollars) and S/. 600.4 soles/month (or US\$ 214 dollars). The 74% of concessionaires earn between S/. 3,000 to S/. 13,000 soles/year.

FIGURE 1. Annual income ranges of the Brazil nut concessionaires



In-house elaboration. Source: Diagnóstico Castañero, October 2010 - BAM

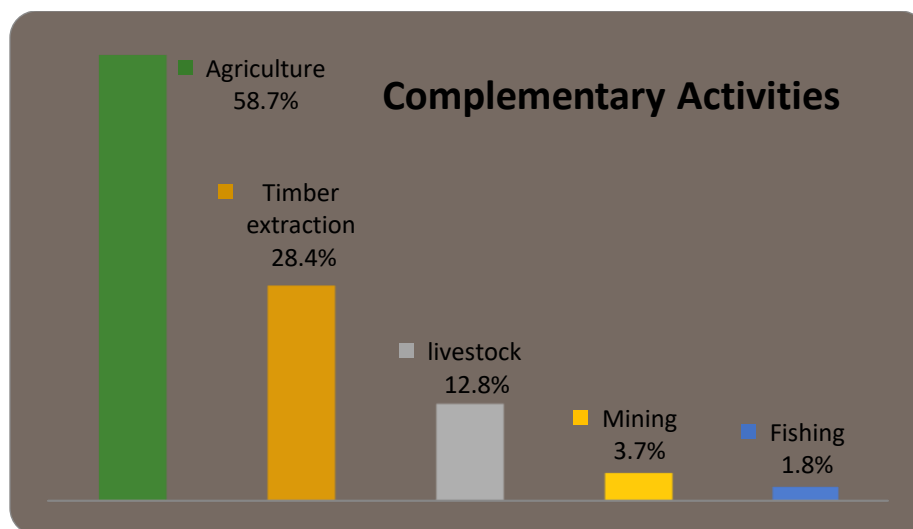
The BN concessionaires, besides the activity of collecting and selling Brazil nuts, have other economic activities that complement their source of income.

In that sense, the activities related to forest resources and farming are considered as a way of diversifying their main activity. Figure 2 shows that agriculture is the second most common activity, followed by timber extraction, which is done legally by developing a complementary management plan²⁰.

FIGURE 2. Complementary activities undertaken by the Brazil nut concessionaires

¹⁹ Perú: La Industria de la Nuez de Brasil en Madre de Dios. In: Las Microfinanzas y las Pequeñas Empresas Forestales. Estudio FAO: Montes 164. Roma. 2007.

²⁰ Since year 2002, timber harvesting for commercial purposes inside a Brazil nut concession was allowed (Supreme Decree N°014-2006-AG), for which it must be presented an Annual Complementary Management Plan (PMCA). The *Intendencia Forestal de Fauna Silvestre* (the former forest authority) established the maximum permissible extraction volume be equal to 5.0 m³/ha.



In-house elaboration. Source: Diagnóstico Castañero, October 2010 – BAM

Agriculture is mainly carried to produce staple food for self-consumption and/or sale in the local market. The production is focused in Corn, Plantain, Rice and Cassava. Additionally, the concessionaires grow other products, but in a much lesser volume, like Papaya, Chili, Mango, Avocado, Coffee, Sapote, Sugarcane, Pineapple, Sacha Inchi, Sweet Potato, etc.

This activity is mostly developed in the agrarian plots possessed or owned of the Brazil nut collectors, but in some cases, it also occurs within the Brazil nut concessions.

Sociocultural Profile

Formal Education: According to the survey, 52% of Castañeros have received elementary education and 32% of them have received secondary education. 6.4% of Castañeros had no studies. These percentages are reflected in the level of reading and writing, where 89.9% of Castañeros affirmed they could read and write very well. Even so, note that if the percentages of Castañeros who do not read and those who read poorly are added, it makes up 8.3%.

Culture: Castañeros can be described as of Andean-Amazon culture. The survey shows that 49.5% of the population was born in Madre de Dios, while 42.2% of Castañeros were born somewhere in the southern highlands of Peru (67.4% come from Cusco and 21.7% come from Puno). Half of the migrant Castañeros came to Madre de Dios more than 30 years ago and most of them (79%) at least before the 90's.

Of all Castañeros interviewed, the 75% said they identified themselves with the Amazonian culture and specifically, 66% said they were "Madrediosense" (regional identity that includes "Huarayos", Castañeros and "Maldonadenses"). On the other hand, 19% claims an Andean identity.

The Quechua is the second language in importance, after Spanish. 34.9 % of Castañeros speak it fluently and 13.8% understand it.

The Castañeros are religious people. A great majority is catholic (73.4%) and an important sector (16.6%) is evangelical. The term “Christian” includes everyone with a religious belief without referring to a specific religion.

Other people involved in the Brazil nut activity

The production of the Brazil nut has four components: the production, harvesting, processing (drying and soaking, peeling, peeled nut drying) and commercialization (FAO, 2007)²¹.

This activity involves various actors or agents, from collection to processing for getting the peeled and dry nut, which is the final product sold in local and international markets. Said agents are the concessionaires, “barriqueros”, intermediaries, processing people and exporting companies. Beside this group, the NGOs supporting concessionaires at various stages of the production chain as well as the Castañeros organization itself complete the social group of the Brazil Nut activity (IIAP, 2006)²². They are described next:

Brazil nut producer: Called Castañero or Castaña producer, he/she is the concession holder that among with his/her family, organizes the extracting activities and optionally, the processing ones.

Barriquero: A person hired by the concessionaire in charge of collecting and transporting the nuts from the forest to the camp store. His salary depends on the volume of nuts collected.

Peelers: Women are preferred for this job, as the peeling step is critical for the quality of the product.

Intermediates: Their job is to buy directly the first nuts out of the camps to supply the companies. Many of them are financed by companies. Their profit is obtained through the sales margins from the transactions.

Processing and trading companies: In Madre de Dios there are several companies that buy, process and export the brazil nuts. Some of them are “El Bosque EIRL”, “La Nuez SRL”, “Candela Perú”, “La Selva SA”, “Agrícolas Forestales SAC”, among others.

NGOs: They promote Brazil nut activity development and the conservation of the Brazil nut forest. Some of these NGOs are “Asociación para la Conservación de la Cuenca Amazónica” (ACCA), “ProNaturaleza”, “CAMDE Perú”, “Sociedad Peruana de Derecho Ambiental” (SPDA), “Rainforest Alliance”, “World Wildlife Fund” (WWF), etc.

Farming Producers

The Agrarian Plan of Madre de Dios indicates agriculture is an “Activity characterized by the dominance of the traditional migration system, adapted to the conditions of the region: the

²¹ Perú: La Industria de la Nuez de Brasil en Madre de Dios. In: Las Microfinanzas y las Pequeñas Empresas Forestales. FAO Study: Montes 164. Food and Agriculture Organization of the United Nations. Rome. 2007.

²² Evaluación Económica de la Extracción de Castaña (*Bertholletia excelsa* H.B.K) – Departamento de Madre de Dios. (Working paper). Luis Álvarez Gómez and Sandra Ríos Torres. Programa de Ordenamiento Ambiental - IIAP. Iquitos, Perú. 2006.

prevailing use and/or application of unimproved seed and poor agricultural practices: slash and burn, use of common seeds and hand harvesting, and by restricted and inadequate external inputs. This system is subject to weather conditions and availability of poor soils with high acidity (typical forest), which added to the above, results in low yields. The production goes to the livelihood of the rural population and a small surplus for the local market, which does not cover the regional demand." OPA/DRA-GOREMAD.

In addition, the agricultural activity in Madre de Dios²³ is considered a livestock-dominated economic front associated with subsistence agriculture, covering 583 526 hectares or 3.08% of Madre de Dios area. "The agrarian activity is subsistence-driven with emphasis in livestock; there is predominance of grasses growing on agricultural lands, which is reflected in the statistical data of 2007, which shows that about 56.4% of the total area corresponds to growing pasture." IIAP-GOREMAD, 2008.

Despite the livestock predominance is seen in all the grasslands present in much of the road axis, especially between Santa Rosa town - Puerto Maldonado City and El Triunfo Town - Iñapari City; IIAP notes that "the large majority of grasslands don't contain the number of cattle they can sustain, or in many cases, there was no evidence of a head of cattle, which gives the impression that grasslands were made in order to consolidate and protect land possession from the likely invasion by other settlers." IIAP-GOREMAD, 2008.

Concerning the profits of this activity, "The average annual income of farmers in Madre de Dios, determined by the ratio between the gross value of farming production and the number of farmers, for the year 2007 was S/. 5,951 soles, with a monthly average of S/. 496 soles per month." DIREAG/GOREMAD, 2007.

In the Project Zone, there are people who develop agricultural activities such as agriculturists, ranchers and others. These people are owners or possessors of agricultural lands along the Inter-Oceanic Highway, secondary roads and riverbanks of the Tahuamanu, Inambari and Madre de Dios Rivers. Most farmers have land titles, many of them provided by the former land titling program²⁴ of the Ministry of Agriculture. Currently, the Organismo de Formalización de la Propiedad Informal (COFOPRI) grants these titles.

TABLE 14. Average Area of Farms in Las Piedras and Tahuamanu Districts

District	N° Farms	Area (Ha)	Area/Farm (ha)
Las Piedras	1 904	47 785	25.1
Tahuamanu	678	20 640	30.4

Source: Digital database - BAM

²³ Informe: Uso actual de las tierras. Juan Manuel Ramírez Barco. Zonificación Ecológica y Económica del Departamento de Madre de Dios. IIAP – GOREMAD.

²⁴ Proyecto Especial de Titulación de Tierras y Catastro Rural – PETT

The cultivated area within the districts of the Project Zone, in year 2001, was equal to 5,452 hectares, composed by pastures, rice and yellow corn (the main crops of said year) in a proportion of 56.7%, 17.6% and 9.9%, respectively.

TABLE 15. Cultivated Area per District per Crop

Agrarian Agency	Rice	Beans	Yellow Corn	Soy	Cassava	Plantain	Pastures	Papaya	Others	Total (ha)
Las Piedras	781	27	380	3	192	348	2171	15	100	4017
Tahuamanu	180	64	160	0	22	36	918	5	50	1435
Total (ha)	961	91	540	3	214	384	3,089	20	150	5452

Source: Plan de Desarrollo Concertado de Madre de Dios 2002-2011(various authors)

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

The Project Area is formed by a set of non-timber concessions, specifically Brazil nut (BN) concessions that were granted by the Peruvian Government from year 2002, after the recognition and regulation of this activity by the Forestry and Wildlife Law of year 2000.

These concessions are dispersed in a well-defined zone, where the majority of BN concessions (aprox. 1000) are located (both margins of Stretch 3 of the Inter-Oceanic Highway, most of them at the left side).

In the beginning, 377 concessions joined the Project, but the number increased during the first three years of operations, reaching 405 associates so far. More concessions are expected to join the project in the future (as it is a grouped project). Each concession consists of an irregular polygon of "n" vertices²⁵. Annex 1 shows a table with the unique code for each concession (which is the contract's code), their areas and centroids coordinates.

The boundaries of the PA were defined based on the legal boundaries of each concession contract; nevertheless, some parts (especially the ones near the IOS and secondary roads) were excluded because they had been deforested.

The overlap of areas among different concessions was an issue encountered to calculate the total Project Area²⁶. In that sense, the project design includes activities addressed to close the boundaries of each concession with formal agreements and official acknowledgement by forest authority.

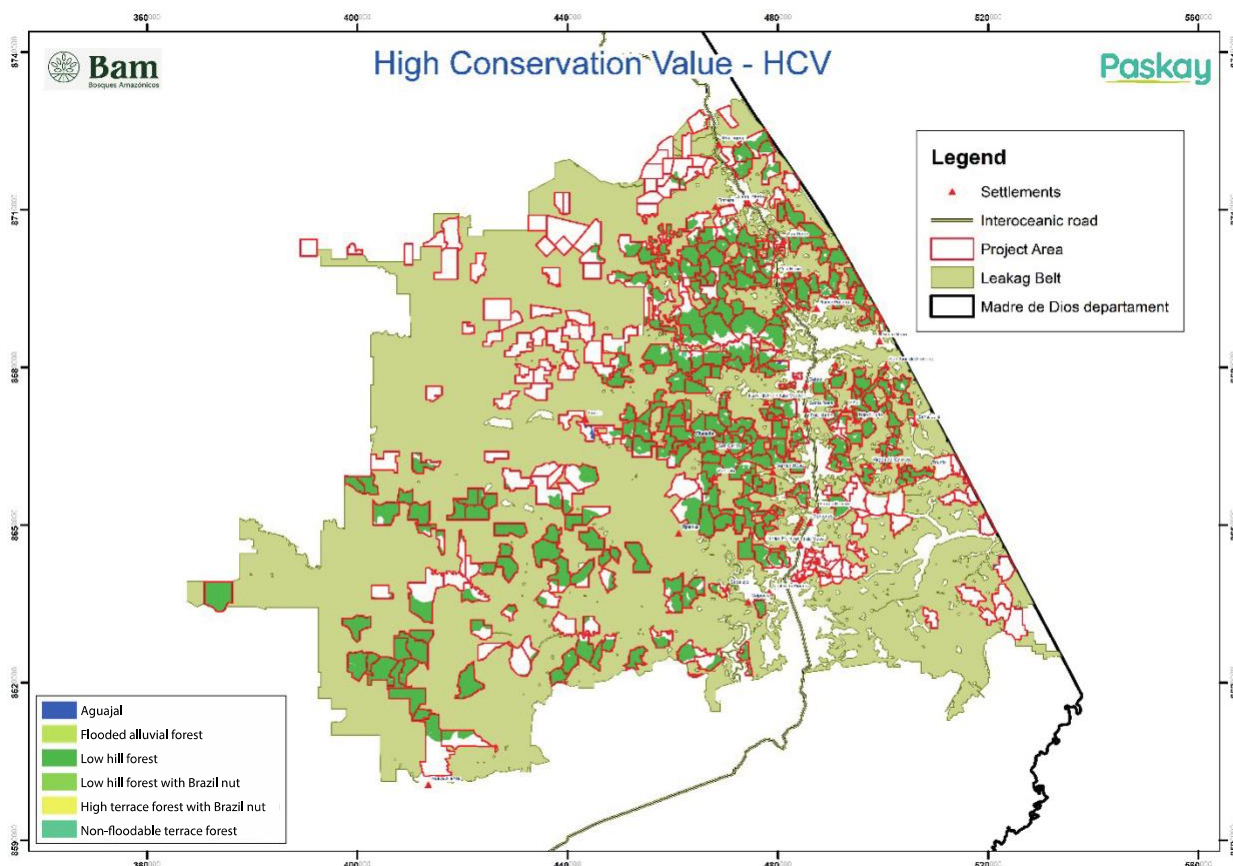
In addition, there were some areas identified that could classify as peat soils according to the map of Forest and Soil of ZEE. Therefore, we have removed all areas that did not classify as forest.

²⁵ The coordinates of the vertices of each concession are not shown in this document due to practical issues, but are kept available in BAM's office

²⁶ BAM is currently working with the concessionaires' members of the Project to resolve this issue by re-dimensioning their boundaries

Additionally, the overlaps were solved in ArcGIS by dissolving all the boundaries to get a net area. The resulting Project Area is 329,564 hectares of forestland.

MAP 9. Map of the Project Area Boundaries



The Project Zone has been determined as the Project Area plus the Leakage Belt, which is comprised of other Brazil nut concessions and neighboring properties. The Project Zone covers a total area of 1,015,316 hectares. Its boundary is delineated in the previous maps and contains the entire BN region.

This boundary was considered sufficient to estimate the influence of activities of the project due to the following considerations:

It is composed by holders of land (concessions) of similar characteristics of those who occupy the Project Area. The Brazil nut concessionaires, as well as the agricultural properties, are rural families of scarce resources that live of these activities for their subsistence.

It is located in an equidistant way from the principal access roads, terrestrial and fluvial. The only difference between the Brazil nut concessionaires who form part of the Project Area and the ones that form part of the Project Zone (in leakage belt) is its adhesion to the project REDD+ being this a circumstantial situation which can vary with the adhesion and/or withdrawal of each type of concessionaire.

Since this is a “grouped project”, it is expected that more Brazil nut concessions join the project at their own discretion (i.e. voluntarily and when they deem appropriate). All non-project concessions are included in the Project Zone, specifically in the Leakage Belt.

Additionally, the concept of Leakage Belt was mentioned in previous sections. It is an area expected to receive the avoided deforestation from the Project Area, located inside the Project Zone. Because the Leakage Belt is large enough (over twice the project area) and is mainly composed by other BN concessions with equal risk of invasion and land use change, we consider that areas beyond this boundary will not suffer leakage. In the same way, people living outside the Project Zone whether forestry concessionaires, miners, native communities, etc. are unrelated to the project, therefore, they will not be affected either positively or negatively by the activities of it.

2.1.6 Stakeholder Identification (G1.5)

The process followed to identify project stakeholders was based on two criteria:

- For non-government stakeholders: affluence/presence of groups within the project zone was analyzed, identifying and including different types of land tenure (including forest areas and non-forest areas). Based on this criterion, Brazil nut concessionaires, timber concessionaires for forest areas and agricultural and cattle ranching producers and miners were included in the project stakeholder mapping.
- For government stakeholders: legal competences directly or indirectly related with the land use was evaluated and considered. Indirectly, local municipalities were included in the project stakeholder mapping, while directly, the Ministry of Environment, Forest and Agrarian authorities, Regional Government and sanctioning entities were also considered in the evaluation.

Non-government stakeholders:

a) Organizations of Brazil Nut Concessionaires

The Brazil nut concessionaires have had various and different organizations over the time. Some were created by public entities, projects, community organization, etc. Currently, they are grouped in a second level organization called Federación Departamental de Productores Castañeros de Madre de Dios – FEPROCAMD.

FEPROCAMD was founded on November 18, 2009, and registered in SUNARP²⁷ on April 15, 2010 with a certificate registration number of 11016791. This organization represents 11 Brazil nut associations and constitutes the superior organization, which represents the majority of BN concessionaires of Madre de Dios.

²⁷ SUNARP is the National Office for Registration of Titles, Rights and Properties

TABLE 16. FEPROCAMD based associations, certificate of registration and legal representative

Departmental Federation Of Brazil Nut Producers Of Madre De Dios Based Associations		
Nº	Name	Nº Of Certificate In Public Records
1	Asociación de Productores de Extractores de Castaña de Planchón	11016567
2	Asociación de Productores y Extractores de Castaña de Shiringayoc	11016632
3	Asociación Castañera Agroforestal de Carmen Rosa	11016658
4	Asociación de Productores y Extractores de Castaña de Mavila	11016615
5	Asociación Agroforestal Alegría, Alto Malecón San Carlos y Anexos	11015063
6	Asociación de Productores Castañeros y Agroforestales de Alerta	11016540
7	Asociación de Castañeros de Alegría	11000665
8	Asociación de Productores y Extractores de Castaña de Río Pariamanu y Afluentes	11016654
9	Asociación Castañera Agroforestal de Varsovia	11016652
10	Asociación de Productores y Extractores de Castaña de Loreto	11016672
11	Asociación de Extractores Productores Forestales y Agropecuario de La Novia	11006728

Additionally, in the Project Zone there is the Asociación de Recolectores de la Nuez Amazónica del Perú - RONAP, founded in 2003. RONAP groups 58 Brazil nut producers of Madre de Dios and has its own Organic Certification and Fair Trade Certification programs. Even though, this organization is not member of FEPROCAMD nor the REDD project.

In the whole region, there are around 1.000 Brazil nut concessionaries. Less than a half (405) have joined to the project.

b) Organizations of the Timber Forestry Concessionaires

Most of the timber concessionaries are members of two organizations:

- The Forest Management Committee of the Madre de Dios
- The Timber Federation of Madre de Dios

c) Agrarian organizations

Within the Project Zone, no relevant agricultural associations have been identified. Regularly, farmers are organized in function to the agrarian agencies distributed in each district. On a regional level, farming has the Agrarian Departmental Federation of Madre de Dios.

d) Mining organizations

The mining concessionaires are organized in associations per district, sectors or rivers. Within the Project Zone, no relevant mining association has been identified. At a departmental level, all the miners and miner associations are affiliated to the Miners Federation of Madre de Dios – FEDEMIN, organization which brings together 24 miners associations in Madre de Dios. This organization is at the same time affiliated to the Artisanal Mining Federation of Peru (FENAMARPE), which brings together 198 associations of miners in 18 regions of the country.

Government stakeholders:

Madre de Dios Regional Government

The Regional Government of Madre de Dios is the main authority at the second level of government. During decentralization process in the first years of current century, most of the agrarian and forest legal competences were transferred from central government to regional governments. In this entity, the key offices are: ARA (Environmental Authority), GERFOR (Forest authority) and OCTI (Cooperation for development office).

Las Piedras Municipality

This is the district level municipality, where the project is located. The main benefit from the project is that the Brazil nut activity creates some local economic chains.

Specialized Attorney in environmental affairs.

The main role of this entity is to investigate and accuse where some illegal activities have been done related with forest activities, as illegal logging, illegal hunting.

OSINFOR

The forest surveillance authority is in charge of field inspections in forest concessions, including Brazil nut concessions, to assess if the forest holder activities meet what is approved in their planning tools and establish sanctions, if not.

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

TABLE 17

Stakeholders and Others involved in the Project				
Institution/Organization	Areas	Relationship With the Activities of the Project	Level of Relationship	Impact

Madre de Dios Regional Government	Regional Natural Resources Management	Forestry and Wildlife management (Tambopata and Tahuamanu)	Will rely on the sustainable management of Brazil nut areas. Activity Monitoring and Surveillance	Player	Positive
Las Piedras district municipal	Tambopata Provincial Municipality	Hall, Citizen Participation Program, Economic, Productive and Social Development Management	Managements of social, economic and environmental projects that contribute to the REDD project	Involved	Positive
Tahuamanu district municipal	Provincial municipality of Tahuamanu	Hall, Citizen Participation Program, Economic, Productive and Social Development Management.	Managements of social, economic and environmental projects that contribute to the REDD project	Involved	Positive
Executive. Public Ministry		Mixed Provincial Prosecutor of Tahuamanu and the Provincial Crime Prevention Environmental Matters Attorney of Tambopata	Investigation action will be in coordination with oversight research, and enforcement related to criminal acts and attacks against the rights of Brazil nut members	Involved	Positive
Agency for Supervision of Forest and Wildlife Resources OSINFOR		Regional Headquarters	Actions to be coordinated and incised for proper application of regulations norms and legal defense to possible sanctions against unsubstantiated Brazil nut harvesters	Involved	Positive
Producers Departmental Federation of Madre de Dios Brazil nut (FEPROCAMD)		All base associations of Brazil nut harvesters	Brazil nut REDD project	Player	Positive

	involved in the Project			
Bosques Amazónicos SAC	Private Enterprise	Proponent of the Project	Player	Positive
Community organizations (including populated centers and scattered population)	President and board of the community, Lieutenant Governor and municipal agent	Coordination of planning and community management of REDD project	Involved	Positive
Farmers	Associations and agricultural interest groups	Participants of the training and agroforestry economic managements projects	Involved	Positive
Brazil nut concessionaires	Associations and Brazil nut interest groups	Executors, participants and beneficiaries of REDD project Brazil nut	Player	Positive
Timber Forestry Concessionaires	Organizations of Timber Concessions	Potential participants in future trainings related with improved forest management	Involved	Positive
Mining concessionaires	Mining organizations	Mining activity is one of the main drivers of deforestation. The project plans to work with them to promote techniques to do their activity (where legally authorized) with the minimum feasible impact.	Involved	Negative

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

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs	Outcomes	Impacts	
	(short term)	(medium term)	(long term)	
<i>CLIMATE</i>				
R1. A1. Implementation of a holistic monitoring, control and surveillance	A) 01 satellite system to identify deforestation threats: the implementation of an early alert system to detect hot spots (possible threats) in the area using spatial data.	# fire alerts reports/monthly	Develop and provide tools needed to identify and control deforestation threats. Capacity to respond to and stop environmental	R1. Significantly reduced GHG emissions caused by deforestation in the Brazil nut

system (MCS) (satellite or space-based, technical, legal) to address deforestation threats.	B) 02 teams of experts for providing permanent support to the project and concessionaires when confronting deforestation threats (01 technical, 01 legal): the recruitment of technical experts to evaluate early warnings and address potential threats in the field. Also, the recruitment of legal experts to accompany concessionaires in the process of reporting possible environmental crimes in the area to the competent authorities.	# technical assistances # legal assistances # environmental crime denunciations filed and closed	crimes / deforestation, together with competent authorities.	forests of Madre de Dios.
	C) 06 surveillance and monitoring checkpoints	# checkpoints implemented		
	D) Cooperation agreements with relevant authorities for strengthening reaction capacity in front of deforestation threats.	# cooperation agreements celebrated		
R1. A2. Provide permanent training to project stakeholders in sustainable forestry management (concessions management; concessions monitoring and control; sustainable productive activities).	A) The implementation of training workshops throughout the year for strengthening stakeholders' capacities in sustainable forestry management to foster sustainable productivity and avoid deforestation.	# of trainings/year	Increase project partners' knowledge/understanding of: forestry Law and alternatives to timber extraction, sustainable forest management and compliance with certifications, among others. Increase project partners capacity for developing sustainable forestry management activities.	R1. Significantly reduced GHG emissions caused by deforestation in the Brazil nut forests of Madre de Dios.
R1. A3. Support the development of annual management plans and supervising the correct course of operations.	A) Support in the design and submission of documents to the competent authorities	# documents supervised	Management plans duly designed and submitted to the competent authorities	R1. Significantly reduced GHG emissions caused by deforestation in the Brazil nut forests of Madre de Dios.
	B) Concession operations monitoring	# concessions supervised	Duly executed management plans, respecting the permitted extraction levels to ensure the forest balance	
R1.A4: Campaigns on conservation of forests and environmental goods and services	Execute two annual campaigns through channels such as newsletters, radio campaigns and others according to the strategy defined by the communications area	# campaigns held annually on forest conservation	increased community awareness in the project area about the benefits of conserving forests and their biodiversity, working sustainably with ecosystem resources.	R1. Significantly reduced GHG emissions caused by deforestation in the Brazil nut forests of Madre de Dios.

R2. Establish a forestry nursery for reforestation of brazil nut and agroforestry purposes	A5. A) Developed a scientific process for the reproduction of Brazil nut trees to improve production capacity within the project area.	# nurseries implemented # plants grown/developed # plants installed	Increase brazil nut production (# fruits/hectare) on concessions partners of the project for the benefit of BN concessionaires	R2. Promote the development of natural climate solutions (conservation, reforestation, agroforestry when applicable) and sustainable forest management to maintain ecosystem integrity.
	B) Install a nursery for the establishment of seedlings to supply reforestation/agroforestry systems in accordance with BAM's forestry genetic improvement program.		The restoration of degraded areas within the project area, increasing the capacity for carbon sequestration and ecosystem recovery	
COMMUNITY				
R1. Strengthen FEPROCAMD's organizational and executive capacity.	A1. Provide administrative and operational support for the life of the Federation, ensuring its proper management for the benefit of its members.	# number of associations duly registered and established in accordance with the Federation's by laws	A solid organization that is able to efficiently attend to the needs of its members (concessionaires), fulfilling its objective of providing sustainable development for the community and protecting the forests of Madre de Dios.	R1. Strengthen the organizational and management capacity of the Federation and its members to ensure the sustainable and integrated management of forest concessions.
		# of associations with registered and duly remunerated representatives to perform their duties in accordance with the provisions of the Federation's by-laws		
R1. A2. Provide services for the correct ordering and bordering of concessions (concession demarcation) according to concession contract with Peruvian state	Provide project partners (concessionaires) with management and boundary services to ensure compliance with their concession contract requirements and proper management of their areas.	# of concessions properly ordered	Sanitized, registered and duly managed areas for adequate forest management	R1. Strengthen the organizational and management capacity of the Federation and its members to ensure the sustainable and integrated management of forest
		# concessions properly limited		
		# concessions fully registered in Public Registries		
R2. A3. Support concessionaires in improving their production and commercial capacity with respect to the	Define production and commercial strategies to increase the value of the Brazil nut activity	# productive initiatives implemented	Higher productive and commercial capacity around the brazil nut activity that is translated into higher economic income for the Brazil nut families.	R2. Provide commercial and operational support to increase income generated by the Brazil nut activity, improving the
	Implement productive and commercial pilots to improve the situation of the Brazil nut sector.	# commercial initiatives implemented		

Brazil activity.	nut				livelihoods of the community.
BIODIVERSITY					
R1. Implement a scientific program for permanently evaluating and monitoring flora and fauna within the Project Zone.	A1. a	Conduct field expeditions on conservation in the project area; within the strategic framework of the BAM Science Program.	02 expeditions per year (dry season biodiversity assessment and rainy season biodiversity assessment); use and implementation of camera traps; monitoring visits.		R1. Guarantee and maintain the integrity of biological diversity and ecological processes in the Brazil nut concessions and the wider Project Zone.
		Receive scientific reports from third parties on conservation in the project area; within the strategic framework of BAM's Science Program.	2-4 reports per expedition in the different areas of biology		
R2. A1. Control of illegal hunting and flora trade in the project zone with the support of authorities and other competent organizations		Consolidate cooperation agreements with authorities and competent authorities that can provide support in the control of threats to biodiversity in the area.	# of field actions by FEMA, USAID or other competent authorities	Safeguarding the integrity of biodiversity in the project area	R2. The biodiversity in the Project Area has improved, as well as the water quality.
		With the support of competent organizations, identify and report environmental threats or crimes against biodiversity in the area.	# of complaints with follow-up		
R2. A2. Training in biodiversity awareness and conservation will be held annually among project members and other stakeholders.		Conduct training for the community in general regarding the identification and conservation of biodiversity.	# trainings regarding biodiversity conservation annually		R2. The biodiversity in the Project Area has improved, as well as the water quality.
		Conducting awareness campaigns on the importance of biodiversity in the project area and how to deal with potential threats	# campaigns held annually		

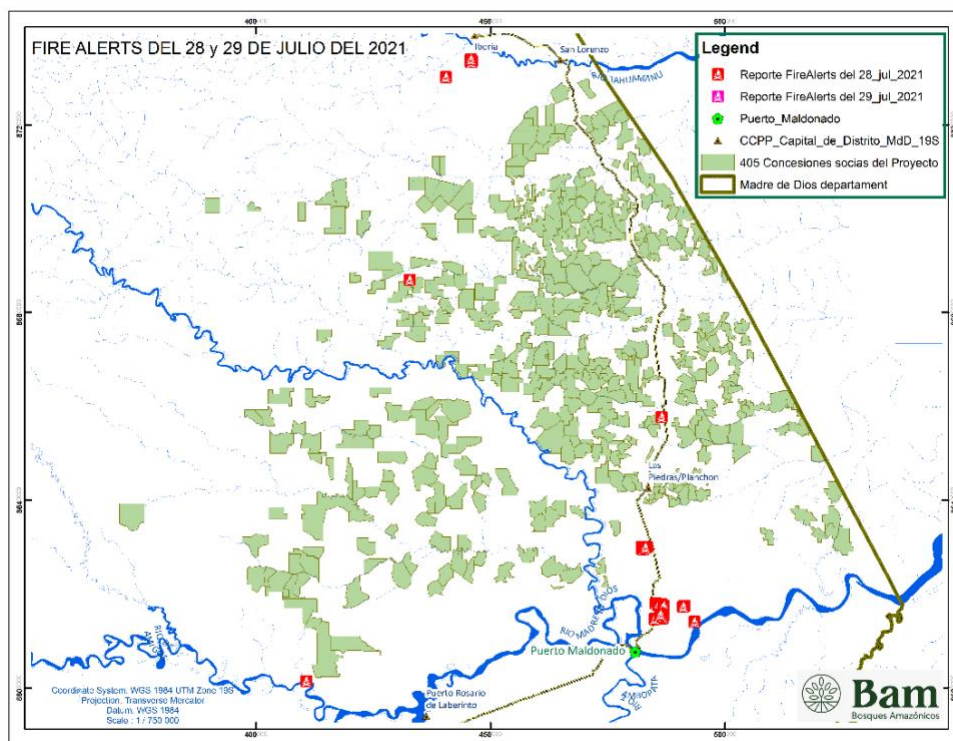
Climate Component

R1: Significantly reduced GHG emissions caused by deforestation in the Brazil nut forests of Madre de Dios.

A1: Implement a holistic monitoring, control and surveillance system (MCS) (satellite or space-based, technical, legal) to address deforestation threats.

The Project monitoring system is based on 3 pillars: satellite monitoring, technical monitoring and legal monitoring.

Satellite monitoring and control: As part of the satellite system, spatial data from official sources (e.g. GEOBOSQUES; NASA) is daily used to identify the dynamism within the project zone. As a result, early warnings of hot spots (potential deforestation threats) are identified on a daily basis over the area. See map below as an example.



MAP 10

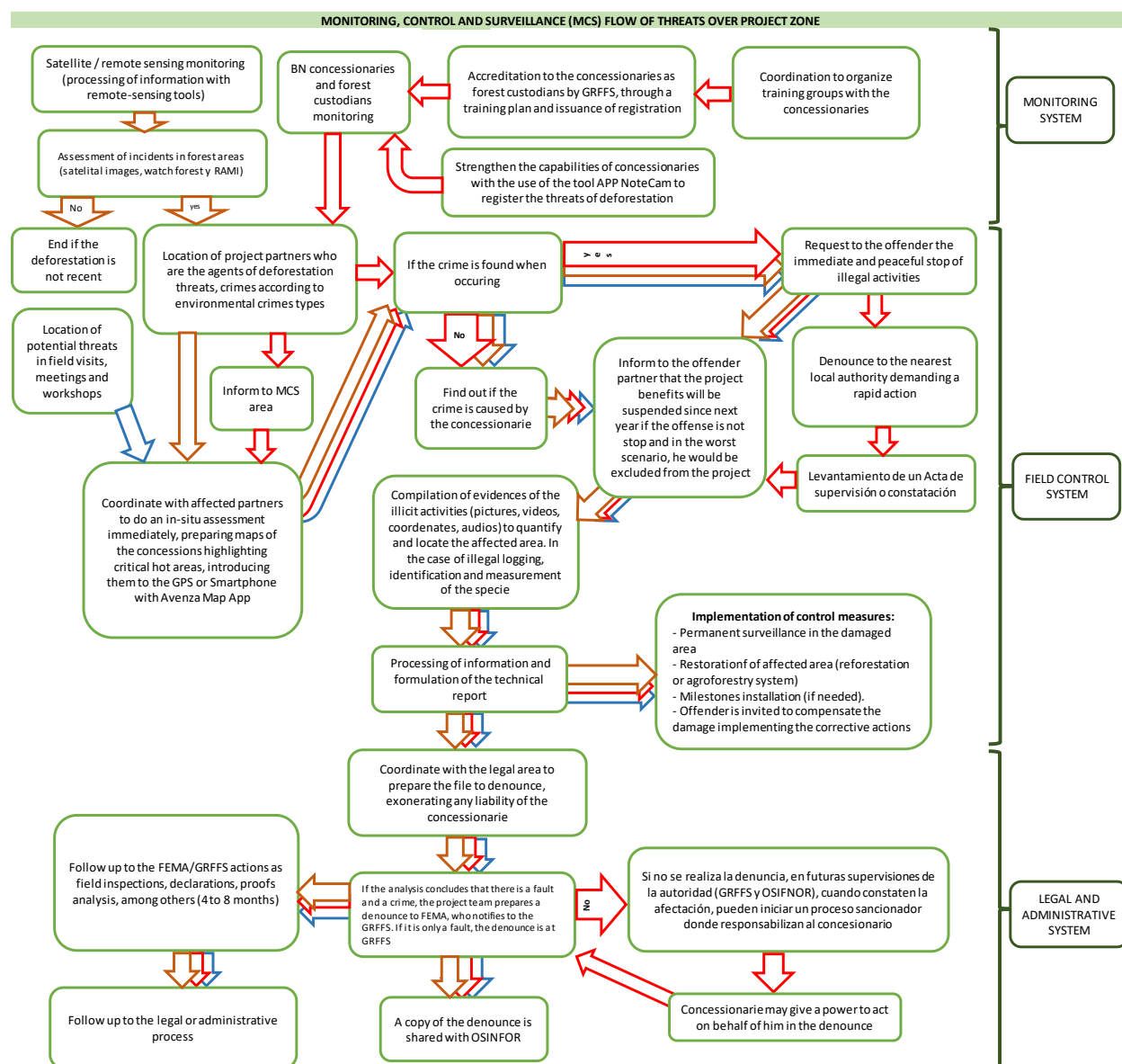
As part of the system for identifying deforestation threats, the project's expert staff trains concession partners in the use of applications (apps) to identify and record possible environmental crimes, such as the NoteCam application, which seeks to speed up the identification of deforestation threats, fires or illegal logging, by verifying coordinates and hot spots. With this application, the concessionaires themselves, guardians of the forests, can immediately identify and report any irregular occurrences in their areas to the project team for an efficient response.

Technical monitoring and control: with the information provided by the satellite or remote pillar and with the information gathered from the permanent visits to the different project areas, the field technical team activate response protocols depending on the type of environmental crime(s) occurred (Figure 3). The response includes a combination of field inspections, patrolling and legal advisory. For attending concessionaires, the technical expert team goes to the concessions or project areas affected/potentially affected to advise the partners in the process, collecting evidence and making the necessary reports to file the respective complaints to the competent authorities. For accomplishing their tasks properly, the technical team is duly equipped with cameras, GPS, drones, etc.

Legal monitoring and control: the system is accompanied by the legal structure, where, once the information has been collected, the project's technical and legal team accompanies the concession partners in the process of filing complaints with the competent authorities, following up on the cases until they are completed.

Implementation of action protocols: the control, monitoring and surveillance system has established protocols to act rapidly and efficiently according to the type and degree of threat in the area. These action protocols are shared with the project stakeholders.

FIGURE 3

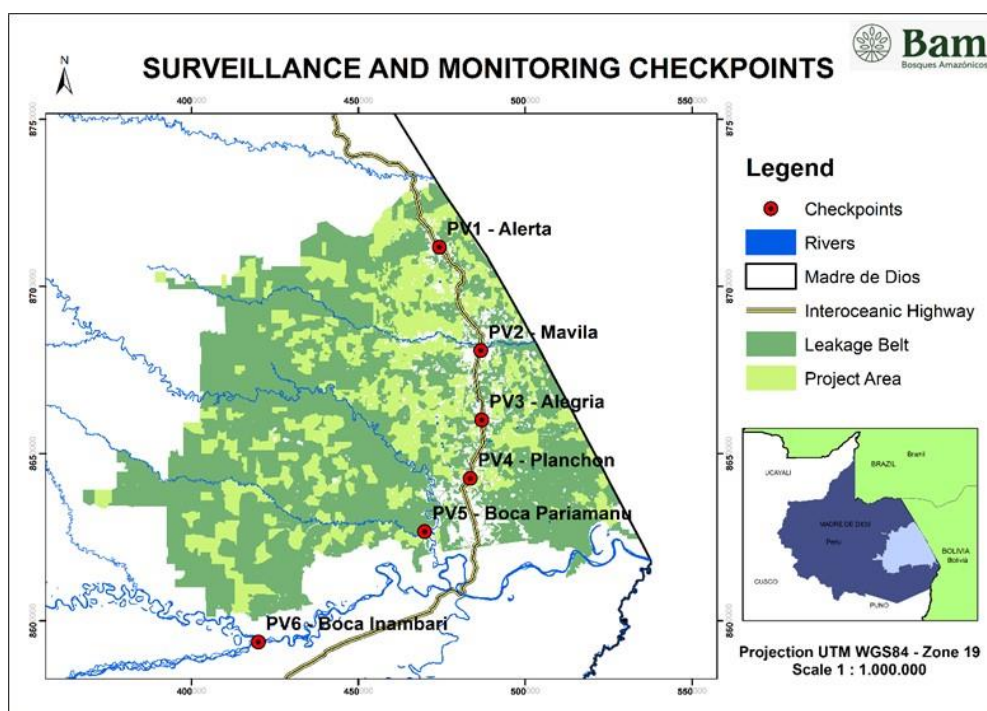


Regular training and participation of stakeholders: As part of the activities implemented, regular training is shared with stakeholders regarding the functioning of the monitoring control and surveillance system. These workshops are also used to train concession partners in the use of technologies that allow them to identify and report deforestation threats in the project zone.

Agreements with stakeholders (competent authorities): in order to have a stronger and better articulated response capacity, the project seeks for the support of the competent institutions, relying on inter-institutional alliances and agreements to ensure the timely, adequate and legitimate resolution of cases. Agreements and alliances will be made with the Regional Government, the Forestry Directorate, the regional office of FEMA, OSINFOR, district municipalities, etc.

Checkpoints building: furthermore, six permanent control posts will be installed for surveillance, information, registration and case management. These checkpoints will be managed by the project and will be recognized by the regional forestry authorities (Forestry Department-GOREMAD). They will also be strategically located in (or near) the agricultural offices and in the main population centers of the Project Zone. Each control post will have a team of 2 technicians permanently monitoring the area. The technicians will have the necessary equipment and resources to efficiently carry out the control and surveillance activities.

MAP 11. Location of control and surveillance checkpoints



- P1. Alerta (MCS) post: this is a strategic location as it is the last mayor local center in the Brazil nut concession sector. There is a station of the Agrarian Directorate (Forestry Office), a relevant organization for the proper development of forest management and productive activities for the benefit of the members. From this point there is access to sectors such as La Novia, Tahuamanu, etc.

- P2. Mavila (MCS) post: this location is strategic because it is the second most important town along the road and because it is the access point to other Brazil nut sectors. This is where the only Agriculture Department (Forestry Office) guard post is located. From here you can access other Brazil nut sectors such as Shiringayoc, Nuevo Aposento, etc.
- P3. Alegria (MCS) post: this is an important town located on the margins of the transoceanic highway. From this point, other important Brazil nut sectors such as Loreto, Nuevo San Juan, San Carlos, Varsovia, etc. are accessible.
- P4. Planchón (MCS) post: this is a strategic location for being the capital of Las Piedras district, where the Forestry Office of the Department of Agriculture is also located. From this point, other important Brazil nut sectors like Sabaluyoc, Lake Valencia, etc. are accessible.
- P5. Boca Paríamanu (MCS) post: this is a strategic area from where the Brazil nut sector that has access to the Paríamanu and Las Piedras rivers will be monitored. This is a convergence point and access point to the Madre de Dios River, a direct route for Brazil nut production to Puerto Maldonado. The main threats to be controlled will be mining activity and illegal loggers.
- P6. Boca Inambari (MCS) post: *This is a strategic zone to monitor the Brazil nut areas of Laberinto, Garrapatayoc, etc. This zone will be designed in coordination with the relevant authorities and in alliance with other organizations for its viability and implementation.*

It is important to highlight that the control, monitoring and surveillance system applies to the entire project zone, i.e. concessions that are part of the project and those that are not, since it is essential to avoid any type of threat throughout the territory in order to prevent any possible entry into the project area. It is therefore intended to minimize any risk of leakage and damage to the project area.

The growing trend of slashing and burning of agricultural biomass, which is set at the edges along the Interoceanic highway (area mainly covered by agricultural land) and secondary roads in the Project Zone (area covered by Brazil nut concessions and farms), are the main factors acting and mobilizing of deforestation that will be controlled by the project. Actors who are diverted by this control could be constituted as leakage of the project and could be threats of the following areas within the Project Zone:

A2: Provide permanent training to project stakeholders in sustainable forestry management (concessions management; concessions monitoring and control; sustainable productive activities).

The Project provides permanent training to stakeholders, mainly to concession holders who are part of the project zone (project and non-project concession members) in order to promote conservation and sustainable forest management in the project's area of influence. Annually, at least four technical workshops are run with participation of the population in the Project Zone. Training is provided regularly in main topics such as:

- **Monitoring control and surveillance:** training on control, monitoring and surveillance in the area focuses on explaining stakeholders about the operation processes and protocols of the MCS system and concessionaires' roles, responsibilities and reaction protocols to prevent deforestation threats. For example, training concessionaires in the use of applications that allow them to immediately report any type of threat in the area.

- **Sustainable management of the concessions:** training is provided regarding the legal conditions to adequately manage the concessions in accordance with the commitments established with the Peruvian state. For example, training is provided in the preparation of management plans and reports for the sustainable use of ecosystem resources, etc. Likewise, training is provided regarding the functioning of authority structure, requirements and processes (of each regulatory apparatus) in order to ensure the compliance with law.
 - The Implementation of Techniques for Reduced Impact Logging (RIL): techniques of utilization of Reduced Impact, such as directional felling, dragging of little impact, forest road planning, among others.
 - Mechanisms of forest certification and forest management and silviculture to improve their management plans and annual operating plans. Design and implementation of forest inventories and censuses, using GPS and forest measuring instruments of forest species recognition techniques, forestry, timber location, information processing forest certification standards among others.
 - Design and implementation of inventories
 - Training in plots monitoring and tree measurement techniques.
- **Sustainable forestry activities:** the project also organizes and promotes workshops for fostering the development of sustainable economic activities that seeks community benefit and biodiversity conservation.

As part of the project strategy, alliances and cooperation agreements are sought with competent authorities, for them to be involved /participate in stakeholder trainings.

It is important to highlight that trainings, when applicable, are given not only to the concession holders who are members of the project but also to the concession holders who are not yet part of the project as well as to other stakeholders of interest in order to continue mitigating the threats of deforestation in the total project zone, minimizing the risks of leakage / deforestation.

A3: Support the development of annual management plans and supervising the correct course of operations.

The project's technical and legal team, involved in the monitoring, control and surveillance system, provides permanent support to the partners in the design and development of annual documents or plans for the use of ecosystem resources that must be submitted to the competent authorities in accordance with their concession contracts. Some of the points established in these documents are as follows:

- Establishment and development of activities in each concession or concession groups.
- The quality, number and location of the roads which the concessionaires have implemented must be established, considering that they are concessions for the use of the Brazil nut.
- The number and location of Brazil nut trees and the estimated production of Brazil nuts (in barricas and kg)

Once the annual Operational Plans have been developed and submitted, the technical team in its regular rounds monitors that the harvesting operations in the concessions are being carried out in an adequate, planned and approved manner.

In the case of the BN concessionaries who, eventually do artisanal logging, they need to elaborate and get the approval of complementary plans, which should include the following information:

- Use of timber forest species (maximum of 5m³/ha/year)
- Determination and clearing or thinning for the development of commercial species.

R1. A4: Campaigns on conservation of forests and environmental goods and services

The project through the community relations strategy and communications plan will develop a series of campaigns promoting forest conservation, knowledge of the goods and services provided by the forest and disseminating the project characteristics of the REDD Brazil nut harvesters.

These campaigns will be through workshops, outreach materials, training materials, advertisements in media, public announcements, events, etc. These campaigns will be directed and focalized according to their objective within the project such as regional authorities, policy makers, local communities, the Brazil nut harvesters, and the community at large.

The overall objective for all these campaigns is that all communities in the Project Zone and the Region of Madre de Dios, are informed and reassess the importance of forest conservation and its ecosystem goods and services. It is considered that, annually, at least 2 outreach campaigns will run and promotion of Brazil nut forests, conservation and REDD project activities.

Being one of the objectives of these campaigns, political advocacy for forest governance, it is expected to reach agreements, conventions, regional and sector resolutions, work records, etc. that benefit the Brazil nut sector and the conservation of forests.

R2. A5: Establishment of a forestry nursery for reforestation and/or agroforestry purposes

A forestry nursery will be implemented according to the technology and capacities currently developed by the Project Developer. BAM has initiated a forestry genetic improvement program, to grow native species of the best genetic quality. In its more than 15 years of research working with native species, BAM has accumulated a genetic capital made up of more than 1 million trees developed from the selection of the best specimens from multiple provenances in Peru. To improve forest capacity, BAM have initiated a cutting-edge program in cooperation with the Instituto Tecnológico de Costa Rica (TEC), one of the leading institutions in research of native species worldwide and is being led by Dr. Olman Murillo, PhD with 35 years of experience in genetic improvement processes. This program entails reproducing the highest-quality individual trees: taller, thicker, healthier and straighter trees that grow efficiently. With this knowledge, the project proponent seeks to transmit the know-how to FEPROCAMD and the project members. Furthermore, to establish the nursery within the project area to supply the highest quality seedlings for the reforestation initiatives and agroforestry systems proposed by the project and its members.

In this way, restoration and conservation of ecosystems is promoted, and economic opportunities foster for the benefit of project partners.

To this end, two main activities will be implemented:

- In line with BAM's forestry genetic improvement program, the company will develop a specific side research process for the reproduction of Brazil nut trees, with the aim of improving production capacity within the project area. To this end, BAM's technical team, with the advice of the experts from the Instituto Tecnológico de Costa Rica (TEC), will work on the process of Brazil nut reproduction, seeking to develop successful grafts to produce genetically superior Brazil nut trees, which have the capacity to start their productive cycle in a shorter period of time.
- The project will install a nursery for the establishment of seedlings to supply reforestation/agroforestry systems in accordance with BAM's forestry genetic improvement program.

In other words, scientific/technical capacity and operational capacity will be developed. At this operational points, the concessionaires will be supplied with:

- Brazil nut plants of superior genetic quality, to reforest their areas with trees that have the capacity to produce fruit (brazil nut) in a shorter cycle.
- Other plants of genetically superior native species in accordance with BAM's forest genetic improvement program (species such as shihuahuaco and marupa).

The determination and implementation of reforestation areas, type of enrichment and enrichment as well as the determination and implementation of permanent plots and monitoring and tree measurement of species established will be led by the Project technical team and technical advisors. These efforts will be complemented by periodic training of partners in forest management (reforestation), monitored by the monitoring and surveillance system and assisted by the project's technical team

Community Component

R1: Strengthen the organizational and management capacity of the Federation and its members to ensure the sustainable and integrated management of forest concessions.

A1: Strengthen FEPROCAMD's organizational and executive capacity.

The correct organization of concessionaires is vital to:

- strengthen community role in front of local authorities and different stakeholders at the local and national level, raising awareness of their position as a fundamental organization for the conservation of forests. Also, strengthen their position as agents of sustainable development for their region.
- strengthen their capacity to generate productive value chains around sustainable forest management. In particular, to strengthen their productive and commercial capacity for the development of the Brazil nut activity.
- strengthen their capacity to react to possible deforestation threats or events in their concessions.

- among others

In this sense, the project identifies and promotes that, to the extent that the organization is legally constituted and recognized under its bylaws, its needs and interests will be met and its objectives fulfilled. BN concessionaires grouped in FEPROCAMD, with the support of the project, have developed organizational mechanisms to: improve Brazil nut activity (production and commercial capacity), better protect their concessions, improve forestry management capacity, among others.

At the beginning of the project, in March 2010, assistance was provided to consolidate the formalization of eleven associations forming part of the Federation of Brazil nut producers of Madre de Dios (FEPROCAMD), with their respective registration and updated documentation of their institutional life. The notary registry procedures for the subsequent registration of FEPROCAMD began in March and ended in April 2010, successfully completing the legal formalization of the federation, FEPROCAMD. All activities implemented to meet the above goal were led by BAM and FEPROCAMD. BAM's role was to advise and give permanent support to officials/social leaders belonging to each one of the associations forming the FEPROCAMD.

To date, the organization, FEPROCAMD, is legally constituted and duly registered in the public registry. In addition, it is governed according to its approved bylaws. The project supports the Brazil nut organization in formalizing and updating their social institutions in accordance with their bylaws, providing support in the development of the necessary documentation, process management, registration with the authorities, etc. BAM and FEPROCAMD have the administrative documentation for each of the concessions, as well as updated management instruments for each of the areas. Having an effective organization and updated documentation serves to continue the defense and support in the optimal management of the Brazil nut areas.

The principal functions of the Federation (as foundation by-laws) are:

- To integrate needs, requirements and initiatives of its member associations, in order to contribute to economic, social and cultural development of individuals and families engaged in the extraction, collection, transformation and commercialization of Brazil nut in the Madre de Dios region.
- To protect the interests of its member Associations, defend their rights and support their actions before the political, administrative and judicial authorities.
- Raise awareness among Brazil nut concessionaires, regarding the appropriate and sustainable use of natural resources and the importance of conservation.
- Promote the regularization, updating and enforcement of concession owners' contracts with the Peruvian State, advocating for the signing and enforcement of concession contracts and commitments; overcoming overlaps with agricultural producers, loggers and other forest product concessionaires.
- Promote better practices for the collection, drying, handling, and transformation of Brazil nut; assimilating new technologies, encouraging permanent training and promoting the use of modern machinery and equipment.

Promote the conservation and repopulation of the Brazil nut forests, fighting logging and preventing forest fires, as well as the protection and defence of the local Brazil nut producer against illegal Brazil nut imports and price concentration.

A2: Provide services for the correct ordering and bordering of concessions (concession demarcation) according to concession contract with Peruvian state

As part of the project's activities, demarcation and ordering of concessions is provided as a service. The aim is to ensure the proper sanitation of the concessions in order to manage them optimally and in accordance with the requirements and considerations framed in the concession contract with the Peruvian state. To this end, the project provides 2 specific services for project members:

- Demarcation: for the correct demarcation of the areas (concessions), avoiding overlapping with other types of properties or land ownership. This ensures the optimal sanitation of the areas and their corresponding registration with the competent authorities.
- Management ("Ordenamiento"): for the periodic inventory of the forest species found in each concession, to ensure sustainable management of the areas. That is, to carrying out a complete inventory of the typology and quantity of forest species in the area. In this manner, a control and registry can be kept for the optimal conservation of the forests, as required by law.

A3. Support concessionaires in improving their production and commercial capacity with respect to the Brazil nut activity.

The project provides support to improve the productive and commercial capacity of the Brazil nut activity so that the concessionaires can improve their family's economic situation. In this way, the project has **dedicated an area within its management team to structure strategies and actions that will lead the concessionaires to improve their revenue streams and, specifically for BN activity, have a better position in the market.** Initiatives around Brazil nut such as the following:

Improvement in the productive capacity of the Brazil nut: as mentioned, the project will work on a specific genetic improvement program for the Brazil nut tree in order to develop high quality genetic seedlings that will have the capacity to produce fruits in a shorter production cycle.

Improvement of commercial strategies: the project will provide support to the concessionaires in order to seek commercial strategies that will enable them to have a better position in the market, for example, after developing a corresponding feasibility analysis, strategies to be implemented might be:

Export: export the product directly as an organization or cooperative, without having to sell it to local intermediaries.

Direct sales to end clients: to engage the product with local end companies that have the capacity to pay a better price for the Brazil nut, avoiding sales to intermediaries.

Value added products: the project will also seek to promote the development of higher value-added products such as Brazil nut oil and others.

International certifications: to ensure the traceability and high quality of the products in the market. The project will promote valuable certification for the Brazil nut harvesters affiliated to the project, by obtaining international certifications such as organic certification, concession holders might achieve a higher added value, and consequently higher margins, for their product. Organic certification is a system that ensures the traceability of the origin of the product, as well as the absence of use of agrochemicals along the entire production chain. The organic agribusiness is a form of sustainable resource management, its main feature is growing, raising and manufacture of food products making maximum use of natural resources and avoiding the use of polluting agrochemical or synthetic agents.

A4. Support concessionaires for the development of other sustainable production value chains.

As mentioned before, the project has dedicated an area within its management team to structure strategies and actions that will lead the concessionaires to improve their revenue streams. To this end, the team in command is constantly evaluating different sustainable economic alternatives that will allow concessionaires to have greater income streams for their families. In this line, the team: identifies development opportunities; performs the corresponding feasibility analyses; promotes strategic alliances with technical, financial or other organizations that allow carrying out the initiative; determines the implementation phases for initial pilots; determines the large-scale implementation phases based on the results of the pilots; monitors the results and makes the corresponding adjustments to ensure the impact of the initiatives.

Among the initiatives under analysis could be, for example, in addition to the aforementioned reforestation systems, agroforestry systems with short-cycle commercial species such as cocoa; fish farming, among others.

Biodiversity Component

R1. The biodiversity in the Project Area is identified and monitored regularly

A1. Implementation of a Science Program

The project has established a Science Program that seeks to evaluate the ecological value and importance of the ecosystems located in the project's areas of influence. Among its main objectives are: to carry out a continuous inventory of natural diversity with emphasis on the most valuable species and communities in ecological terms (threatened or endangered species, varieties of restricted distribution, organisms new to science, and others); to carry out an ecological characterization of the natural communities; among others. The goal is to conduct an assessment of the health of the forests where Brazil nuts grow and to determine their composition and wealth, estimating the diversity of flora and fauna and identifying the main species according to their conservation status. Among the activities implemented as part of the Science Program are the following

Continuous inventories of biological diversity: identify the most valuable species and natural communities in the Brazil nut forests in ecological terms and to characterize the natural communities in the area.

HCV: areas with HCV are identified in the Project Zone and monitored permanently.

Camera trap system for biodiversity documentation: install cameras in the project's forests to record threatened and endangered species.

Partner organizations: encourage the establishment of partnerships with leading scientific institutions for the development of the activities included in the Science Program, ensuring the accuracy of the data and promoting top-level scientific research in the project area and region.

R2. The biodiversity in the Project Area has improved, including the rivers and water bodies

A1. Control of illegal hunting and flora trade in the project zone with the support of authorities and other competent organizations.

The project seeks to identify any threats to biodiversity in the project area. To this end, strategic alliances with relevant authorities and organizations are sought in order to control illegal hunting of species in the area of influence.

MOU BAM - PREVENIR (USAID)

The purpose is to coordinate and collaborate towards facilitating the implementation of REDD+ mechanisms, promoting forest conservation and sustainable management in the territories of influence.

The PREVENIR project works with the Government of Peru and civil society to improve conditions to prevent and fight environmental crimes and thereby reduce them, as well as to reduce the negative impact in and around protected areas, forests and indigenous lands, including working with environmental defenders in the Peruvian Amazon.

The Parties subscribing to this Memorandum share the common objective of contributing to the conservation of fragile ecosystems, the prevention and reduction of environmental crimes, and the sustainable development of the Peruvian Amazon.

A2. Training in biodiversity awareness and conservation will be held annually among project members and other stakeholders.

Training in environmental crime, endangered Fauna recognition will be held among project member and other stakeholders. These activities will be developed annually in training workshops and by disseminating of pamphlets where endangered fauna species are visualized and identify by the community.

2.1.9 Climate, Biodiversity and Community Benefits Assessment Period (G1.9)

January 01st, 2010 to December 31st, 2040

2.1.10 Differences in Assessment Periods (G1.9)

No differences in assessment periods are planned.

2.1.11 Implementation Schedule (G1.9)

TABLE 18

Date	Milestone(s) in the project's development and implementation
24/09/2009	BAM and FEPROCAMD signed the Strategic Agreement to implement a REDD project
13/06/2012	Brazil Nut REDD Project is validated under VCS and CCB Standards
14/11/2013	First VCS Verification (Vintage 2010-2012)
14/01/2014	CCB Validation
13/10/2020	Second VCS Verification (Vintage 2013-2014, 2015-2016)
29/04/2022	Third VCS Verification (Vintage 2017, 2018, 2019, 2020)
2023	First CCB Verification (Vintages 2017 to 2022)
2023	Fourth VCS Verification (Vintages 2021, 2022)
2023	Establishment of the nursery of the project
2024 until the end of the project	First Joint (VCS+CCB) Verification (Vintages 2023) and later biennial joint verifications
2024	Building of the Brazil nut processing plant

2.1.12 Risks to the Project (G1.10)

TABLE 19. The Project Risks Table

Risk Factor	Risk Level	Descriptions and Measures Proposed
Climate Risks		
Deforestation risk in the Project Area	Medium	Alternative economic activities (often informal and illegal, such as illegal logging and agriculture) could pose a risk of deforestation. If such activities are more profitable than conserving forests, they can be an agent of deforestation in the project area. Activities such as informal gold mining (because of its high short-term profitability) could distort the local economy and intensify deforestation risks for a certain part of the project in the vicinity of mining activities. To mitigate this risk, the project implements different activities, among the most relevant:

		The project seeks to establish collaboration agreements and rely on different local and national authorities in order to strengthen its capacity to react to deforestation threats: to prevent or mitigate possible invasions by informal loggers, miners or other environmental crimes affecting the concessions. The project implements a holistic monitoring control and surveillance system based on spatial analysis of the area as well as the technical and legal support from experts for the correct identification and control of deforestation threats. The project includes ongoing training of stakeholders in sustainable forest management, including the procedures of authorities for the handling and sanctioning of environmental offenses by the competent authorities
Risk posed by fires	low to moderate	There is low to moderate risk posed by fires in Madre de Dios arising from the local custom of forest clearing by fire, which could potentially cause leakages. The project seeks to mitigate this risk in different ways: The project's monitoring, control and surveillance program includes a satellite pillar that analyzes the spatial dynamics in the Project Zone, using data from sources such as NASA and GEOBOSQUES to report daily alerts of hot spots or fires within the area. Training and organization at community-level is key in the attempt to prevent the negative impacts of burning. As part of the ongoing training provided by the project, the aim is to train the community in sustainable forest management, including how to react to possible fires. As part of the training program, the project seeks to work with experts and competent authorities in each specific area. For example, in the area of fire control, we will seek to work with INDECI (Institute of Civil Defense). INDECI will be brought in to promote, together with the Civil Defense Committees, the execution of awareness programs on forest fire prevention in the Madre de Dios region. These programs will target the local population and will aim to build and strengthen its capacities vis-à-vis the technical directives of specialized entities.
Risk arising from implementation of other important	Low	Besides the Interoceanic Highway, there is no other significant project under construction in the project zone.

projects in the Project's Zone		
Risk of extreme meteorological events (floods, droughts, winds), geological risk (for example volcanoes, earthquakes, landslides)	Very low	Madre de Dios department does not pose significant risks when it comes to extreme climatic events. With the exception of one cyclical event called a 'freeze,' caused by invasions of polar air masses and leading to sudden decrease in temperature (up to 15% within the span of hours), increase in stratiform cloud cover, intensification of the wind and increase in atmospheric pressure. However, since this is a natural cyclical event, it does not pose a threat to the remaining standing forest. Madre de Dios is also a geologically stable department. According to the Nation Center for Geophysical Data (CNDG), it is a region without seismic activity (Bernal et al 2001) The presence of the forests prevents any important risk of flooding or landslides. There are periodic floods on the alluvial plain but these are part and parcel of a natural dynamic in the local forests.
Communities Risk		
Risk arising from activities of the Project Area's mining concessionaires	Medium	In the polygon 2 and 3 of the Project Area, part of the Brazil nut concessions area overlaps with the zone of mining activity proposed by the Emergency Decree 012-2010, which declares the mine use plan in Madre de Dios to be of national importance. The risk is still uncertain since the same decree in its article 7 paragraph d. clarifies that in cases where mining rights overlap with the rights of the concessionaire, among them Brazil nut concessionaires, the mining entity has to obtain a favorable technical opinion from the Competent National Authority, in this case the General Directorate of Forests and Fauna, the same institution that granted the approval for Brazil nut concessions and has approved their forest management plans, and for this reason a favorable opinion would not make sense. As part of the project's monitoring, control and surveillance system, the areas where there is a possible impact of mining activities are monitored daily (satellite system). In addition, the project's technical team makes periodic expeditions to these areas in order to identify any deforestation or threats. Regarding overlapping and mining activities within the concession area, the project plans to work with the regional government of Madre de Dios and the Ministry of the Environment to resolve any conflicts. The concessions in these areas are also involved in the boundary and management processes provided by the project for its partners.

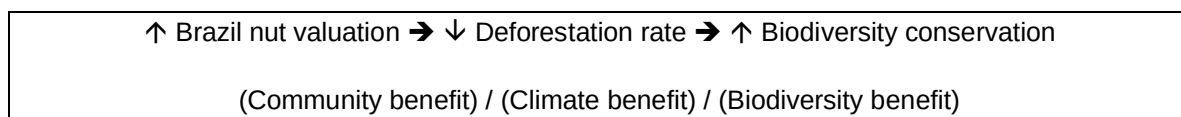
Risk of social instability	Very low	Although the community is committed to the project, the rural population and their organizations still have an incipient knowledge of how the REDD mechanism works in detail, which could lead to a priori resistance to the mechanism. Therefore, one of the constant tasks of the project is to communicate and reinforce the understanding of REDD, its benefits, commitments and challenges. To this end, the project works closely with representative organizations in the project areas, as well as with local public authorities. The uncontrolled increase in migration of the Andean population to the Madre de Dios region, facilitated by the improvement of infrastructure (roads and others) and other development projects, especially urban projects in the Madres de Dios region, could translate into a risk of encroachment into the territories where REDD projects are being developed. To mitigate this risk, the project strengthens the organizational capacities of the Brazil nut concessionaires and provides them with the tools to oversee their territories (monitoring system, technical and legal support, sanitation services, among others). Strategic alliances and constant cooperation with the competent authorities will strengthen land use plans and respect for forest concessions.
Risk of population growth and increase of unsustainable activities.	Very low	Madre de Dios is the least populated department of the country with 141,070 inhabitants and a population density of 1.65 inhabitants per km² (INEI Census 2017). The changes precipitated by the construction of the Interoceanic Highway, together with the mining exploitation in the region, can engender demographic processes of a greater magnitude than those observed between 2002 and 2007 (with 20,437 immigrants 5 years or older).
Biological Risks		
Due to deforestation and human settlements in the Project Zone	Medium	The deforestation leads to a loss of biodiversity, therefore the deforestation risk described in climate factor has been the same as for biodiversity, however, the level of impairment would be given by the biological characteristics of the impacted area. In addition to the actions described, the project has proposed in the Plan of trainings, workshops to encourage sustainable activities in the forest the recognition and importance of endangered wildlife species. This is complemented by the science program implemented to assess and monitor the biological wealth and diversity of the project area.

Risk of attack by pests and diseases	Very low	For being the Project Area a natural heterogeneous forest the risk of diseases or pests is minimal.
Risk of extreme weather events (floods, drought, wind). Geological risks (volcanoes, earthquakes, landslides)	Very low	As mentioned above, Madre de Dios is a geologically stable department. According to the Nation Center for Geophysical Data (CNDG), it is a region without seismic activity (Bernal et al 2001) Drought can affect agricultural production, the last major drought occurred in 2005 (Marengo J. et al 2008) which was the 6th lowest level measured in the black river in 103 years, the last major drought occurred in 1926 therefore is a rare phenomenon. Climate change can possibly increase the frequency of droughts and, unless appropriate conservation measures are undertaken, convert the tropical forest into a net emitter of CO₂. Recently, a study of the last big drought in the Amazon in 2005 (Phillips, et al 2009, published in Science) has found evidence that the Amazon forest, despite the fact that for years it has been helping to halt the advance of climate change, is surprisingly sensitive to drought, which has the potential to turn these forests into net CO₂ emitters. The very presence of the forests prevents any important risk of flooding or landslides.

2.1.13 Benefit Permanence (G1.11)

Some of the measures are directly related to ensure the permanence of climate, community and biodiversity benefits.

Specifically, according to project diagnosis of the land use dynamic, the sequence is as follows:



So, based on that, the main strategy is to focus on ensure that surrounding communities (Brazil nut collectors and other rural families, not dedicated to BN activity) obtain increased incomes thanks to the project implementation.

In that sense, the project plans to “support concessionaires in improving their production and commercial capacity with respect to the Brazil nut activity” (R2 A3) but also “Provide permanent training to project stakeholders in sustainable forestry management” (R1 A3) and “Establish a forestry nursery for reforestation of brazil nut and agroforestry purposes” (R1 A5) to increase incomes from non-forest areas (as restoration and agroforestry).

2.1.14 Financial Sustainability (G1.12)

The Brazil Nut REDD Project has been verified three times for harvests/vintages (2010-2017) and is being verified for a new harvest process for year 2017-2020. By selling carbon credits in an increasingly consolidated market, the project expects to have sufficient revenue to ensure financial sustainability to implement activities to meet project objectives. Throughout its years of operation, BAM has consolidated a portfolio of clients that includes the most important players in the market, achieving an important positioning of the project worldwide.

BAM is an established company with more than 17 years of experience operating forestry projects in Peru. The company has assets worth US\$50 million, including 24,433 hectares of private property. The property, which is located in Campo Verde, Ucayali, comprises primary and secondary forest and more than 1,000 hectares of a plantation of native species with commercial value (biological asset).

A level of uncertainty is related with the national nesting process that, according to reported by MINAM, it was planned to be approved during 2021 but is up to date not finalized.

2.1.15 Eligibility Criteria for Grouped Projects (G1.14)

As a grouped project, new concessions with similar characteristics can be incorporated into the project over time. As mentioned above, the requirement is: forest concessions, especially Non-Timber Forest Products (as the Brazil nuts) in Madre de Dios.

Within the universe of Brazil nut concessions which are more than 1000 concessions, 405 have been formally incorporated into the project. The objective is to incorporate new families to generate the greatest amount of benefit for the community and forest protection.

The criteria stated in VCS Standard v3.1 was analyzed. Similar conditions between BN concessions (part or non-part of the REDD BN concessions Project) identified are:

- o Concessionaries that have already joined the project have similar characteristics than the ones who haven't yet in terms of size, distance to roads, physiography, condition of the holder of the concession, etc., so as BL-UP module develops, the modelling includes all the BN concessions as part of the RRD and RRL, and even more, concessionaries who haven't joined the project yet are the main destination of potential leakage because of similar degree of capability to deal with newcomers and invaders. In that sense, baseline scenario has been projected and can be determined to the whole Reference Region (including all the Brazil Nuts concessions) for the whole crediting period.
- o New concessionaries can access easily to project activities (i.e., organizational strengthening, control and surveillance system, regular training, etc.) by joining the project. Moreover, some activities are being implemented without any difference between concessionaries, for example, the monitoring, control and surveillance system comprises the whole project zone to identify any possible threats in the area and surroundings. The monitoring of risks is for the entire area as both type of concessions (partner and non-

partner) are mixed or interleaved. Only economic benefits as the distribution of carbon profits and some activities such as bordering and management of concessions require the acceptance of the agreement with BAM.

- o Finally, the protocol to accept new concessionaries in the project database assures that proof of title and eligibility for crediting is being complied, i.e., Forest Management Plan, Concession Contract with the Peruvian State.
- o Finally, the last condition is that the concessionaire has not signed any other agreement that involves the trading of the GHG emissions reductions.
- o In that sense, as it has been analyzed in the applicability conditions of each module, both actual concessionaries and potential concessionaries meet the requirements of the methodology.

Given that above items are already covered, the following set of criteria for acceptance of new concessionaries is the following:

- o Signing of the standard contract with the Federation.
- o Knowledge and acceptance of conditions of the long term agreement between the Federation and BAM.
- o To be the holder of a Concession Contract in force with the Peruvian State.
- o Not having signed a contract regarding carbon rights with other companies, organizations or individuals.
- o In case of applying for legal logging, accept to access to FSC certificate and/or other procedure to comply with the VCS methodology

2.1.16 Scalability Limits for the Grouped Projects (G1.15)

The current grouped project only may scale up to other NTFP concessions in Madre de Dios. The project may not include other types of concessions or land tenure types in Madre de Dios, nor other NTFP in other jurisdictions in the Peruvian Amazon or other neighboring countries in the Amazon basin.

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

In Madre de Dios, forest areas have been already allocated to different land tenants, including NTFP concessions, associated with Brazil nut harvesting and rubber harvesting. It covers around 1.2 million hectares, this is, around 4 times the current project area joined. In that sense, there is no risk that the project expands beyond those limits.

2.2 Without-project Land Use Scenario and Additionality

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

Alternative Scenarios

The range of potential land use scenarios and the associated drivers of land use changes most likely to occur within the project zone in the absence of the project are the following:

- o Continued dedication to Brazil nut activity under traditional artisan methods and selling in local markets with low added value
- o Progressive land transition from forest cover to non-forest cover associated to agrarian activities and, in minor grade, to urbanization processes

Artisanal Brazil Nut Activity with Low Added Value (Scenario 1)

Revenues in this scenario are generated from the Brazil nut²⁸ activity with low added value²⁹ and timber harvesting in small scale.

The BN producers harvest an average of 136 Brazil nut barrels per year. To ensure the supply of nuts, private companies apply the common practice of giving “Habilitos” (pre-payment for future harvest) to the concessionaires who invest this working capital for the collection of the BN during the “Zafra” (collecting season). Through this practice, the concessionaires have cost-effectiveness in terms of TIR, due to limited self-investment (although sometimes profit in nominal terms remains of subsistence). The average net income estimated is S/.10 339 a year.

The small-scale logging activity within Brazil nut concession is usually performed by an agreement between the concessionaire and a logger, corresponding to 50% of the concessionaires’ profit. The scenario assumes an annual average of 206m³ of wood (determined of the extraction balances), with average revenue and cost of S/.357 and S/.230 per cubic meter (m³) respectively.

Alternative Land Use Activities (Scenario 2 or Baseline):

Revenues in this scenario are generated by livestock and agriculture activities³⁰, and additionally, in the remaining areas of the forest, Brazil nut collection and timber harvest at small scale (keeping both the cases described above).

Agricultural activity corresponds to Corn production, carried out by small farmers through slash-and-burn of the forest. The average productivity of the corn is estimated at 1.014 kg per hectare, low performance compared to the national average (3.962³¹ kg / ha). For livestock, the maximum productivity of meat considered is 45 kg per hectare of pasture. The profitability of livestock,

²⁸ Information obtained from “La cadena de valor de la castaña amazónica”, Corporate Author: Comité Técnico Multisectorial de la Castaña - 2006.

²⁹ The low value added of Brazil nuts activity refers to the lack of harvesting techniques and international certifications that allow better prices in the market.

³⁰ Information obtained from “Strategies for Conservation along the Interoceanic Highway in Madre de Dios, Peru: A spatial economic analysis” prepared by GRADE, March 2010.

³¹ Ministry of Agriculture - DGIA, 2008

especially near Puerto Maldonado and Las Piedras (very close to the proposed Project Zone), reaches a top value of \$ 140/ha/year, and decreases the farther away from the city center or Interoceanic highway. This scenario considers an average profitability of the two activities, agricultural livestock operations, S/.192.5 per hectare.

This analysis works with an average of 800 hectares³² per concessionaire, and an annual historical deforestation rate of 1.04%.

2.2.2 Most-Likely Scenario Justification (G2.1)

The most likely scenario is alternative land use activities. The justification of this scenario is described below:

To threats over the zone and Project Area described above, are added threats of legal and regulatory nature such as zoning process (ZEE) and the regional ordinance that approves it, the mining ordinance and urgency decree, the Biofuels Promotion law and the natural potential for these crops in Madre de Dios, amongst others who propose a scenario "without project" with real and quantifiable deforestation threats. The following describes the existing laws and regulations that support the Baseline scenario proposed:

Law of Forestry and Wildlife N° 27308

Despite the existence of a new forestry law, it is not yet in force because its rules have not been promulgated. Therefore, the continued application of Law No. 27308 whose Title 1 Article 7, designates as national resources all forest resources and land whose main use would be the forest, either with or without forest cover. It states that the land cannot be used in activities affecting the vegetation, such as agriculture and livestock, unless permitted by law for specific cases (not described).

It also says that the only way to access forest resources (not to land per se) is through the award of a concession, according to its various modalities (forest, ecotourism, reforestation, etc.). The granted period can be 40 years and the concessionaire is asked to develop a sustainable management of given resources, justified by management plans. Otherwise, the concessionaire would be penalized or even lose the concession contract.

In the contract between the grantee and the State, a clause states the inheritance rights of the holder of the concession to his heirs if he dies first. Thus, the term of the concession is honored and the risk that the areas granted are returned to the state before its due course and without effective protection is limited in this way.

In addition, Title V, Article 27 prohibits burning the forest, which is the initial step for other activities.

Organization for the Formalization of Informal Property (COFOPRI)

³² Real evidence of Brazil nuts concessionaires' database from Bosques Amazónicos SAC

Despite the existence of the Forest Law, COFOPRI, which is a government entity, legalizes land ownership in rural forested areas (which belong to the state) if simple possession can be evidenced³³:

- o Having a direct, continuous, peaceful and public use of the area for over 5 years, in the case of private property, and for more than one year if it is state property
- o The property must be exploited economically (agriculture) as many years as the period of possession.

There is nothing specified over intangible land; leaving open the possibility for any individual to take possession of forest areas, productive or protected with a high biological value, only to carry out "economic exploitation".

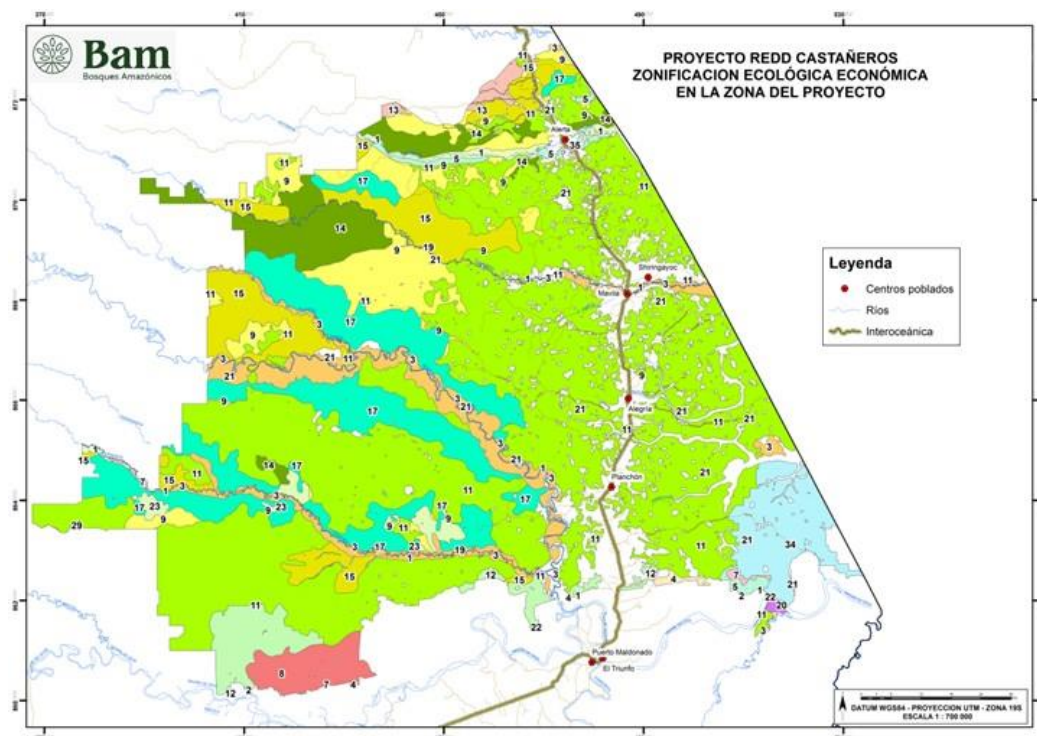
In fact, this system is very old and is the result of prior government policies that promoted the "colonization" of the Peruvian Amazon, since it is considered (and still is considered by many) as an "empty space" and "unproductive", favoring thus the change of land use.

Ecological Economic Zoning: Regional Ordinance N° 032-2009-GRMDD-CR

Many classes of ZEE grouped together with forestry, agricultural crops and pastures with or without usage limitations, and even denote mining potential. An example of this is the class for permanent crop areas, pastures, forest production with very high potential to medium of wood and stands of Brazil nut, and fish high potential, which occupies 51% of the zone. Although it is true the contemplated activities are not necessarily opposite, when performed under agroforestry techniques, agro-silvo-pastures, etc., do involve forest clearing in different degrees. By containing activities with different land use, the arrangement opens the possibility deforestation. The following map illustrates the uses proposed by the ZEE proposals in the Project Area.

³³ Taken from the Distribution Document of COFOPRI: Formalization of Rural Lands. Available in :www.cofopri.gob.pe

MAP 12. Ecological Economic Zone in the Project Area



Leyenda

- 1 - Zonas para cultivo en limpio con calidad agrológica media, limitaciones por suelo, inundación y drenaje, asociados con protección
- 2 - Zonas para cultivo en limpio con calidad agrológica media, limitaciones por suelo, inundación y drenaje, asociados con protección y potencial minero aurífero
- 3 - Zonas para cultivo en limpio con calidad agrológica baja, asociados con pasto y protección por suelo y drenaje
- 4 - Zonas para cultivo en limpio con calidad agrológica baja, asociados con pasto y protección por suelo y drenaje, con potencial minero aurífero
- 5 - Zonas para cultivo permanente, asociado con pasto y protección, con limitaciones por suelo
- 7 - Zonas para cultivo permanente y pasto, asociados con producción forestal y protección, con limitaciones por pendiente y suelo
- 8 - Zonas para cultivo permanente y pasto, asociados con producción forestal y protección, con limitaciones por pendiente y suelo, asociado con potencial minero aurífero
- 9 - Zonas para cultivo permanente, pasto, producción forestal y potencial piscícola alto
- 10 - Zonas para cultivo permanente, pasto, producción forestal, con potencial muy alto a medio de madera y potencial piscícola alto, asociado con potencial minero aurífero
- 11 - Zonas para cultivo permanente, pasto, producción forestal con potencial muy alto a medio demadera y rodales de castaña y potencial piscícola alto
- 12 - Zonas para cultivo permanente, pasto, producción forestal con potencial muy alto a medio de madera y rodales de castaña y potencial piscícola alto, asociados con potencial minero aurífero
- 13 - Zonas para cultivo permanente, pasto, producción forestal con potencial muy alto a medio de madera y rodales de shiringa y potencial piscícola alto
- 14 - Zonas para pastos y producción forestal, asociados con cultivo permanente con limitaciones por pendiente y suelo
- 15 - Zonas para producción forestal muy alto a medio de madera y rodales de castaña y potencial piscícola alto
- 17 - Zonas para producción forestal y protección con limitaciones por pendiente y suelo
- 19 - Zonas para pesca de subsistencia
- 20 - Zonas para pesca comercial y de subsistencia
- 21 - Zonas de protección de cochas
- 22 - Zonas de protección por suelo, drenaje o inundación
- 23 - Zonas de protección de muy alto valor bioecológico
- 29 - Zonas de conservación privada
- 34 - Zona de interes regional para la conservación del Lago Valencia
- 35 - Zona para expansión urbano industrial

Source: IIAP, 2009.

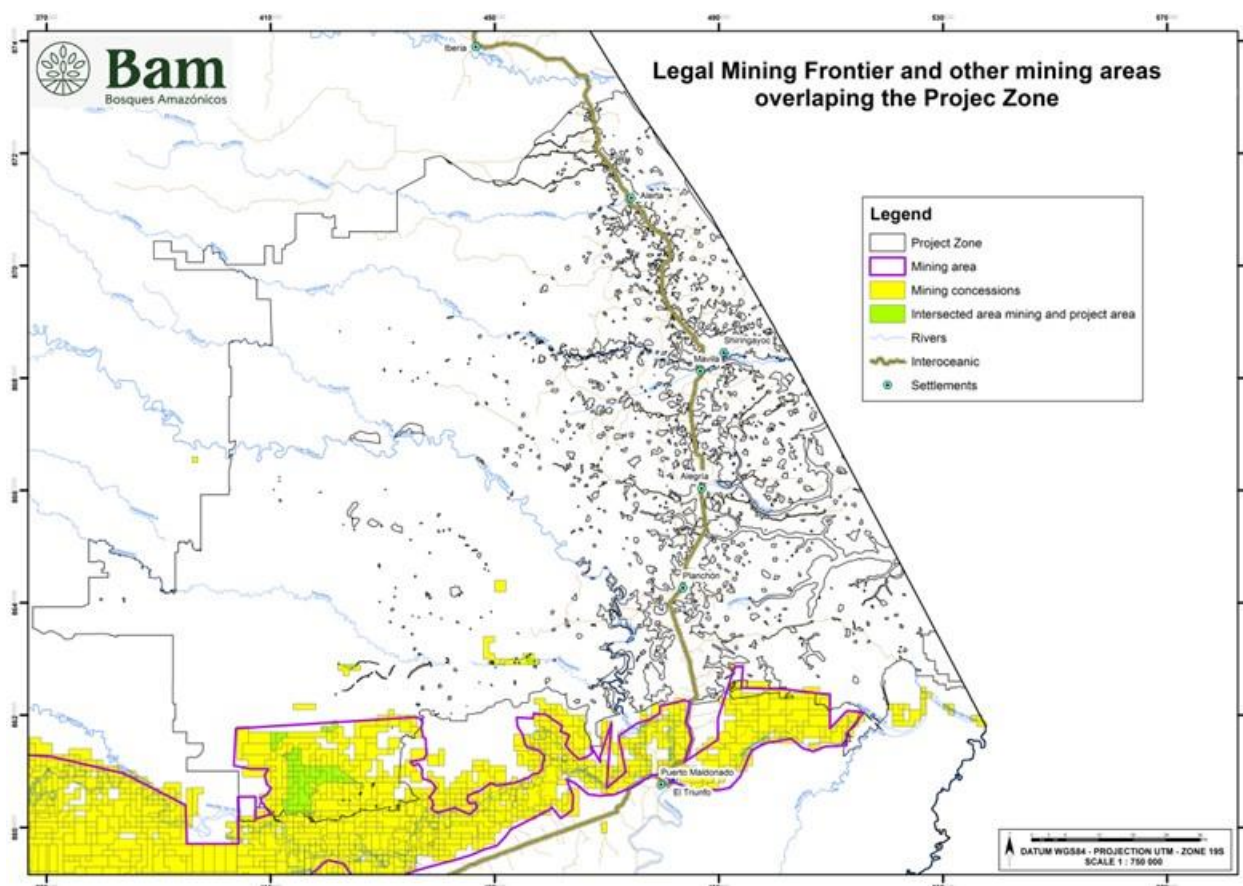
Mining Planning: Emergency Decree N° 012-2010 MINAM

In the southern part of the Project Zone, and therefore the Project Area, there is an overlap with the proposed mining area by the Ministry of Environment in its Emergency Decree No. 012-2010

MINAM. This overlap ascends to 225 475 hectares and represents 172 460 ha of mining concessions in the zone and 22 160 ha within the Project Area.

Map 19 shows the location of the mining concessionaires and petitions within and outside the mining area of SD N° MINAM 012-2010 that overlap Brazil nut concessions, which is incompatible and shows a deficiency state to grant rights over natural resources in a way that does not create conflict (SPDA, 2009). In absence of the project, mining would prevail over the lands of Brazil nut concessionaires in the southern Project Zone.

MAP 13. Current mining concessions within the mining area of that overlap the PA and PZ

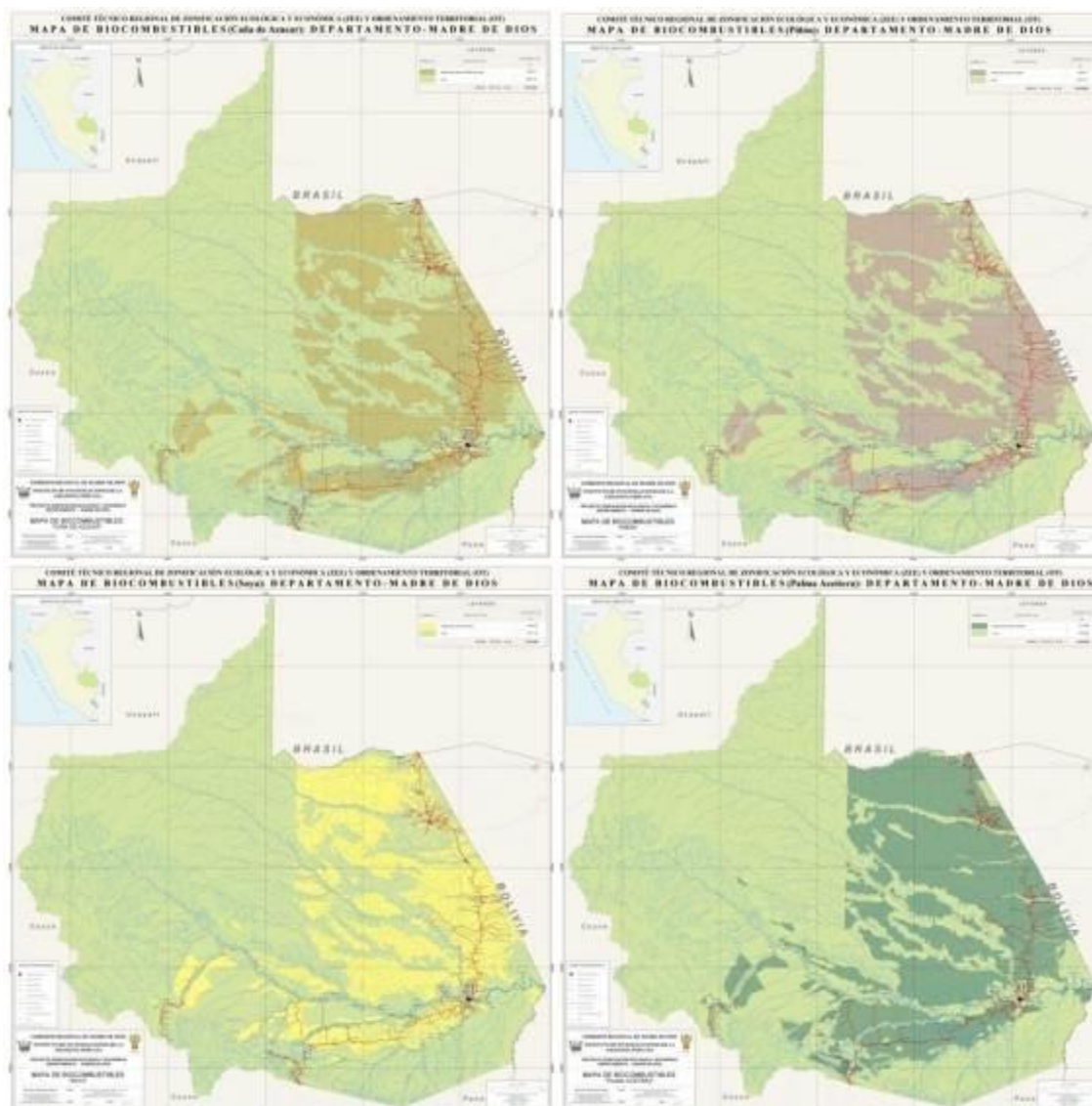


Biofuels: Supreme Decree N°013-2005-EM

According to the ZEE, the area with potential for biofuel crops includes Project Areas, which crops are a major threat to the continuation of the project and forests of the region (Figure 9). A project of GOREMAD by 22 million soles for the "Training and technical assistance for cultivation and industrialization of Oil Palm (*Elaeis guineensis*) in the districts of Tambopata, Laberinto and Inambari in Madre de Dios" according to the Report N°. 09-A-2008-GOREMAD/GRDE/SGDP of GOREMAD. However, the installation is considered as a possibility in the not near future, because

it requires high level of investment, technology, and there is still no installed capacity nor marketing centers for the specific product³⁴.

MAP 14. Natural potential for growing biofuels in the Department of Madre de Dios (Sugarcane, Soya, Palm Oil and Pinion)



Common Practice Analysis in the Brazil nut Region

Although in Madre de Dios, the Brazil nut activity dates back to the mid-twentieth century, only recently in the 90's that the Brazil nut activity begins to increase, expand and initiate a process of

³⁴ These requirements belong to soybean crop, which is the most common biofuel crop in the neighbor region of Acre, Brazil. Conservation strategies along the Intercoceanic Highway in Madre de Dios, Peru. A spatial economic analysis. Conservation Strategy Found - GRADE, 2010.

regional consolidation as one of the main economic activities (the first companies that process and export Brazil nut are installed and consolidated).

Thus in 1999, the public sector, together with some NGOs (which the newly founded Association for the Conservation of the Amazon Basin – ACCA is most notable) and the company Candela Peru, seeing the growing importance of this activity, developed a diagnosis and Strategic Plan for the Brazil nut sector. That document did not spread.

Given the enactment of the Forest and Wildlife Fauna Law in 2000, the Brazil nut activity in Madre de Dios began a process of organization, formalization, and promotion, in which various public institutions, private companies and civil society organizations participated.

Specifically, the Projects of Formalization of the Brazil nut Activity began, led by NGOs who realized the importance of adapting the activity to these regulations (reorganization of the areas, preparation of management documents, harvesting techniques, forest management, etc.). The first step was given by ProNaturaleza with the legal organization in the Tambopata Natural Reserve (RNT) between the years 1998-2000; supplemented and updated by ACCA in 2003; other NGOs have implemented projects from that year to date (mainly ACCA, International Conservation – CI Peru, WWF, CESVI and in recent years, CAMDE Peru).

The projects that have been developed to date are:

TABLE 20. Existing Projects in the Brazil Nut Region

N	Period	Projects	Cooperating	Results
1	2003-2004 y 2005-2007	"Formalization of the access to forest resources and Implementation of a Sustainable management of Brazil nut in Madre de Dios"	Critical Ecosystem Partnership Fund (CEPF) – USA	Project which had two stages, a total of 320 Brazil nut concessions were formalized, in a total of 211 843.5 ha. This project succeeded formalizing, giving guidelines and technical criteria to the forest authority (ex INRENA). Planning and / or mapping Brazil nut concessions. Preparation of General Forest Management Plans (PGMF) and Annual Operating Plans (POAs). Training inventory techniques and Brazil nut ordering. Forestry regulations. Support for the institutional strengthening of the Office of Non Timber Products INRENA.
2	2004-2006	Sustainable management of Brazil nut forest (Bertholletia excelsa) through legal physical sanitation of concessions and improvement cropping systems in Madre de Dios	America's funds FONDAM. US\$ 95 812	40 concessions and Alerta and Alegria attended with Brazil nut regulation and general plan elaboration in forest management. Mapping and formulation of 40 PGMFs. Estrada's Redesign and manual highway implementation. Construction of 4 warehouses, 4 nuts dryers and 4 latrines. Training of 40 concessionaires in

				mapping techniques, forest inventory, and basket weaving technique. Transmission of radial micro program.
3	2007-2008	Sustainable Use of Brazil Nut <i>Bertholletia excelsa</i> – management Forest Improving for forest conservation in the national reserve of Tambopata and Bahuaja Sonene National Park of Madre de Dios, Peru	ACCA/ Flamingo fund 60 775 Euros	32 Brazil nut harvesters that have organic and forestry certification. The project seeks to work in 30 117 hectares of natural Brazil nut forests RNT. The aim is to train the Brazil nut harvesters in the RNT almost 100% attention was accomplished
4	2007-2008	Sustainable management of the natural Brazil nut forests (<i>Bertholletia excelsa</i>) in the Amazonia od Madre de Dios, Peru.	ACCA/ European union 494 826 Euros	210 families, about 150 000 ha. Tambopata and Tahuamanu. Project which served to give support and technical advice to the Brazil nut harvesters, had relatively regular results didn't reach the designed success. Because technical management of the harvest and post-harvest was improved, but no progress was made in exchange income and products value added
5	2007-2011	Strengthening local groups for the Conservation of Biodiversity and Sustainable Land Management in the Conservation Complex Madidi-Manu. Bolivia and Peru.	Initiative for Conservation in the Andean Amazon ICAA - USAID. US\$1 251 418	Project which intended to continue the Brazil nut arrangement and infrastructure construction of harvest in the Brazil nut sectors of Madre de Dios. Did not reach the expected success
6	Jul 2008-Ago 2010	PAT Project: Improving economic incomes around Brazil nut Activity Agroforestry of the Producers and located in the La Novia stretch - Alerta, Tahuamanu – Madre de Dios		Agroforestry system development that allow to conserve the Amazonian soil, diversifying their use and making it more profitable for the farmer without the loss of biodiversity.

In-house elaboration

While the work done since ACCA achieved great results, practically leading the Brazil nut projects, other organizations also joined this process, among the most important projects are the following:

- o Strengthening Sustainable Forest Management in Amazonian Territories of Indigenous Peoples in Peru - FORIN (2006-2008). Executed by WWF, CESVI, IBIS, Welthungerhilfe and AIDSEP. European Union. 2 000 000 euros. (\$ 449 000 dollars for Madre de Dios).

CESVI applied the project in Madre de Dios³⁵, in the CCNN: Arturo Port, Boca Pariamanu, Three Islands, Palma Real and Belgica. The implemented activities were community development plans, land management, sustainable forest management, and organic certification of the Brazil nut, strengthening of the local indigenous governance and development multi-communal enterprise, forestry and trade chains for forest products.

Results:

- Illegal logging in native communities has been reduced through indigenous surveillance, promotion of new regional alliances and advocacy
- The boundaries of the five native communities are legally recognized and / or sanitized.
- Three native communities have integral plans of territorial ordering, General Forest Management Plans (PGMF) and Annual Operating Plans (POAs)
- Two native communities have met the Gradual System Approach to Management and Organic Certification of the Brazil nut process and have certified Brazil nut in community forests according to the standards of organic certification EU and NOP-USDA
- Indigenous organization has been formed AFIMAD, responsible for promoting the business chain based on the Brazil nut
- Two indigenous communities of Madre de Dios have developed business forest plans
- Improving the competitiveness of the producers of the sector Alegria for the processing and marketing of the Brazil nut (2008-2009). Executed by CAMDE Peru and financed by FONDEBOSQUE. Project Value 262 463.00 dollars. Beneficiaries, 25 CASAL SAC partners.

Results:

This project began the implementation of a processing plant in Alegria sector. This processing plant is being managed by CASAL SAC. Infrastructure and equipment has been given by another cooperation fund (FONDAM). To the date has begun the collection of data activities, storing and peeling of Brazil nuts. Industrial processing has not yet started, the production of processed products no the export of such.

- The Brazil nut Concessions Planchón–Manuripe sector have strengthened the competitiveness of Post-Harvest Management Processes and Market Relation (2009-2010). Executor: Environmental Conservation and Development in Peru (CAMDE). FONDAM: U.S. \$ 124 985.31 (co-financed with CEPF).

Results:

³⁵ The Project was implemented in: Madre de Dios, Loreto, Junín, Ucayali. Its objective was promoting land use planning, management and the sustainable management of forest resources of 36 indigenous communities in the Peruvian Amazon.

- Construction of a basic module for the post-harvest and primary processing of Brazil nut managing: expanding raw material warehouse, building drying area, tank Brazil nuts, dressers and SSHH for staff
- Equipment and implementation of the basic module for the management of post-harvest and primary processing of Brazil nut
- Adaptation to the mixed certification system of forest management (FSC) and organic
- Development of a Strategic Plan for CASAL and a Business Plan for certified Brazil nut.
- Training of 25 families in business management, Brazil nut forest management and conservation awareness and protection of their Brazil nut
- Technical assistance to 25 families for proper crop, post-harvest and primary processing of Brazil nut management

As the projects implemented in Brazil nut concessions since twenty years ago (2000) are discussed and compared with the REDD activities proposed by BAM, it appears that the projects implemented FAILED IN COMPARISON with REDD activities, according to the following indicators of relevance:

- There is no experience in REDD in the proposed area. None of the analyzed projects considered to reduce CO₂ emissions by controlling deforestation and degradation, likewise, none of the projects considered to control the direct threats to the Brazil nut forests. The Brazil nut concessions REDD Project is proposed as the first project for avoiding unplanned deforestation and degradation practiced in the project area; and it bases its activity in monitoring and safeguarding the concession areas as well as in generating added-value to the products, among others.
- Coverage. The non-REDD projects analyzed only had a coverage (in areas and beneficiaries) of an average of 50 families reached (in the case of the ACCA projects) to a maximum of 200 Brazil nut concessionaires (summation of several processes), to which they have received technical assistance, have ordered their concessions and have developed plans to manage their concessions (a situation which is required every year). These projects helped to formalize the legal ownership of the concession.

Another fact to be considered is that proposed projects to date have had a lifetime of no more than 4 years, while the Brazil nut concessions REDD Project is intended to last until 2040.

- Economic valuation. The projects analyzed do not have a proposal to generate their own businesses that can add value to the product. They have focused on generating processes of formalization and management, activity that today, still continues as a pending task. The only successful experience of economic improvement is the project executed by CASAL SAC., but it only benefits 25 Brazil nut producers.

- o Articulation and association for development. The experiences gained with Brazil nut producers are oriented to groups of interest focused on sectors, which have made impact on certain issues and groups of Brazil nut families. The association for the Brazil nut development was not promoted, which constitutes a significant difference from the activities proposed by BAM, an association aimed not only to defend their areas, but also to promote the management of forests with the increased value by the environmental services.

2.2.3 Additionality (G2.2)

To complement the additionality analysis of the project, a comparison of the financial/economic attractiveness between Scenarios 1 and 2 (baseline) and the project have been made, excluding the expected revenues of carbon in order to verify that the project (without carbon revenues) is less attractive. The financial indicators used were IRR³⁶, Payback Period and Average Investment. These include costs and revenues relevant to each activity.

The investment analysis below provides relevant assumptions and clear comparison between the proposed project and other scenarios of land use. For more detail on the calculations, please refer to the Excel document "Scenarios Calculations".

Relevant Assumptions of Each Scenario

The activities are evaluated in a 10-year horizon, and use a discount rate of 15%. Furthermore, the analysis considers the capacity and production volume of each activity, according to the standards of the Madre de Dios region.

REDD Project in Brazil Nut Concessionaires (Excluding Carbon Revenues):

The Project income will be generated by the processing and marketing of high value-added Brazil nut. The analysis shows the financial attractiveness of the proposed project³⁷.

The estimated production is based on storage capacity, operational processes and technology acquisition of the future plant. The supply of raw material will be gradual, reaching a production level of about 3000 tons of Brazil nuts in shell. The final products will be marketed primarily in international markets.

The project includes a monitoring and surveillance system in all Brazil nut concessions, since so far this activity has been developed inefficiently by the own Brazil nut harvesters due to lack of funds. Also, the organic certification of the Brazil nut concessions will be sought, thus achieving better revenues.

Comparison of Financial Indicators

³⁶ This IRR ratio refers to the Project IRR calculated a return based on project cash outflows and cash inflows only, irrespective the source of financing.

³⁷ In fact, BAM will support 100% of the costs of the Project in turn of a percentage of the sales in carbon credits and from the Brazil nut processing plant. Investments include: 1) implementation of the Brazil Nuts processing plant, 2) work capital for the harvesting activities of Brazil Nuts concessionaires' partners of the project, 3) formalization of the documentation of each Brazil Nuts concession in order to meet the terms of the contracts, 4) implementation expenses of the project.

The activities proposed in the REDD Project in Brazil Nuts Concessions (peeled, process and transformation of Brazil nuts, monitoring and surveillance), without the GHG credit revenues, shows lower rate of return 18.7% compared to other scenarios analyzed. The proposed project estimates a total investment of approximately US\$1.6 million for machinery and equipment to implement the Brazil nuts processing plant.

Artisanal Brazil nuts activity (low value-added) has a return rate of 53.1% over the next 10 years; the concessionaire's investment is very small, less than US\$0.01 million. In this scenario, the main problem that generates the latent deforestation of the area is the reduction of productivity due to loss of standing Brazil nuts forest. This would have an impact on the economy and cost-effectiveness of the concessionaires in the long term.

Alternative land use activities (Agriculture and Livestock, along with Artisanal Brazil nuts activity in remaining forest), even if these activities require more efficient management techniques and investment to be sustainable, this scenario has higher rate of return in the absence of the project, IRR 56.1%. This is explained because the artisanal Brazil nut activity profitability will be reduced over the years due to the deforestation grows in the area. It is estimated that in ten years, approximately 10% of the hectares of Brazil nut concessions turn into alternative land use activities such as livestock and agriculture. The scenario estimates a total investment of approximately US\$0.01 million.

TABLE 21. Summary of Financial Indicators

	TIR	Period of Return	investment (millions US\$)
Proposed Project (without carbon credits)	18.7%	<7 years	1.6
Artisanal Brazil nut Activity (without added value)	53.1%	<3 years	0.01
Alternative activities (agriculture and livestock)	56.1%	<3 years	0.01

Self-elaboration

Brazil nut concessionaires of Madre de Dios are not attractive to the financial system and, consequently, it is difficult for them to start a project to implement high value without private initiative. Comparing the results, we see that the highest average investment is of project, which in turn has the longest recovery period (seven years); making this scenario the less attractive (the other two scenarios would recover their investment in less than 3 years).

It is possible that in the long term, the dealers can organize, implement the organic certification of their concessions and improve the collection activity; however, the high costs of these activities will have a negative impact on their profits. Consequently, the scenario will not be sustainable and deforestation process would increase because of the risk of expansion of the agricultural frontier and informal mining.

There is also a high trend of international markets to become rigorous with the organic certification, therefore, the collection methods should be better to those traditional, artisanal methods currently used, in order to improve the quality of the Brazil nuts.

Since the project is close to a couple of Protected Natural Areas: Tambopata National Reserve and Bahuaja Sonene national park, it is very beneficial to develop conservation activities to preserve the biodiversity and prevent the progressive deforestation of the area.

The investment comparison analysis has determined that the other scenarios of land use have better financial indicators (TIR, and Payback Period and Average investment) than the proposed project. Consequently, the proposed project is not financially the most attractive alternative.

Sensitivity Analysis

Finally, we did a sensitivity analysis to show whether the financial attractiveness is robust to reasonable variations in costs.

The following table shows the sensitivity of the IRR to changes on cost parameters of each scenario. To develop this analysis, we made the stress test of -5% and 5% on the cost parameters of each activity, since it is a key variable to quantify the impact on IRR. This analysis shows that the proposed project revenues without carbon components is less profitable than other scenarios of land use, even if reducing their costs is considered.

TABLE 22. Sensitivity Analysis

Scenario	Δ Costs	TIR
REDD project in Brazil nut Concessions (excluding carbon revenues):	-5%	22.7%
	0%	18.7%
	5%	14.5%
artisanal Brazil nut activity with low added value	-5%	56.3%
	0%	53.1%
	5%	49.9%
land use Alternative Activities	-5%	59.6%
	0%	56.1%
	5%	52.6%

Self-elaboration

These results conclude that the proposed project activity is not financially attractive compared to other activities

Finally, we can ensure that the project is additional, and that the proposed activities will not happen unless it is implemented.

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

The project does not intend to use any type of benefits (climate, community or biodiversity) as offsets, differently than VCU sales in voluntary markets.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

FEPROCAMD and BN concessionaires have plenty of access to project documentation and progress through different channels such as:

Reports shared with representatives: the project developer sends periodic reports to the FEPROCAMD representatives, such as progress reports on the sales of carbon credits.

Communication tools: bimonthly bulletins are generated with the progress of the project on its different fronts, including the progress of development activities (e.g. the monitoring system) and commercial activities for the generation of carbon credits (e.g. verification processes). These newsletters are distributed directly to concessionaire members of the project at workshops and meetings held throughout the year.

Meetings: regular meetings and assemblies are held where project progress such as development activities for the benefit of partners and commercial activities for the generation and sale of carbon credits are discussed.

Although many of the concessionaires do not have direct access to the internet, and therefore do not have access to the VCS website, the corresponding documents are shared with FEPROCAMD representatives. Also, as mentioned, the progress of VCS processes is shared with all partners through different channels such as newsletters and periodic meetings. The corresponding VCS documents are also posted on the company's website.

In addition, the project office is open 5 days a week to concessionaires and representatives, who are attended by a team that is permanently at their disposal, for example, to provide them with information on the project's scope.

2.3.2 Dissemination of Summary Project Documents (G3.1)

At the beginning of the project, different decentralized assemblies were held to publicize the implications of the project: characteristics, benefits, commitments, risks, etc. The process of public dissemination to communities, project participants and society in general followed the communication strategy proposed by the project developer. In appendix 5, it is included the graphic evidence.

BAM has a communications area run by professionals who have, among other expertise, communication skills for working with communities. The BAM area establishes communication protocol and policies for its REDD projects. These protocols and strategies are in turn shared with the representatives of FEPROCAMD, taking into consideration their contributions to them.

The communication strategy for Madre de Dios region is based on inter-institutional actions 1) institutional image at the international, national and regional levels, 2) promotion and dissemination of projects 3) communication and political advocacy of each project 4) communication of the progress of the project in terms of activities implemented, number of partners impacted by the project, among others.

Likewise, the project team also has a communications area in charge of supporting the project developer to land/capture the different communication strategies established for the different stakeholders. This area is also responsible for recording the activities, events, progress of the project activities to communicate them to the different stakeholders.

The progress of the Project is communicated to the community always following the communication strategy proposed, through channels such as: periodic meetings with the community, newsletters or bulletins, through the WhatsApp group that the project with its members and other channels if relevant as radio announcements, among others.

Communication protocols include:

Stakeholder Analysis

Stakeholder mapping: a complete mapping of the stakeholders directly or indirectly involved in the project is made. In this sense, a complete database is created by type of institution/organization detailing: stakeholder profile, stakeholder information, form of involvement with the project (direct/indirect), geographic factors, frequency of communication, communication strategy, areas of cooperation, institutional affinities, among others. Possible risks and conflicts with these stakeholders are also detailed.

Also, a mapping of the different channels that may be relevant for the good management of the project (television, radio, newspapers, etc.) is made. A directory is made for the project so that relevant suppliers are at hand.

Diagnosis of communication at the level of actors and stakeholders: based on the complete database of the different institutions and stakeholders in general an analysis is made of how the local population communicates, how information flows, which communication agents are present (radio, word of mouth, assemblies, etc.) and how they interact with each other. This step is essential because it is necessary to recognize the interlocutor, their perceptions of communication and their information and knowledge qualifications.

Institutional communication strategy: having recognized and characterized the interlocutors (public, beneficiaries, etc.) a communication strategy is elaborated at institutional level, institutional and at project level.

Communication plan: once the communication strategy and guidelines have been established, community communication plans are developed (project level). This is where the operational levels of the communication strategy are established.

2.3.3 Informational Meetings with Stakeholders (G3.1)

From 2013 to 2021, 70 general assemblies, 27 board meetings and 35 decentralized workshops were carried out.

TABLE 23

<i>Year of meetings</i>	<i>General Assemblies</i>	<i>Board meetings</i>	<i>Decentralized workshops</i>
2013	12	11	4
2014	10	3	7
2015	12		
2016	11	2	2
2017	7	3	2
2018			
2019	11	2	2
2020	<i>Pandemic</i>	<i>Pandemic</i>	<i>Pandemic</i>
2021	7	6	18
TOTAL	70	27	35

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

Every year BAM works on an annual budget which includes the different activities necessary to comply with the Project goals. This budget proposal is later shared with FEPROCAMD's representatives for their feedback and approval. Hence, every year, BAM and FEPROCAM co-develops an annual budget for the project, determining the project annual costs. Furthermore, BAM shares periodic reports to FEPROCAMD's representatives regarding the improvement in the budget execution. In that way, every partner can understand the status of the project implementation. Additionally, BAM shares detailed reports on the sales of carbon credits to FEPROCAMD (including volumes, prices, clients and other details from each transaction made).

Benefits from the project such as the implementation of different activities to support concession management and community livelihood are also shared throughout the different communication channels: meetings, bulletins, webpage, WhatsApp group, Facebook group etc. Regarding profit sharing, the community is also communicated permanently through the channels mentioned.

Throughout the years, the sale of carbon credits has been allocated entirely to cover the project activity costs, and the community has been advised permanently of this matter being aware of volatility of carbon markets. Since 2020 the project has been sharing (in addition to project activities) economic benefits directly to each project partner from the sales of carbon credits. This

has been communicated to concessionaire partners throughout the different communication channels: meetings, bulletins, WhatsApp group, project office, etc.

In addition, as mentioned above, the project team conducts periodic meetings/workshops in the different associations (decentralized) to share and discuss project issues so that all concessionaires are fully informed.

All relevant information is shared in advance and in a timely manner with the community.

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

BAM and FEPROCAMD representatives (president and board) have direct communication and are continuously (daily) discussing and gathering for project purposes. BAM has designated a Project Director and a Project Coordinator who are permanently in Madre de Dios for leading the development of the project in coordination with FEPROCAMD's representatives. Furthermore, a group of specialists are hired for project purposes with the responsibility of executing the activities and processes required by the project. This whole team is based in Madre de Dios, and are 5 days a week available at the project offices. They permanently receive concessionaires for attending their requirements.

In this line, communication between BAM and FEPROCAMD is permanent and fluid. Relevant information regarding the project is shared informally (regular meetings, calls, etc.) and formally when required (through letters). Information shared includes Validation and Verification Processes (with third party auditors and VERRA).

As mentioned before, different channels have been developed for promote fluid communication, such as: meetings³⁸, Facebook page, WhatsApp group were 160 partners are members (40% of current partners), bulletins, etc. **The coming CCB revalidation has also being communicated through these channels. E.g.:**



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

During validation and verification processes (both VCS and CCB), the external auditors have the opportunity to: visit the project, have interviews with FEPROCAMD and BAM's representatives, have interviews with different (random) concessionaires and/or interviews with stakeholders they consider relevant for the auditing process. This approach is independently if the audit is virtual or in person, which will depend on the sanitary conditions of both countries, Peru and auditors' nationality.

2.3.7 Stakeholder Consultations (G3.4)

The process of community and stakeholder consultation for project design was carried out based on a community consultation protocol. For verification of the activities covered to achieve community consultation, see the following protocol considered the following components or stages:

Coordination with Brazil nut Leaders

³⁸ Meetings were cancelled during COVID-19 pandemic due to national restrictions.

The process of consultation and diffusion started by identifying and establishing relations with the main leaders the Brazil nut sector. The project proponent put special emphasis on making relations with all the leaders recognized by Brazil nut producers (concessionaires). To achieve this purpose BAM staff visited all Brazil nut sectors to identify and verify the legitimacy and representativeness of the leaders in each area.

Diffusion of REDD+ Project to Brazil nut Leaders

Once established the contact, BAM proceeded to spread and expose the possibility of executing a REDD+ Project in the area, through several working meetings between BAM and Brazil nut leaders in each sector as in Puerto Maldonado project implication, benefits, costs, compromises, risks, among others were communicated and discussed.

Visit to BAM Experience

To reinforce carbon project understanding and natural climate solutions relevance, as well as to demonstrate the experience and institutional seriousness of BAM, the main leaders of each sector were invited to Pucallpa, in the region of Ucayali to visit and learn about BAM's Campo Verde Reforestation Project, an extensive formerly degraded area that was reforested by BAM, being the first large scale reforestation with native species ever done in the country. This visit showed/reinforced Brazil nut producers the opportunity for developing REDD in Madre de Dios and BAM's high experience in carrying out such projects.

Establishment of Commitments, Act of Intention

Once the opportunity of REDD was diffused and demonstrated, commitments at an institutional level were established and an Act of Intent between BAM and FEPROCAMD was signed. This was a relevant step for the project as the Act of Intent established the agreements and commitments at this stage.

Organizational Strengthening and Technical Assistance

One of the established agreements demanded by the leaders, considering the problems of social, legal and political fragmentation of the Brazil nut sector, was to support organizational strengthening of the sector, as well as the technical assistance for concessionaires, which was included as a priority activity for the project.

Signature of Framework Agreement

This activity took place after a democratic process conducted by FEPROCAMD, where the base representatives were elected and their representatives ratified (new Directing Board). After this reconstitution assembly, a plenary meeting was held with the presence of the Brazil nut leaders and BAM, where the terms of the main agreements and terms of the association were agreed and defined for the execution of the REDD project between BAM and the Brazil nut sector (through FEPROCAMD). This framework agreement has been physically distributed to all grassroots associations of FEPROCAMD.

Consultation Process and Brazil nut Affiliation

The REDD Brazil nut project (BAM-FEPROCAMD) with technical assistance CAMDE PERU, begun the diffusion of this agreement through campaigns, consultations, lectures, workshops and working groups involving Brazil nut concessionaires. Observations were raised and answered. All project partners decided to participate in the project freely and with informed consent.

The diffusion of the project implications continues. Observing the wide acceptance of the project among the Brazil nut concessionaires, the project team continues with the diffusion of the project through workshops, decentralized meetings, one to one meetings, etc. Currently, new concessionaires are joining the project in a free and informed decision.

Contract Signing

As mentioned, within this consultation process, the Brazil nut concessionaires decided whether to participate in the project or not. The Brazil nut concessionaires that did decide to participate began its incorporation to the project with the signing of a Contract with FEPROCAMD on Transfer of Carbon Rights. In it, the concessionaire transfers their rights of environmental services of carbon capture to the FEPROCAMD and this transfers them to BAM (defined in the framework agreement, in return they get the benefits of the REDD project).

2.3.8 Continued Consultation and Adaptive Management (G3.4)

The project's activities are permanently adjusted as a to a permanent of a permanent evaluation and feedback.

Annually the parties agree on a work plan and budget for the activities to be implemented according to the needs, context, available resources, etc. Always, seeking to fulfill the obligations and objectives of the project.

Additionally, activities are always strengthened/adjusted with feedback from stakeholders, especially the community. For example, in the workshops held throughout the year, the project team provides a space for the community to send their needs and proposals for activities to be carried out or reinforced.

As an example, the Control System and Monitoring implementation was modified. Now, the Monitoring Control and Surveillance system is designed to be integrated/holistic, considering an articulation of three pillars: satellite, technical, legal.

2.3.9 Stakeholder Consultation Channels (G3.5)

Channels used for consultation were decentralized assemblies with local associations during many months in 2009, followed by a massive general assembly with the participation of the Ministry of Environment at the moment, Mr. Antonio Brack (RIP). This information is detailed in Annex 8 in VCS PD.

TABLE 24

CONSULTATION PROCESS WITH BRAZIL NUT STAKEHOLDERS OF MADRE DE DIOS – REDD BRAZIL NUT FARMERS PROJECT				
N	WORKSHOP / MEETING	PARTICIPANTS	DATE	PLACE
1	Meeting with FEDECAM leaders. Coordination and planning of the consultation.	14 Brazil nut farmers (3 women), leaders of Brazil nut farmers associations	Monday, July 13 th , 2009	Puerto Maldonado
2	Meeting with FEDECAM. Presentation of the REDD Brazil nut Farmers Project.	Board of Directors of the Departmental Federation of Brazil nut Farmers of Madre de Dios.	Tuesday, July 14 th , 2009	Puerto Maldonado
3	Meeting with Brazil nut farmers of Alto Malecon San Carlos and Varsovia	28 Brazil nut farmers (5 women)	Sunday, July 26 th , 2009	Community center of San Carlos town
4	Meeting with Brazil nut farmers of Planchon	10 Brazil nut farmers (2 women)	Sunday, August 2 nd , 2009	Amphitheatre of Las Piedras municipality, Planchon town
5	Meeting with Brazil nut farmers of Alto Malecon San Carlos and Varsovia	18 Brazil nut farmers (3 women)	Sunday, August 2 nd , 2009	Community center of San Carlos town
6	Meeting with Brazil nut farmers of Pariamanu.	14 Brazil nut farmers (3 women)	Monday, August 3 rd , 2009	Pump house of Madre de Dios. Puerto Maldonado
7	Meeting with Brazil nut farmers of Sabaluyoc	11 Brazil nut farmers (2 women)	Sunday, August 30 th , 2009	House of a settler of Sabaluyoc town
8	Participation in Assembly with Brazil nut farmers. Election of FEPROCAMD Board of Directors.	42 Brazil nut farmers (6 women) representatives of different Brazil nut farmers associations	Saturday, September 12 th , 2009	Puerto Maldonado
9	Assembly between Brazil nut farmers of Alerta and FEPROCAMD. Presentation of the REDD Brazil nut Farmers Project.	36 Brazil nut farmers (12 women) and Board of Directors of the Brazil nut Farmers Federation of Madre de Dios - FEPROCAMD	Saturday, September 26 th , 2009	Premises of ECOMUSA, Alerta town
10	Presentation of the REDD Brazil nut Farmers Project to leaders of the Brazil nut sectors.	56 Brazil nut farmers leaders from different sectors and associations.	Wednesday, October 07 th , 2009	Amaru Mayu Hotel, Puerto Maldonado.
11	Presentation of the REDD Brazil nut Farmers Project to Brazil nut farmers of Monterrey. Revision of the agreement of carbon rights transfer.	14 Brazil nut farmers (7 women)	Saturday, November 21 st , 2009	Community center of Monterrey
12	Meeting with Brazil nut farmers of Boca Pariamarca and Ashipal. Presentation of the REDD Brazil nut Farmers Project.	7 Brazil nut farmers (3 women)	Saturday, 21 st , 2009	House of a Brazil nut farmer in Boca Ashipal
13	Presentation of the REDD Brazil nut Farmers Project and absolution of consultations to Brazil nut farmers of Alegria	12 Brazil nut farmers (4 women)	Sunday, November 22 nd , 2009	Community center, Alegria town

14	Meeting with Brazil nut farmers of Sabaluyoc	9 Brazil nut farmers (2 women)	Saturday, November 28 th , 2009	Office of Bosques Amazonicos. Puerto Maldonado
15	Exposition of the REDD Brazil nut Farmers Project to Brazil nut farmers of La Novia	9 Brazil nut farmers (5 women)	Friday, December 4 th , 2009	Community center of La Novia
16	Presentation of the REDD Brazil nut Farmers Project to the Brazil nut farmers Association of Alerta	26 Brazil nut farmers (5 women)	Saturday, December 12 th , 2009	Premises of ECOMUSA, Alegria
17	Participation in the event organized by OSINFOR and CAMDE PERU. The REDD Brazil nut Farmers Project was disseminated.	38 Brazil nut farmers (9 women), representatives of the Forest Management of Madre de Dios and OSINFOR	Friday, June 4 th , 2010	Premises of CASAL SAC. Alegria town
18	Meeting with Brazil nut farmers of Shiringayoc	7 Brazil nut farmers (1 woman)	Sunday, June 6 th , 2010	Shiringayoc town
19	INFORMATIVE WORKSHOP ON PROGRESS AND RESOLUTION OF CONSULTATIONS REGARDING THE REDD PROJECT – Alerta town	32 Brazil nut farmers	Sunday, June 13 th , 2010	Premises of ECOMUSA, Alerta town
20	INFORMATIVE WORKSHOP ON PROGRESS AND RESOLUTION OF CONSULTATIONS REGARDING THE REDD PROJECT – Alegria town	53 Brazil nut farmers	Sunday, June 20 th , 2010	Premises of ECOMUSA, Alegria town
21	INFORMATIVE WORKSHOP ON PROGRESS AND RESOLUTION OF CONSULTATIONS REGARDING THE REDD PROJECT – Brazil nut farmers of Pariamanu.	11 Brazil nut farmers	Saturday, July 3 rd , 2010	Premises of BAM in Puerto Maldonado
22	INFORMATIVE WORKSHOP ON PROGRESS AND RESOLUTION OF CONSULTATIONS REGARDING THE REDD PROJECT – Planchon Sector	21 Brazil nut farmers (2 women)	Friday, July 09 th , 2010	Amphitheatre of Las Piedras municipality, Planchon town
23	FIRST MEETING OF REDD BRAZIL NUT FARMERS PROJECT PARTNERS, taken place in Puerto Maldonado city to show the progress of the project and the business plan of the Brazil nut company of the Project, property of all partners.	400 Brazil nut farmers, representatives of Bosques Amazonicos, representatives of the Brazil nut Farmers Federation, local authorities and Environmental Minister of Peru.	Sunday, July 18 th , 2010	Premises of Cabaña Tropical in Puerto Maldonado
24	TRAINING WORKSHOP "Agreement of Brazil nut Concessions, Liabilities and Responsibilities", Technical assistance for the elaboration of AOP and presentation of OSINFOR to Brazil nut farmers – Alerta town	39 Brazil nut farmers	Saturday, August 14 th , 2010	Premises of ECOMUSA – Alerta town
25	TRAINING WORKSHOP "Agreement of Brazil nut Concessions, Liabilities and Responsibilities", Technical assistance for the elaboration of AOP and presentation of OSINFOR to Brazil nut farmers – Mavila town	27 Brazil nut farmers	Friday, August 20 th , 2010	Community center, Mavila town
26	TRAINING WORKSHOP "Agreement of Brazil nut Concessions, Liabilities and Responsibilities", Technical assistance for the elaboration of AOP and presentation of OSINFOR to Brazil nut farmers – Planchon town	33 Brazil nut farmers	Thursday, August 26 th , 2010	Amphitheatre of Las Piedras municipality, Planchon town
27	TRAINING WORKSHOP "Agreement of Brazil nut Concessions, Liabilities and Responsibilities", Technical assistance for the elaboration of AOP and presentation of OSINFOR to Brazil nut farmers – Alto Malecon San Carlos and Varsovia	33 Brazil nut farmers	Saturday, August 28 th , 2010	Amphitheatre of Las Piedras municipality, San Carlos town

Other ways used to communicate and disseminate the project were interviews in local radio, TV and newspapers. This information may be found in Annex 9 of VCS PD.

TABLE 25

PROCESS OF COMMUNICATION AND DISSEMINATION OF THE BRAZIL NUT FARMERS PROJECT OF MADRE DE DIOS					
N	COMMUNICATION ACTIVITY	QUANTITY	PUBLIC	DATE	PLACE
1	MADRE DE DIOS RADIO, 1 p.m. newscast: Explanatory interview regarding the Project to the General Manager and Technical Manager of Bosques Amazonicos.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Monday, January 11 th , 2010	Puerto Maldonado
2	"EI JAQUE" NEWSPAPER: Explanatory interview regarding the Project to the General Manager of Bosques Amazonicos.	2 pages	Brazil nut farmers of Madre de Dios and institutions	Monday, January 11 th , 2010	Puerto Maldonado
3	PROMOTIONAL SPOTS of the REDD BRAZIL NUT FARMERS PROJECT in Radio Madre de Dios, La Exitosa and Radio Sinfonia.	172 spots during one month	Brazil nut farmers of Madre de Dios and institutions	Monday, January 11 th , 2010	Puerto Maldonado
4	H VISION TV, newscast "Ver para creer" (<i>seeing then believing</i>): Explanatory interview regarding the Project to the General Manager of Bosques Amazonicos.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
5	H VISION TV, newscast "Ver para creer" (<i>seeing then believing</i>): Interview to the President of FEPROCAMD regarding the position of the Brazil nut farmers towards the project.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
6	H VISION TV, newscast "Realities": Explanatory interview regarding the Project to the General Manager of Bosques Amazonicos.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
7	LA EXITOSA RADIO, newscast "La Voz de Madre de Dios" (<i>the voice of Madre de Dios</i>): Explanatory interview regarding the Project to the General Manager of Bosques Amazonicos.	30 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
8	H VISION TV, Magazine Program "LA PALABRA" (<i>the word</i>): Explanatory interview regarding the Project to the general manager of Bosques Amazonicos.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
9	H VISION TV, regional newscast "INTERCAMBIO" (<i>exchange</i>): Explanatory interview regarding the Project to the general manager of Bosques Amazonicos.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
10	SINFONIA RADIO, newscast "La Voz Dirigencial" (<i>the managerial voice</i>): Explanatory interview regarding the Project to the General Manager of Bosques Amazonicos.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, January 13 th , 2010	Puerto Maldonado
11	H VISION TV, prime-time newscast "Tiempo de Cambio" (<i>time for a change</i>): Explanatory interview regarding the Project to the General Manager of Bosques Amazonicos.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, January 13 th , 2010	Puerto Maldonado
12	H VISION TV, prime-time newscast "Tiempo de Cambio" (<i>time for a change</i>): Explanatory interview regarding the Project to the General Manager of Bosques Amazonicos.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, January 13 th , 2010	Puerto Maldonado
13	Publishing in GESTIÓN Newspaper: The Ecologic gold. Article that suggests the projects of BOSQUES AMAZÓNICOS as sustainable	30 thousand	At national level	Monday, May 10 th , 2010	At national level

	alternatives to the development of the Amazon, with regard to gold extraction.				
14	Participation in the event organized by the Forestry Engineering Faculty of the UNAMAD	20 minutes	Professors and students	Friday, June 25 th , 2010	University population
15	Printing of the informative and explanatory graphic material (Triptych) regarding the REDD Brazil nut Farmers Project: what are carbon bonds, the agreements of rights transfer, the benefits of the project.	1 thousand	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Madre de Dios
16	GRAPHIC MATERIAL: Poster of the First Meeting of REDD Brazil nut Farmers Project Partners	200 units	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Puerto Maldonado
17	GRAPHIC MATERIAL: Banner of the First Meeting of REDD Brazil nut Farmers Project Partners	10 units	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Puerto Maldonado
18	GRAPHIC MATERIAL: Flyer of the First Meeting of REDD Brazil nut Farmers Project Partners	2 thousand	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Puerto Maldonado
19	INFORMATIVE BULLETIN: of FEPROCAMD with information for all members of such institution.	2 thousand	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Puerto Maldonado
20	PRENSA REAL TV PROGRAM: Interview to Biologist Juan Carlos Flores, Regional Manager of Bosques Amazonicos to explain about the Brazil nut in Madre de Dios and the REDD Brazil nut Farmers Project.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Monday, July 12 th , 2010	Community center of San Carlos town.
20	PRENSA REAL TV PROGRAM: Interview to Ant. Marco Villegas, Social Specialist of Bosques Amazonicos, to explain the process of consultation and the social problematic of the Brazil nut farmers within the framework of the REDD Brazil nut Farmers Project.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Monday, July 12 th , 2010	Community center of San Carlos town.
21	PRENSA REAL TV PROGRAM: Interview to Biologist Juan Carlos Flores, Regional Manager of Bosques Amazonicos to explain about the Project and invite to the First Meeting of REDD Brazil nut Farmers Project Partners.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, July 13 th , 2010	Community center of San Carlos town.
22	PRENSA REAL TV PROGRAM: Interview to the President of FEPROCAMD, to comment about the favorable position of the Brazil nut farmers towards the REDD Brazil nut Farmers Project and invite all its affiliates to the FIRST MEETING OF REDD BRAZIL NUT FARMERS PROJECT PARTNERS.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, July 13 th , 2010	Community center of San Carlos town.
23	PRENSA REAL TV PROGRAM: Interview to the Technical Manager of Bosques Amazonicos, to absolve doubts concerning the REDD Brazil nut Farmers Project and to explain about all the information which will be given in the FIRST MEETING OF REDD BRAZIL NUT FARMERS PROJECT PARTNERS.	20 minutes	Brazil nut farmers of Madre de Dios and institutions	Friday, July 16 th , 2010	Community center of San Carlos town.
24	LA EXITOSA RADIO: Interview to the President of FEPROCAMD concerning the Project and its perspectives and to invite to the First Meeting of REDD Brazil nut Farmers Project Partners.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Friday, July 16 th , 2010	Puerto Maldonado

25	IDENTITY ARTICLES: T-shirts of the project given to all the Brazil nut farmers partners to promote the identity with it.	500 units	Brazil nut farmers of Madre de Dios	Sunday, July 18 th , 2010	Madre de Dios
26	DISSEMINATION FAIR: Dissemination stand of the REDD Brazil nut Farmers Project and identity of the Brazil nut in the region of Madre de Dios, within the framework of the Fair organized by the Ombudsman's Office	1 stand with 8 explanatory billboards	General population of Puerto Maldonado	Friday, July 23 th , 2010	Plaza Mayor (Main Square) of Puerto Maldonado
27	Reprinting of the informative and explanatory graphic material (Triptych) concerning the REDD Brazil nut Farmers Project: what are carbon bonds, the agreements of rights transfer, the benefits of the project.	2 thousand	Brazil nut farmers of Madre de Dios and institutions	Sunday, August 15 th , 2010	Madre de Dios
28	Publishing in GESTION Newspaper: Map for carbon quantification, its relation with the REDD projects. Article which comments the development experience in REDD of BOSQUES AMAZONICOS in Madre de Dios.	30 thousand	At national level	Tuesday, September 07 th , 2010	At national level
29	Publishing in CARETAS Magazine: Article in the supplement concerning the conservation of Forests, edited by the Environmental Ministry.	30 thousand	At national level	Thursday, September 09 th , 2010	At national level
30	LA EXITOSA RADIO: Interview to the president of FEPROCAMD concerning the Project and all paperwork that must be done by the Brazil nut farmers to accomplish with their commitment with the State.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, September 15 th , 2010	Puerto Maldonado
31	LA EXITOSA RADIO: Interview to William Moreno, Regional Coordinator of CAMDE PERU, NGO in charge to give support in the technical work to all the Brazil nut farmers partners of the REDD project, explaining about all the requirements and dates of attention to the Brazil nut farmers partners.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, October 6 th , 2010	Puerto Maldonado

Currently, consultation processes are carried out permanently throughout different channels: permanent decentralized meetings, social media (Facebook, WhatsApp), office meetings (open from Monday to Friday), direct contact (telephone) with the project's admin team, a suggestion box has been established at the Project's office for concessionaires and stakeholders' comments, suggestions and complaints.

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

The project proponent has an official policy against any type of discrimination, which is uploaded in the company webpage. No incidents have occurred during period of design and implementation. As detailed above, the consultation phase was carried out directly with the community involved, incorporating the representatives from each association.

The project actively and strongly promotes the participation of stakeholders directly and through their pre-existing grassroots organizations (FEPROCAMD and its local associations). Through the general and local assemblies, funded by the project, all the participants may express their ideas about the project. Annual plans are approved jointly by FEPROCAMD and BAM.

The main information that is shared with Brazil nut leaders and members are:

- Annual plans and budgets
- Commercial information related with carbon trading
- Validation and verification results

The participation may occur through different channels, as workshops, surveys, WhatsApp and an office, that is permanently open, funded by the project, to receive to stakeholders.

As a consequence of these measures, the participation of women in the grassroots organizations is significant as may be seen below:

Total	Women	%

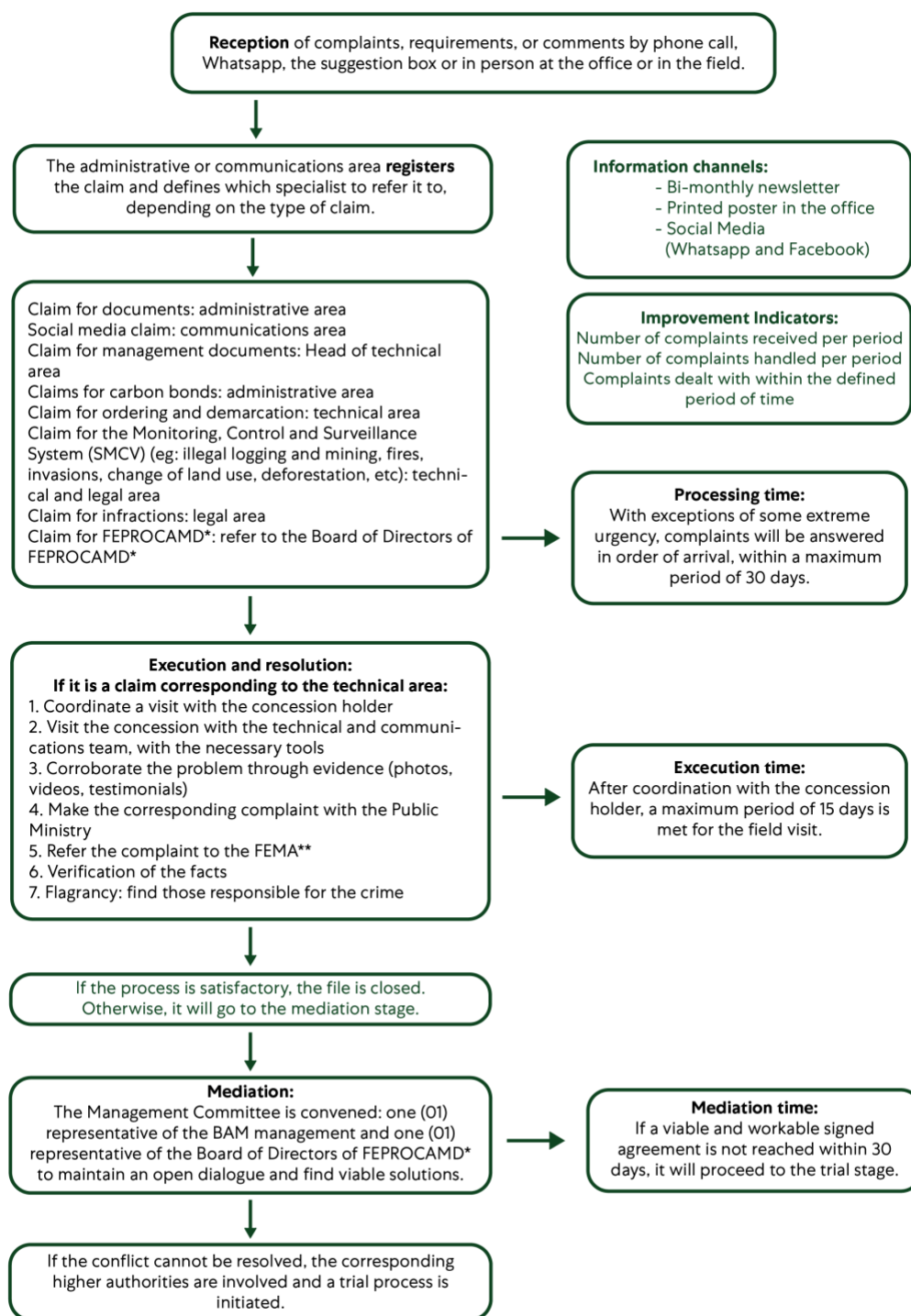
FEPROCAMD	6	2	33%
Associations' presidents	14	3	21%
Associations directors			24%
Workshops participations	577	254	44%
Project partners			40%

2.3.11 Anti-Discrimination Assurance (G3.7)

The project proponent has an official policy against any type of discrimination, which is uploaded in the company webpage.

2.3.12 Feedback and Grievance Redress Procedure (G3.8)

A suggestion mailbox has been installed in project offices so anyone may submit anonymously or with his name, any question, claim, denounce or recommendation referred to any activity promoted by the project and/or with the project funds. During the first years of the project, many suggestions were received and answered as described in Monitoring Reports. In addition, and following the new CCB guidance, the project proponent has elaborated a new protocol for feedback and grievance redress mechanism, that is detailed in the following flowchart.



*FEPROCAMD: Federation of Brazil Nut Producers of Madre de Dios
**FEMA: Specialized Prosecution in Environmental Matters

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

The suggestion box is accessible for every person in the project offices. Other channels as direct opinion in assemblies are open too.

The channels that will be used to make partners and stakeholders the FGRM include:

- Bi-monthly newsletters
- Poster printed in the project office
- Social networks (WhatsApp group chat, project Facebook page)

2.3.14 Worker Training (G3.9)

The project does not hire workers as BN harvesting is essentially an activity developed by rural families. Even though that, training to BN collectors in different topics, specifically legal framework, environmental crimes, among others are permanently implemented, while others are planned to be done as reforestation, fire prevention and others.

2.3.15 Community Employment Opportunities (G3.10)

The project does not hire workers as BN harvesting is essentially an activity developed by rural families.

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

TABLE 26

Norm	Effective Date	Relevant articles demonstrating compatibility with the layout/implementation of the Project
LEGISLATIVE DECREE 728 (TUO SUPREME DECREE 003-97-TR) PRODUCTIVITY AND COMPETITIVENESS LAW	March 28th, 1997	This law promotes the massive access to employment through special programs and stimulates productive private sector investment. Furthermore, it improves levels of appropriateness 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.
SUPREME DECREE 001-96-TR PRODUCTIVITY AND COMPETITIVENESS REGULATION	January 26th, 1996	This regulation develops and specifies the objectives and tenets of Legislative Decree 728.
LAW 29245 THIRD-PARTY SERVICES PROVIDER LAW	June 26th, 2008	This law regulates private third-party services. Also it regulates the cases from outsourcing, the requirements, rights and obligations, and penalties for companies that distort the use of this method for corporate engagement.
SUPREME DECREE 006-2008-TR THIRD-PARTY SERVICES PROVIDER REGULATIONS	September 12th, 2008	This regulation develops and specifies the objectives and tenets of Law 29245.

TUO SUPREME DECREE 001-97-TR SENIORITY BENEFITS LAW	March 1st, 1997	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.
SUPREME DECREE 004-97-TR SENIORITY BENEFITS REGULATION	April 15th, 1997	This regulation develops and specifies the objectives and tenets of Supreme Decree 001-97-TR
LEGISLATIVE DECREE 713 VACATION LAW	November 8th, 1991	This law regulates the consolidation of the benefits provided by the existing labor laws.
SUPREME DECREE 012-92-TR VACATION REGULATION	December 3rd, 1992	This regulation develops and specifies the objectives and tenets of Legislative Decree 713.
LAW 27735 HALF/END-OF-YEAR HOLIDAY BONUSES LAW	May 8th, 2002	This law establishes the right of workers subject to the labor of the private sector to receive two bonuses in the year, among others.
SUPREME DECREE 005-2002-TR HALF/END-OF-YEAR HOLIDAY BONUSES REGULATION	July 4th, 2002	This regulation develops and specifies the objectives and tenets of Law 27735.
LEGISLATIVE DECREE 892 PROFIT SHARING LAW	November 8th, 1996	This standard regulates the right of workers to participate in the profits of companies that develop income-generating activities.
SUPREME DECREE 009-98-TR PROFIT SHARING REGULATION	November 6th, 1998	This regulation develops and specifies the objectives and tenets of Supreme Decree 009-98-TR.
LEGISLATIVE DECREE 688 SOCIAL BENEFITS CONSOLIDATION LAW	5th, 1991	This law regulates social benefits for workers.
SUPREME DECREE 024-2001-TR SOCIAL BENEFITS CONSOLIDATION REGULATION	July 22nd, 2001	This regulation develops and specifies the objectives and tenets of Legislative Decree 688.
SUPREME DECREE 007-2002-TR LAW ON DAYS OF WORK, HOURS AND OVERTIME	July 4th, 2002	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.
SUPREME DECREE 008-2002-TR REGULATION ON DAYS OF WORK HOURS AND OVERTIME	July 4th, 2002	This regulation develops and specifies the objectives and tenets of Supreme Decree 008-2002-TR.
LEGISLATIVE DECREE 25593 (TUO SUPREME DECREE 010-2003-TR) LAW ON COLLECTIVE LABOR RELATIONS	October 5th, 2003	This law regulates union's freedom, i.e., all those relations through which workers can bargain collectively for better working conditions or otherwise.
SUPREME DECREE 011-92-TR REGULATION ON	October 14th, 1992	This regulation develops and specifies the objectives and tenets of Law on Collective Labor Relations.

COLLECTIVE RELATIONS	LABOR		
LAW 28806 INSPECTION LAW	LABOR	July 22nd, 2006	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.
SUPREME DECREE 019-2006- TR REGULATION OF LABOR INSPECTION SYSTEM		September 1st, 2007	This regulation develops and specifies the objectives and tenets of Law 28806.
LAW 26636 PROCEDURAL LABOR LAW		June 21st, 1996	This law regulates all the judicial procedures that workers and employers need to do in order to access justice.
SUPREME DECREE 039-91- TR INTERNAL REGULATION		December 30th, 1991	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.

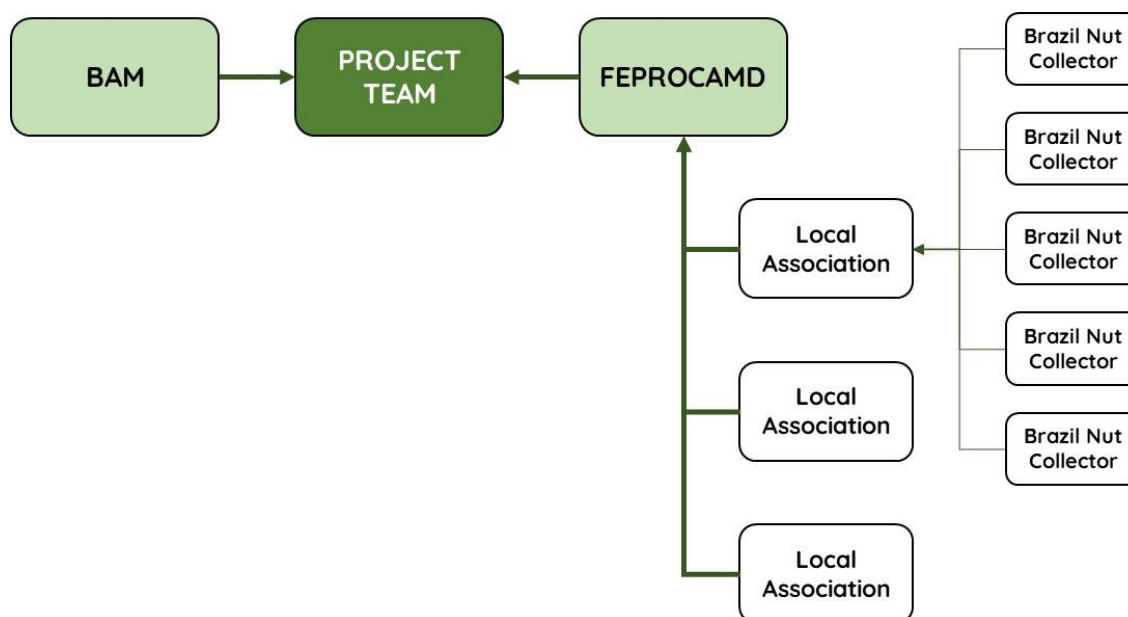
2.3.17 Occupational Safety Assessment (G3.12)

As explained above, the project does not hire workers. Even though that, the BN harvesting imply some occupational risks related with the fall of pods, the risk of wild fauna attacks and management of machetes, among others. The project plans to do specific training regarding these topics and measures to mitigate these risks.

2.4 Management Capacity

2.4.1 Project Governance Structures (G4.1)

FIGURE 5.



2.4.2 Required Technical Skills (G4.2)

BAM has more than a decade of experience designing and implementing REDD and reforestation projects, including the current Brazil Nut REDD projects, working closely with more than 400 families and their leaders, and trading carbon credits generated from joint activities. His experienced team includes multidisciplinary profiles as can be seen in their webpage: <https://www.bosques-amazonicos.com/equipo/>.

In addition, BAM has a partnership with PASKAY, who has a long experience designing and conducting this type of projects as may be seen in PASKAY web page (www.paskay.pe).

2.4.3 Management Team Experience (G4.2)

BAM has more than a decade of experience designing and implementing REDD and reforestation projects, including the current Brazil Nut REDD projects, working closely with more than 400 families and their leaders, and trading carbon credits generated from joint activities. His experienced team includes multidisciplinary profiles as can be seen in their webpage: <https://www.bosques-amazonicos.com/equipo/>.

In addition, BAM has a partnership with PASKAY, who has a long experience designing and conducting this type of projects as may be seen in PASKAY web page (www.paskay.pe).

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

The Project is managed by BAM office in Madre de Dios, with the assistance of FEPROCAMD team and BAM office in Lima. Professionals involved in the project have experience in the management of carbon sequestration projects, especially in financial issues. Some of them have participated in VCS forest carbon validation and verification processes, including REDD+ (including the validation and verification of this project) and reforestation projects. In addition, most of them have worked or for a long time in the forestry sector of the region of Madre de Dios, where the

project will be developed. Furthermore, the Brazil nut concessionaires, who are partners in the project, live in the same or surrounding location of the project.

The team includes personnel with experience in design and implementation of AFOLU projects. An example of a project developed and managed by the same team is the ARR Project “Reforestation of pastures in Campo Verde with native species, Pucallpa, Peru”, validated in 2007 and verified in years 2012 and 2013 under the VCS.

The management system used by the project is adaptable to the site conditions. This includes the Forest Management Plans of Brazil nut concessionaires, the instructions for each activity to be developed (POEs) and the Monitoring Plan.

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

The project has more than a decade of operation in which it has achieved verifications from 2010 to 2019, demonstrating and proving its impact. Throughout these years the project developer has consolidated a network of strategic allies and clients composed of the most important actors of the voluntary market (intermediaries, final clients, platforms). With the consolidation of the carbon market and the project's capacity to generate credits in significant volumes (approx. 2 million per year), the project can self-finance its needs to cover the activities required to achieve the conservation and sustainability objectives mentioned in detail in this document.

Additionally, the project developer, BAM, is a company with a solid financial balance sheet, backed by real assets of great value such as land and biological assets of its own forest plantations. Additionally, BAM is the first Peruvian forestry company to enter the Lima Stock Exchange, successfully placing thematic debt instruments (sustainable, green) in the local financial market. BAM is the first forestry company in LATAM to have the Climate Bonds Initiative (CBI) certification for a debt instrument (bond) to finance its restoration and conservation operations. In this sense, BAM has the financial backing to safeguard the correct operation of the project.

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

BAM has developed and implements an Ethics and Anti-Corruption Policy aimed at directors, managers, collaborators, suppliers and / or clients so that they apply ethical principles in their efforts and activities inside and outside the company.

Being the main economic activity of BAM the environmental services, we have committed to endorse the coming rules that will be adopted by National authorities.

2.4.7 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

In this section, it is included information regarding Financial Statements, commercial contracts and sales of the company, during the current monitoring period. This information will be available and shared with audit team during verification field visit.

2.5 Legal Status and Property Rights

2.5.1 Statutory and Customary Property Rights (G5.1)

As described in the PD, the forest concessions granted to Brazil nut harvesters have not any type of conflicts neither with other legal rights nor with consuetudinary rights of ancient traditional communities. The project area has been used for NTFP harvesting for many decades so no other rights are disputed over this area. It must be remembered that these concessions were granted in 2002 to 2003, over previous BN forest areas, in most of the cases already managed by the same persons previously.

2.5.2 Recognition of Property Rights (G5.1)

The project area has been granted to rural families by Peruvian State for non-timber forest extraction since 2002 but the area was used traditionally by the same families for this activity since 40's decade, throughout different legal frameworks.

According to Peruvian legal framework, forest concession contracts are enabling titles that includes the right to environmental services as clearly described in section 2.5.7. Specifically, the Forestry and Wildlife Law acknowledges the exclusive right to "the possession, access, use and benefit of ecosystem services" to indigenous peoples (article 76) and forest holders (article 60).

In that sense, no property rights different than those belonging to BN collectors need to be recognized or are affected by the REDD project.

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

As already documented during VCS and first CCB validation, there are no indigenous groups or traditional uses of forest resources that have been limited with the assignment of the forest concession. Even more, the Brazil nut collection is one of the oldest and most traditional use of forest resources done by local families since 40's. The average age of BN collectors is higher than the media age in Madre de Dios and, before the project, the activity was under risk of decline as most of the sons of the traditional rural families dedicated to BN activity prefer to migrate to the cities and do not plan to continue working in this activity.

The current project recovers and strengthen this activity as it increases the economic value of the Brazil nut and the protection of these boundaries against external threats caused by recent migrants or by other non-traditional activities.

In that sense, the project not only does not imply an invasion of private, community or governmental lands, but will help Brazil nut community to protect their lands from external encroachment. No reallocation was required or done. Even more, the Brazil nut families participate actively and widely in the design and is participating in the implementation of the project, as demonstrated by the different meetings and communications. It is demonstrated that the BN concessionaries who are part of the project, have signed voluntarily its participation after being widely informed with assistance of their representative organizations (FEPROCAMD and the associations), transferring their carbon rights to the FEPROCAMD.

For this reason, no FPIC is needed.

The project is fully implemented in forests that have been legally granted as non-timber forest concessions to individual (mostly rural producers).

The whole project area is composed by legally granted forest concessions as may be checked in a desk with all the files of each concession including concession contracts, management plan, etc.

No land reallocation was required.

2.5.4 Property Rights Protection (G5.3)

As indicated in 2.5.1, the project area has been used for BN production purposes since decade of 40s and since 2003, through concession contracts valid for 40 years, renewable automatically every 5 years, so, at a practical way, permanent. The area has a large tradition of forestry activities with abundance of BN trees.

2.5.5 Illegal Activity Identification (G5.4)

The project faces the risk of occurrence of different types of illegal activities as may be seen in the next table.

TABLE 27.

Illegal activity	Measures taken to reduce the risk
Illegal logging	Forest custodian accreditation, legal advisory & follow up
Invasion / settlements	Early warning system & response protocol, legal advisory & follow up
Illegal mining	Early warning system & response protocol, legal advisory & follow up
Agrarian expansion	Early warning system & response protocol, legal advisory & follow up
Forest fires	Early warning system & response protocol, training
Illegal hunting	Forest custodian accreditation, legal advisory & follow up
Illegal extraction of NTFP	Forest custodian accreditation, legal advisory & follow up

2.5.6 Ongoing Disputes (G5.5)

The area has no unresolved legal conflicts or disputes over rights as they are only granted for BN harvesting purposes.

In some cases, boundaries are not clearly defined between BN concessionaries with other BN concessionaries, or with agrarian plots, mainly. For this reason, the project is helping them to

promote formal arrangements between neighbors regarding that boundaries, settling physical milestones and promoting the signature of bilateral agreements that are converted in files that are submitted to forest authority. All these files are stored in project offices.

2.5.7 National and Local Laws (G5.6)

TABLE 28

Laws	Term	Content
The Constitution	October 31st 1993	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. 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.
Law No. 28611 "General Environment Law"	October 15th, 2005	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. 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. 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 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, emphasizing the importance of implementing systems of conservation of forests and protection of such as far as the degradation and deforestation.
DS No. 006-2009-MINAM "Accurate denomination and proper functioning of the National Commission for	March 29th, 2009	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

Climate Change in accordance with Legislative Decree No. 1013"		content should guide and inform national, sectoral and regional development strategies, plans and projects.
RM 104-2009-MINAM "Approves procedure for the assessment and authorization of Greenhouse Gas (GHG) emissions and carbon sequestration projects"	May 24th, 2009	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.
DS No. 014-2011-MINAM "National Plan of Environmental Action" PLANAA - PERU 2011-2021	July 9th, 2011	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 GHG emissions in the country, generated by changes in land use; as well as reducing vulnerability to climate change.
DS No. 011-2015-MINAM "National Strategy on Climate Change" update of DS No 086-2003-PCM	September 23rd, 2015	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.
Law 26839 "Law on the Conservation and Sustainable Use of Biological Diversity"	July 17th, 1997	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.

Law 26821 "Organic Law for the Sustainable Use of Natural Resources"	June 27th, 1997	It regulates the general framework for the sustainable use of natural resources, as they are part of the Nation's heritage. This law establishes that the natural resources maintained at their source, whether they are renewable or nonrenewable, 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 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.
DL No. 997 "Law on the Organization and Functions of the Ministry of Agriculture"	March 13th, 2008	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.
DL No. 1085 Establishes the Forest and Wildlife Resources Monitoring Agency"	June 28th, 2008	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.
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"	July 10th, 2005	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.

DS No. 009-2013-MINAGRI "National Forest and Wildlife Policy"	August 14th, 2013	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.
Law No. 29763 "Forestry and Wildlife Law" and its four Regulations	September 30th, 2015	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. Article 18 of the Forestry and Wildlife Resources Oversight Agency (OSINFOR) is responsible for supervising and monitoring the 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 scope of its competence. OSINFOR's competencies do not involve Natural Protected Areas, which are governed by their own Law.
DS No. 007-2013-MINAGRI "Regulation of Organization and Functions of the National Forest and Wildlife Service - SERFOR"	July 18th, 2013	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.
DS No. 018-2015-MINAGRI "Regulation for Forest Management"	September 30th, 2015	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.
Law No. 29263 "Law on Ecological Crimes"	October 2nd, 2008	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.

2.5.8 Approvals (G5.7)

The project currently being validated under CCB has been validated under VCS standard accomplishing all the proof of title criteria since 2012 and has been successfully verified permanently since that year.

According to Peruvian legal framework, no specific and explicit approval from Peruvian Government is requested for project implementation and carbon trading.

2.5.9 Right to Claim Benefits (G5.8)

The project has already verified since 2010 to 2016 and is in process of a new verification for 2017 to 2020. In that sense, it has been clearly demonstrated that the project proponent meets all the national legal requirements and specific VCS&CCB standard rules to claim for carbon benefits.

The joint participation in project implementation of BAM, FEPROCAMD and BN concessionaries ensures that accomplishment of project ownership in accordance with CCB specification.

2.5.10 Other Programs (G5.9)

The project does not participate in any Emission Trading Programs and Other Binding Limits, nor other forms of environmental credit or other GHG program.

2.5.11 Double Counting (G5.9)

The project ensures not to sell verified reductions in more than one market, voluntary or compliance. Each sale will be registered in VERRA platform and, when a national registry will be on place, the project will also do what is required to be incorporated in it.

3. CLIMATE

3.1 Without-Project Climate Scenario

3.1.1 Without-Project Estimated Greenhouse Gas Emissions (CL1.1)

Prepared according to the Modular Methodology: Module VMD007 v2 "BL-UP", developed by Avoided Deforestation Partners and approved by VCS on December 2010.

Madre de Dios is one of the two Amazon regions in Peru where REDD initiatives are emerging at growing rhythm. There are around 10 REDD projects being designed in Madre de Dios, and local organizations who are promoting early actions have joined in a Technical Consortium to develop a unique consensual baseline for the whole region. Regional Government is part of this Consortium and the Environment Ministry is also in permanent communication with the group in order to integrate these efforts in the national baseline. For this reason, BAM, with the support of other institutions, has designed and shared this model with Madre de Dios Consortium to be used as an input of this regional baseline. For the specific case of the Castañeros REDD Project, the regional model was adapted to meet the module requirements. Therefore, the baseline was developed following the procedures of module VMD007 v2 “BL-UP”, and is intended to represent the expected deforestation of the Brazil nut region, where the Project Area is located. It takes into consideration the existing particularities given the vast area under analysis.

PART 1: DEFINITION OF BOUNDARIES

1.1 Definition on the spatial boundaries of the analytical domain

1.1.1 Reference Region

1.1.1.1 Reference Region for Projecting Rate of Deforestation (RRD)

Defined as the spatial delineation of the analytic domain from which information of deforestation rates and spatial patterns of deforestation are obtained, projected into the future and monitored. For that it shall be representative of the general patterns of unplanned deforestation.

In order to obtain said areas for the region of Madre de Dios, as two of them are required for unplanned deforestation, we have made an analysis of existing literature:

The reported impacts of the deforestation in forest areas around similar road infrastructure projects have helped us to establish the boundaries of the reference region, given that the Madre de Dios department is crossed by the Interoceanic highway which accounts for much of the historic deforestation in a direct and indirect way.

Wood extraction effects through rivers and forest roads have been observed up to 50 km way from principal roads (Dourojeanni, 2006b – Page 34 and Delgado, 2008 – Page 19) in the Peruvian Amazon. Moreover, Brindao et al. stated that in the well-developed road network of more than 241,000 km in the Brazilian Amazon, all the deforestation is concentrated in a 50 km buffer from roads.

Laurence et al. (2002) wrote that highways impart more impact than roads and distance from highways was the single most important predictor of deforestation ... because “they promote efficient, year-round access to forest”. In Peru, it is predicted that the environmental and social impacts that will occur after the improvement and paving (recently finished) of the IOH will not be the same as those observed in the past, and that intensity, amplitude and speed of those actions will be dramatically increased (Dourojeanni, 2006b), as seen.

In addition, until the paving of IOH, Madre de Dios was an isolated region, more integrated with Brazil than with the rest of the country. Before the construction of this highway, it could take 2-3 days to go to Cusco, while now it takes around 14 hours.

As a result of this review, it became clear that the boundary of the Reference Region for Madre de Dios had to be determined by the presence of roads in it, so that all areas at risk of deforestation would be covered. In that sense, the reference region was defined by establishing a buffer of 50 km from the existing road network of the region. For this, the official map of Madre de Dios and its road network, updated by the VIAS Project developed by ACCA (2007) were used.

The resulting buffer comprises more than half of the Madre de Dios region area, and, according to methodological requirement, a part of this region has been used for the RRD of this project.

According to the module, the RRD area should be minimum equal to MREF (minimum size of reference region for projecting rate of deforestation), where:

RAF (Reference Area Factor) = $7500 \times PA^{-0.7}$	MREF = RAF x PA
RAF = $7500 \times (291,566.5)^{-0.7}$	MREF = $1.121 \times 291,568.9$
RAF = 1.121	MREF = 326,950.9 ha

This selected area of the above mentioned buffer includes forest and non-forest lands, and given that a RRD requirement is that it must cover only forest at the beginning of the historical period, the non-forest lands up to year 2000 were removed. Moreover, all lands that could be classified as peats were also removed.

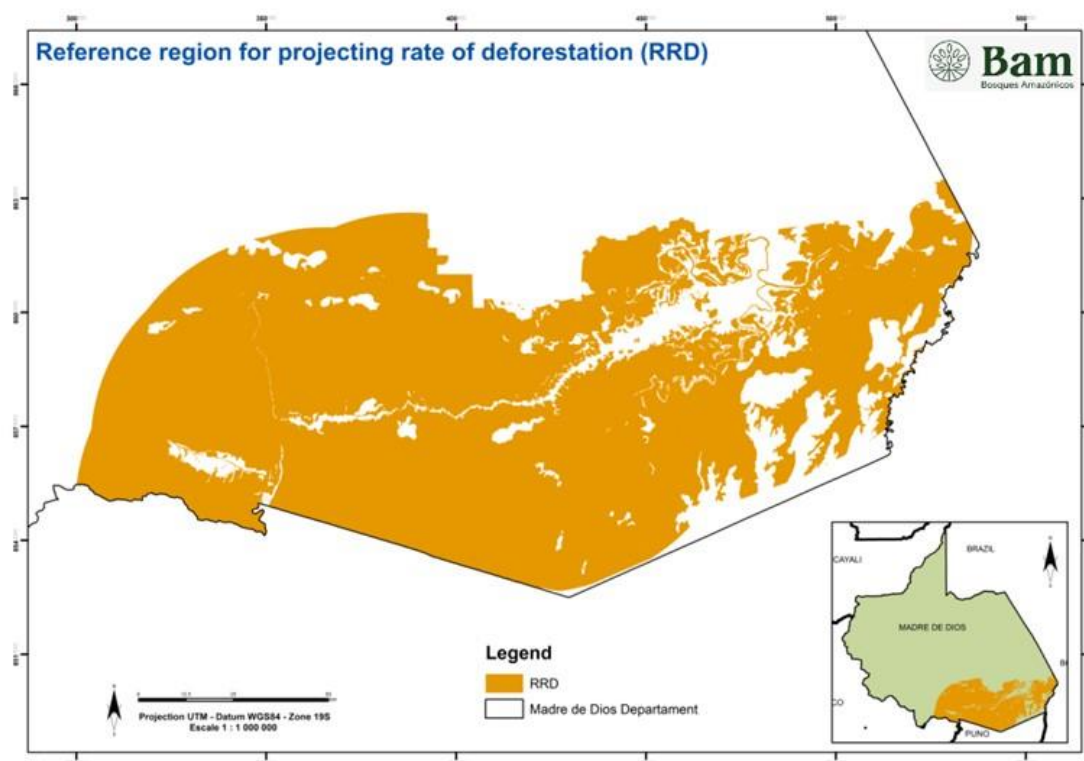
After these deductions, several parcels of forest were obtained making a total of 1'351,992.06 ha forming the RRD for Castañeros REDD Project.

Therefore, the RRD established complies with the criteria:

- o It is 100% forest at the start of the historical reference period (2000).
- o It is bigger than MREF
- o It is formed by parcels and is representative of the general patterns of deforestation that affects the Project Area

It is important to recall that this Deforestation Model is in its way to become a regional model for Madre de Dios region.

MAP 15. Reference Region for projecting rate of deforestation



Agents of Deforestation

The three major agents of deforestation are: agriculturalists, ranchers and miners. While the first two is expected to cause the biggest proportion of deforestation in the PA, given that the profits for carrying pastures for cattle and crops will increase due to the paving of the IOH, miners represent a serious risk for a small part of PA, especially in the southern section.

The selected RRD covers the areas where these agents are present. It is not possible to calculate the proportion of agriculturalist versus ranchers considering that rural families usually develop both activities³⁹. According to National Census⁴⁰, most of occupations related with rural activities do not distinguish between cattle ranchers and agriculturalists. The proportion of residents (lived in area >5years) versus migrants (lived in area <5 years) in RRD and PA were taken from the National Census of 2007, and resulted in 3-1 for both areas (RRD and PA) as can be seen in following table.

TABLE 29. Composition of local population by region and project districts

Region / Origin	Residents	Migrants
RRD ⁴¹	62,488	21,266

³⁹ 40% of the deforested areas from 2000 to 2005 in the Stretch 3 of IOH have a combination of agriculture and pastures. CDC-SZF-INRENA, 2007.

⁴⁰ From Data Consult System of Settlements and Disperse Population. *National Census 2007: XI of Population and VI of Housing*. INEI. Can be found in <http://inei.inei.gob.pe/inei/RedatamCpv2007.asp?id=ResultadosCensales?ori=C>

⁴¹ Includes the districts of Tambopata, Inambari, Las Piedras, Laberinto, Huepetuhe and Madre de Dios

	75%	25%
PA ⁴²	5,593	1,667
	77%	23%

Landscape factors

The Forest Strata used in all the project boundaries is based on the Forest Map of the Economic Ecologic Zoning made by IIAP in year 2009 for the entire Madre de Dios region.

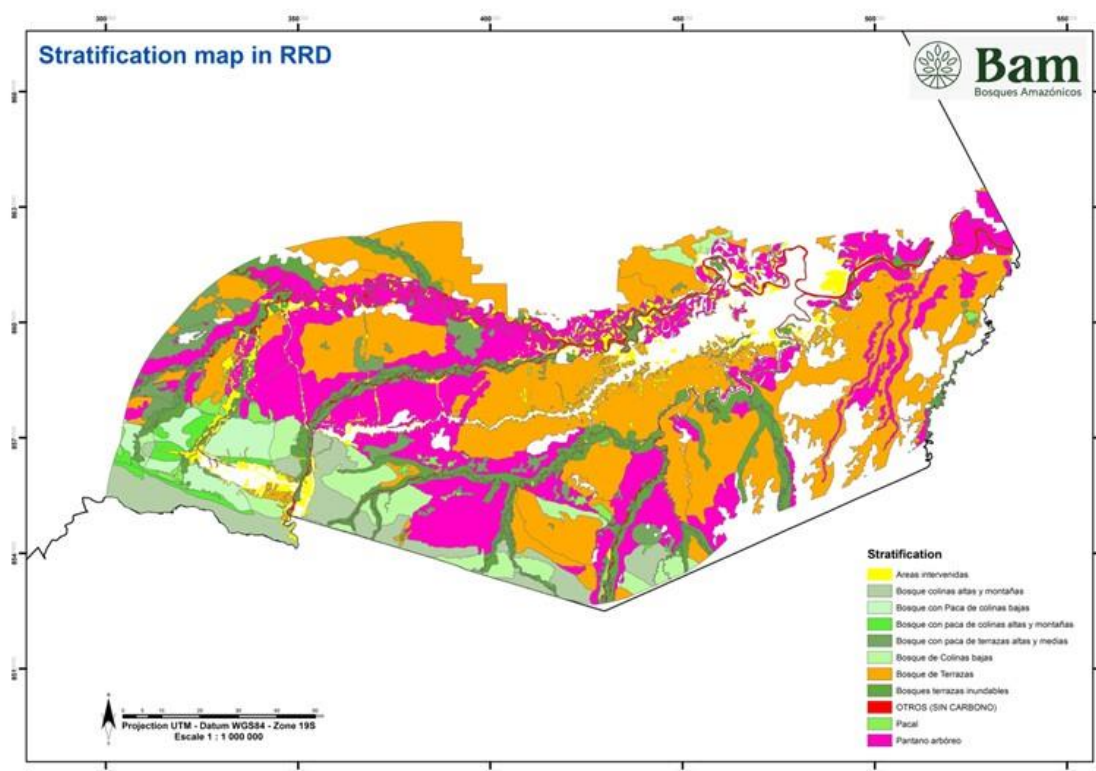
TABLE 30. Forest Strata

Forest Strata	Code	Mining Stratum		Agrarian Stratum	
		RRD	PA	RRD	PA
Low hills with bamboo (paca) forest	BPCb	2.3%	-	2.6%	4.4%
High and mid terrace with bamboo (paca) forest	BPT	4.6%	3.9%	2.8%	10.2%
Low hills forest	BCb	0.8%	-	7.0%	11.1%
Terraces forest	BT	8.2%	23.2%	53.6%	72.0%
Flooded terraces forest	BTI	25.6%	20.8%	-	-
Bamboos (Pacal)	P	1.4%	2.0%	0.8%	2.1%
Swamp trees	PA	43.9%	50.1%	16.3%	-
High hills and mountain forest	BCaM	0.6%	-	9.5%	-
High hills and mountain with bamboo (paca) forest	BPCaM	0.5%	-	1.7%	-
Intervened Areas	AI	7.9%	-	2.9%	-
Others (Without Carbon)	NB	4.2%	-	2.8%	0.3%
TOTAL		100.0%	100.0%	100.0%	100.0%

The following map shows the forest types throughout the RRD:

MAP 16. RRD Forest Stratification

⁴² Includes the districts of Tahuamanu and Las Piedras, as in LK-ASU.



The land suitable for conversion is based on the Soil Use Capacity Map established in the ZEE, which was also used for the next comparison:

TABLE 31. Land suitable for conversion in RRD and PA

Soil Use Capacity	Mining Stratum		Agrarian Stratum	
	RRD	PA	RRD	PA
Land suitable for annual crops	54.56%	67.69%	0.00%	-
Land suitable for permanent crops	34.20%	32.31%	71.16%	77.72%
Land suitable for pastures	0.35%	-	0.61%	-
Land suitable for forestry production	4.27%	-	16.68%	21.97%
Land suitable for protection	3.59%	-	8.70%	-
Settlements	-	-	0.00%	-
Water Bodies	3.02%	-	2.85%	0.31%
Total	100.00%	100.00%	100.00%	100.00%

The slope and elevation were compared using DEM, and as can be seen in following chart, both factors are similar in PA and RRD.

TABLE 32. Elevation and Slope Classes

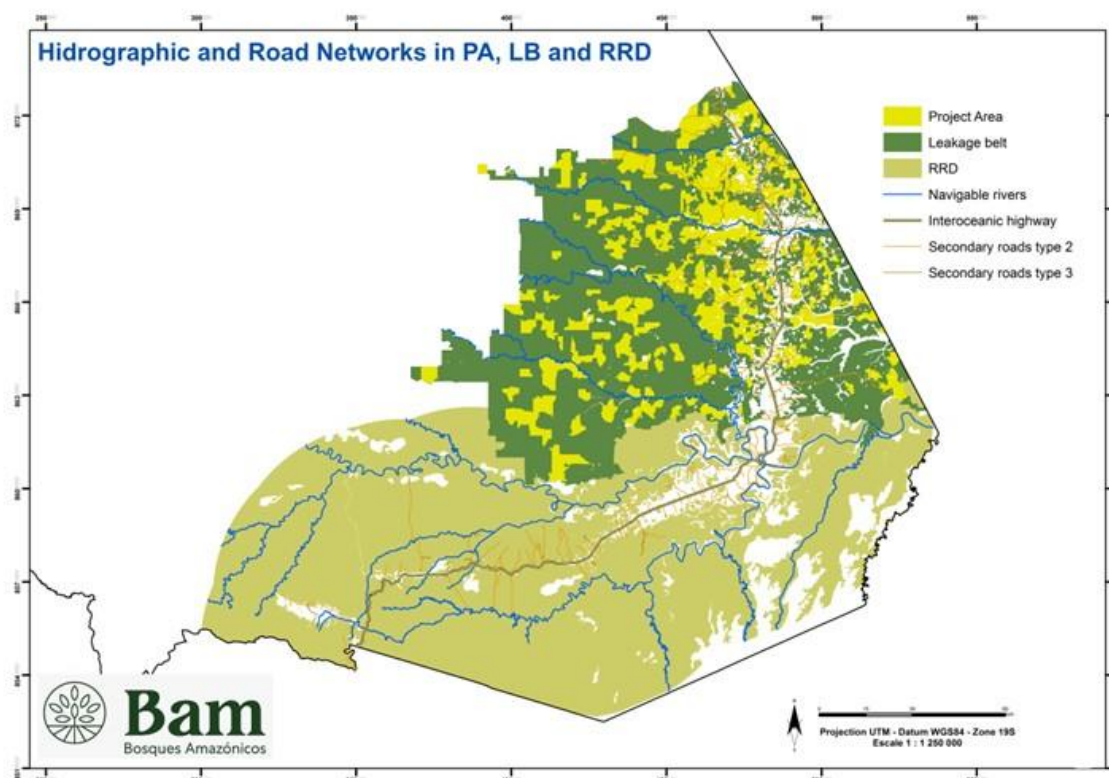
Elevation	PA	RRD	Slope (%)	PA	RRD
0 a 500	100%	97.7%	<15%	99%	95%
500 + m	0%	2.3%	>15%	1%	5%

The main classes of land suitable for conversion in PA are also the most representative in RRD. This is also the case in Forest Strata results. Furthermore, the slope and elevation in both boundaries are very similar, as almost 95% of RRD's and AP's areas are in the same classes of each factor. Thereby the new RRD accomplishes the proportionality criteria requested for the methodology.

Transportation Networks and Human Infrastructure

In the case of transportation factors, navigable rivers and roads are not part of forest concessions and, as they have not been classified as forest, they cannot be part of PA neither of RRD (at the start of the historical reference period). Nevertheless, rivers and roads cross these boundaries, and no significant differences in density are seen in Map 3.

MAP 17. Hydrographic and Road Networks in Project Area, Leakage Belt and RRD



Social factors

As RRD and PA are under the same political jurisdiction, social and regulatory factors can be considered similar. As shown in Table 2, there are no significant differences within areas in terms of population composition (ethnic, birth place, etc.) neither density. Fortunately, Madre de Dios is not under the effect of political violence. Even though, we have stratified the RRD in 3 zones: mining zone, farming zone and non-yet profitable zone, PA covers also the 3 areas.

TABLE 33. Settlement Density in project Area and RRD

Settlements	PA	RRD
n° / km ²	0.0027	0.0032

Policies and regulations

As explained before, RRD is located also within Madre de Dios Region (where REDD project is being developed completely), where, as part of national decentralization policy, many competences are being transferred to Regional Governments. This includes the administration of natural forests, including the review and approval of management plans. Territorial Ordering is also under responsibility of local authorities. For this reason, RRD does not cross to another sub-national administrative unit and Project Area is completely under administrative control of Regional Government of Madre de Dios, the same as RRD.

Exclusion of planned deforestation

As showed in REDD-MF document, in MADRE DE DIOS there are not large-scale productive activities. Agriculture, cattle ranching and even mining, which are the main causes of deforestation in the region are carried out in a self-consumption / artisanal /small –scale way. The few existing regional plans for the Agricultural sector haven't identified spaces where these activities could expand themselves in the future. In the other hand, mining is always considered as an unplanned deforestation activity because it is performed usually illegally.

Regional plans to guide the expansion of infrastructure and urban areas are also non-existent. In the Economic and Ecologic Zoning of Madre de Dios (ZEE) made by IIAP⁴³, there is an identification of the suitability for urban-industrial use inside the region (ZEE, 2009 – Map 20); and by comparing the RRD, it is evident that the latter comprises areas with low and very-low suitability for urban-industrial use. The few ones in the medium, high and very-high category, located along the IOH, were already removed when the deduction of non-forest areas was done.

RRD STRATIFICATION

Considering the coexistence of different deforestation agents inside RRD, it is not to be supposed that the trend of deforestation is similar inside the whole area. As it depends on the patterns of land occupation, which in turn depends on the behavior and representation of the different actors, stratification was made.

Three strata were established, based on the following criteria:

- o The attractiveness of carrying out the three main activities of the region, and
- o Historic deforestation rates per stratum.

In that sense, RRD is divided in: (1) areas where developing productive activities like agriculture or cattle ranching are profitable (based on its closeness to market centers, to roads, etc.)⁴⁴, and (2) areas where these activities are not profitable at least at current situation.⁴⁵ The third stratum is the area where illegal mining is being or can be developed in the near future based on geological characteristics.

Positive (CO+) and Negative (CO-) Opportunity Cost Strata

Based on an independent study developed by the consortium CSF-GRADE⁴⁶, a profitability function has been calculated for corn production (as the best reference for agricultural activity) and meat production (as the reference of cattle ranching). Both functions have been integrated to calculate the maximum opportunity cost of alternative land use where, in each pixel, the higher value (between both) has been used in order to obtain the opportunity cost map.

⁴³ IIAP, Research Institute for Peruvian Amazon, is a public institution in charge of develop scientific researches specialized in Amazon Region (www.iiap.org.pe).

⁴⁴ Called Positive Opportunity Cost Stratum

⁴⁵ Called Negative Opportunity Cost Stratum

⁴⁶ Fleck *et al.* Estrategias de conservación a lo largo de la carretera Interoceánica en Madre de Dios, Perú. Un análisis económico-espacial. (2010)

The Profitability functions consider different geographic, technological and economic factors, for instance: quality of soil, rainfall, labor, investment, density (animals per hectare) among others.

Even though there are other economic activities in Madre de Dios, like timber harvest (inside forestry concessions carried out under management principles) and ecotourism, they are compatible with the maintenance of the forest cover and don't represent alternative activities for Brazil nut harvesting, hence they were not considered in the following analysis neither they cause degradation on forest. Degradation is mainly pushed by illegal loggers or rural families but, based on Participatory Rural Appraisal it does not affect significantly project area. Actually, Madre de Dios is mostly damaged by deforestation threat.

This map has been divided in two zones: the zone where the opportunity cost values are negatives (CO-) and the zone where the opportunity cost values are positive (CO+).

As roads are permanently growing (in the reference period at a rate of 142 km/year), and the agrarian profitability depends directly on transportation costs (which is highly correlated with the status and length of existing roads), both zones are dynamic, with OC+ permanently growing and adding new areas to its zone in detriment of CO-.

Mining Stratum

Additionally, the Southern part of Madre de Dios is affected by illegal mining which, by its high profitability, does not depend on opportunity cost but it depends directly on international price of gold.

Based on several studies of the mining activity in Madre de Dios, it was evident that any other activity could not compete against the profitability of extracting gold in a short term, reinforced by the continuing rise in international gold prices.

However, the mining activity is held in specific areas across the region. INGEMMET made an estimation of the existences of gold trough Madre de Dios and found out that commercial amounts of this metal could be found in the geologic layer *Quaternary Holocene*.

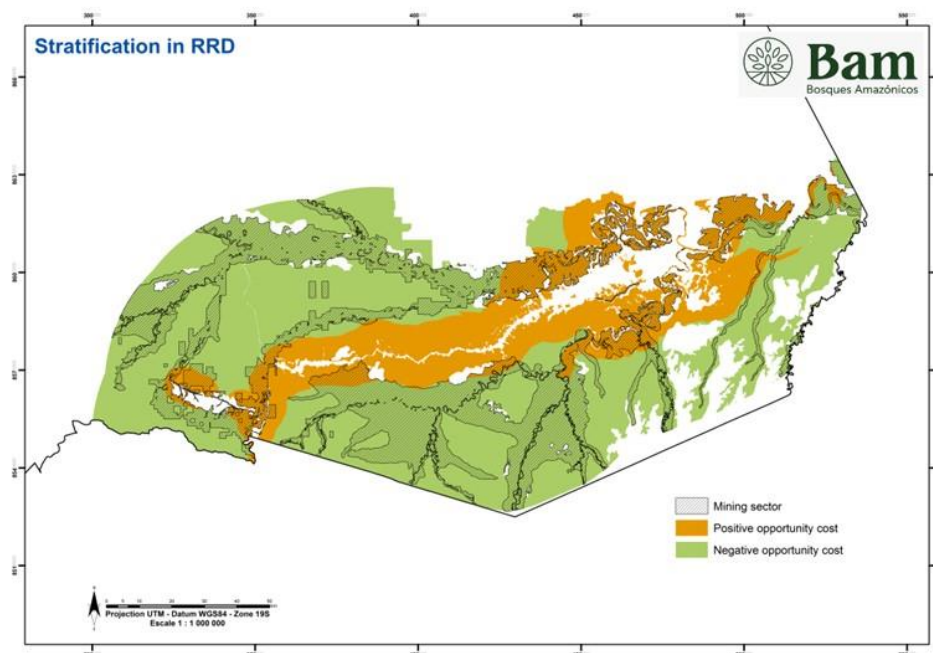
Therefore, the Mining Stratum comprises the actual mining concessions and petitioners, and the areas with mining potential (Quaternary Holocene). The defined area by the Emergency Decree N° 012-2010, that could legally hold mining activities is added to the Holocene layer to compose the Mining Stratum.

In that sense, Mining Stratum overlaps with CO+ and CO- strata prioritizing over them.

The area of the Mining Stratum is static, which means that it will not increment over time. The deforestation rate for this area has been based on the historical rate found for the reference period in the mining petitions area.

In the following map is possible to see the 3 strata forming the RRD:

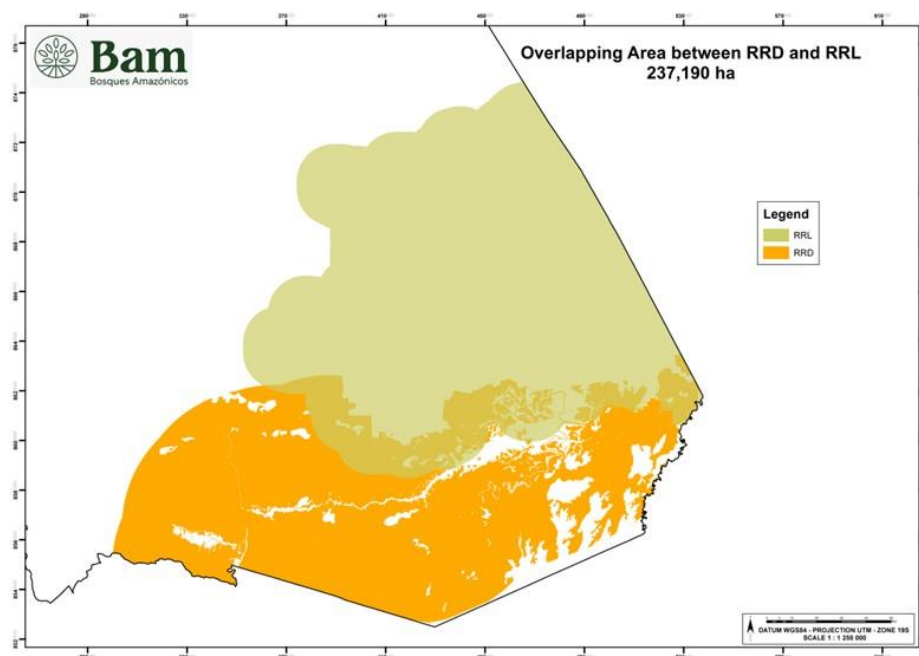
MAP 18. Strata in RRD



1.1.1.2 Reference Region for Projecting Location of Deforestation (RRL)

The Reference Region for Projecting location of deforestation is a continuous parcel of 1'804,906.47 hectares, where no deductions of non-forest land were made. It overlaps a sector of the RRD, and its area of forest equals the area of the RRD (+19%). The boundaries of RRL and the overlapping sector can be seen in Map 19.

MAP 19: Reference Region for locating deforestation



RRL consists of 11.09% non-forest land (9.7% deforested areas and 1.4% rivers), and 88.9% of forest. It includes the PA and LB as required, and the proportions of forests suitable for conversion to the deforestation agents' land-use practices of the RRL and the PA are the same ($\pm 30\%$) at the start of the baseline period, as demonstrated by:

Soil Suitable for Conversion

As for RRD, we have used the Soil Use Capacity Map from ZEE to determine the land most suitable for conversion given that it shows the soil natural capacity for the development of other land uses.

TABLE 34. Soil suitable for conversion in RRL and Project Area

Soil Use Capacity	RRL	PA
	%	%
Land suitable for annual crops	11.66	2.44
Land suitable for permanent crops	57.41	76.08
Land suitable for pastures	-	-
Land suitable for forestry production	27.39	21.18
Land suitable for protection	2.04	-
Settlements	0.06	-
Water Bodies	1.43	0.3
Total	100	100

Precipitation Regime

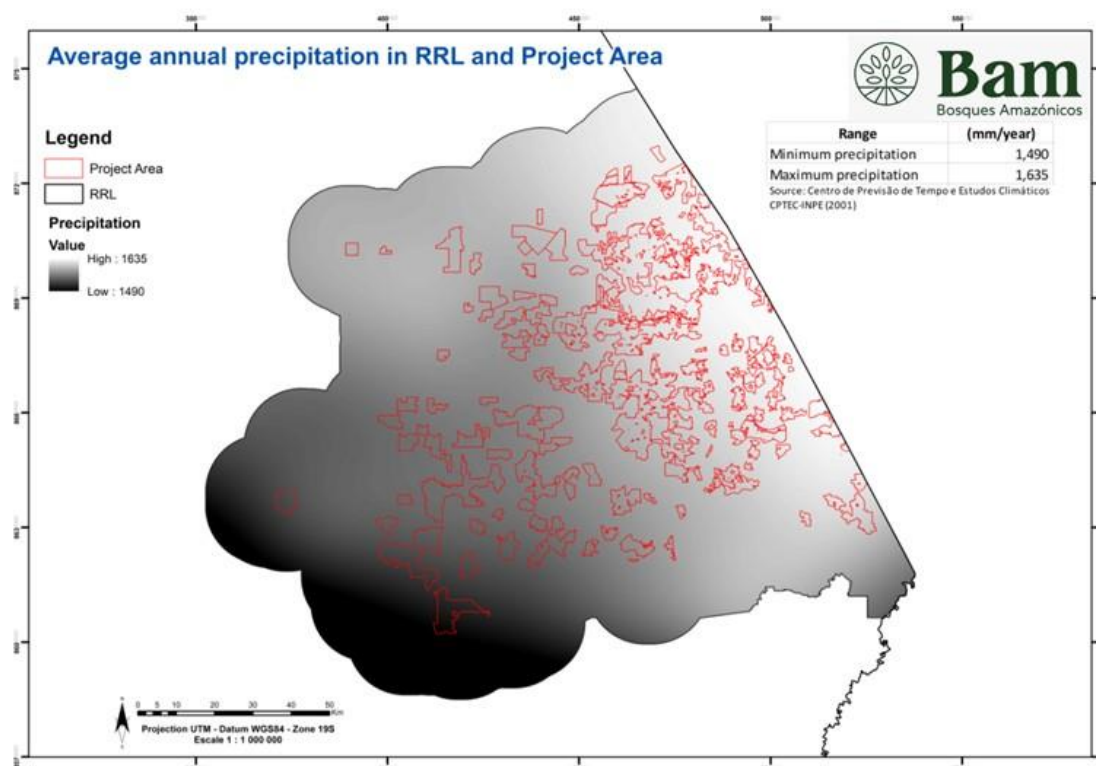
The average annual precipitation in the Madre de Dios Plain⁴⁷ normally varies between 1500 and 3000 mm per year. The dry season goes from May to November (8 months), while the wet season goes from December to March (4 months) and holds approximately more than 50% of the annual precipitation. According to IIRSA SUR-WALSH (2007), a characteristic of these southeastern lowlands, where the Stretch III of the Interoceanic Highway⁴⁸ is located, is that there is the possibility of having very dry months during the dry season; in contrast to the central and northern lowlands of the country.

The above mentioned is consistent with the graphic information (spatialized precipitation values) obtained for the period 1991-2001 by CPTEC-INPE (2001), which shows that RRL and Project Area have the same precipitation regime. This information is presented in the following map:

⁴⁷ Economic Ecologic Zoning of Madre de Dios. IIAP-GOREMAD, 2009.

⁴⁸ *Estudio de Impacto Socio Ambiental (EISA) del Corredor Vial Interoceánico Sur, Perú-Brasil*. Chapter 4.2.2. IIRSA SUR – WALSH. March, 2007. Can be found in http://www.mtc.gob.pe/portal/transportes/asuntos/proyectos/pvis/tramo_3/eisa/4.2.2_Clima.pdf.

MAP 20. The Average Annual Precipitation Map for the period 1996–2001



Elevation

RRL and Project Area are located in the Madre de Dios Plain⁴⁹, which is below 500 AMSL. In fact, the whole area of both boundaries is in the first 500 m elevation class, as seen in the next table.

TABLE 35. Elevation Classes in RRL and Project Area

Elevation (m)	PA	RRL
0 a 500	100%	100%

Markets

Access to markets is the variable which has the greatest impact on agrarian profitability, ergo, in the deforestation rate and location. For this reason, it is quite important to identify markets for agrarian products in order to determine if both areas, RRL and PA, have similar accessibility to markets.

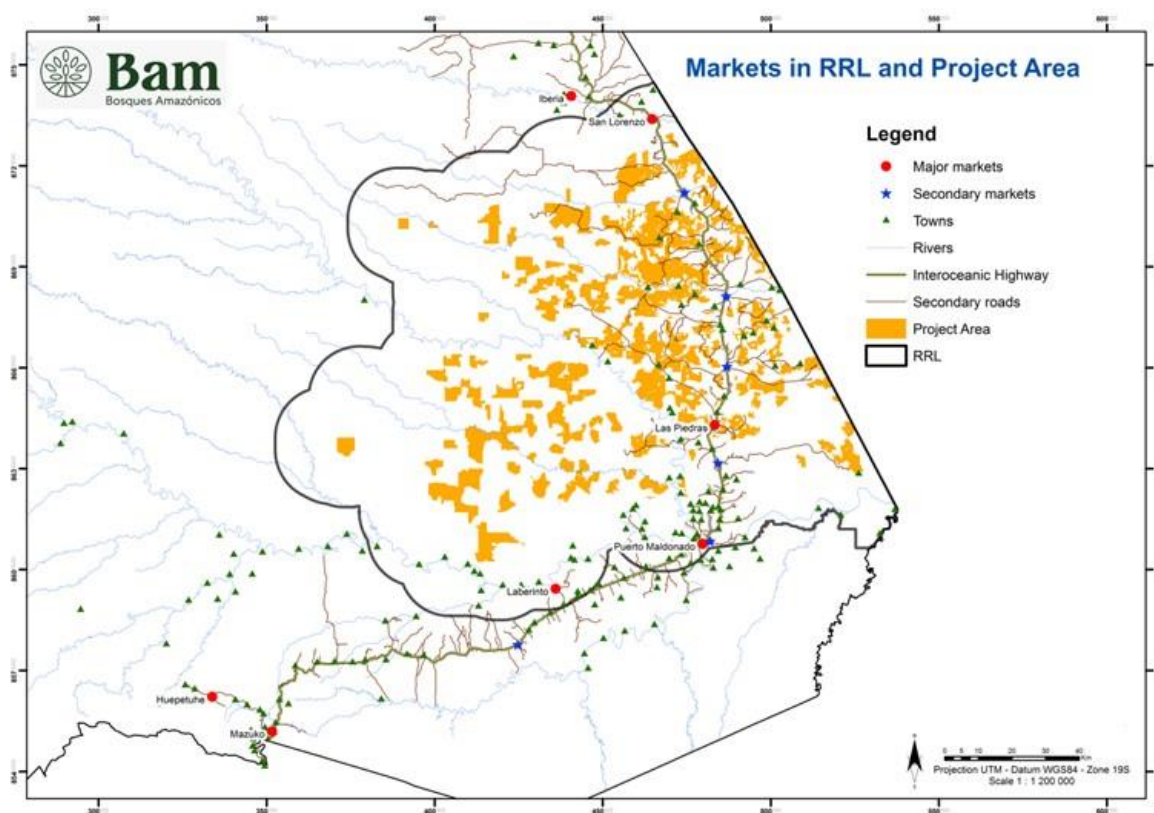
In Madre de Dios, markets for agrarian products in turn are mainly located along the IOH. The principal ones reachable from RRL and PA are the cities of Puerto Maldonado, Iberia, Laberinto,

⁴⁹ In the ZEE final document, the Madre de Dios Region is divided in 3 major biophysical units defined by many factors as geology, physiography, vegetation and others. The broader unit is the Madre de Dios Plain.

Las Piedras and San Lorenzo. In the first 3 cities there are the only slaughterhouses of the whole Madre de Dios region, needed for the commercialization of meat. Agricultural products as corn can be traded in all markets as it is a product used as feed for chicken, which is a typical rural activity in Peru.

The smaller towns also around of OIH have been named as Secondary markets in Map 7 (in blue). They connect principal markets, suppliers of commodities, with the other small towns (in green) located in more distant areas through river courses and secondary roads. As PA is evenly distributed inside RRL, they both have the same access to markets.

MAP 21. Location of Markets in and around RRL and Project Area



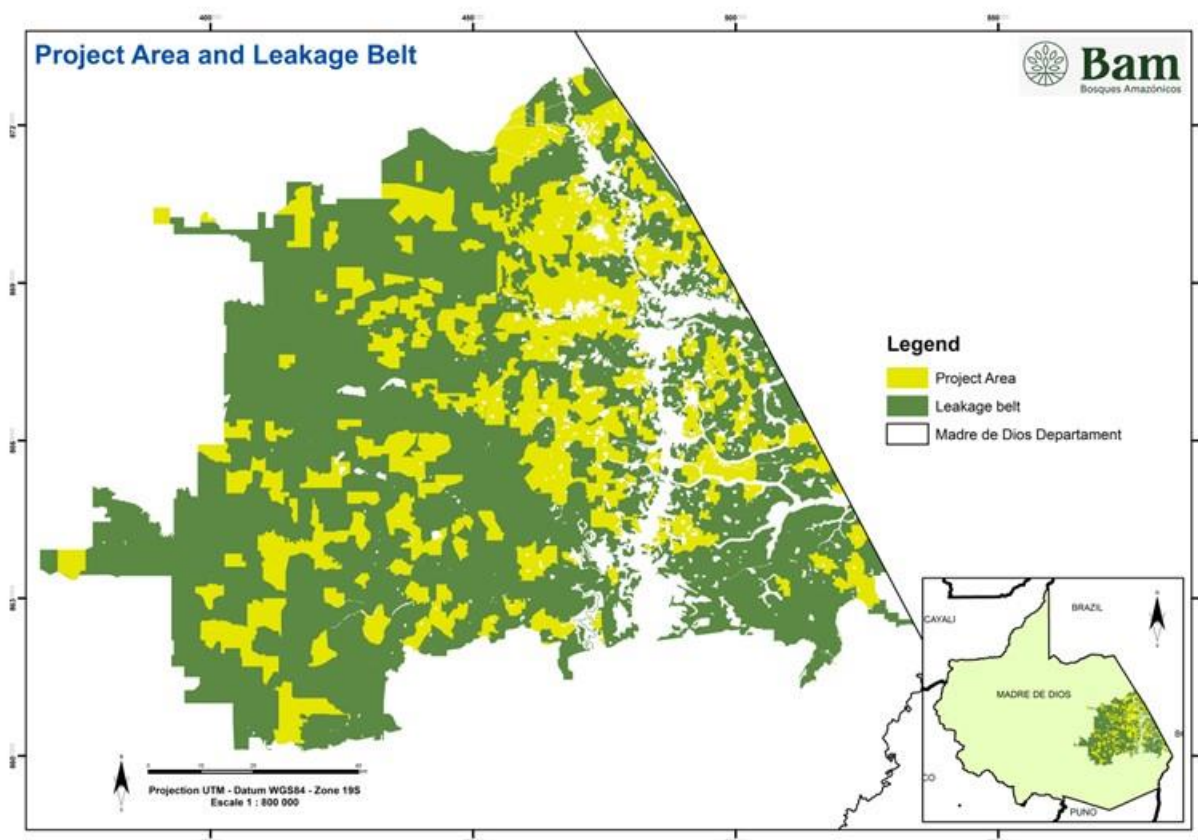
1.1.2 Project Area

The Project Area is formed by a set of non-timber concessions, specifically Brazil nut (BN) concessions that were granted by the Peruvian Government from year 2002, after the recognition and parameter setting of this activity by the Forestry and Wildlife Law of year 2000.

These concessions are dispersed in a well-defined zone, where the majority of BN concessions (nearly 1000) are located in the region (both margins of Stretch 3 of the Inter-Oceanic Highway, most of them at the left side).

Currently, the ones that have joined the project are 377, and more are expected in the future. The areas⁵⁰ of these project's concessions make up a total of 310,936.3 hectares. Each concession consists of an irregular polygon of "n" vertices⁵¹. A table with the unique code for each concession (which is the contract's code), their areas and centroids coordinates can be seen in Appendix 5.

MAP 22. Castañeros REDD Project Area and Leakage Belt



The boundaries of the PA were defined based on the legal boundaries of each concession contract, nevertheless some parts, especially the ones near the IOH and secondary roads, have been deforested so they have been excluded.

Another issue with the total area is that some boundaries overlap between different concessions, making it unreliable to use the areas stated in the contracts⁵². Finally, by using the Forest Map and the Soil Map of the ZEE, there were some areas identified that could classify as peat soil (REDD-MF document, Appendix 4) and, for this reason were also excluded.

Therefore, in order to comply with the requirements for PA of the methodology, we have removed all areas that did not classify as forest. Additionally, the overlaps were solved in ArcGIS by

⁵⁰ According to the area stated in the concession's contract.

⁵¹ The coordinates of the vertices of each concession are not shown in this document due to practical issues, but are kept available in BAM's office.

⁵² BAM is currently working with its associated concessionaires to solve this issue by dimensioning their boundaries.

dissolving all the boundaries to get a net area. The resulting area for the Project is 291,566.5 hectares of 100% forest land at the beginning of the project activity.

1.1.3 Leakage Belt

The Leakage Belt (LB) area of the Project has been determined by the BN region⁵³ surrounding the PA. Because of the similarity of conditions inside the PA and the LB, it is assumed that the deforestation agents will displace their traditional activities from the PA to this region.

The same work of defining net areas, as the one made for PA, was done. National Protected Areas were also removed; therefore, the LB net area is 723,748.3 hectares. It is also immersed in the RRL and includes the other BN concessions that have not joined the project yet principally (598,374.25 ha), as well as Forestry concessions (16,788.71 ha), Ecotourism and Conservation concessions (10,347.01 ha) and Native Communities (6,299.84 ha), among others.

A similar analysis of factors between PA and Leakage Belt has been done:

As the main area of the LB is composed by the other BN concessions, there are no differences in location (as can be seen in Map 8), type of landholder (typical rural families), size of the concessions, among other relevant factors between PA and LB; therefore, the regulatory and social factors are the same for both.

In the case of transportation factors, navigable rivers and roads are not part of forest concessions and they cannot be part of the PA and the LB as they have not been classified as forest. For this reason, density cannot be calculated as it would be zero in both cases, even though some of these rivers and roads cross within concessions that are part of project area and, in other cases, rivers and roads are natural boundaries of project area and leakage belt, as can be seen in Map 3 of page 8, that also shows that there are no significant differences in density of rivers and roads throughout the relevant area classes (PA, LB, RRD).

The landscape factors are considered next, and all of them confirm the similarity between the two boundaries.

TABLE 36. Proportionality of Types of Forest in LB and PA

Forest Strata	Code	Mining Stratum		Agrarian Stratum	
		LB	PA	LB	PA
Low hills with bamboo (paca) forest	BPCb	0.08%	-	8.83%	4.36%
High and mid terrace with bamboo (paca) forest	BPT	1.71%	3.91%	10.78%	10.15%
Low hills forest	BCb	1.40%	-	17.17%	11.06%

⁵³ It was already mentioned that this is a well-defined zone, where almost all the BN concessions are located.

Terraces forest	BT	15.92%	23.16%	60.35%	71.97%
Flooded terraces forest	BTI	25.91%	20.83%	-	-
Bamboos (Pacal)	P	1.23%	1.98%	1.95%	2.14%
Swamp trees	PA	53.68%	50.11%	0.08%	-
Intervened Areas	NB	0.08%	-	0.83%	0.31%
Others (Without Carbon)	TOTAL	100.00%	100.00%	100.00%	100.00%

TABLE 37. Land suitable for conversion in LB and PA

Soil Use Capacity	Mining Stratum		Agrarian Stratum	
	LB	PA	LB	PA
Land suitable for annual crops	75.33%	67.69%	-	0.00%
Land suitable for permanent crops	23.07%	32.31%	63.47%	77.72%
Land suitable for pastures	-	-	-	-
Land suitable for forestry production	1.48%	0.00%	35.70%	21.97%
Land suitable for protection	0.06%	-	-	-
Settlements	-	-	-	-
Water Bodies	0.07%	-	0.83%	0.31%
Total	100%	100%	100%	100%

TABLE 38. Elevation and Slope in LB and PA

Elevation	PA	LB	Slope (%)	PA	LB
0 a 500	100%	100%	<15%	99%	98%
500 + m	0%	0%	>15%	1%	2%

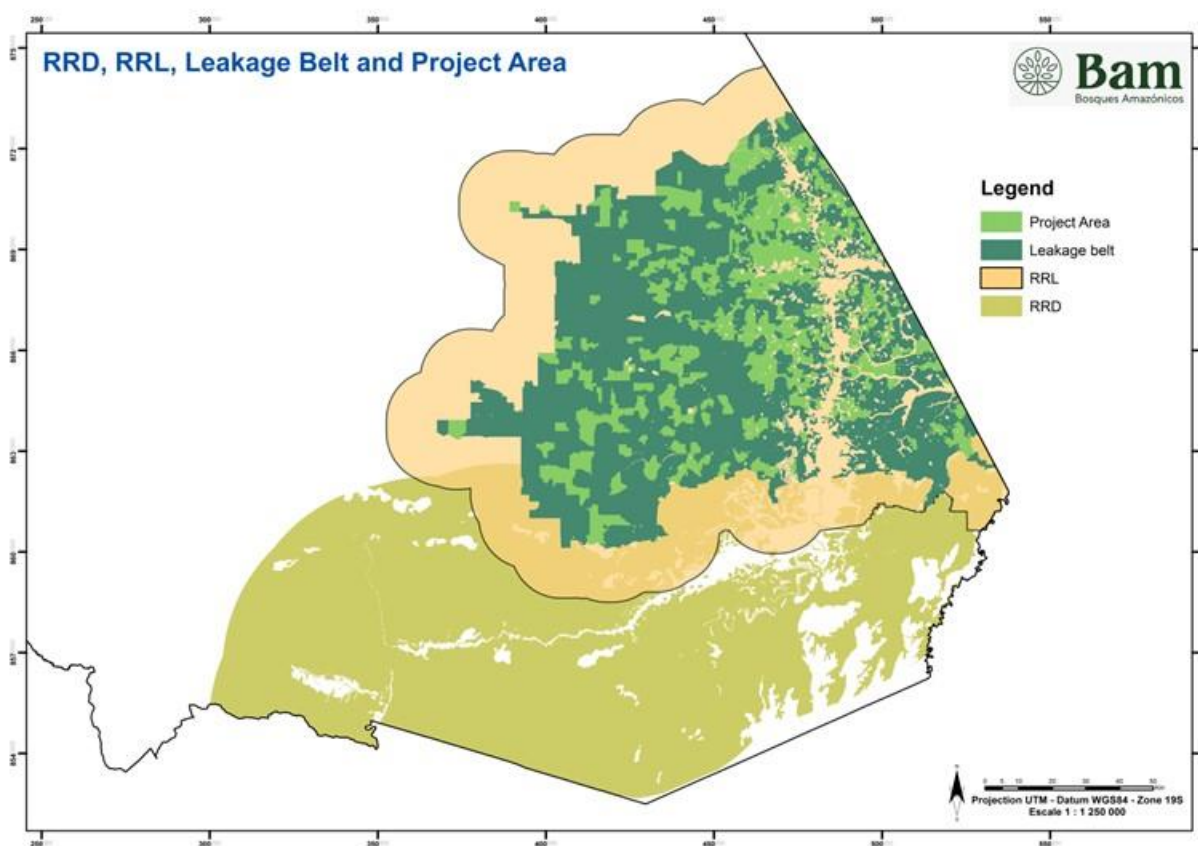
In conclusion, the Leakage Belt:

- o Includes forested areas closest to the PA.
- o All parts are accessible and reachable by the project baseline deforestation agents.

- o The landscape and transportation factors were considered for the determination of the LB.
- o Policies, regulations and social factors of the LB are of the same type or have the same effect as in the PA.
- o The LB area is more than 90% of the Project Area in 2009.

Finally, a map with all the boundaries of the Castañeros REDD Project is presented next:

MAP 23. Defined boundaries for the proposed project



1.2 Temporal Limits

Start date and ending date for Historic Reference Period

The historic reference period goes from year 2000 to year 2008, and includes the analysis of 2000, 2005 and 2008 images.

Starting Date and Ending Date for the Project Crediting Period

Start date of the Project Activities: 24/09/2009

Start date of the Crediting Period: 01/01/2010

End date of the Crediting Period: 31/12/2040

Revision Frequency of Baseline

According with the methodology, baseline will be reviewed every 10 years.

As required, the baseline has to be revisited every ten years from the start of the project in order to have valid projections. The approach selected is based on historic deforestation trends, called Simple Historic. The steps undertaken are presented:

PART 2: ESTIMATION OF ANNUAL UNPLANNED DEFORESTED AREA

2.1 Analysis of Historic Deforestation

2.1.1 Data sources collection and calculation of historic deforestation rate

Satellite images used for the analysis and modeling of deforestation were Landsat 5 and Landsat 7 and includes 3 points in time: 2000, 2005 and 2008 with a resolution of 30x30 m. The used sources to get the Landsat images were National Institute for Space Research from Brazil (INPE) and USGS Global Visualization Viewer.

In the selection of the satellite images we compared quick looks and their %CC reported for each quadrant shown in both websites, to get images with less than 10% cloud cover over the desired areas.

After having done a search and purchase of images, a group of these ones were selected based on their characteristics that make them more appropriate for a visual interpretation of deforestation patterns and for the elaboration of the Mosaic (given that many scenes are needed to cover the whole area of RRD). We chose the best images available for each scene, which are:

TABLE 39. Images used for the analysis of deforestation in the Reference Period

Path-Row	2000	Image 2005	Image 2008
2-68	24/11/2000 (7TM)	10/08/2005 (5TM)	18/08/2008 (5TM)
2-69	27/07/2000 (5TM)	13/10/2005 (5TM)	14/05/2008 (5TM)
3-68	17/08/1999 (5TM)	18/09/2005 (5TM) 17/08/2005 (5TM)	05/05/2008 (5TM)
3-69	23/05/2000 (5TM)	16/07/2005 (5TM) 17/08/2005 (5TM)	25/08/2008 (5TM)
4-67	29/08/2001 (5TM)	23/07/2005 (5TM)	01/09/2008 (5TM)
4-68	07/07/1999 (5TM)	05/08/2004 (5TM)	01/09/2008 (5TM)

For the present case, a broader area (a buffer area of 50 km around all roads) than the project boundaries were analyzed, given that at the beginning those were bigger. Now, RRD and RRL were reduced and the only scenes required to cover our areas are 2-68, 2-69, 6-68 and 3-69, hence just them will be used to monitor in future periods.

A field assessment work has been done for accuracy of the whole map. The results show an accuracy of no less than 90% as requested by the methodology. The description of the process can be seen in 2.1.4.

2.1.2 Map of historic deforestation

The deforestation maps with paired data for periods 2000 -2005 and 2005-2008 were generated following the mapping procedure proposed by the Research Institute of the Peruvian Amazon (IIAP) and the Madre de Dios Regional Government. IIAP is the national entity in charge of producing maps for the ZEE of Madre de Dios, and their products are considered official for regional planning. This procedure consisted of:

- a) Selection and acquisition of Satellite images (explained above).
- b) The processing of the images met all recommendations given in the Sourcebook on REDD (GOFC-GOLD, 2009) and the Manual for elaboration of mosaics developed by the IIAP⁵⁴. The summarized process is detailed below:

- o Image conditioning

The acquired images were provided in compressed TIFF format. Decompression was done and exported to ERDAS IMAGINE matrix format (*.img) to then proceed to the union of spectral bands.

- o Geo referencing

The geo-referencing locates the image according to a coordinate system. For the Image of the year 2000, the geo referencing was made using the IGN (National Geographic Institute) National Charter vector data (scale 1: 100,000) as a reference.

For the other images the type of geo referencing was the Image to Image type and it consisted of using an image that has already a projection system, in this case the Mosaic of 2000 (2005 for the 2008 image). However, the IGN National Chart also served as a reference for validation of this geo referencing. The RMS (Root Mean Square) was minimal in all cases, complying with all the requirements for this step as explained in ERDAS field guide.

- o Detection and removal of clouds and shadows

Satellite images with less than 10% cloud cover were selected; the adequate corrections were made with the construction of the mosaic on the next step. According

⁵⁴ IIAP, BIODAMAZ Peru - Finland. 2004. Manual for the elaboration of mosaics of Landsat TM satellite imagery for the Peruvian forest lowlands. Technical Document Nr. 03. Iquitos – Peru.

to the Sourcebook on REDD (GOFC-GOLD, 2009), the preferred method for analysis on images with cloud cover is the visual interpretation, this is considered for step 3.

The cloud coverage for each scene per year is presented in the following table. This information was taken from the metadata shown by the image servers.

TABLE 40. Cloud Coverage in selected Landsat images

Scene Path-Row	Image 2000 CC%	Image 2005 CC%	Image 2008 CC%
p002r068	2.5%	0%	0%
p002r069	2.5%	7.5%	5%
p003r068	0%	0%* 2.5%**	0%
p003r069	2.5%	5%	0%
p004r067	2.5%	0%	0%
p004r068	0%	5%	7.5%

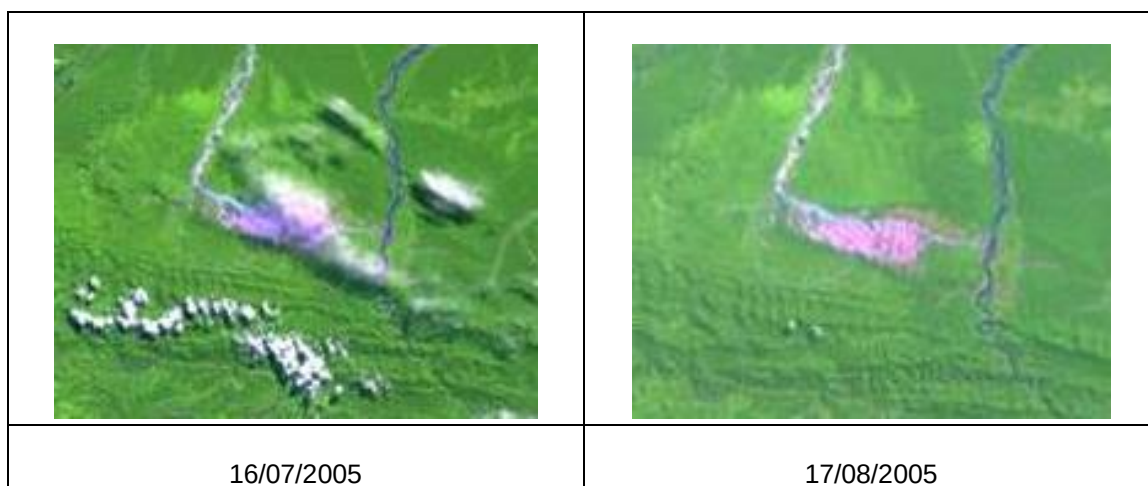
* Combined cc% for quadrants A and C (image 17/08/2005)

** Combined cc% for quadrants B and D (image 18/09/2005)

As can be seen, all the images have less than 10% of cloud coverage. For most cases, the selected images were already cloud free, but for scenes 3-68 and 3-69 there had to be used 2 images per each one.

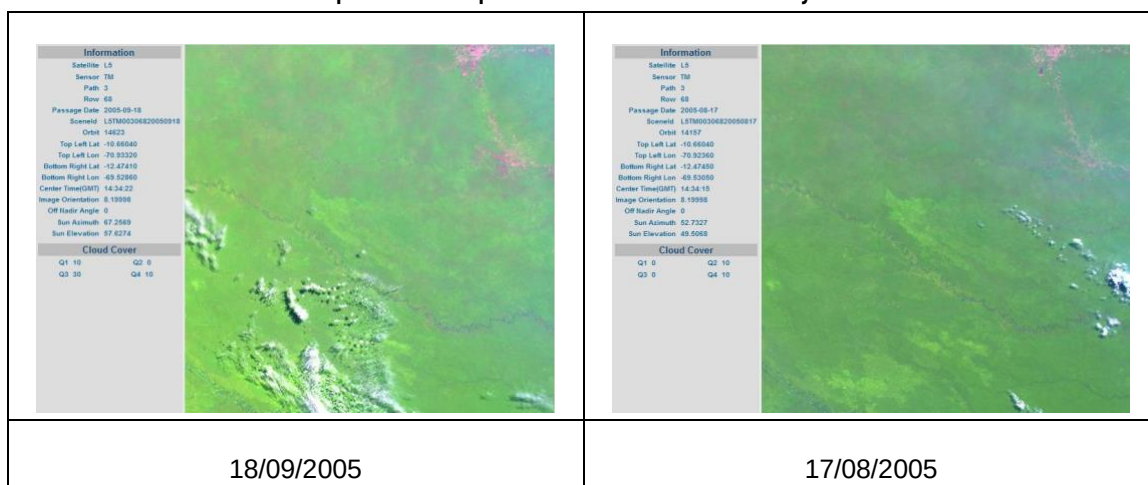
For scene 3-69, the image from 16/07/2005 which is almost free of clouds was overlapped in a small section (that did present clouds) with image from 17/08/2005. The generation of this mosaic was preferred as the second image has more CC% than the first, excepting the section used. A graphic is presented below to illustrate the work done.

FIGURE 6. Comparison of images for mosaic of scene 3-69 of year 2005



For scene 3-68, there were also 2 images used but not in the same way as in scene 3-69. Image of 18//09/200 was free of clouds in quadrants B and D, while image from 17/08/2005 was free in quadrants A and C. Therefore, a mosaic for this scene was done by using the mentioned quadrants from both images, in order to get the lowest cloud coverage as possible. The quick looks are presented next.

FIGURE 7. Comparison of quadrants for scene 3-68 year 2005



- o Radiometric enhancement

This step was performed with the software ERDAS IMAGINE v9.2. The radiometric enhancement was carried out on the digital values of the images to allow you to present a better visual appearance to the images.

- o Mosaic construction

It consisted of the assemblage of all the scenes in order to cover the entire area. The individual images were selected taking into account the visual appearance of these as well as an order for splicing. Consideration was given to the date of the image, to allow the information in the overlapped area to be the most recent. However, if the most

recent image had more cloud coverage, then the other image was preferred in the overlapping area.

c) Generation of vector data by visual interpretation of patterns of deforestation

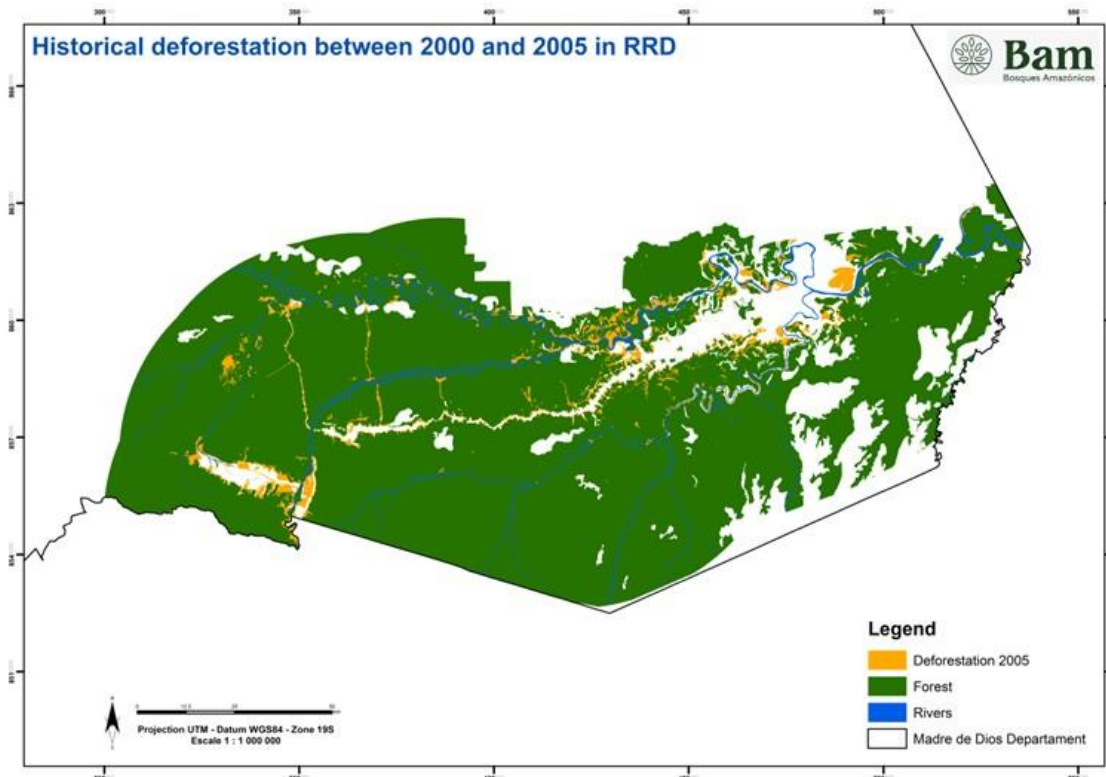
One of the main analysis methods for moderate resolution images is Visual Interpretation (Sourcebook on REDD GOF-C-GOLD, 2009). According to this document, it is a simple and robust method but time consuming, and also requires that the image analysis be performed by an experienced interpreter. In our case, the work was done for all the years by IIAP, the national institution in charge of preparing the maps for ZEE and with a large experience with this kind of process in other Amazon Regions. This step consisted of interpretation, digitizing, editing and encoding of deforestation.

d) Map accuracy assessment

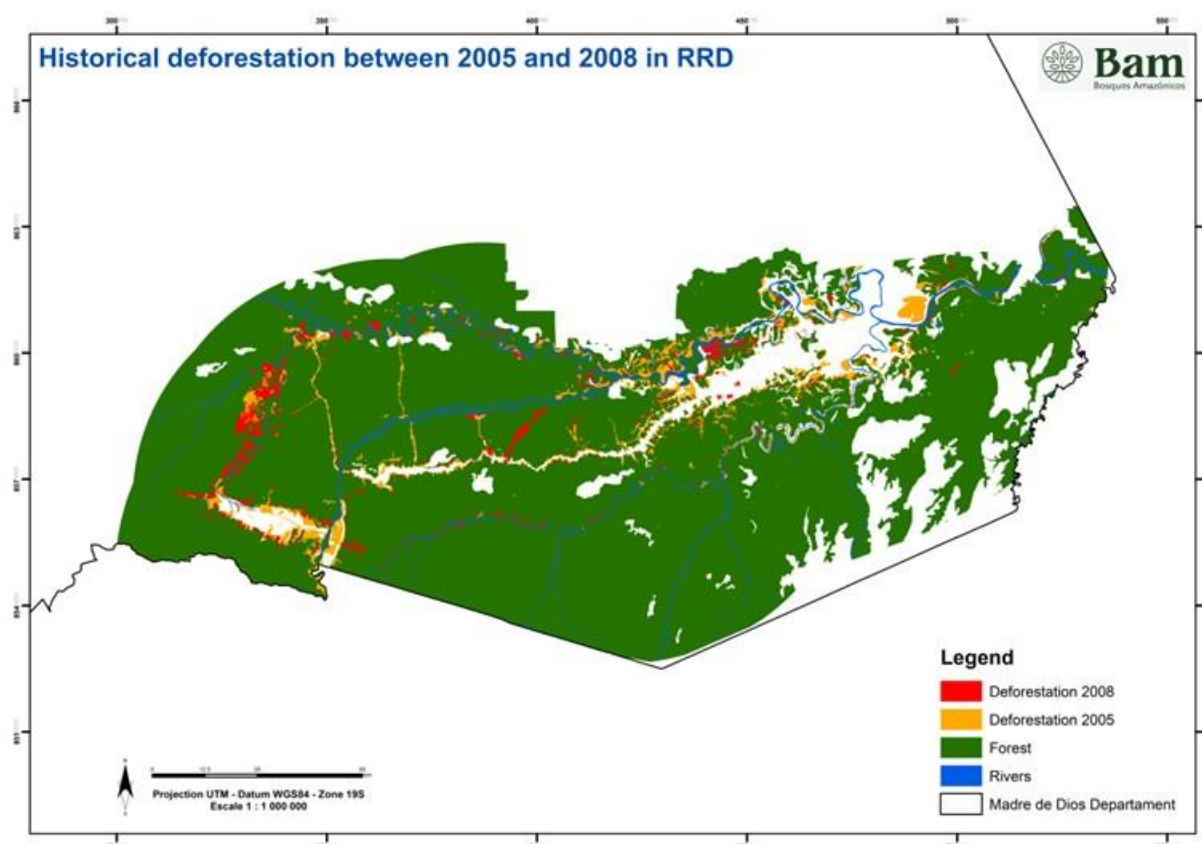
An accuracy assessment of maps was carried out in order to produce credible results of historical deforestation rate. For both classes: forest and non-forest, the minimum accuracy was 90%.

The outcome of this step is the paired maps showing the historical deforestation in RRD for the time periods 2000-2005 and 2005-2008. They can be seen in the following maps.

MAP 24: Historic Deforestation in RRD between years 2000 and 2005



MAP 25: Historic Deforestation in RRD between years 2005 and 2008



2.1.3 Historical Deforestation Calculation

The following charts show the forest and non-forest areas for each stratum of the Reference Region in the historic reference period, according with the previous analysis:

TABLE 41: Remaining Forest and Deforested Areas in the Opportunity Cost Strata in the Historic Reference Period

RRD Strata	CO – (ha)		CO + (ha)	
Year	Deforested	Remaining Forest	Deforested	Remaining Forest
2000	-	956,219.28	-	356,307.58
2005	13,050.12	943,169.16	39,905.6	316,401.98
2008	15,801.79	927,367.36	13,921.06	302,480.92

TABLE 42: Remaining Forest and Deforested Areas in Mining Stratum in the Historic Reference Period

	Mining Stratum (ha)	
Year	Deforested	Remaining Forest
2000	-	124,369.27
2005	16,906.26	107,463.01
2008	8,620.74	98,842.28

In the Mining Stratum, only the area formed by the mining concessions was used to get the deforestation rate, even though this stratum is also made up by the Quaternary Holocene geological layer. The main reason for this exclusion is that, to this date, almost all deforestation due to mining activities has been concentrated in the concessions or petitioners. However, it is expected that the rate seen in those areas would be the same in Holocene layer as it has equal mining potential.

Also, as mentioned before, the Mining Strata is overlapped by the remaining strata (mainly by the negative one).

2.1.4 Accuracy Assessment Map

An accuracy assessment of maps is required in order to produce credible results of historical deforestation rate. The minimum accuracy must be 90% for both classes: forest and non-forest.

In our case, an independent body, local NGO AIDER made the accuracy assessment for the 2008-year map as the most recent year.

The assessment of the digital interpretation was done using ground truthing data, according to the guidelines of methodology as described below:

a. Sampling Design

First, 6 large plots were established along the RRD, distributed over transition zones (areas where deforestation was observed). These areas were selected in order to be an acid test for the work done. Areas clearly deforested and areas without any threat of deforestation do not represent any difficulty for the work of image processing.

These 6 plots are rectangles with, as recommended by Sourcebook, a size of 5,000 hectares each. This makes up a total of 30,000 hectares of sampling area. GOFC-GOLD Sourcebook defines this method to join plots is a common practice known as cluster sampling, with the difference that the location of these rectangles have not been defined statistically but prioritizing transition areas (close the IOH). Each plot was divided in 200 squares (of 500 x 500 m) forming a grid of sub-plots. This grid was developed by AIDER⁵⁵

⁵⁵ The grid of points developed by AIDER is called "*Modelo de Aleatoriedad*".

in order to apply the selection method for choosing the sample points from each of the plots.

Then, from the grid, the sampling points were selected with the Systematic Non-Aligned Method proposed by Chuvieco (1996), which consists on searching randomly the first sampling point and, from it, determining the location of the other points at a systematically non-linear way. The excel function RANDOM was used.

This method allows introducing some randomness in the choice of the sample, while reducing the bias caused by frequency. Additionally, it guarantees a complete review of the whole area.

b. Sampling Size Determination

All statistical sampling has a sampling size according to the desired probability level or confidence level, the allowable error and the heterogeneity (standard deviation). For classified images, where variable is not quantitative but qualitative, a binomial distribution of the probability is recommended (Chuvieco, 2008), establishing the size of the sample with the following formula:

$$n = \frac{Z^2 p q}{E^2}$$

Where:

Z is the x value of standardized normal curve for a specific level of probability;

p is the expected percentage of success;

q is the expected percentage of error (q = 1 – p) and

E is the allowable level of error

Considering the success and failure percentage equivalent to 85% and 15% and an allowable level of error of 10% (for a 95% of confidence), the formula is established as below:

$$n = 1.96^2 \times 85 \times 15 = 48.98$$

$$10^2$$

It means that the minimum size required is 49 sampling points. In total 55 plots were selected and distributed in a proportional way in the 6 areas, with 9 sampling points in 5 areas and 10 10 sampling points in the remaining one.

c. Data Collection

With the support of a GPS, the selected coordinates were located. The classes under assessment are Forest and Non-forest. AIDER's field team visited the 55 points and, if it was not feasible to reach one (because it was located in a private property or in an unsafe zone of illegal mining), they moved to the nearest feasible point, according to the grid selection of points. In any case, the point was GPS referenced and a visual recording of the status of the area was established. The field data was recorded in a simple handbook.

An excel sheet with the coordinates and the field results can be seen in Appendix 6.

d. Results Analysis

With the list of field data and reference data, a squared matrix (m rows and m columns) called confusion matrix was built. Columns use to represent the reference classes (field information), while the rows represent the map classes. In this matrix, the diagonal represents the number of assessment points where both sources (map and field) agree, while the sides are errors of classification. The relationship between the right points and the total points means the global accuracy of map. The residues indicate field classes not included in map, while the residues in rows indicate map classes not verified in the field. In the following table, we show the confusion matrix for our project.

As recommended by GOFC-GOLD Sourcebook, user's accuracy formulae were used to determine the level of confidence for the map for both classes: forest and non-forest. In both cases, the percentage obtained was over the minimum requested by the methodology (90%).

TABLE 43: Confusion Matrix for the accuracy assessment

Predicted (Map) Classes	Actual (Field) Classes		Σ	Commission Errors %
	1	2		
1	25	2	27	7.41
2	1	27	28	3.70
Σ	26	29	55	
Omission Errors %	3.85	6.90		

Forest Accuracy 96.43 %

Deforestation Accuracy 92.59 %

Global Accuracy 94.55 %

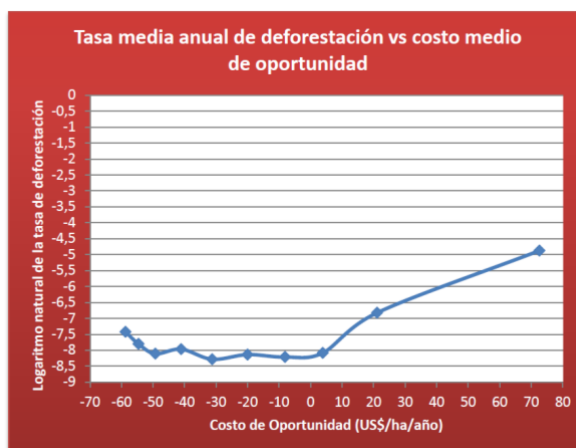
As can be seen, the accuracy for both classes is higher than the minimum allowed (90%). Therefore, no further correction is needed for the image. Also, the same accuracy level is assumed for the past images as they were elaborated following the same methodology.

2.2 Annual unplanned deforestation areas estimation in RRD

The modelled annual area of deforestation in the historical reference period for RRD was calculated using the Historical Average Annual Deforestation approach.

As explained before, the RRD was stratified in 3 areas: Mining, Negative Opportunity Cost (CO-) and Positive Opportunity Cost (CO+) Strata, based (also) on a preliminary graphic analysis of logarithm data of deforestation as a function of opportunity costs (independently that these costs are positive or negative). It shows that, for negative costs area, it is possible that other factors, different than opportunity costs, have more effects on deforestation rate as they show an increase in deforestation even with very negative values of opportunity costs (OC). The same thing was found out in the zone of mining activity, where a very high deforestation rate is observed even though the opportunity cost is very low.

FIGURE 8: Annual Average Deforestation Rate related with Opportunity Cost



As shown in Image 3, in areas with CO- the rate is not related with the value of this cost, while in the zone with CO+, the rate is directly related with the value of this cost.

This finding is one of the main reasons why RRD was stratified. The whole region does not have a homogeneous behavior so it would be wrong to use a general deforestation rate.

Therefore, to calculate historical rates for each RRD strata the areas presented in Table 16 were grouped for the whole reference period per stratum, and the following equation was used:

$$ABSL_{RRD,unplanned,t} = ARR_{D,unplanned,hrp} / T_{hrp} \quad (3)$$

Where:

$A_{BSL,RRD,unplanned,t}$ Projected area of unplanned baseline deforestation in the RRD in year t ; ha

$A_{RRD,unplanned,hrp}$ Total area deforested during the historical reference period in the RRD; ha

T_{hrp} Duration of the historical reference period in years; yr

t 1,2,3... t^* year elapsed since the projected start of the REDD project activity

TABLE 44: Historic Deforestation Rates

Strata	$A_{RRD,unplanned,hrp}$ (ha)	T_{hrp} (yr)	$A_{BSL,RRD,unplanned,t}$ (ha)
Mining	25,527.0	8	3,190.87
Positive Opportunity Cost	53,826.66	8	6,728.33
Negative Opportunity Cost	28,851.92	8	3,606.49

2.3 Annual unplanned deforested area estimated for the Project Area

Using the projected area of unplanned baseline deforestation in RRD we estimated the area to be deforested in RRL. The later was also stratified to get the rates per stratum, and the next formula was applied:

$$A_{BSL, RRL, unplanned, t} = A_{BSL, RRD, unplanned, t} * P_{RRL} \quad (4)$$

Where,

$A_{BSL, RRL, unplanned, t}$ Projected area of unplanned baseline deforestation in the reference region for location RRL in year t ; ha

$A_{BSL, RRD, unplanned, t}$ Projected area of unplanned baseline deforestation in RRD in year t ; ha

P_{RRL} Ratio of forest area in RRL at the start of the baseline period to the total area of the RRD, dimensionless

TABLE 45: Ratio of forest area in RRL to the total area of RRD

Stratum	RRD ha	Forest in RRL at 2008 ha	P_{RRL}
Mining	124,369.27	40,097.3	0.32
Positive Opportunity Cost	356,307.58	551,324.9	1.55

Negative Opportunity Cost	956,219.28	1'053,295.57	1.10

TABLE 46. Projected Areas of unplanned baseline Deforestation in RRL

Stratum	ABSL, RRD, unplanned, t ha	P _{RRL}	ABSL, RRL, unplanned, t	
			ha	%
Mining	3,190.87	0.32	1,028.75	2.566
Positive Opportunity Cost	6,728.33	1.55	10,410.94	1.89
Negative Opportunity Cost	3,606.49	1.10	3,972.62	0.38

Given that the deforestation model works with rates in percentages rather than in areas, each stratum's rate was transformed using a simple equation:

$$ABSL, RRL, unplanned, t (\%) = ABSL, RRL, unplanned, t (ha) \times 100$$

Forest in RRL at 2008 (from Table 18)

In this way, the projected deforestation advances at a historical constant rate in each stratum (different between them as can be seen in Table 19).

It is also worth mentioning that previously a regression equation was being used for the CO+ stratum. In this equation the deforestation rate was a function of the opportunity cost; however, after the reduction of the RRL's area, it became not significant ($r^2 < 0.75$), therefore it is no longer used.

PART 3. LOCATION AND QUANTIFICATION OF UNPLANNED DEFORESTATION THREATS

3.1 Location analysis

The type of deforestation in RRL is "frontier deforestation", so location analysis is required.

3.2 Preparation of data sets for spatial analysis

3.2.1 Spatial Models Requirement

According to the module, project proponents must identify the model/software that will be used to analyze where deforestation is most likely to happen in future periods. The model/software used must:

- o Be peer-reviewed
- o Be transparent (no "black box" calculations such as neural networks)

- o Incorporate spatial datasets that have been documented to explain patterns of and are correlated with deforestation (both raster and vector)
- o Be able to project location of future deforestation

The DINAMICA EGO tool (<http://www.csr.ufmg.br/dinamica/>) was used to determine the location of future deforestation. This software was developed by the Center of Remote Sensing from the Universidad Federal de Minas Gerais, leaded by internationally acknowledge scientist Britaldo Silveira Soares-Filho. The first version was used to model different scenarios of deforestation trend throughout the whole Amazon Basin, published in Nature magazine, Vol. 440|23 March 2006|doi:10.1038/nature04389 and has been used lately for many other institutions as Carbon Decisions International (Lucio Pedroni's consultancy company), among others. In that sense, we consider that the software has been largely peer-reviewed by recognized scientists and REDD experts worldwide. As can be read in the program guidelines, information of local experts can be introduced in substitution of pure statistical parameters, if considered.

Here is a list of other regional studies, mainly conducted in the Amazon basin and using DINAMICA EGO, confirming that it is peer-reviewed software used to model natural and social dynamics:

- o Almeida, C.M. et al Modeling Urban Land Use Dynamics through Bayesian Probabilistic Methods in a Cellular Automaton Environment. INPE- UFMG.
- o Soares-Filho, B. et al. DINAMICA – a stochastic cellular automata model designed to simulate the landscape dynamics in an Amazonian Colonization Frontier. ELSEVIER, Ecological Modeling 154 (2002) 217-235.
- o Mas, J.F.; Flamenco, A. 2011. Modelación de los cambios de coberturas/uso del suelo en una región tropical de México. GEOTROPICO, 5(1), Artículo 1:1-24.
- o Nunes, F. et al. Economic benefits of conservation: assessing the potential rents from Brazil nut concessions in Madre de Dios, Peru, to channel REDD+ investments. Foundation for Environmental Conservation 2012.

Also, as can be seen in many guidelines and YouTube videos (www.youtube.com/watch?v=D8L_CtFgDKA, www.youtube.com/watch?v=9JS_zDyIB2o, <http://www.youtube.com/watch?v=fQwsRlloPzQ>), detailed explanations of how it works are available and many trainings have been given to Peruvian (public and private) organizations to ensure that the software is adequately understood. In this way, it is clear enough how the software works and how different drivers and patterns affect the location of future deforestation and, for these reasons, we consider it meets transparency criterion.

For the project's case, the model created to project the deforestation in RRL, can be visualized as a diagram at the interface of the program. Thus every operation performed is known as well as its respective sub-result.

Regarding the inclusion of spatial datasets, model developed in DINAMICA has included different geographic layers in raster format, as distance to roads/rivers/deforested areas/settlements/markets and land tenure types (concessions for different resources, etc.) among

others. All of them have different responses to deforestation depending on their nature (e.g. Forestry Concessions repel deforestation, while IOH attracts it), and for that, shape the future deforestation. It is worth noting that the correlation between all these spatial datasets were also calculated, removing those highly correlated.

Software has been specifically designed to predict, based on historical and new circumstances, future cover category maps (forest / non forest, for our case). In that sense, we consider that DINAMICA EGO software meets with the 4 requirements mentioned above. More information can be found in their website or the studies also mentioned.

3.2.2 Preparation of spatial datasets

Existing digital layers that are officially used in the Madre de Dios Region were collected from different institutions (GOREMAD, ACCA, COFOPRI, etc.), trying to get at least 1 factor of each of the four classes presented in the module.

TABLE 47: Spatial Datasets collected for the project

Spatial Dataset	Source	Year
Reforestation Concessions	Forestry and Wildlife General Direction (DGFFS)	2010
Forestry Concessions	Forestry and Wildlife General Direction (DGFFS)	2010
Brazil Nut Concessions	Forestry and Wildlife General Direction (DGFFS)	2010
Mining Concessions	Geological Mining and Metallurgical Institute (INGEMMET)	2011
Land Use Capacity	Peruvian Amazon Research Institute (IIAP) - Regional Government of Madre de Dios (GOREMAD)	2009
Protected Natural Areas	National System for Protected Natural Areas (SERNANP)	2009
Native Communities	Instituto del Bien Común (IBC)	2009
Quaternary Holocene	Peruvian Amazon Research Institute (IIAP) - Regional Government of Madre de Dios (GOREMAD)	2009
Agricultural Parcels (PETT)	Regional Government of Madre de Dios (GOREMAD)	2009
Geology	Peruvian Amazon Research Institute (IIAP) - Regional Government of Madre de Dios (GOREMAD)	2009
Productive Aptitude	Peruvian Amazon Research Institute (IIAP) - Regional Government of Madre de Dios (GOREMAD)	2009
Vegetation	Peruvian Amazon Research Institute (IIAP) - Regional Government of Madre de Dios (GOREMAD)	2009

Interoceanic Highway (IOH)	Regional Government of Madre de Dios (GOREMAD)	2009
Secondary Roads until 1999	Regional Government of Madre de Dios (GOREMAD)	2009
Secondary Roads until 2007	Asociación para la Conservación de la Cuenca Amazónica (ACCA)	2009
Hydrographic System	Peruvian Amazon Research Institute (IIAP) - Regional Government of Madre de Dios (GOREMAD)	2009
Settlements	Regional Government of Madre de Dios (GOREMAD)	2009

The column Year of the above chart refers to the year in which the data was obtained from the official sources, also listed. All of these sets were received in shape (vector) files and were adequate, in ArcGIS 10.0 with the tool ArcToolbox – Analysis tools – Extract – Clip, to match only areas located within the RRL. Finally, they were converted to raster files automatically by the modeling software.

The data sets were created from GPS coordinates obtained by the respective institution (listed in Table 20) through field work are:

- o Reforestation Concessions
- o Mining Concessions
- o Native Communities
- o Agricultural Parcels (PETT)
- o Brazil Nut Concessions
- o Interoceanic Highway (IOH)
- o Forestry Concessions
- o Secondary Roads until 1999
- o Secondary Roads until 2007
- o Settlements

Many of these datasets are in constant actualization (PETT and concessions) because new concessions are granted or reshaped (through a process of re-measurement or re-delimitation given that there are some problems of overlap), Therefore we obtained from each source the most actual ones.

It is worth noting that all the above mentioned files are constituted by polygons and/or points, whose areas and boundaries are officially used by the National and Regional Government when signing new concession contracts, planning infrastructure projects, doing zoning work, etc.

Most of these areas can be easily viewed in a nationwide scale in the websites of public institutions, like:

- o http://dgffs.minag.gob.pe/pdf/mapas_tematicos/Concesiones%20Maderables%20y%20No%20Maderables.pdf
- o <http://www.sernanp.gob.pe/sernanp/bmapas.jsp>

The maps coming from the Ecologic Economic Zoning, developed by IIAP-GOREMAD in 2009, are based in multiple datasets which were processed following IIAPs methodology, which can be seen in a diagram in Appendix 7. These datasets are:

- o Landsat 5 TM images (30 x 30 m of spatial resolution) with 7 bands: 3 from the visible spectrum and 3 from the infrared spectrum. Band 6 (from the thermal infrared spectrum) is sub-divided in 2 sub-bands and has a resolution of 120 m for sensor TM. This sensor is always recommended because it has been created specifically for natural resources research.
- o National Chart (Scale 1:100000) compared with satellite information since 1979 and periodically updated. 45 charts were used to cover Madre de Dios Region developed in the world geodesic system of year 1984 (WCS84), prepared by the National Geographic Institute. Each chart includes level curves, land cover, rivers, lakes and islands and other relevant signals. Geometric correction (geo-referencing) was also done for each image. Relevant benchmarks (as bridges or settlements) were geo-referenced and used to stabilize the images and keep the margin of error within $\pm 7-15$ meters.
- o RADAR images for topography and slope with panchromatic 100 meters band.
- o Planimetric Maps (Scale 1:250000) to fill areas not covered by National Chart because of clouds.
- o Political Map (Scale 1:1000000) Source: National Geographic Institute (IGN), 1983.
- o Ecological Map (Scale 1:1000000) Source: National Office of Evaluation of Natural Resources (ONERN) - 1973, 1994.
- o Climatic Map (Scale 1:1000000) Source: SENAMHI, 1988.
- o Forest Map (Scale 1:1000000) Source: ONERN – 1995.

For a further review of the entire digital process, the work document Digital Processing of Images and Modeling from ZEE was sent.

It should be mentioned that the same processing techniques used in Landsat images for ZEE were applied in the analysis of the historic deforestation of the RRD.

All Spatial Datasets collected, excepting Natural Protected Areas (ANP) because no ANP is located inside the RRL, were used to create the variables used in the modeling as shown below:

TABLE 48: Spatial variables per class used in the modelling process

Classes	Factors
Landscape	Soil Use (1)
Landscape	Holocene Quaternary (2)
Landscape	Geology (3)
Landscape	Productive Aptitude (4)
Landscape	Vegetation (5)
Accessibility	Distance to Secondary Roads (6)
Accessibility	Distance To Rivers (7)
Accessibility	Distance to Interoceanic Highway - IOH (8)
Anthropogenic	Distance to Settlements (9)
Anthropogenic	Distance to Deforested Areas (10)
Land Tenure	Reforestation Concessions (11)
Land Tenure	Forestry Concessions (12)
Land Tenure	Brazil Nut Concessions (13)
Land Tenure	Mining Concessions (14)
Land Tenure	Native Communities (15)
Land Tenure	Agricultural Parcels – PETT (16)

These spatial variables are classified by the type of data they represent. In that sense, the two categories of variables are:

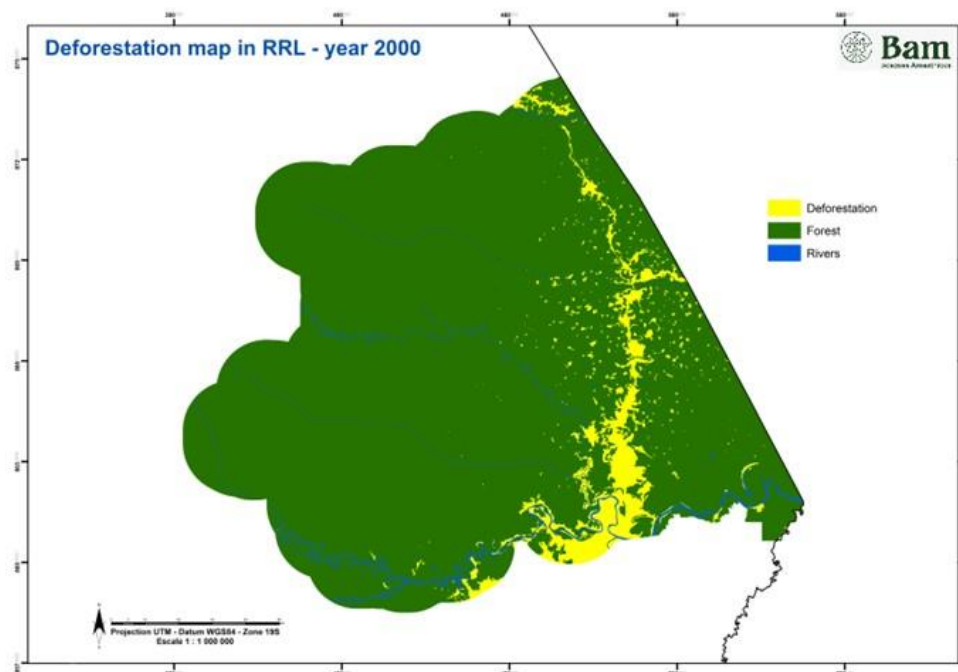
- o Categorical variables: landscape and land tenure factors.
- o Continuous variables: accessibility and anthropogenic factors.

These files are converted in raster files as DINAMICA EGO only works with this type of data. All shape files were transformed to a raster matrix with ArcGIS version 9.3 (ESRI, 2008).

The forest/non-forest maps for RRL were made from the same mapped images used for RRD, given that we analyzed a broader area than both regions. The procedures for elaborating theses

maps were already explained in steps 2.1.1 to 2.1.4 of this module, and meet all the requirements listed in said steps. They are also in raster files.

MAP 26. Deforestation Map in year 2000 RRL



Map 27. Deforestation Map in year 2005 RRL

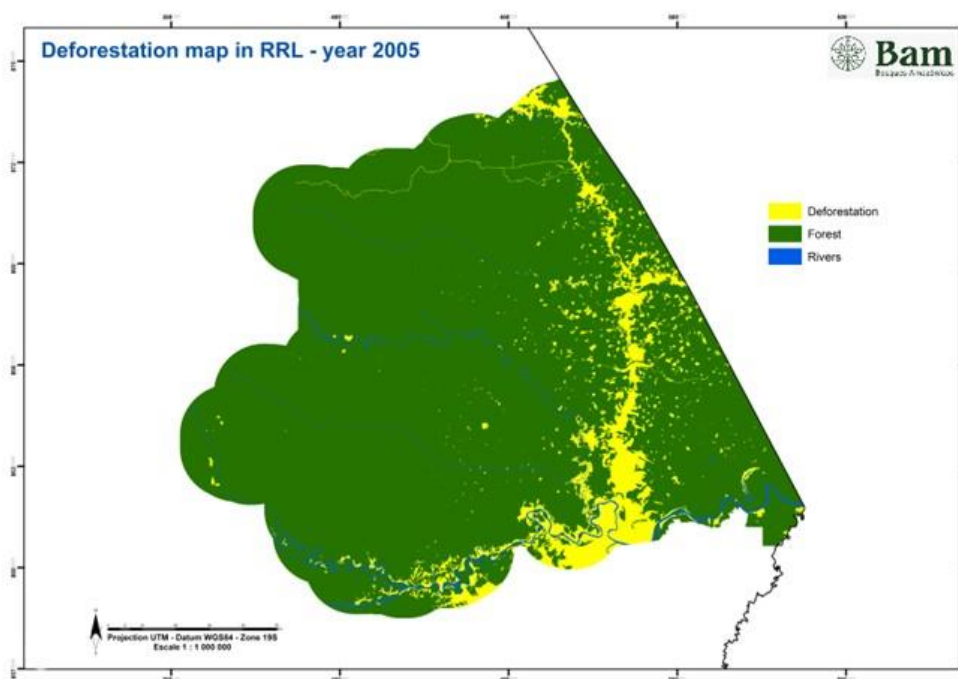


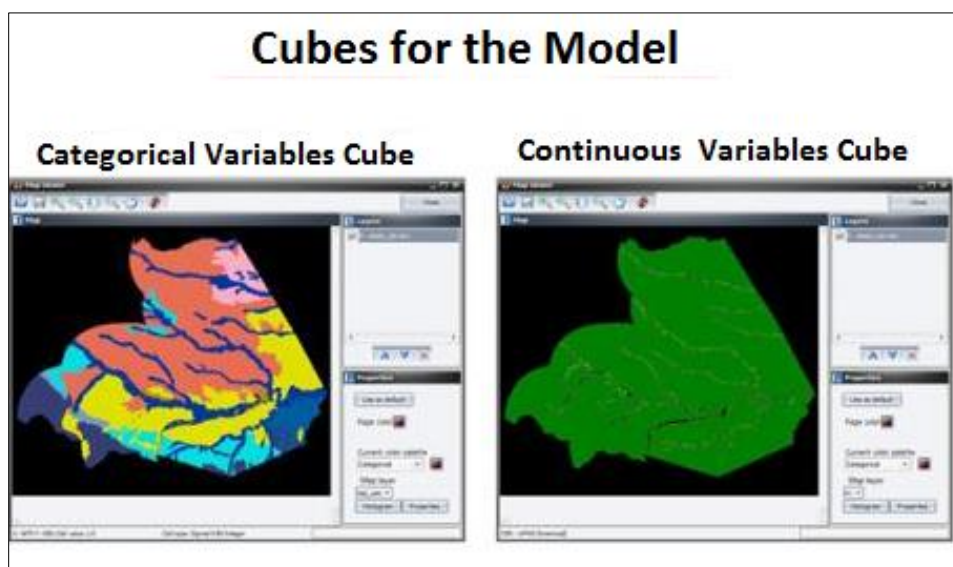
TABLE 49: Spatial properties for raster files

After the conversion of all the spatial variables to raster files, they are grouped in Cubes to create a processing unit. Specifically, these cubes are multilayer maps that organize the spatial data to be entered in the modeling process. This operation is done in DINAMICA EGO. The two cubes created are:

- The process of cubes creation is graphed in the following example diagram:

v3.0

FIGURE 10: Cubes for the Model



3.3 Preparation of Deforestation Risk Maps

The process of elaborating Risk Maps consists in two major steps: Calibrating the model and Modeling with the outputs from the calibration.

Model Calibration

Its main objective is to obtain results of the incidence that the variables gathered have over the deforestation process. Calibration consists in 2 sub-steps called Calculation of Correlation that could exist between variables and Calculation of Weights of Evidence. To do this, we worked with deforestation maps for year 2000 and 2005 that gave us a calibration period of 5 years.

a. Calculation of Correlation

As the modeling is based on the statistical method “Weights of Evidence”, whose condition is that no correlation exists between the factor maps, and given that some of them represent similar factors (e.g. Geology's Map and Holocene Quaternary's Map); a correlation analysis for all the factors (from 1 to 16 showed in Table 21 taken together) was done in DINAMICA EGO, using Cramer's Test and Joint Information Uncertainty's Test. The maximum acceptable values were 0.5 for each⁵⁶.

The result from this analysis is that the following factors are correlated (surpassed the maximum limit of 0.5 in either of the methods) and should not be used at the same time:

TABLE 50: Pair of factors correlated

⁵⁶ Soares-Filho *et al.* empirically established thresholds of 0.45 for Cramer Test and of 0.35 for Joint Information Uncertainty's Test, nevertheless Bonham-Carter (1994) mentioned by Almeida (2004) states that inferior values than 0.5 for both methods represent less association between variables than otherwise.

Distance to Deforested Areas	PETT
Distance to Deforested Areas	Forest Concessions
Productive Aptitude	Geology
Productive Aptitude	Soil Use
Productive Aptitude	Vegetation
PETT	Distance to IOH
PETT	Vegetation
Soil Use	Geology
Soil Use	Vegetation
Holocene Quaternary	Geology
Holocene Quaternary	Soil Use
Holocene Quaternary	Productive Aptitude
Holocene Quaternary	Vegetation
Holocene Quaternary	Distance to Rivers
Distance to IOH	Forest Concessions
Distance to second roads	Forest Concessions

With this information we created 10 scenarios (simulations) that combined differently the factors mentioned above, being careful not to mix those correlated. For security, the same correlation analysis was remade for each scenario, to check the inexistence of any correlation.

TABLE 51: Scenarios tested

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10
1	1	5	4	1	3	2	4	3	2
6	6	6	6	6	5	6	6	6	6
7	7	7	7	7	6	8	7	7	9
8	9	8	8	9	7	10	9	9	11
10	10	10	10	11	8	11	11	11	13

11	11	11	11	13	10	13	13	13	14
13	13	13	13	14	11	14	14	14	16
14	14	14	14	15	13	15	15	15	16
15	15	15	15	16	14		16	16	
					15				

* The numbers in the table correspond to the given value to each factor in Table 21.

The correlation analysis confirmed that the drivers are not correlated, though there are Cramer values in some scenarios that are near the limit. It was also seen that all JIU values were less than 0.5 by far. For these reasons, we did develop a Risk Map for all the scenarios. The graphic results of Scenario 3 can be seen in Appendix 8.

TABLE 52: Highest Cramer Values per scenario

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10
1-14 (0.47)	1-14 (0.47)	5-13 (0.46)	4-13 (0.479)	9-16 (0.48)	3-5 (0.47)	-	9-16 (0.48)	9-16 (0.48)	9-16 (0.48)
			4-14 (0.478)	1-14 (0.475)	5-13 (0.46)		4-13 (0.479)	6-16 (0.467)	6-16 (0.467)
				6-16 (0.467)			4-14 (0.478)		
							4-16 (0.472)		
							6-16 (0.467)		

* The numbers in the table correspond to the given value to each factor.

b. Calculation of weights of evidence

The approach of Weights of Evidence is the basis of the model for projecting deforestation. This technique allows mixing different patterns simultaneously in a unique equation for the calculation of probability of occurrence of transitions (Forest to Non-Forest) in the presence or under the simultaneous influence of the different variables.

For the Calculation of the Weights of Evidence, the Deforestation Maps of years 2000 and 2005 were used. As mentioned before, these maps are already in raster files and equal the model raster matrix.

The layers of Rivers, IOH, Secondary Roads and Bridge (Billinghurst Bridge over the Madre de Dios River) were overlaid on each of the deforestation maps mentioned. The resulting maps are called Land Coverage Maps, and the values for the pixels of the raster files mentioned making the maps are:

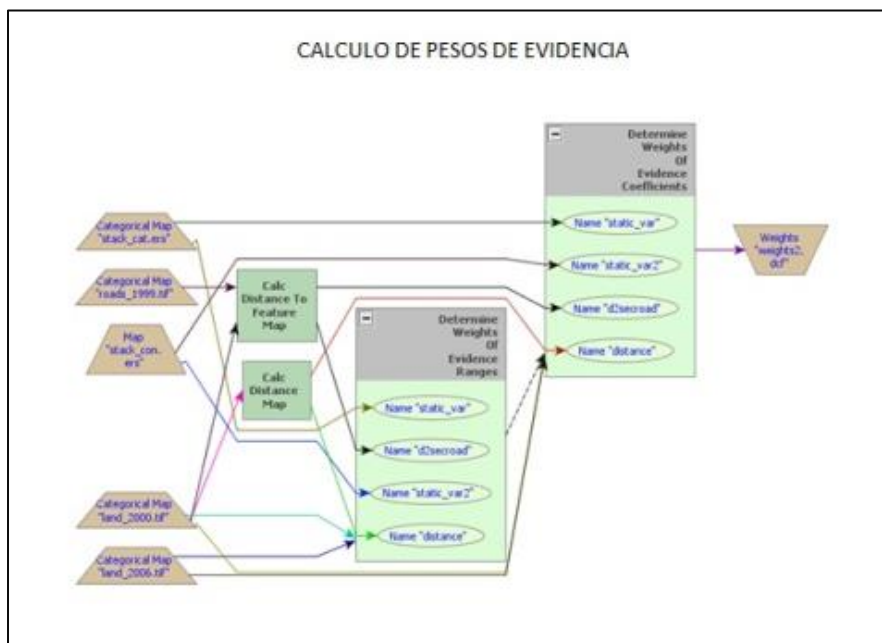
TABLE 53: Pixel Values for the Land Coverage Maps

Land Cover	Pixel Value
Forest	2
Deforestation	1
Secondary Roads	3
Interoceanic Highway	4
Rivers	5
Bridge	6

A model in DINAMICA EGO was elaborated to create the weights of evidence. This model considers a final classification of the variables:

- o Static Variables, represented by the variables inside the Categorical Variable Cube and Continuous Variable Cube.
- o Dynamic Variables, represented by the Distance to Deforested Areas and the Distance to Secondary Roads (which were not included in the cubes).

FIGURE 11. Weights of Evidence calculation



An example of the results obtained from this process is shown in Image 7. The guidelines of the software state that the project developer should use the values automatically generated by the

model. Nevertheless, they can be changed if peer review exists or if experts' opinion is collected for the given weight of evidence value. For the project, no weight evidence value was changed.

FIGURE 12. Graphic with a result of the Weights of Evidence for Natural Protected Areas

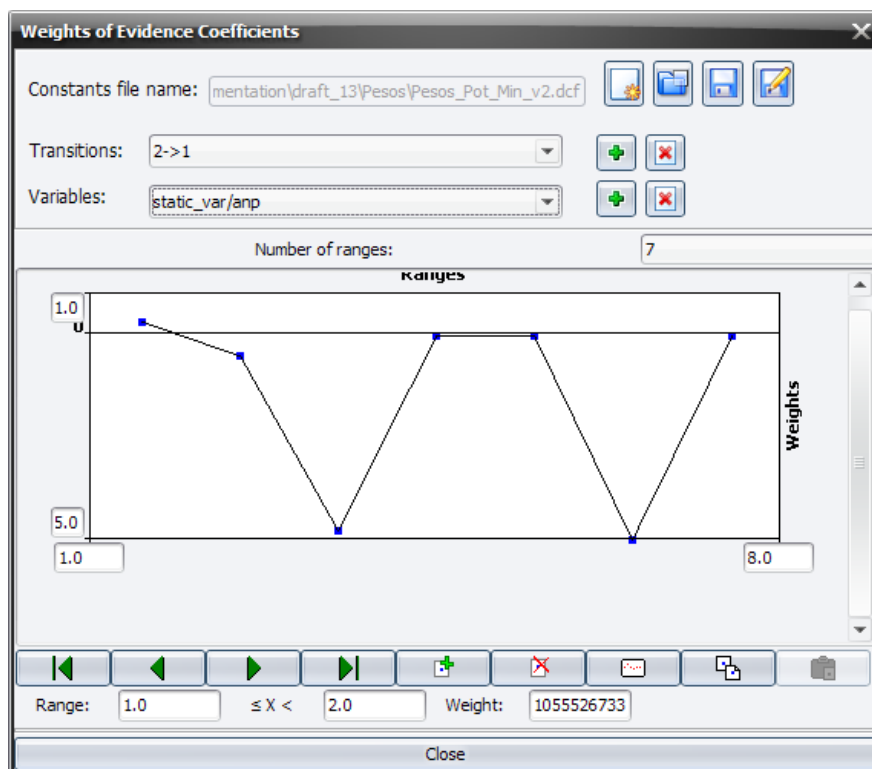


TABLE 54. Interpretation of the Weights of Evidence Values

Value	Interpretation
Negative value (-)	Range of the driver that rejects the transition (Forest to Non-forest)
Neutral value (0)	Range of the driver that is neutral
Positive value (+)	Range of the driver that attracts the transition (Forest to Non-forest)

The process for calculating the weights of evidence was repeated for each one of the scenarios (simulations), as they combine differently the variables used.

It is worth noting that the Weights Evidence Method is a peer review procedure, used in the studies made on the Amazon Basing mentioned in sub-step 3.1.1

Modelling

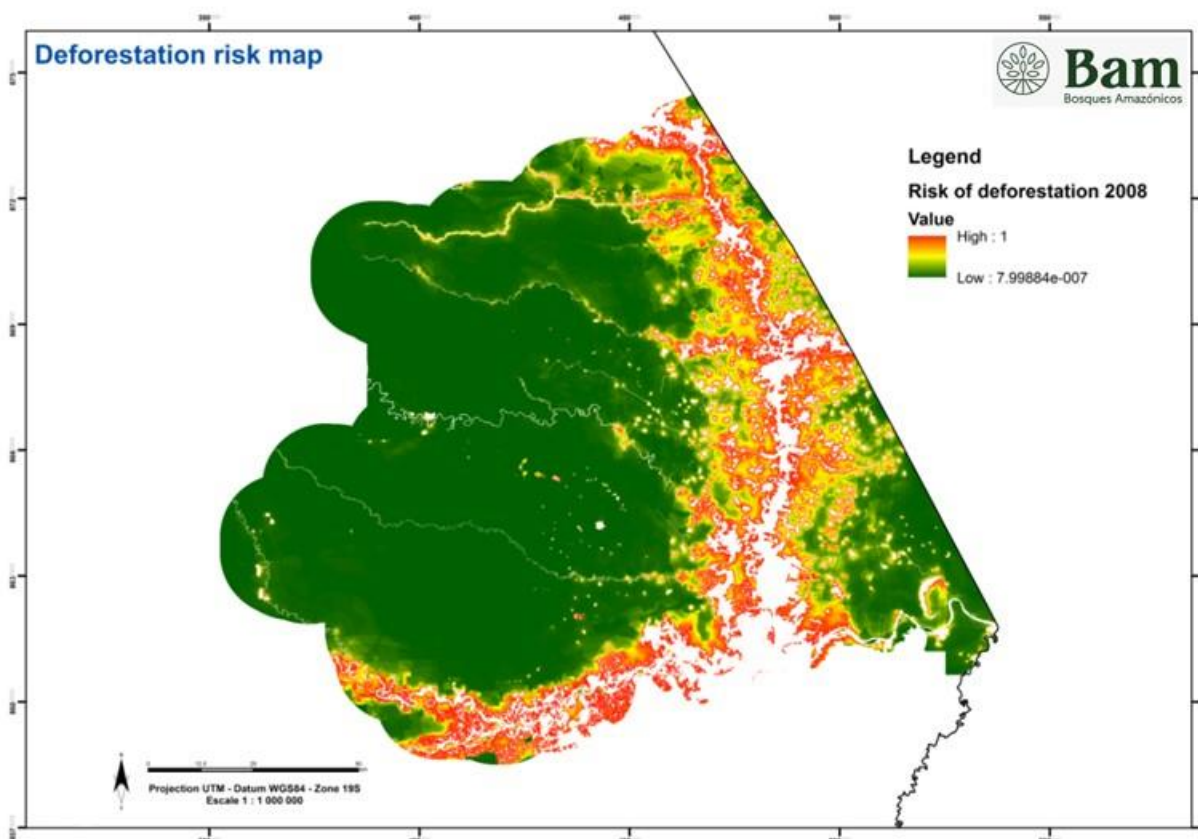
In order to generate the Risk Maps, the following data are entered into the Model of Deforestation:

- o The results of the calibration process (weights of evidence for each scenario defined by the mix of variables selected based on the correlation results).
- o The Historic Rates of Deforestation of the 3 Strata.
- o The Categorical Variables Cube and the Continuous Variables Cube.
- o Dynamic Variables
- o Map of Deforestation of year 2005

The model is run and a Risk Map for each scenario (simulation) under test is obtained, for comparing them in next step, so that the most accurate one would be used for modeling the Baseline deforestation.

The Risk Maps were prepared to indicate the risk of deforestation, for each pixel location, in a numeric scale. In this case, the pixels take values from 0 (minimum risk) to 1 (maximum risk).

MAP 28. Risk Map of Scenario 3



3.4 Selection of the most accurate Deforestation Risk Map

This selection is achieved through the confirmation (validation) of the models of deforestation created, and by the subsequent comparison of those results.

From the Risks Maps created of each scenario, we elaborated Predictions Maps for the confirmation period (2005-2008). These Prediction Maps were overlapped to the map showing real deforestation in the confirmation period. This map is represented by the Real Deforestation Map of 2008 in RRL that was created following the same criteria used for the other Coverage Maps of year 2000 and 2005, with the only difference that the secondary roads map of year 2007 was used given that is the most actual one.

By comparing the predicted areas of each map versus the real deforestation seen in the Real Deforestation Map of 2008, the Figure of Merit (FOM) was calculated according to the following equation:

$$\text{FOM} = \frac{\text{CORRECT}}{\text{CORRECT} + \text{ErrA} + \text{ErrB}} \quad (15)$$

Where:

CORRECT Area correct due to observed change predicted as change; ha

ErrA Area of error due to observed change predicted as persistence; ha

ErrB Area of error due to observed persistence predicted as changed; ha

The results in Table 28 show that all the Prediction Maps have FOM values over 60%, which complies with the minimum limit of 40% for frontier deforestation. All the Prediction Maps as well as the Real Deforestation Map of 2008 in raster files are at disposition by request for further revision. The FOM calculations can be seen in the excel file Castañeros REDD Project Calculations v5.xlsx, spreadsheet FOM.

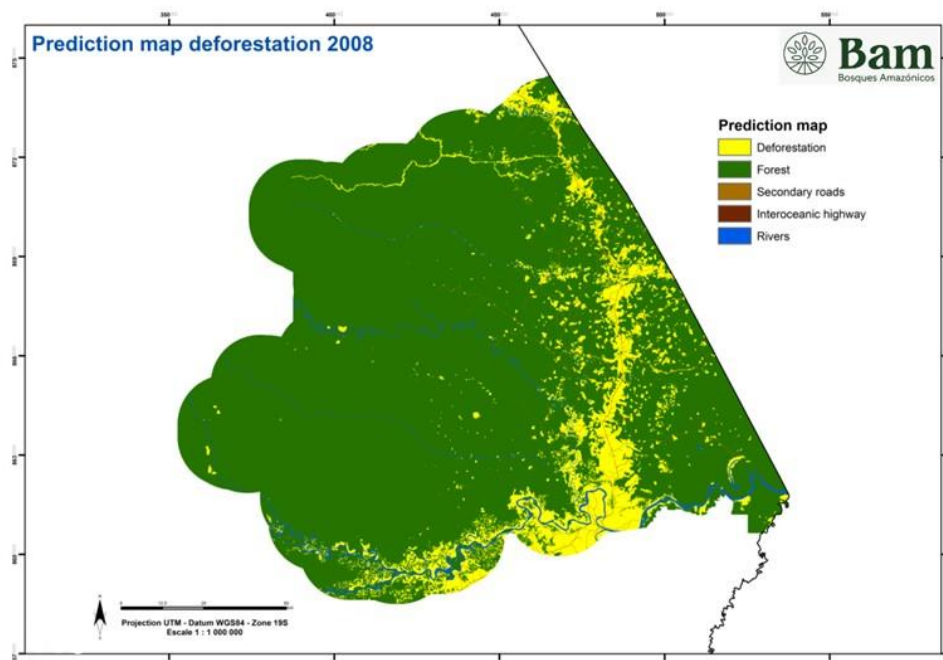
TABLE 55. FOM values for the simulations

	Prediction Maps									
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10
Correct (ha)	147,575.3	147,265.8	149,309.4	149,402.6	146,559.5	149,611.3	147,254.2	148,169.6	146,421.4	146,210.7
Err _A (ha)	18,284.2	18,578.1	16,502.7	16,427.1	19,166.4	16,177.1	18,614.9	17,681.3	19,421.5	19,606.0
Err _B (ha)	46,091.9	46,363.6	44,222.7	44,067.4	47,060.8	43,833.0	46,250.7	45,505.6	47,316.8	47,513.4
FOM	0.696	0.694	0.711	0.712	0.689	0.714	0.694	0.701	0.687	0.685

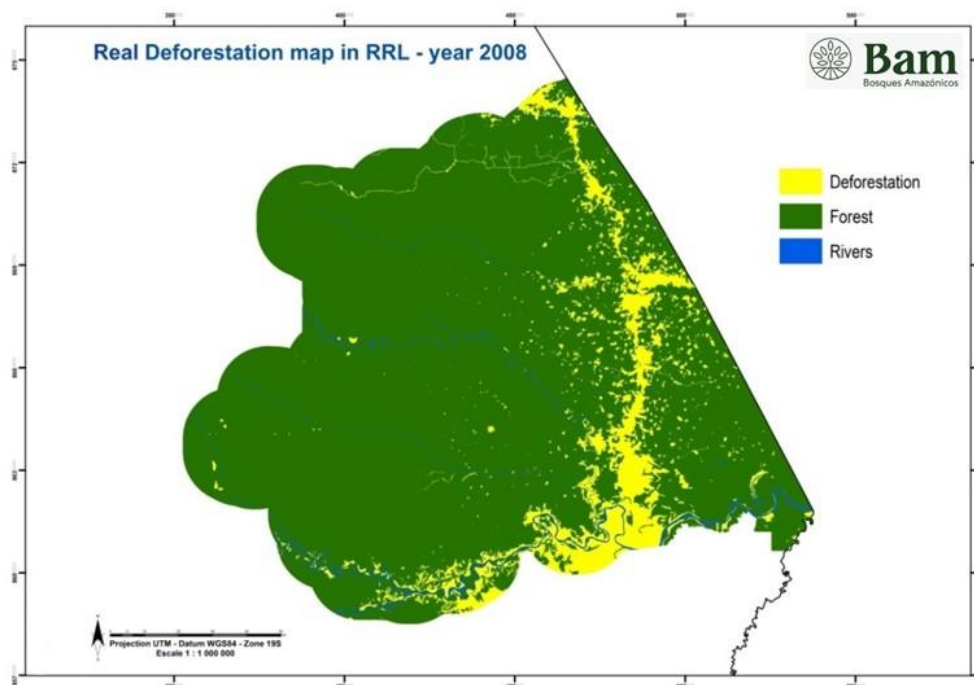
The scenarios with the highest FOM values are S3, S4 and S6. However, the later uses 10 factor maps while the first two use only 9. By comparing the correlation test results, it is evident that the factor Productive Aptitude (used in S4) tends to correlate with more factors, having therefore 2 correlation values near the maximum limit. In the other hand S3 has only 1 value (0.46 between

Brazil nut concessions and vegetation) which is lower than the 2 before mentioned. For these reasons we have chosen the Prediction Map from Scenario 3.

MAP 29. Prediction Map of Scenario 3 of projected deforestation until year 2008



MAP 30. Real Deforestation Map in RRL until year 2008



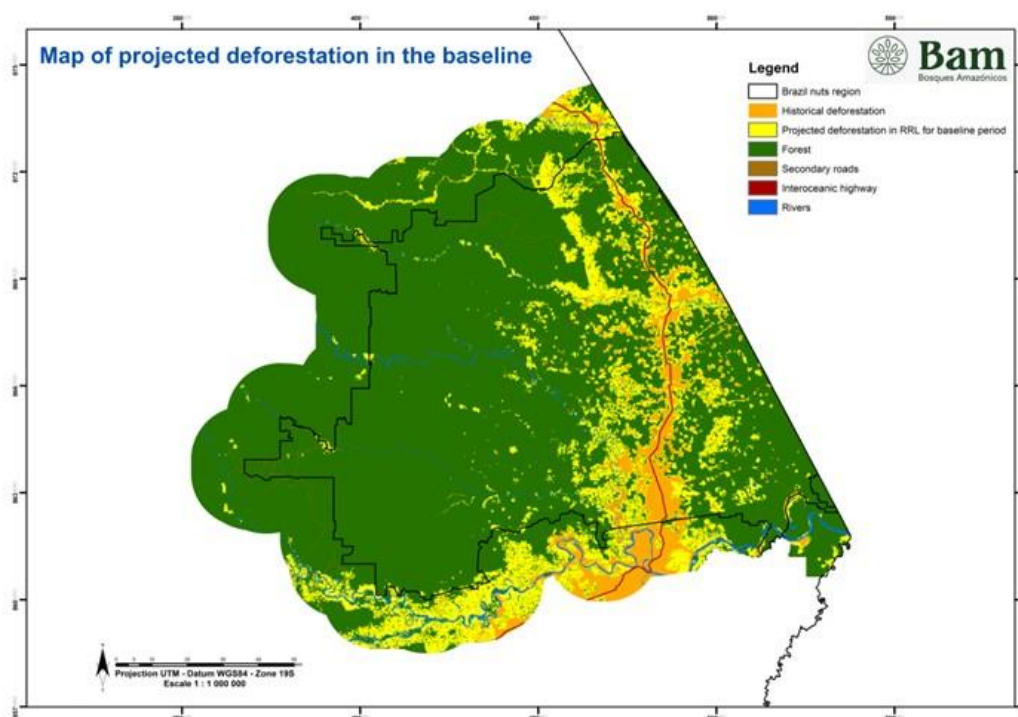
3.5 Mapping of the locations of future deforestation

3.5.1 Where location analysis has been conducted

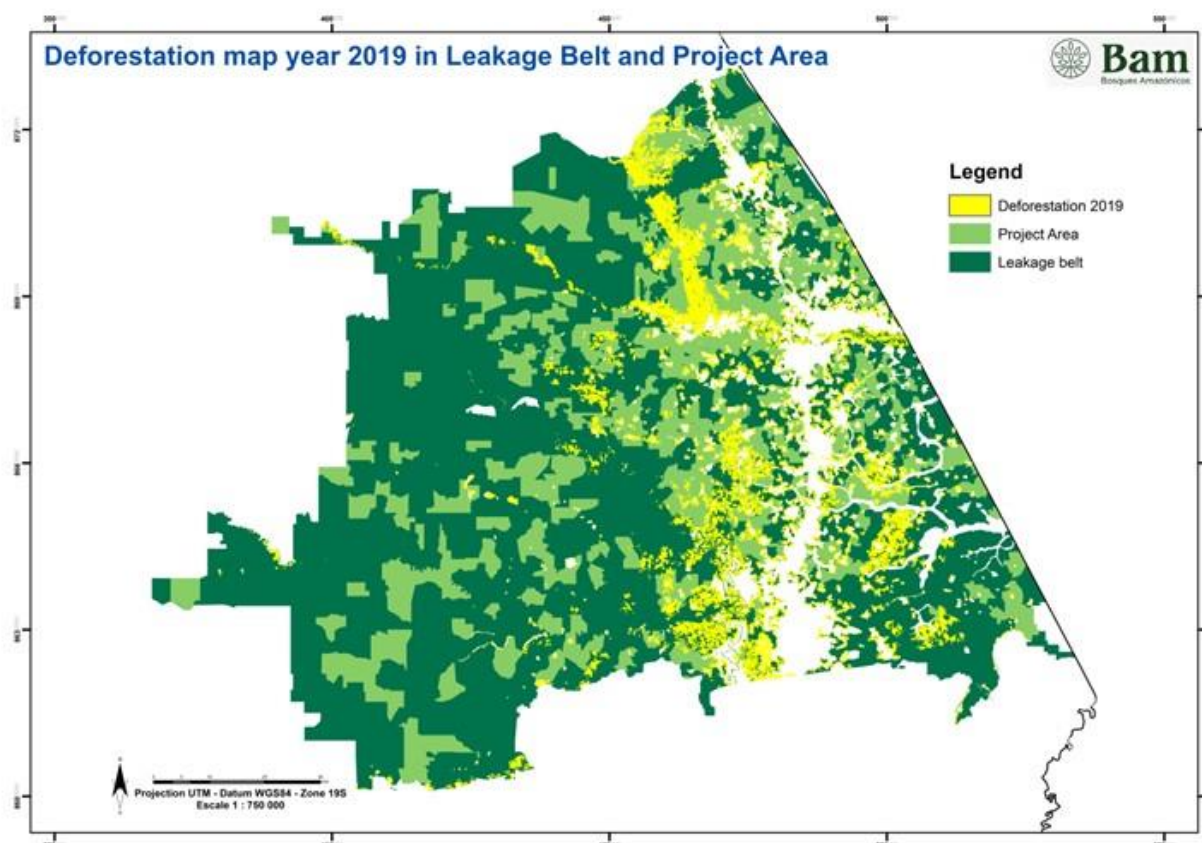
The model allocates land use change from forest to non-forest to pixels with the highest deforestation risk value, based on the deforestation Risk Map, as much as necessary to cover the amount of hectares to be deforested, which has been calculated for each stratum from its different rates (historical in both cases and dynamic, year-dependent for CO+ stratum). A map of baseline deforestation for year 1 is generated by the software in raster file for the whole Reference Region.

This process is repeated yearly for the whole crediting period. With all this information a table of deforested area in the baseline scenario for the first baseline period and the whole crediting period for the Project Area and the Leakage Belt per forest strata can be extracted and produced.

MAP 31. Projected Deforestation in the Reference Region for the Baseline Period



MAP 32. Projected Deforestation in the Project Area and Leakage belt in the Baseline Period



The resulting areas to be deforested in the project boundaries PA and LB can be seen in the following tables:

TABLE 56. Projected areas of deforestation in Project Area

Strata i		Annual areas deforested in each forest class within the Project Area							SUM
		BTI	PA	BPT	BT	P	BCB	BPCB	
T	Year	ha	ha	ha	ha	ha	ha	ha	Cumulative
1	2010	56.5	53.9	40.3	2,982.8	18.1	19.7	260.6	3,431.9
2	2011	100.3	84.7	180.5	5,924.7	52.4	41.8	514.7	6,899.1
3	2012	126.0	116.4	313.6	8,808.1	78.1	85.2	773.8	10,301.3
4	2013	166.9	159.3	468.3	11,852.9	108.9	138.1	1,082.8	13,977.2
5	2014	190.5	187.5	566.1	14,855.3	133.1	207.7	1,305.1	17,445.4
6	2015	246.5	228.9	675.0	17,802.8	175.9	307.0	1,617.2	21,053.2
7	2016	275.7	254.6	782.4	20,577.9	243.5	393.7	1,947.3	24,475.1

8	2017	303.0	315.1	895.3	23,222.9	322.1	450.7	2,241.7	27,750.7
9	2018	344.3	367.5	952.7	26,025.7	431.5	500.6	2,485.7	31,108.0
10	2019	382.1	434.5	1,034.9	28,577.9	511.2	547.5	2,711.6	34,199.7

Table 57. Projected areas of deforestation in Leakage Belt

Strata i		Area deforested in each forest classes within the Leakage Belt							SUM
		BTI	PA	BPT	BT	P	BCB	BPCB	
T	Year	ha	ha	ha	ha	Ha	ha	ha	Cumulative
1	2010	117.46	496.03	159.80	4,995.13	22.68	43.86	161.82	5,996.77
2	2011	271.71	913.93	329.18	9,611.17	63.52	116.95	505.11	11,811.57
3	2012	400.76	1,532.97	554.01	14,206.55	153.25	191.05	860.50	17,899.08
4	2013	519.22	2,109.66	782.87	18,868.97	258.60	272.72	1,264.79	24,076.82
5	2014	647.77	2,581.50	976.95	23,472.91	355.89	354.38	1,623.20	30,012.60
6	2015	818.66	3,127.94	1,121.62	28,117.69	520.74	430.00	2,139.90	36,276.55
7	2016	1,022.82	3,722.27	1,249.16	32,985.28	657.85	565.10	2,653.58	42,856.06
8	2017	1,274.87	4,198.14	1,366.62	37,910.84	776.82	689.61	3,228.76	49,445.66
9	2018	1,533.47	4,798.53	1,503.73	42,519.83	888.22	809.58	3,786.30	55,839.66
10	2019	1,734.10	5,330.35	1,575.31	47,382.88	981.99	975.94	4,409.36	62,389.94

For the whole crediting period, the deforested area in the baseline scenario is 100,296.7 ha for the Project Area and 193,542.6 ha for the Leakage Belt.

PART 4: ESTIMATION OF CHANGES IN CARBON STOCKS AND GHG

4.1 Stratification

Pre-Deforestation Strata (forest strata)

Stratification has been based on the original Forest Stratification developed by IIAP and Regional Government of Madre de Dios for the Ecological Economic Zoning. These strata have been grouped by similarity obtaining no more than 10 strata, according to GOF-C-GOLD Sourcebook. The applicability criteria for using this pre-existing stratification and further detail can be found in X-STR module. The final Forest Strata for the Project Area is:

TABLE 58. Forest Strata in the Castañeros REDD Project Area

i	STRATA	Code	Project Area
1	Flooded terraces forest	BTI	2,193.4
2	Swamp Trees	PA	5,276.4
3	High and mid terrace with bamboo (paca) forest	BPT	28,939.8
4	Terraces Forest	BT	204,712.1
5	Bamboos (Pacal)	P	6,221.0
6	Low Hills Forest	BCb	31,085.4
7	Low hills with bamboo (paca) forest	BPCb	12,267.3
8	Others (Without Carbon)	NB	871.1
Total Area (ha)			291,566.5

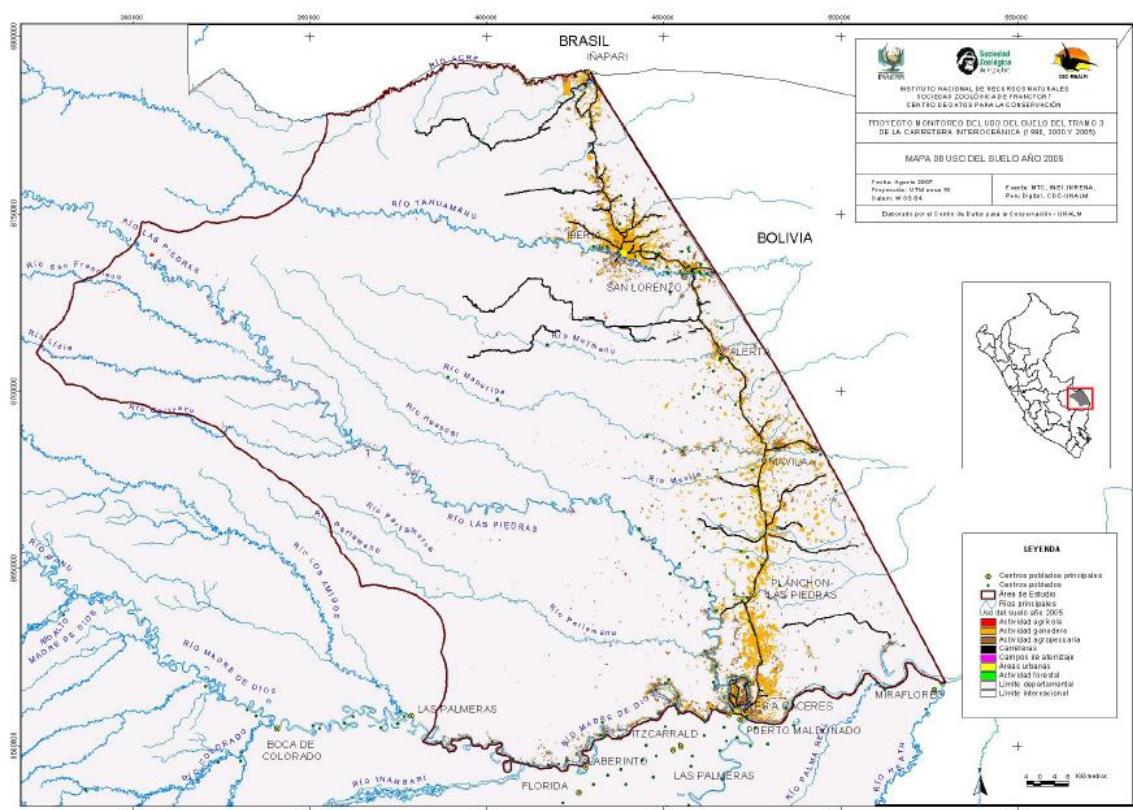
The stratum NB contains water bodies, beaches and sand banks that remained in the PA after the exclusion of non-forest lands. This stratum will not be included in the further the estimations of carbon stocks, carbon stock changes and emissions; and therefore the total forest area in the PA is 290,695.5 ha.

Post-Deforestation Strata

To determine the post deforestation land uses, we have analyzed the results of the study made of the land use changes over the Stretch 3 of the IOH (CDC-SZF-INRENA, 2007)⁵⁷. This study was carried out using the methodology developed by the same authors for the monitoring of the Peruvian south west Protected Natural Areas, and covers an area of 2'660,654 hectares, including the provinces of Tahuamanu and Tambopata. The period analyzed was 1990-2000-2005 and the images used for this purpose were Landsat (years 1990, 2000 and 2005) and additional CBERS images for year 2005.

MAP 33. Land use Map, 2005. Monitoring Study

⁵⁷ CDC-UNALM, SZF, INRENA, 2007. Monitoreo del uso del Suelo entre Puerto Maldonado e Iñapari, correspondiente al tramo 3 de la carretera interoceánica para los años 1990,2000 y 2005. Lima, 45p. Available in <http://www.ibcperu.org/doc/isis/11992.pdf>



In the next chart, monitoring results are shown, being established the degree of land use change for those years (1990, 2000 and 2005). It must be mentioned that agriculture is focused on areas near roads and river sands. Farming was established by the study as the class combining agricultural activities and livestock, because the image could not determine if the areas were destined to crops or pastures, or in many cases, because they were both present in the area.

TABLE 59. Results of the monitoring of post-deforestation land uses in stretch 3 of IOH

	1990	2000	2005	Var. %
Forest	2,516,202	2,470,645	2,452,195	
Deforestation	56,795	102,197	120,783	
Agriculture	949	3,587	4,074	3.37%
Pastures (cattle ranching)	15,493	50,814	64,897	53.73%
Farming	39,477	45,965	48,886	40.47%
Infrastructure	876	1,831	2,926	2.42%

Source: CDC-SZF-INRENA, 2007. Own elaboration

The trend of land use change in the post-deforestation scenario, evaluated in the mentioned study in an area surrounding our project area, can let us infer that human activities are the cause of deforestation and that they are increasing permanently every year. Table shows that grazing is the activity with the fastest growth rate duplicating its participation as a deforestation driver from 27% in 1990 to 54% in 2005, while farming has reduced their explanatory power from 70% to only 40%, accumulated at 2005.

Data for year 1990 shows that Farming was the most common activity, followed by cattle ranching and agriculture. In year 2000, the three activities grew very much (more than three times for agriculture and cattle ranching). For year 2005, both activities kept the growth of their lands but not so rapidly as in the previous period.

We decided to use the data for year 2005 as the most actual information available, and as it is accumulated deforestation, it represents the general trend of the whole deforestation in Madre de Dios. It is very clear that grazing is the most representative activity of the deforested areas, and is the only one that grows at a positive rate.

Its representativeness can be verified with data from production areas of main crops for year 2007 in Tahuamanu and Tambopata provinces. For this reason, it was considered valid to use the percentages of the presented monitoring study.

TABLE 60. Production Areas of main crops in Madre de Dios (2007)

Crops	area	%
Pastures	15,673.00	60.84
Hask rice	4,278.20	16.61
Yellow corn (hard)	4,149.02	16.11
Frijol grano seco	544.50	2.11
vegetable	88.52	0.34
cassava/ manioc	889.25	3.45
Others (sweet potato, waermelon, soy)	138.25	0.54
Total	25,760.74	100
Source: Agricultural Agency of Madre de Dios		

Then, the list of the final likely post-deforestation land-uses is presented following:

Agriculture	3.37%	100.0 % for the agrarian strata (CO+ and CO-)
Pastures (Cattle Ranching)	53.73%	
Farming	40.47%	
Infrastructure (*)	2.42%	

(*) Increase of urban areas, highways

This is calculated from agrarian post-deforestation land use. Illegal mining, in project area, represents 3.62% of total post-deforestation land use so previous percentages are multiplied times 96.38%, obtaining the following net percentages:

Agriculture	3.25%	100.0 % for the whole area
Pastures (Cattle Ranching)	51.79%	
Farming	39.01%	
Infrastructure	2.32%	
Mining	3.62%	

4.2 Estimation of carbon stocks and changes per stratum

4.2.1 Carbon Stocks of the forest

The equation used to calculate the carbon stocks in the forest strata is:

$$C_{BSL} = C_{AB\_tree,i} + C_{BB\_tree,i} + C_{AB\_non-tree,i} + C_{BB\_non-tree,i} + C_{DW,i} + C_{LI,i} + C_{SOC,i} \quad (16)$$

Where:

C_{BSL}	Carbon stock in all carbon pools in forest stratum i; t CO ₂ e ha ⁻¹
$C_{AB\_tree,i}$	Carbon stock in aboveground tree biomass in forest stratum i; t CO ₂ e ha ⁻¹
$C_{BB\_tree,i}$	Carbon stock in belowground tree biomass in forest stratum i; t CO ₂ e ha ⁻¹
$C_{AB\_non-tree,i}$	Carbon stock in aboveground non-tree biomass in forest stratum i; t CO ₂ e ha ⁻¹
$C_{BB\_non-tree,i}$	Carbon stock in belowground non-tree biomass in forest stratum i; t CO ₂ e ha ⁻¹
$C_{DW,i}$	Carbon stock in dead wood in stratum i; t CO ₂ e ha ⁻¹
$C_{LI,i}$	Carbon stock in litter in the forest stratum i; t CO ₂ e ha ⁻¹
$C_{SOC,i}$	Carbon stock in soil organic carbon in the forest stratum i; t CO ₂ e ha ⁻¹
i	1,2,3... M strata

As mentioned in T-SIG module, non-tree biomass, litter and dead wood are insignificant based on Carbon Inventories from Native Community of Belgica. For this reason, these pools were conservatively omitted. Soil organic carbon was also omitted, therefore only above- and below-ground tree biomasses are being considered for the present project.

Carbon stocks for each stratum are presented in following table:

TABLE 61. Carbon Stocks per forest strata

ID	Name	Above Ground	Below Ground	$C_{BSL,i}$
		t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹
BTI	Flooded terraces forest	314.39	75.45	389.84
PA	Swamp trees	749.38	179.85	929.23
BPT	High and mid terrace with bamboo (paca) forest	402.93	96.70	499.63
BT	Terraces forest	761.48	182.76	944.24
P	Bamboos (Pacal)	608.06	145.93	753.99
BCB	Low hills forest	822.93	197.50	1,020.43
BPCB	Low hills with bamboo (paca) forest	365.85	87.80	453.65

Detailed explanation of how it has been calculated, including formulae used and statistical analysis, can be found in CP-AB module.

4.2.2 Estimation of post-deforestation carbon stocks

The simple approach (Option 1) was used to estimate the post-deforestation carbon stocks. For this, the following steps were undertaken:

The list of likely post-deforestation land uses is already given in step 4.1.

To establish the carbon stocks for each post-deforestation land use, information from several studies⁵⁸ made in the Peruvian Amazon was gathered and compared. We also checked the information provided in the Agricultural National Census of 2007, and based on the cultivated area of each crop (table 33), we established that the main crops of the region were Rice and Corn (preferred for having more carbon stock), and that the most common pasture was *Brachiaria decumbens*.

The following values were determined for each land use class:

TABLE 62. Carbon Stocks per post-deforestation strata

ID	Name	$C_{post,i}$
		t CO ₂ e ha ⁻¹

⁵⁸ Alegre, J. Arevalo, L. Ricse, A. Reservas de Carbono según el uso de la tierra en dos sitios de la Amazonia Peruana. Agroforestería para la Producción Animal en América Latina - II - Memorias de la Segunda Conferencia Electrónica (Agosto de 2000-Marzo de 2001) FAO.

DP	Deforestation for Pastures	18.63
DF	Deforestation for Farming	31.75
DI	Deforestation by Infrastructure	0.0
DA	Deforestation by Agriculture (Corn)	31.75
DM	Deforestation by Illegal Mining	0.0

Given that Farming carbon stock can't be calculated directly because it is an activity that combines in different proportions agriculture and pastures, determined so by the CDC-SZF-INRENA; we initially estimated it as a weighted average between corn and pasture using the percentages from above. Nevertheless, now only corn carbon stock is being considered because is the biggest stock when compared to pastures', having this way a more conservative result and being consistent with option 1 of methodology.

4.3 Estimation of the sum of baseline carbon stock changes

Based on land use change from initial forest strata to final post-deforestation land uses, and considering the changes in respective stocks, we estimated the total change in carbon stocks for the reference period of the Project Area and Leakage Belt. In both cases, no timber harvest is carried out in the process of deforestation and therefore C_{wp} was not accounted.

The equations used for that end are:

$$\Delta C_{TOT} = C_{BSL} - C_{post} - C_{wp} \quad (18)$$

$$C_{BSL} = \sum \sum ((C_{BSL,i}) * A_{unplanned,i,t}) \quad (19)$$

$$C_{post} = \sum \sum ((C_{post,i}) * A_{unplanned,i,t}) \quad (20)$$

Where:

ΔC_{TOT}	Sum of the baseline carbon stock change in all pools up to time t^* ; t CO ₂ e
C_{BSL}	Total forest carbon stock in areas deforested; t CO ₂ e
C_{post}	Total post-deforestation carbon stock in areas deforested; t CO ₂ e
C_{wp}	Total carbon stock in harvested wood products; t CO ₂ e
$C_{BSL,i}$	Carbon stock in all carbon pools in the forest stratum i; t CO ₂ e
$A_{unplanned,i,t}$	Area of unplanned deforestation in forest stratum i at time t; ha
$C_{post,i}$	Carbon stock in all carbon pools in the post-deforestation stratum i; t CO ₂ e

$A_{unplanned,i,t}$ Area of unplanned deforestation in post-deforestation stratum i at time t ; ha

t 1,2,3... t years elapsed since the projected start of the REDD project activity

I 1,2,3, ... M strata

The cumulative results for Project Area are: at the end of crediting period (2040) is equal to 86'904,039 t CO₂; and equal to 29'439,451.1 t CO₂ for the first 10 years.

The cumulative results for Leakage Belt are: at the end of crediting period (2040) is equal to 161'714,949.47 t CO₂; and equal to 53'454,406.38 t CO₂ for the first 10 years.

TABLE 63. Total Forest Carbon stock in areas deforested in Project Area

Carbon stock changes in initial (pre-deforestation) forest classes in <u>Project Area</u>																Total C stock change in initial forests	
Strata i		BTI		PA		BPT		BT		P		BCB		BPCB		Cumulative	Annual
T	Year	ha	tCO ₂ e	ha	tCO ₂ e	ha	tCO ₂ e	ha	t CO ₂ e	ha	tCO ₂ e	ha	tCO ₂ e	ha	tCO ₂ e	tCO ₂ e	t CO ₂ -e
1	2010	56	22,010	54	50,122	40	20,149	2,983	2,816,427	18	13,683	20	20,062	261	118,231	3,060,684	3,060,684
2	2011	100	39,108	85	78,695	180	90,168	5,925	5,594,298	52	39,529	42	42,695	515	233,489	6,117,983	3,057,299
3	2012	126	49,130	116	108,206	314	156,660	8,808	8,316,955	78	58,914	85	86,934	774	351,035	9,127,833	3,009,851
4	2013	167	65,048	159	148,022	468	233,983	11,853	11,191,929	109	82,099	138	140,946	1,083	491,220	12,353,246	3,225,413
5	2014	191	74,285	188	174,254	566	282,845	14,855	14,026,919	133	100,343	208	211,933	1,305	592,071	15,462,649	3,109,403
6	2015	247	96,098	229	212,665	675	337,247	17,803	16,810,026	176	132,651	307	313,270	1,617	733,628	18,635,586	3,172,937
7	2016	276	107,497	255	236,555	782	390,895	20,578	19,430,346	243	183,583	394	401,747	1,947	883,418	21,634,039	2,998,453
8	2017	303	118,109	315	292,766	895	447,312	23,223	21,927,860	322	242,877	451	459,874	2,242	1,016,971	24,505,768	2,871,729
9	2018	344	134,223	367	341,482	953	476,025	26,026	24,574,358	432	325,356	501	510,800	2,486	1,127,656	27,489,900	2,984,132
10	2019	382	148,962	435	403,783	1,035	517,079	28,578	26,984,290	511	385,410	547	558,639	2,712	1,230,107	30,228,270	2,738,371

TABLE 64. Total post-deforestation carbon stock in areas deforested in Project Area

Carbon stock changes in final (post-deforestation) non forest classes in <u>Project Area</u>												Total C stock change in final post-deforestation classes	
Strata f		Cause of deforestation										Cumulative	Annual
		Pastures		Farming		Agriculture (Corn)		Infrastructure		Illegal Mining			
t	Year	Ha	t CO ₂ -e	ha	t CO ₂ -e	Ha	t CO ₂ -e	ha	t CO ₂ -e	Ha	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
1	2010	1,777	33,110	1,339	42,506	112	3,542	80	-	124	-	79,157	79,157
2	2011	3,573	66,560	2,691	85,448	224	7,121	160	-	250	-	159,129	79,971
3	2012	5,335	99,383	4,018	127,585	335	10,633	239	-	373	-	237,600	78,471
4	2013	7,238	134,846	5,452	173,113	454	14,427	325	-	506	-	322,385	84,785

5	2014	9,034	168,306	6,805	216,068	567	18,006	405	-	632	-	402,380	79,995
6	2015	10,902	203,113	8,213	260,752	684	21,730	489	-	762	-	485,595	83,215
7	2016	12,674	236,125	9,547	303,133	796	25,262	568	-	886	-	564,520	78,925
8	2017	14,371	267,727	10,825	343,703	902	28,643	644	-	1,005	-	640,073	75,553
9	2018	16,109	300,117	12,135	385,285	1,011	32,108	722	-	1,126	-	717,510	77,437
10	2019	17,710	329,944	13,341	423,576	1,112	35,299	794	-	1,238	-	788,819	71,309

TABLE 65. Sum of the baseline carbon stock change in all pools in Project Area

Classes		Total C stock change in initial forests		Total C stock change in final post-deforestation classes		Total baseline carbon stock change in <u>Project Area</u>	
		cumulative	annual	cumulative	annual	annual	cumulative
t	Year	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e	tCO ₂ -e	tCO ₂ -e
1	2010	3,060,684	3,060,684	79,157	79,157	2,981,526	2,981,526
2	2011	6,117,983	3,057,299	159,129	79,971	2,977,328	5,958,854
3	2012	9,127,833	3,009,851	237,600	78,471	2,931,379	8,890,233
4	2013	12,353,246	3,225,413	322,385	84,785	3,140,628	12,030,861
5	2014	15,462,649	3,109,403	402,380	79,995	3,029,408	15,060,269
6	2015	18,635,586	3,172,937	485,595	83,215	3,089,721	18,149,990
7	2016	21,634,039	2,998,453	564,520	78,925	2,919,528	21,069,518
8	2017	24,505,768	2,871,729	640,073	75,553	2,796,176	23,865,695
9	2018	27,489,900	2,984,132	717,510	77,437	2,906,695	26,772,390
10	2019	30,228,270	2,738,371	788,819	71,309	2,667,062	29,439,451

TABLE 66. Total Forest Carbon stock in areas deforested in Leakage Belt

Carbon stock changes in initial (pre-deforestation) forest classes in <u>Leakage Belt</u>																Total C stock change in initial forests	
Strata i		BTI		PA		BPT		BT		P		BCB		BPCB		Cumulative	Annual
T	Year	ha	tCO ₂ e	ha	tCO ₂ e	ha	tCO ₂ e	ha	tCO ₂ e	ha	tCO ₂ e	ha	tCO ₂ e	ha	tCO ₂ e	t CO ₂ -e	t CO ₂ -e
1	2010	117	45,789	496	460,931	160	79,841	4,995	4,716,575	23	17,104	44	44,753	162	73,409	5,438,401	5,438,401
2	2011	272	105,924	914	849,255	329	164,468	9,611	9,075,206	64	47,891	117	119,341	505	229,144	10,591,230	5,152,829
3	2012	401	156,234	1,533	1,424,482	554	276,800	14,207	13,414,321	153	115,547	191	194,958	860	390,369	15,972,709	5,381,480
4	2013	519	202,416	2,110	1,960,360	783	391,146	18,869	17,816,743	259	194,985	273	278,291	1,265	573,776	21,417,717	5,445,008
5	2014	648	252,528	2,581	2,398,807	977	488,115	23,473	22,163,950	356	268,343	354	361,623	1,623	736,372	26,669,738	5,252,021
6	2015	819	319,149	3,128	2,906,580	1,122	560,400	28,118	26,549,712	521	392,632	430	438,784	2,140	970,776	32,138,032	5,468,294

7	2016	1,023	398,739	3,722	3,458,854	1,249	624,122	32,985	31,145,862	658	496,016	565	576,643	2,654	1,203,808	37,904,043	5,766,011
8	2017	1,275	496,999	4,198	3,901,047	1,367	682,806	37,911	35,796,750	777	585,716	690	703,700	3,229	1,464,740	43,631,759	5,727,716
9	2018	1,533	597,814	4,799	4,458,942	1,504	751,314	42,520	40,148,717	888	669,716	810	826,127	3,786	1,717,668	49,170,298	5,538,539
10	2019	1,734	676,029	5,330	4,953,131	1,575	787,078	47,383	44,740,583	982	740,413	976	995,879	4,409	2,000,325	54,893,438	5,723,140

TABLE 65. Total post-deforestation carbon stock in areas deforested in Leakage Belt

Carbon stock changes in final (post-deforestation) non forest classes in <u>Leakage Belt</u>												Total C stock change in final post-deforestation classes	
Strata f		Cause of deforestation											
		Pastures		Farming*		Agriculture (Corn)		Infrastructure		Illegal Mining			
t	Year	Ha	t CO ₂ -e	ha	t CO ₂ -e	Ha	t CO ₂ -e	ha	t CO ₂ -e	ha	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
1	2010	3,105	57,854	2,339	74,272	195	6,190	139	-	217	-	138,316	138,316
2	2011	6,117	113,953	4,608	146,291	384	12,191	274	-	428	-	272,435	134,119
3	2012	9,269	172,683	6,982	221,687	582	18,475	416	-	648	-	412,844	140,409
4	2013	12,468	232,283	9,392	298,201	783	24,851	559	-	872	-	555,335	142,490
5	2014	15,542	289,549	11,708	371,717	976	30,978	697	-	1,086	-	692,244	136,909
6	2015	18,786	349,981	14,151	449,299	1,179	37,443	842	-	1,313	-	836,723	144,479
7	2016	22,193	413,457	16,718	530,789	1,393	44,234	995	-	1,551	-	988,480	151,757
8	2017	25,606	477,031	19,288	612,403	1,607	51,036	1,148	-	1,790	-	1,140,470	151,990
9	2018	28,917	538,718	21,783	691,595	1,815	57,635	1,297	-	2,021	-	1,287,949	147,478
10	2019	32,309	601,912	24,338	772,723	2,028	64,396	1,449	-	2,259	-	1,439,031	151,083

TABLE 66. Sum of the baseline carbon stock change in all pools in Leakage Belt

Classes		Total C stock change in initial forests		Total C stock change in final post-deforestation classes		Total baseline carbon stock change in <u>Leakage Belt</u>	
		Cumulative	Annual	Cumulative	Annual	Annual	Cumulative
T	Year	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e	tCO ₂ -e	tCO ₂ -e
1	2010	5,438,401	5,438,401	138,316	138,316	5,300,085	5,300,085
2	2011	10,591,230	5,152,829	272,435	134,119	5,018,710	10,318,794
3	2012	15,972,709	5,381,480	412,844	140,409	5,241,071	15,559,865
4	2013	21,417,717	5,445,008	555,335	142,490	5,302,518	20,862,382
5	2014	26,669,738	5,252,021	692,244	136,909	5,115,111	25,977,494
6	2015	32,138,032	5,468,294	836,723	144,479	5,323,816	31,301,309
7	2016	37,904,043	5,766,011	988,480	151,757	5,614,254	36,915,563

8	2017	43,631,759	5,727,716	1,140,470	151,990	5,575,726	42,491,289
9	2018	49,170,298	5,538,539	1,287,949	147,478	5,391,060	47,882,349
10	2019	54,893,438	5,723,140	1,439,031	151,083	5,572,057	53,454,406

4.4 Estimation of the sum of baseline greenhouse gas emissions

The emissions of GHG as a consequence of deforestation activities within the project area in baseline, are determined according to module by the sum of CO₂ emissions of the combustion of fossil fuel by stratum each year, the greenhouse gas emissions different to CO₂ by biomass burnt by stratum per year and the direct emissions of N₂O by application of nitrogen within the project area.

$$GHG_{BSL,E} = \sum \sum (E_{FC,i,t} + E_{BiomassBurn,i,t} + N_{2O_{direct-N,i,t}}) \quad (22)$$

Where:

$GHG_{BSL,E}$ Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline; tCO₂e

$E_{FC,i,t}$ CO₂ emission from fossil fuel combustion in stratum i in year t; tCO₂e

$E_{BiomassBurn,i,t}$ Non- CO₂ emissions due to biomass burning as part of deforestation activities in stratum i in year t; tCO₂e

$N_{2O_{direct-N,i,t}}$ Direct N₂O emissions as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t, tCO₂e

Emissions of CO₂ by combustion of fossil fuel

The estimation of CO₂ by combustion of fossil fuel, according to module E-FFC is optional. However, its quantification is proposed if CO₂ emissions of combustion of fossil fuel with project are larger than the estimated emissions in baseline.

There is no information about the number of machinery, equipment, trucks, etc. that would be incorporated annually as a consequence of agriculture or farming activities during baseline (after deforestation) in the project area. In the other hand, there is strong evidence that these activities are carried in self-consumption/ small-scale way⁵⁹, which is supposed to minimally use fuel consuming' machinery. Therefore, it was decided not to measure the variable. This is a conservative approach. Likewise, the module indicates that fossil fuel is an optional source of emission.

Emissions of N₂O due to nitrogen application

No application of fertilizers is supposed in the post-deforestation activities given their traditional management.

⁵⁹ More details in REDD-MF module.

Emissions of other GHG by biomass burning

The estimation of burnt biomass has been developed according to module E-BB, and has accounted for: conversion of forest land into non-forest land using fire and periodic burning of agriculture lands after harvest season.

In reference to the burning of forest biomass, it has been estimated that 55% of the deforested area is burnt in the field⁶⁰ for the development of any of the post-deforestation activities. In case of post-deforestation activities, it was defined that only agricultural lands would be burned in spite of the local knowing that pasture lands are also burned each year. This was established in order to be conservative.

The carbon stock emissions due burning is already included in the previous step and thus, they were not accounted in this step. The emissions of GHG are therefore represented by the liberation of CH₄ or N₂O.

The entire procedure is presented in E-BB module, and the results for GHG emissions in the baseline period for PA are 765,330.5 tCO₂e, combining forest and agriculture burning.

TABLE 67. GHG Emissions (CH₄ and N₂O) due to forest burning in Project Area as part of deforestation activities

GHG emissions due to biomass burning in forest strata as part of deforestation activities inside <u>Project Area</u>													
		Biomass Burnt per Forest Strata = Area (ha) x 0.55*** x AG biomass (t/ha)							Total GHG Emissions				
Strata i		BTI	PA	BPT	BT	P	BCB	BPCB	Total	CH ₄		N ₂ O	
AG Biomass t/ha		174.99	417.09	224.27	423.83	338.44	458.03	203.63	Cumulative	Cumulative	Annual	Cumulative	Annual
T	Year	t	T	t	t	t	t	t	t	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
1	2010	5,434	12,374	4,974	695,300	3,378	4,953	29,188	755,600	53,950	53,950	23,424	23,424
2	2011	9,655	19,428	22,260	1,381,081	9,759	10,540	57,642	1,510,364	107,840	53,890	46,821	23,398
3	2012	12,129	26,713	38,675	2,053,231	14,544	21,462	86,661	2,253,415	160,894	53,054	69,856	23,035
4	2013	16,059	36,543	57,764	2,762,984	20,268	34,796	121,269	3,049,682	217,747	56,853	94,540	24,684
5	2014	18,339	43,019	69,827	3,462,867	24,772	52,321	146,166	3,817,310	272,556	54,809	118,337	23,796
6	2015	23,724	52,501	83,257	4,149,941	32,748	77,338	181,113	4,600,622	328,484	55,928	142,619	24,283
7	2016	26,538	58,399	96,501	4,796,827	45,322	99,180	218,092	5,340,859	381,337	52,853	165,567	22,947
8	2017	29,158	72,276	110,429	5,413,395	59,960	113,530	251,063	6,049,811	431,957	50,619	187,544	21,978
9	2018	33,136	84,303	117,518	6,066,744	80,322	126,103	278,388	6,786,512	484,557	52,600	210,382	22,838
10	2019	36,775	99,683	127,653	6,661,691	95,147	137,913	303,680	7,462,542	532,826	48,269	231,339	20,957

⁶⁰Ministerio del Ambiente, 2000. Mapa de la Deforestación de la Amazonía Peruana, Capítulo 4.

TABLE 68. GHG emissions (CH₄ and N₂O) due to biomass burn in agriculture in Project Area

GHGs Emissions from Biomass Burning (from Agricultural wastes) in <u>Project Area</u>						
		Burnt Areas*	CH ₄		N ₂ O	
T	Year		Cumulative	Annual	Cumulative	Annual
		ha	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
1	2010	111.6	84.63	84.63	32.39	32.39
2	2011	224.3	170.13	85.50	65.11	32.72
3	2012	334.9	254.03	83.90	97.22	32.11
4	2013	454.4	344.68	90.65	131.92	34.69
5	2014	567.1	430.21	85.53	164.65	32.73
6	2015	684.4	519.18	88.97	198.70	34.05
7	2016	795.7	603.56	84.38	230.99	32.29
8	2017	902.1	684.34	80.78	261.91	30.92
9	2018	1,011.3	767.14	82.79	293.60	31.69
10	2019	1,111.8	843.38	76.24	322.77	29.18

4.5 Calculation of net emissions

The previous calculations are summarized with the following equations:

$$\Delta C_{BSL,unplanned} = \Delta C_{BSL,PA,unplanned} + GHG_{BSL,E} \quad (23)$$

$$\Delta C_{BSL,PA,unplanned} = \Delta C_{TOT,PA} \quad (24)$$

$$\Delta C_{BSL,LK,unplanned} = \Delta C_{TOT,LB} \quad (25)$$

Where:

$\Delta C_{BSL,unplanned}$ Net greenhouse gas emissions in the baseline from unplanned deforestation; tCO₂e

$\Delta C_{BSL,PA,unplanned}$ Net CO₂ emissions in the baseline from unplanned deforestation in the project area; tCO₂e

$\Delta C_{BSL,LK,unplanned}$ Net CO₂ emissions in the baseline from unplanned deforestation in the leakage belt ; tCO₂e

$GHG_{BSL,E}$ Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline; tCO₂e

$\Delta C_{TOT,PA}$ Sum of the baseline carbon stock change in all pools up to time t^* in the project area, tCO₂e

$\Delta C_{TOT,LB}$ Sum of the baseline carbon stock change in all pools up to time t^* in the leakage belt, tCO₂e

The total net GHG emissions in the Project Area in the baseline from unplanned deforestation are 30'204,781.55 tCO₂e (baseline period), and 89'162,855.89 tCO₂e for the entire crediting period.

For Leakage Belt, the values found for $\Delta C_{BSL,LK,unplanned}$ will be used in LK-ASU module for subsequent calculations. As it is equal to $\Delta C_{TOT,LB}$ the results are already presented in Table 41.

The Final result for the emissions in Project Area can be seen in the next table:

TABLE 69. Total of Equivalent CO₂ in the Project Area

T	Year	Total Sum of carbon stock change in baseline (t CO ₂) $\Delta C_{BSL,PA,unplanned}$	Greenhouse Gas Emissions in the Project Area in baseline (t CO ₂ -e) $GHG_{BSL,E}$	Net GHG Emissions in the Baseline from Unplanned Deforestation Cumulative (t CO ₂ -e) $\Delta C_{BSL,unplanned}$
1	2010	2,981,526.18	77,490.46	3,059,016.64
2	2011	5,958,853.97	154,896.57	6,113,750.53
3	2012	8,890,233.13	231,100.96	9,121,334.10
4	2013	12,030,860.90	312,764.06	12,343,624.96
5	2014	15,060,269.10	391,487.37	15,451,756.47
6	2015	18,149,990.35	471,821.56	18,621,811.91
7	2016	21,069,518.49	547,738.50	21,617,256.99
8	2017	23,865,694.69	620,446.91	24,486,141.60
9	2018	26,772,389.54	695,999.60	27,468,389.14
10	2019	29,439,451.10	765,330.46	30,204,781.55

It must be remained that future deforestation will be monitored permanently following the procedures described in M-MON module, which follows the technical parameters that have been used by IIAP during the preparation of historic reference period maps. These results will be compared with deforested areas in baseline scenario to calculate the real net emission reductions generated by the project.

In addition, baseline will be reviewed at year 10, according with methodology requirements.

3.2 Net Positive Climate Impacts

3.2.1 With-Project Estimated Greenhouse Gas Emissions (CL2.1)

The ex-ante estimations of total emissions due to project activities were developed according to the module “Methods for monitoring of greenhouse gas emissions and removals” (M-MON)⁶¹. These activities are currently under implementation and ex-post results will be monitored and reported for verification purposes.

The total emissions under the project case are estimated with:

$$\Delta C_p = \sum (\Delta C_{p,defPA,i,t} + \Delta C_{p,Deg,i,t} + \Delta C_{p,DistPA,i,t} + GHG_{p-E,i,t} + \Delta C_{p,Enh,I,t})$$

(Eq. N° 1 M-MON Module, VCS Modular Methodology)

Where,

ΔC_p Net greenhouse gas emissions within the project area under the project scenario;
tCO₂e

$\Delta C_{p,defPA,i,t}$ Net carbon stock change as a result of deforestation in the project area in the project case in stratum i at time t, tCO₂e

$\Delta C_{p,Deg,i,t}$ Net carbon stock change as a result of degradation in the project area in the project case in stratum i at time t, t CO₂-e

$\Delta C_{p,DistPA,i,t}$ Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum i at time t, t CO₂-e

$GHG_{p-E,i,t}$ Greenhouse gas emissions as a result of deforestation and degradation activities within the PA in the project case in stratum i at time t, t CO₂-e

$\Delta C_{p,Enh,I,t}$ Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline in stratum i at time t, t CO₂-e

i 1,2,3 ... M strata

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

Each parameter mentioned comes from particular equations and procedures, which are explained next. Those results were then used in the final equation (above) to obtain:

TABLE 70. Cumulative GHG Emissions in the Project Area under the Project Scenario

T	Year	ΔC_P (Ex-ante) tCO ₂ e
1	2010	132,868.9

⁶¹ Approved VCS Module VMD0015 v2.1, available at <http://v-c-s.org/methodologies/VMD0015>

2	2011	265,737.7
3	2012	398,606.6
4	2013	531,475.4
5	2014	664,344.3
6	2015	797,213.2
7	2016	930,082.0
8	2017	1,062,950.9
9	2018	1,195,819.8
10	2019	1,328,688.6
11	2020	1,461,557.5
12	2021	1,594,426.3
13	2022	1,727,295.2
14	2023	1,860,164.1
15	2024	1,993,032.9
16	2025	2,125,901.8
17	2026	2,258,770.6
18	2027	2,391,639.5
19	2028	2,524,508.4
20	2029	2,657,377.2
21	2030	2,790,246.1
22	2031	2,923,115.0
23	2032	3,055,983.8
24	2033	3,188,852.7
25	2034	3,321,721.5
26	2035	3,454,590.4

27	2036	3,587,459.3
28	2037	3,720,328.1
29	2038	3,853,197.0
30	2039	3,986,065.8
31	2040	4,118,934.7

3.2.2 Carbon Stock Change in the Project Case

It is set in M-MON that carbon stock change should be attributed to three main activities: Deforestation, Degradation and Natural Disturbances that may occur inside the PA in the with-project case.

Carbon Stock Change in the Project Case due to Unplanned Deforestation

The monitoring of deforestation will be made through the analysis of satellite images in order to obtain the areas of change inside PA. The description of techniques and assumptions to be used are explained in the Monitoring Section (3.4). Once the deforested areas are estimated, the following equation must be used:

$$\Delta C_{p,DefPA,i,t} = \sum (A_{DefPA,u,i,t} * \Delta C_{pools,P,Def,u,i,t}) \text{ (Eq. N° 3 M-MON Module, VCS Modular Methodology)}$$

Where,

$\Delta C_{p,defPA,i,t}$	Net carbon stock change as a result of deforestation in the project area in the project case in stratum i at time t, tCO ₂ e
$A_{DefPA,u,i,t}$	Area of recorded deforestation in the project area stratum i converted to land use u at time t; ha
$\Delta C_{pools,P,Def,u,i,t}$	Net carbon stock changes in all pools in the project case in land use u in stratum i at time t, tCO ₂ e
i	1,2,3 ... M strata
t	1,2,3 ... t* years elapsed since the start of the REDD project activity

And,

$$\Delta C_{pools,P,Def,u,i,t} = C_{BSL,i} - C_{P,post,i} - CWP_i \text{ (Eq. N° 5 M-MON Module, VCS Modular Methodology)}$$

$C_{BSL,i}$ Carbon stock in all pools in the baseline case in stratum i, tCO₂e ha⁻¹

$C_{P,post,i}$ Carbon stock in all pools in post-deforestation LU u in stratum i, tCO₂e ha⁻¹

CWP _i	Carbon stock sequestered in wood products from harvest in stratum i, t CO ₂ e ha ⁻¹
u	1,2,3 ... U post-deforestation land uses

This calculation will be undertaken for each monitoring period. In the present case, the ex-ante emissions resulting from deforestation in the project scenario were set to zero since the Project activities are being implemented, and these include a Monitoring and Surveillance System in the Project Area as well as an Early Alert System. These activities are preventing deforestation from occurring inside the PA.

Moreover, it is considered that no timber extraction occurs in the process of deforestation. In any case, not accounting for carbon stock sequestered in wood products is conservative, and will not be considered in the N°5 M-MON equation.

Carbon Stock Change in the Project Case due to Degradation

Degradation in the PA can occur through either selective legal logging or illegal extraction of trees for timber or fuel and charcoal. The methodology suggests the use of ground-based methods to account for degradation like the Participatory Rural Appraisal (PRA) or the systematic sampling. The general formula for total degradation is:

$$\Delta C_{P,Deg,i,t} = \Delta C_{P,DegW,i,t} + \Delta C_{P,SelLog,i,t} \quad (\text{Eq. N° 7 M-MON Module, VCS Modular Methodology})$$

Where,

$\Delta C_{P,Deg,i,t}$	Net carbon stock change as a result of degradation in the PA in the project case in stratum i at time t, tCO ₂ e
$\Delta C_{P,DegW,i,t}$	Net carbon stock change as a result of degradation through extraction of trees for illegal timber or fuelwood and charcoal in the PA in the project case in stratum i at time t, tCO ₂ e
$\Delta C_{P,SelLog,i,t}$	Net carbon stock change as a result of degradation through selective logging of FSC certified forest management areas in the PA in the project case in stratum i at time t, tCO ₂ e
i	1,2,3 ... M strata
t	1,2,3 ... t* years elapsed since the start of the REDD project activity

The specific equations for each source of degradation are described in the Monitoring Section (3.4).

At present, no degradation by illegal timber extraction or fuelwood production is expected, according to the prior results of the PRA developed in 2019 (see Degradation Monitoring Report.docx). If any pressure over the concessions by these activities is identified, then it will be accounted and the emissions deducted for the monitoring period.

On the other hand, degradation by legal timber extraction is expected to occur every year in different concessions. In year 2010, the 23% of project members did logging (Extraction Balance

2010, Forestry Directorate). In general, this proportion is similar to those seen in previous years, but since the start of the Project, it has decreased considerably.

The extraction of timber depends on many factors, being the most important the economic needs of the concessionaires. As seen in the first 3 years of the project, we foresee that the increase of income resulting from the improves made to the Castaña activity as well as the improves in the extraction practices, would keep the degradation emissions from logging in lower values to those seen in 2010. Hence, an estimation of the emissions from legal logging was made using 2010-year field data. For said calculation, we followed the methodological steps from M-MON Module, Section 5.2.2.2. The entire procedure can be revised in attached document Degradation Estimations.xlsx

The value obtained represents the maximum expected for each year. Ex-post data will be available for every monitoring period.

Table 71. Yearly Degradation Emissions in Project Scenario

$C_{p,Deg,i,t}$			
Stratum	$C_{p,DegW,i,t}$	$C_{p,SelLog,i,t}$	TOTAL
BTI	-	785.54	785.54
PA	-	2 876.22	2 876.22
BPT	-	6 694.19	6 694.19
BT	-	103 731.73	103 731.73
P	-	1 819.07	1 819.07
BCB	-	12 444.26	12 444.26
BPCB	-	3 534.32	3 534.32
TOTAL	-	131 885.33	131 885.33

Table 72. Cumulative Degradation Emissions in the Project Area in Project Scenario

T	Year	$C_{p,Deg,i,t}$
1	2010	131 885.33
2	2011	263 770.66
3	2012	395 655.99
4	2013	527 541.33

5	2014	659 426.66
6	2015	791 311.99
7	2016	923 197.32
8	2017	1 055 082.65
9	2018	1 186 967.98
10	2019	1 318 853.31
11	2020	1 450 738.64
12	2021	1 582 623.98
13	2022	1 714 509.31
14	2023	1 846 394.64
15	2024	1 978 279.97
16	2025	2 110 165.30
17	2026	2 242 050.63
18	2027	2 373 935.96
19	2028	2 505 821.30
20	2029	2 637 706.63
21	2030	2 769 591.96
22	2031	2 901 477.29
23	2032	3 033 362.62
24	2033	3 165 247.95
25	2034	3 297 133.28
26	2035	3 429 018.61
27	2036	3 560 903.95
28	2037	3 692 789.28
29	2038	3 824 674.61

30	2039	3 956 559.94
31	2040	4 088 445.27

Carbon Stock Change in the Project Case due to Natural Disturbances

Regional and national data of occurrence of natural disturbances such as forest fires, pests and disease outbreaks and extreme weather (flooding) were analyzed and revealed that the kind of disturbances do not have significant impacts in the forest of the PA.

Fire

Due to the climatic characteristics of the area: high humidity, annual average rainfall of 2000 mm also considered as high, maximum moderate temperatures; there is a very low incidence of natural fires in the Amazon region, which correspond to the department of Madre de Dios and the project area. In Wildfire (2007) Manta⁶² states that "Forest Fires of natural cause in South America are associated mainly to thunderstorms (lightning)... and fortunately tropical thunderstorms of the Oriental plain are accompanied by heavy rains that keep the flame lit by lightning most of the time off". In the specific case of Peru, she affirms that forest fires are 100% anthropic and explicitly intentioned, whose main cause is the burning for grazing and agriculture activities. However, she also mentions that other factors such as the promotion of agriculture and stock farming, oil exploitation and construction of pipelines and roads, etc., make the natural forests to be more vulnerable to fire.

There has only been one considerable fire in 20 years (dated in 1999) and it affected 90 has of agricultural parcels. This information is confirmed by INEI⁶³, although it only has information recorded for period 1996 – 1999. On the other hand, the international forest fire alert system "Fire Alert System" shows that from years 2002 to 2009 there have been many outbreaks of fire. The map shows that these outbreaks were distributed throughout the Interoceanic Highway, for which it can be deduced that they correspond to the burning of agricultural areas and/or for the opening of new ones, since these are located just around the road axis. The difference between these sources of information shows that the official data only includes data from large-scale forest fires, which compromise forested areas.

Pests and Disease Outbreaks

The tropical rain forest, due to its great diversity of species, is very resistant to plagues and endemic diseases. They usually occur in areas of homogeneous vegetation such as plantations, especially the ones with non-native species. In the Amazon forest there are no reports on plagues and endemic diseases in the natural forests of Madre de Dios.

Extreme Weather

⁶² Manta Nolasco, María. Assessment of natural and socio-economical causes of forest fires in South America. Wildfire 2007.

⁶³ INEI. <http://www.inei.gob.pe/biblioineipub/bancopub/Est/Lib0351/indice8.htm>

In the INEI and INDECI statistics there are many weather events considered as natural emergencies. However, the region of Madre de Dios has only records of floods that mostly affect pastures and agricultural and urban areas. For the forest, periodic flooding of the floodplain is part of its natural dynamic and does not represent a risk of change in carbon stocks.

Another event that affects population is “Friaje” which occur cyclically and can be described as the incursion of polar air masses associated to the sudden decrease in air temperature (15 °C in just a few hours), increase in the cloudiness of strati form type, intensification of the winds and increase of the atmospheric pressure. According to Marengo (1983) the most affected department is Madre de Dios, but as is a natural cyclical event, do not represent a danger to the permanence of the standing forest.

Geological Risk

Madre de Dios is also a geologically stable department. According to the National Center of Geophysical Data (CNDG) is a region with no seismic activity (Bernal et al 2001). This is because it is far from the Fire Belt and the main seismic epicenters of the country.

Therefore, ex ante the net carbon stock change as a result of a natural disturbance in project case equals zero. However, if some natural disturbance occurs within the PA it will be monitored and reported.

Carbon stock change in the project case due to forest growth

Carbon stock enhancement was not included either in the baseline or the project scenario. This activity will not be monitored in order to be conservative.

3.2.3 Non-CO2 Greenhouse Gas Emissions in the Project Case

When significant, GHG emissions different to CO₂ will be calculated with the following equation:

$$GHG_{P,E,i,t} = EF_{C,i,t} + E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t} \quad (\text{Eq. N° 30 M-MON, VCS Modular Methodology})$$

Where,

$GHG_{P,E,i,t}$	Greenhouse gas emissions as a result of deforestation activities within the project area in the project case in stratum i in year t; tCO ₂ e
$EF_{C,i,t}$	Emissions from fossil combustion in stratum i within the PA in year t; tCO ₂ e
$E_{BiomassBurn,i,t}$	Non-CO ₂ emissions due to biomass burning in stratum i in year t; tCO ₂ e
$N_2O_{direct-N,i,t}$	Direct N ₂ O emissions as a result of nitrogen application on the alternative land use in stratum i within the PA in year t; tCO ₂ e
i	1,2,3 ... M strata
t	1,2,3 ... t* years elapsed since the start of the REDD project activity

GHG Emissions from Biomass Burning

No deforestation or degradation, and therefore emissions from biomass burning, are considered inside the Project Area in the with-project case, because of the expected results of the proposed activities.

GHG Emissions from Fossil Fuel Combustion

The implementation of some activities in the with-project scenario will result on emissions due to fossil fuel combustion, which were ex-ante estimated using the procedures detailed in the “Estimation of emissions from fossil fuel combustion” module (E-FFC)⁶⁴.

The equations used in said estimations, approved by IPCC (2006), are:

$$EF_{C,i,t} = \sum (Fuel_{a,i,t} \times EF_a) \quad (\text{Eq. N°1 E-FCC Module, VCS Modular Methodology})$$

Where,

$EF_{C,i,t}$ Net CO₂-e emissions of fuel consumption in stratum i in year t; tCO₂e

$Fuel_{a,i,t}$ Amount of fuel of type a consumed in stratum i in year t; terajoule (Tj)

EF_a Emission factor of fuel type a; tCO₂e/Tj

a 1,2,3 A fuel types (e.g. diesel, gasoline, etc.)

And,

$$Fuel_{a,i,t} = \text{LitersFuel}_{a,i,t} \times \text{DensityFuel}_{a,i,t} \times \text{NCVFuel} \div 106 \quad (\text{Eq. 2 E-FCC, Modular Methodology})$$

$\text{LitersFuel}_{a,i,t}$ Quantity of fuel type a consumed in in stratum i in year t; lt

$\text{DensityFuel}_{a,i,t}$ Density of fuel type a; kg/ltr

NCVFuel Net caloric value of fuel type a; Tj/Gg

The parameters used in both equations are:

Table 73. Emission Factors

EF _a	Default effective CO ₂ emission factor (EF)	Unit	Source
Electric Energy	0,472	tCO ₂ /MW-hour	Emission Factor Used in Kyoto mechanisms
Caloric Energy	69.3	tCO ₂ /TJ	Table 1.4 Chapter 1 Vol. 2 of IPCC, 2006.

⁶⁴ Approved VCS Module VMD0014 v1.0, available at <http://v-c-s.org/methodologies/VMD0014>

Motor Gasoline	69.3	t CO ₂ /TJ	Table 1.4 Chapter 1 Vol. 2 of IPCC, 2006.
Gas/Diesel Oil	74.1	t CO ₂ /TJ	Table 1.4 Chapter 1 Vol. 2 of IPCC, 2006.

Table 74. Density and NCV values

Variable	Type of fuel	Value	Liters per ton	Source
Density	Motor Gasoline	0.7407 kg/Lt	1350	Table A.3 Page 181 of the Energy Statistics Manual of OECD/IEA, 2004.
Net Calorific Value (NCV)	Motor Gasoline	44.75 TJ/Gg	1350	Table 1.12, Chapter 1, Volume 2, IPCC 2006 Inventory Guidelines and Table A.3 Page 181 of the Energy Statistics Manual of OECD/IEA, 2004.
	Gas/Diesel oil	43.38 TJ/Gg	1185	

The activities that were estimated are listed below, and more calculation details can be found in the excel document Ex-ante GHG Emissions in the with-project case.xlxs.

Brazil nut Processing Plant

The implementation of the Brazil nut processing plant will present emissions mainly from the installation and use of equipment for processing the nuts. All the machines needed to process the Brazil nut were listed, and the consumption of fuel and energy was estimated per machine, per hour, per day and finally per year (see specifically the Plant's Energetic Consumption spreadsheet). Then, by using Eq. N°1 E-FCC, the annual expected emissions were estimated:

Table 75. Equivalent emissions from the Processing Plant

Equipment's Source of Energy	Annual Consumption	Total Emissions tCO ₂ e/year
Electric Energy	659.72 MW-hour	311.39
Caloric Energy	9.15 TJ	633.98
Total		945.37

Tree Nursery

The emissions calculated for this activity will proceed mainly from the transport of construction materials and annual inputs like sand, soil, seeds, etc., and the transport of seedlings. The emissions of N₂O from applying nitrous fertilizers inside the Tree Nursery have not been considered, in spite of being planned, because E-NA Module⁶⁵ states that when it happens in tree nurseries outside Project Area, they may be considered as negligible.

⁶⁵ Name under the Modular Methodology of the A/R Methodological tool "Estimation of direct N₂O emissions from nitrogen application", available at http://cdm.unfccc.int/EB/033/eb33_repan16.pdf

The items considered can be seen in spreadsheets Tree Nursery Calculations and Tree Nursery Emissions, and are based on the preliminary design of the implementation and operation of the tree nursery, made by Engineer J. Chavez, who is also in charge of the Forest Plantation and tree nursery of the Campo Verde Project (Reforestation of Pastures in Campo Verde with native species, Pucallpa, Peru; validated by VCS in 2009).

The tree nursery at a first stage, will have a capacity of 60 000 seedlings, and during a second stage of implementation it is expected that it will double its production (with 120 000 seedlings). During first stage the emissions will be 5.53 tCO₂e/year, while in full capacity they will be 11.06 tCO₂e/year. This final amount was considered for the total emissions calculation.

Table 76. Equivalent emissions from the Tree Nursery

Total Emissions		1st stage	Full capacity
$E_{FC, TreeNursery} =$	$\sum(E_{FC1}, E_{FC2}, E_{FC3}, E_{FC4}) =$	5.53	11.07

Surveillance Emissions

Concessionaires will organize a Ground Team of Monitoring and Surveillance, formed by 12 people divided into sub-teams of two people for each of the 6 Checkpoints that will also be implemented. A weekly preventive patrolling system will be implemented throughout the boundaries of the project area, highlighting some critical points.

The Forest Surveillance Committee will be formed by active members of the Federation, who will directly receive the reports and findings of the Monitoring and Surveillance Team.

A protocol is being elaborated to gather graphic information and statements to legally prosecute those ecological crimes committed within the project area.

The patrolling system includes 4 different river routes as well as a number of routes along roads per sectors. For each means of transport, we have estimate the fuel (gasoline) consumption per month.

TABLE 77. Consumption of gasoline from Monitoring and Surveillance activity

	Total gallons
River	170
Roads	90
Month	260
Year	3120

The emissions are estimated using the annual gasoline consumption and the equations mentioned before:

TABLE 78. Equivalent emissions from Monitoring and surveillance

Type of Fuel	Annual Consumption (l)	EFC, Surveillance tCO ₂ e
Gasoline	11 793.60	27.09

Construction of Checkpoints

Six checkpoints will be constructed. All of the Checkpoints will be located in strategic places in order to monitor and control illegal logging activities, migratory agriculture and mining activities in PA and its surroundings.

Part of the plan is to adapt 4 premises of the Agricultural Agencies, located in the road axis: Planchon, Alegria, Mavila and Alerta. The arrangement of these offices will include: placement of mesh nets (mosquito nets), painting of furniture and installing equipment.

To monitor the Brazil nut forests next to the river, two more checkpoints shall be implemented considering the availability of land, construction materials and workforce. It is assumed that for their construction, local materials will be employed.

Furthermore, two extra checkpoints are planned to be constructed in areas with larger concentration of Brazil nut concessionaires (in support of the 4 first mentioned), more likely in Varsovia or Lucema, and another one in Nuevo San Juan. These offices will have a small size (16m²) and shall be constructed using rustic materials from the surroundings, to allow their mobility.

Since already constructed infrastructure will be used, the emissions from this activity were set to zero. Also, the new infrastructure to be implemented does not present emissions from transportation of materials or from use of machinery, as the materials used will be those available in the area and the construction of the premises will be artisanal.

By summing these emissions, we obtained the total result for fossil fuel combustion, which can be seen in the following table:

TABLE 79. Emissions from fossil fuel combustion due to implementation of Project Activities

Activity	Emissions of Project Activities (ex-ante) tCO ₂ e/year
Brazil Nut Processing Plant	945.37
Surveillance and Monitoring Patrolling	27.09
Tree Nursery	11.07
TOTAL (E _{F,C,i,t})	983.53

GHG Emissions from Nitrogen Application

Nitrogen applications will not occur inside the Project Area, with the exception of the fertilizer applications inside the Project's tree nursery that will be located outside the PA. Therefore, direct N₂O emissions resulting from these applications were not accounted⁶⁶ as they do not exist in the project area.

The final sum of all preceding calculations make up the ex-ante total emissions under the project scenario (Table 87).

3.2.4 Other GHG Emissions

No other GHG emissions were estimated.

3.2.5 Net GHG Emissions and Significance Test

In the former sub-section, we estimated the with-project scenario carbon stock change and non-CO₂ GHG emissions, which together make up the total with-project GHG emissions (ΔC_P). This value, together with the baseline emissions ($\Delta C_{BSL,unplanned}$), is necessary to estimate the net change. As $\Delta C_{BSL,unplanned}$, calculated in Section G2, also combines the carbon stock change and non-CO₂ GHG emissions, we have determined a total net change by subtracting this value from ΔC_P . The difference can be seen in Table 97.

According to the methodology, only the significant emissions should be considered in the final calculations of the net emission reductions. Therefore, a significance test was done following the procedures of T-SIG module⁶⁷. The relative contributions were estimated using the equation:

$$RC_{Ei} = \frac{E_i}{\sum E_i} \quad (\text{Eq. N}^\circ 5.4.1 \text{ IPCC 2003})$$

Where,

RC_{Ei} Relative contribution of each source to the sum of project and leakage carbon stocks

E_i Carbon stocks by sources

i Index for individual sources of project and leakage stocks

Therefore, the total baseline emissions ($\Delta C_{BSL,unplanned}$) were compared with the total ex-ante project emissions (ΔC_P). The results show project emissions add little when compared to baseline emissions.

TABLE 80. Total GHG emissions in baseline and ex-ante with-project case scenarios

⁶⁶ E-NA module sets out that when the only source of N₂O emissions is due to the application of fertilizer in tree nurseries outside the PA, then these emissions may be considered as negligible.

⁶⁷ Name under the Modular Methodology of the A/R Methodological tool "Tool for testing significance of GHG emissions in A/R CDM project activities" Version 01, available at <http://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-04-v1.pdf>

T	Year	$\Delta C_{BSL,unplanned}$ tCO ₂ e	ΔC_P (Ex-ante) tCO ₂ e	Net change in total GHG Emissions	Summed C_{BSL} and C_P Emissions (for Sig. test)
1	2010	3 059 016.64	132 868.9	-2 926 147.74	3 191 885.5
2	2011	6 126 613.66	265 737.7	-5 860 875.96	6 392 351.4
3	2012	9 144 678.28	398 606.6	-8 746 071.68	9 543 284.9
4	2013	12 518 993.54	531 475.4	-11 987 518.14	13 050 469.0
5	2014	15 750 806.49	664 344.3	-15 086 462.19	16 415 150.8
6	2015	19 079 030.69	797 213.2	-18 281 817.49	19 876 243.9
7	2016	22 190 218.06	930 082.0	-21 260 136.06	23 120 300.1
8	2017	25 181 267.82	1 062 950.9	-24 118 316.92	26 244 218.7
9	2018	28 294 738.86	1 195 819.8	-27 098 919.06	29 490 558.6
10	2019	31 166 325.78	1 328 688.6	-29 837 637.18	32 495 014.4
11	2020	33 971 621.15	1 461 557.5	-32 510 063.65	35 433 178.6
12	2021	36 786 138.40	1 594 426.3	-35 191 712.10	38 380 564.7
13	2022	39 762 626.53	1 727 295.2	-38 035 331.33	41 489 921.7
14	2023	42 599 093.94	1 860 164.1	-40 738 929.84	44 459 258.0
15	2024	45 593 699.93	1 993 032.9	-43 600 667.03	47 586 732.9
16	2025	48 592 792.04	2 125 901.8	-46 466 890.24	50 718 693.8
17	2026	51 573 146.92	2 258 770.6	-49 314 376.32	53 831 917.6
18	2027	54 565 429.60	2 391 639.5	-52 173 790.10	56 957 069.1
19	2028	57 578 382.12	2 524 508.4	-55 053 873.72	60 102 890.5
20	2029	60 436 491.98	2 657 377.2	-57 779 114.78	63 093 869.2
21	2030	63 431 236.17	2 790 246.1	-60 640 990.07	66 221 482.3
22	2031	66 475 500.84	2 923 115.0	-63 552 385.84	69 398 615.8
23	2032	69 507 620.30	3 055 983.8	-66 451 636.50	72 563 604.1

24	2033	72 543 765.62	3 188 852.7	-69 354 912.92	75 732 618.3
25	2034	75 487 049.22	3 321 721.5	-72 165 327.72	78 808 770.8
26	2035	78 719 046.69	3 454 590.4	-75 264 456.29	82 173 637.1
27	2036	81 567 760.37	3 587 459.3	-77 980 301.07	85 155 219.6
28	2037	84 506 925.24	3 720 328.1	-80 786 597.14	88 227 253.4
29	2038	87 343 191.48	3 853 197.0	-83 489 994.48	91 196 388.5
30	2039	90 207 325.33	3 986 065.8	-86 221 259.53	94 193 391.2
31	2040	92 954 858.06	4 118 934.7	-88 835 923.36	97 073 792.8

Table 81 shows that the total emissions in the project case are not significant as their sum is lower than 5% of total emissions. For this reason, ΔC_P is neglected in the final sum of GHG reductions.

TABLE 81. Relative contributions analysis of baseline and project case emissions

Emission	Relative contribution	RC _{Ei} (%)	Rank	Sum of RC _{Ei} (%)
$\Delta C_{BSL,unplanned}$ tCO ₂ e	0.96	95.76	1	95.76
ΔC_P (Ex-ante) tCO ₂ e	0.042	4.243		

3.2.6 Net Impact (CL2.2)

To calculate the total net GHG reductions of the REDD Project activity, we have used the net results from baseline estimations (Section G2), the net results from project-case estimations (G4.2), and the estimated net emissions due to leakage (to be seen in Section CL3). The net emission includes the carbon stock changes and the non-CO₂ GHG emissions under each scenario.

The general formula presented in REDD-MF Module was changed to fit the calculation method required in this standard:

$$C_{REDD,t} = \Delta C_P - (\Delta C_{BSL} - \Delta C_{LK}) \text{ (Modified from Eq. N°1 REDD-MF Module VCS Modular Methodology)}$$

Where,

$C_{REDD,t}$ Total net greenhouse emission reductions at time t; tCO₂e

ΔC_{BSL} Net greenhouse gas emissions under the baseline scenario, tCO₂e

ΔC_P Net greenhouse gas emissions within the project area under the project scenario; tCO₂e

ΔC_{LK} Net greenhouse gas emissions due to leakage; tCO₂e

As shown in the calculations developed, there is no variation in carbon stocks in the with-project case (ex-ante), because the Brazil Nut REDD Project will carry out activities to avoid the projected deforestation in 100%; and the GHG emissions have been dismissed as non-significant.

The emissions due to leakage (in- and outside the Leakage Belt) amount to 2 273 989 tCO₂e during the first 10 years. The percentages and indexes used in the different steps of the estimation are based on the analysis of official information, like the National Census of 2007 and studies of the area carried out by NGO's and different researchers.

Therefore, for the first 10 years of the project:

$$C_{REDD10} = 0 - (31\,166\,326 - 2\,273\,989) = -28\,892\,337 \text{ tCO}_2\text{e, and}$$

For the entire crediting period:

$$C_{REDD31} = 0 - (92\,954\,858 - 6\,801\,255) = -86\,153\,603 \text{ tCO}_2\text{e}$$

The value of CREDD represents the total greenhouse gases that will not be emitted to the atmosphere because of the implementation of the project activity inside the Brazil nut concessions. Hence, it is evident that the climate impact is positive. It should be stressed that there will be constant monitoring, to verify real emissions.

3.2.7 Measures to Avoid Double Counting of Emission Reductions

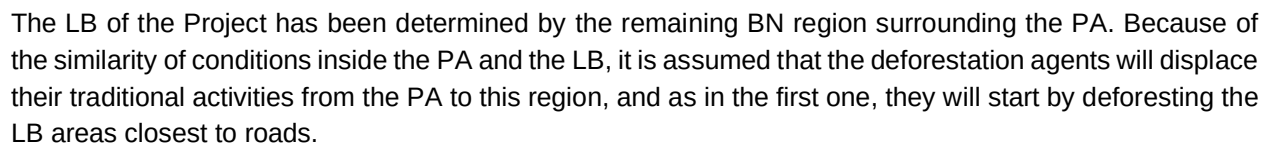
Currently the Ministry of Environment of Peru (MINAM), through the Climate Change and Desertification General Direction, the focal point for REDD in front of the UNFCCC, has announced that a Mitigation Measures National Registry will be launched to record all the reductions generated by the different initiatives, including the REDD projects.

In addition, BAM plans to register all the transactions through VERRA platform to avoid any risk of double counting. In that platform, each VCU has a unique code for transactions and retirements which can be seen in www.vcsprojectdatabase.org.

3.3 Offsite Climate Impacts (Leakage)

3.3.1 Types of Expected Leakage (CL3.1)

The Leakage Belt (LB), according to the Modular Methodology, is the area where the deforestation agents are expected to enter in presence of the project activity. We are using this concept to account for the expected leakage in the surroundings of the PA and in areas that are more distant.



For them, the Brazil nut concessions are very attractive areas as they are unoccupied most part of the year because of the Brazil Nut seasonality. Enforcement is still weak as it is very difficult for concessionaries to legally expulse invaders if they can stay at least for 48 hours.

The project plans to increase the (economic) incentives and improve the conditions of Brazil nut concessionaries to protect their areas while giving options and training to deforestation agents to switch to other alternative activities. Reforestation, Brazil nut processing, patrolling are labor-

intensive activities which will generate employment and incomes for the population. In addition, the surveillance system (that includes legal advisory) should inhibit migrants to come to these areas.

Nevertheless, leakage due to the avoided unplanned deforestation project is expected and was calculated in the following steps.

3.3.2 Quantity of Expected Leakage (CL3.1, 3.3)

3.3.2.1 Baseline Carbon Stock Changes and Greenhouse Gas Emissions in the Leakage Belt

In order to estimate the leakage due to project activities, the Modular Methodology requires the prior estimation of baseline deforestation inside the Leakage Belt area. Therefore, it was constructed according to BL-UP module. The same criteria to estimate the carbon stock change in the Project Area (Section G2) was used in this step. Some of them are:

- o The Forest Stratification is based on the Forest Map of the Madre de Dios ZEE, developed by the Peruvian Amazon Research Institute (IIAP) and the Regional Government of Madre de Dios (GOREMAD) in 2009. This stratification will remain the same for the entire baseline period.
- o The post-deforestation land-uses were defined based on the analysis made of the study of land use monitoring, in 3 points in time of the Inter-oceanic Highway, stretch 3 (CDC-UNALM/SZF/INRENA, 2007). These land-use-post-deforestation classes will also remain the same for the entire baseline period.
- o The carbon stocks in pre- and post-deforestation classes are fixed for the entire baseline period.

The whole procedure can be seen in detail in the excel document: Castañeros REDD Project Calculations CCB.xlsx. The cumulative results for each year in the baseline are shown in Table 97.

TABLE 82. Total Carbon Stock Change in the Leakage Belt in Baseline

T	Year	Total carbon stock change in baseline (tCO ₂ e) $\Delta C_{BSL,LK,unplanned}$
1	2010	5 300 084.75
2	2011	10 308 114.05
3	2012	15 538 968.68
4	2013	20 689 658.44
5	2014	25 686 756.01
6	2015	30 862 440.19
7	2016	36 362 406.24

8	2017	41 819 891.84
9	2018	47 083 900.24
10	2019	52 526 195.36
11	2020	58 023 748.87
12	2021	63 458 158.31
13	2022	68 851 037.66
14	2023	74 109 771.25
15	2024	79 350 342.35
16	2025	84 521 826.64
17	2026	89 652 401.30
18	2027	94 884 946.66
19	2028	99 805 582.09
20	2029	104 997 733.42
21	2030	109 814 057.91
22	2031	114 603 273.39
23	2032	119 520 794.31
24	2033	124 463 797.74
25	2034	129 294 242.03
26	2035	133 975 947.53
27	2036	138 732 243.19
28	2037	143 517 124.03
29	2038	148 385 871.65
30	2039	153 159 465.19
31	2040	158 055 109.37

3.3.2.2 Estimation of Unplanned Deforestation Displaced from the Project Area to the Leakage Belt

According to the module, the estimated carbon stock changes and the GHG emitted in the Project Area should be multiplied by a factor less than 1, which represents the percentage of deforestation that would be displaced into the Leakage Belt. This factor has been obtained by analyzing the activities that cause deforestation within groups of people in the districts of Tahuamanu and Las Piedras.

The Project Area and Leakage Belt are located in the provinces of Tahuamanu (covering the District of Tahuamanu) and Tambopata (covering the districts of Tambopata, Laberinto and Las Piedras). However, only the districts of Tahuamanu and Las Piedras were considered to calculate the proportion of deforestation by leakage, as only 5.4% of Laberinto is included in the project area (quite unrepresentative) and Tambopata has 70% of its population in the city of Puerto Maldonado, which is outside the PA and LB and has very different economic activities (mostly services as it is the largest urban area in the region).

In order to calculate the proportion of deforestation by immigration, the information provided in the National Census of 2007⁶⁸ has been considered as showed in the following table.

TABLE 83. Population by Economic Activity and Residence Period in the project zone

Activity by group	Las Piedras			Tahuamanu			TOTAL			
	≥ 5 yr. in the district	< 5 yr. in the district	Total 1	≥ 5 yr. in the district	< 5 yr. in the district	Total 2	≥ 5 yr. in the district	< 5 yr. in the district	Total	%
Agriculture - cattle raising, hunting and forestry	869	133	1 002	354	99	453	1 223	232	1 455	40.4
Mining and quarrying	13	19	32	-	1	1	13	20	33	0.92
Fishing	5	4	9	3	-	3	8	4	12	0.33
Construction	26	21	47	196	333	529	222	354	576	16
Manufacturing industries	130	49	179	36	92	128	166	141	307	8.52
Retail Trade	166	46	212	45	30	75	211	76	287	7.97
Wholesale trade	5	1	6	2	3	5	7	4	11	0.31
Transport, storage and communications	143	32	175	30	50	80	173	82	255	7.08

⁶⁸ Data Consult System of Settlements and Disperse Population. National Census 2007: XI of Population and VI of Housing. INEI.

Hotels and restaurants	106	24	130	23	24	47	129	48	177	4.91
Teaching	26	15	41	27	20	47	53	35	88	2.44
Private households and domestic services	34	19	53	4	5	9	38	24	62	1.72
Pub. Admin. and defense	12	9	21	12	28	40	24	37	61	1.69
Other act. Com. Serv. and personal	20	8	28	11	11	22	31	19	50	1.39
Health and Social services	9	15	24	5	6	11	14	21	35	0.97
Sale, maintenance and repair of motor vehicle and motorcycles	15	12	27	-	7	7	15	19	34	0.94
Real state act., business and rents	4	6	10	-	3	3	4	9	13	0.36
Electricity supply, gas and water	2	-	2	-	2	2	2	2	4	0.11
Unspecified economic activity	88	21	109	22	11	33	110	32	142	3.94
Total	1 673	434	2 107	770	725	1 495	2 333	1 127	3 602	100

Source: **National Census 2007**. Compiled by author

Of all the activities carried out by the population, only Agriculture and Livestock (presented under the same cell of the table) and Mining are considered a direct cause of deforestation. Taking the sum of both districts it results that 41% of the population is engaged in activities that cause deforestation, of which 34.31% are residents and 7.0% are migrants.

TABLE 84. Percentage expected at the Interior of the Leakage Belt

Deforestation Agents			Proportion not changed by Project Activity	Expected Proportion of Inhabitants engaged in deforestation		
Type	Activity	%				
Migrants (7%)	Agriculture - livestock	6.44	0.1	0.64	1.2	5%
	Mining	0.56	1	0.56		

Residents (34.31%)	Agriculture – livestock	33.95	0.1	3.4	3.76	
	Mining	0.36	1	0.36		
		41.31				

Source: In-house calculations

In both cases, there are people who will be dedicated to agriculture, livestock or mining. Conservatively, it is believed that people engaged in mining activities, whether be residents or migrants, will not change their line of business, as mining is currently the activity that produce the largest revenues in the region, and which growth in recent years evidence a tendency to a further increase⁶⁹.

With the farmers, whose activity is often of subsistence and from which they obtain a low revenue, the REDD Project aims to work and conduct surveillance, monitoring and training activities for the implementation of sustainable activities. Thus, it is estimated that 10% (worst scenario) of such population will not change their line of business and will maintain the deforestation activity.

It is expected then that the population that will cause deforestation and will migrate to the Leakage Belt will be 5%. As mentioned, this percentage has to be multiplied by the baseline emissions in the PA (in table 75, section G2-3.6), and the result is added to the estimated baseline in LB to obtain the emissions in the Leakage Belt under the project scenario. Finally, the difference between the project and baseline emissions in the LB is the ex-ante estimated leakage due to displacement of deforestation from the PA to the LB. this can be resumed in the following equation:

$$\Delta C_{LK-ASU-LB} = [(\Delta C_{BSL, \text{unplanned}} \times 0.05) + \Delta C_{BSL, \text{LK unplanned}}] - \Delta C_{BSL, \text{LK unplanned}}$$

(Developed according to Step 3.a LK-ASU Module, VCS Modular Methodology)

Where,

$\Delta C_{LK-ASU-LB}$	Net CO ₂ emissions due to unplanned deforestation displaced from the Project Area to the Leakage Belt; tCO ₂ e
$\Delta C_{BSL, \text{unplanned}}$	Net GHG emissions in the baseline from unplanned deforestation; tCO ₂ e
$\Delta C_{BSL, \text{LK unplanned}}$	Net CO ₂ emissions in the baseline from unplanned deforestation in the Leakage Belt; tCO ₂ e
0.05	Proportion of population causing deforestation that will be displaced from Project Area to Leakage Belt due to project implementation

TABLE 85. Cumulative Emissions due to Unplanned Deforestation displaced from the PA to LB

⁶⁹ Artisanal Mining Assessment in Madre de Dios. Mosquera et al. International Conservation Foundation. 2009

T	Year	Net CO ₂ emissions due to displaced unplanned deforestation from PA to LB $\Delta C_{LK-ASU-LB}$
1	2010	152 950.83
2	2011	306 330.68
3	2012	457 233.91
4	2013	625 949.68
5	2014	787 540.32
6	2015	953 951.53
7	2016	1 109 510.90
8	2017	1 259 063.39
9	2018	1 414 736.94
10	2019	1 558 316.29
11	2020	1 698 581.06
12	2021	1 839 306.92
13	2022	1 988 131.33
14	2023	2 129 954.70
15	2024	2 279 685.00
16	2025	2 429 639.60
17	2026	2 578 657.35
18	2027	2 728 271.48
19	2028	2 878 919.11
20	2029	3 021 824.60
21	2030	3 171 561.81
22	2031	3 323 775.04
23	2032	3 475 381.02
24	2033	3 627 188.28

25	2034	3 774 352.46
26	2035	3 935 952.33
27	2036	4 078 388.02
28	2037	4 225 346.26
29	2038	4 367 159.57
30	2039	4 510 366.27
31	2040	4 647 742.90

3.3.2.3 Estimation of Unplanned Deforestation Displaced from the Project Area to Outside the Leakage Belt

The leakage outside the LB must be accounted as well, and it is estimated by calculating a number of factors detailed in LK-ASU module. These are:

Available National Forest Area for Deforestation (AVFOR)

It has been defined as the total area of forest available nationwide, which has been equaled to the total area of forest in the country (TOTFOR) minus the areas under protection (PROTFOR) and under management (MANFOR).

TABLE 86. Forest Area divided by availability in the country

Category	Ha	Source
TOTFOR	70 180 130.4	PROCLIM, 2000
PROTFOR	16 452 255.7	Forest Bureau of the Ministry of Agriculture
MANFOR	8 586 493.6	DGFFS - Ministry of Agriculture

$AVFOR = TOTFOR - PROTFOR - MANFOR$ (Eq. N° 2 LK-ASU Module, VSC Modular Methodology)

$$45\,141\,381.13 = 70\,180\,130.4 - 16\,452\,255.7 - 8\,586\,493.6$$

Available forest area in Leakage Belt ($PROP_{LB}$)

It is the available forest area in the Leakage Belt (LBFOR) as a proportion of the total available national forest area (AVFOR).

The LBFOR area was defined as the total forest area in the LB minus the areas under active management, represented by Forest Timber Concessions (16 788.71 ha) and Ecotourism and

Conservation Concessions (10 347.01 ha). The Brazil nut concessions present in the LB (598 374.25 ha) are not being considered for the total managed areas in this calculation, because they are under the same conditions and suffer the same risk of deforestation as the PA (composed by this kind of concessions). Their legal status of “concession” will not prevent the possible leakage.

$$PROP_{LB} = LBFOR / AVFOR \quad (\text{Eq. N}^\circ 3 \text{ LK-ASU Module, VSC Modular Methodology})$$

$$0.01531 = [718\,282.33 - (16\,788.71 + 10\,347.01)] / 45\,141\,381.13$$

Proportional Difference in Carbon Stocks in and Outside LB ($PROP_{CS}$)

According to the methodology, a stratification of AVFOR by carbon stocks has to be made. There are studies of carbon stock nationwide, in different stratum or types of forests. However, such studies have not been homogenized to date, but there is an ongoing work. For this step, the data established for Peru in the Second Communication on Climate Change⁷⁰ was used to derive the country's average carbon stock: the emissions by land use change in natural forests for period 1990 – 2000 (56,827 Gg CO₂ equivalent) divided by the deforested areas on the same period (149,631.76 has). The resulting carbon stock for available forest outside LB (COLB) is 379.779 tCO₂/ha

The average of the carbon stock in the Leakage Belt (CLB) has been determined based on the average carbon stock by stratum and the representation of each in the Leakage Belt (weighted average), being equal to 688.39 tCO₂.

$$PROP_{CS} = COLB / CLB \quad (\text{Eq. N}^\circ 4 \text{ LK-ASU Module, VSC Modular Methodology})$$

$$0.55 = 379.78 \text{ tCO}_2 / 688.39 \text{ tCO}_2$$

Proportional Leakage for Areas with Immigrating Populations (LK_{PROP})

$$LK_{PROP} = PRO_{IMM} * (1 - PROP_{LB}) * PROP_{CS} \quad (\text{Eq. N}^\circ 5 \text{ LK-ASU Module, VSC Modular Methodology})$$

$$0.03803 = 0.07 * (1 - 0.01531) * 0.55$$

The PRO_{IMM} value, which was taken from Table 99, refers to the proportion of the population composed by migrants who carry out deforestation activities.

Finally, the leakage caused by deforestation actors that will be displaced outside the Leakage Belt is equal to:

$$\Delta C_{LK-ASU, OLB} = (\Delta C_{BSL, LK, unplanned} - \Delta C_{P, LB}) * LK_{PROP} \quad (\text{Eq. N}^\circ 6 \text{ LK-ASU Module, VSC Modular Methodology})$$

Where,

⁷⁰ <http://www.minam.gob.pe/dmdocuments/SCNCC-MINAM.pdf> (page 72).

$\Delta C_{LK-ASU, OLB}$	Net CO ₂ emissions due to unplanned deforestation displaced outside the Leakage Belt; tCO ₂ e
$\Delta C_{BSL, LK, unplanned}$	Net CO ₂ equivalent emissions in the baseline from unplanned deforestation in the Leakage Belt; tCO ₂ e
$\Delta C_{P, LB}$	Net CO ₂ equivalent emissions within the Leakage Belt in the project case; tCO ₂ e
LK_{PROP}	Proportional leakage for areas with immigrating populations; proportion

The ex-ante value of $\Delta C_{P, LB}$ was calculated according to the M-MON Module (Section 6.2, table 5), more details of the procedure can be seen in Castañeros REDD Project Calculations v5.xlsx (spreadsheets Auxiliar 2 and Auxiliar 3).

TABLE 87. Net cumulative CO₂ emissions due to unplanned deforestation displaced outside LB

T	Year	Total carbon stock change in baseline in LB (tCO ₂ e) $\Delta C_{BSL, LK, unplanned}$	Net CO ₂ emissions within the LB in project case (tCO ₂ e) $\Delta C_{P, LB}$	Net CO ₂ emissions due to displaced unplanned deforestation outside LB $\Delta C_{LK-ASU, OLB}$
1	2010	5 300 084.75	3 401 063.88	152 950.83
2	2011	10 308 114.05	6 614 715.25	306 330.68
3	2012	15 538 968.68	9 971 353.60	457 233.91
4	2013	20 689 658.44	13 276 550.03	625 949.68
5	2014	25 686 756.01	16 483 186.45	787 540.32
6	2015	30 862 440.19	19 804 421.51	953 951.53
7	2016	36 362 406.24	23 333 748.13	1 109 510.90
8	2017	41 819 891.84	26 835 814.90	1 259 063.39
9	2018	47 083 900.24	30 213 727.43	1 414 736.94
10	2019	52 526 195.36	33 706 046.26	1 558 316.29
11	2020	58 023 748.87	37 233 824.51	1 698 581.06
12	2021	63 458 158.31	40 721 083.12	1 839 306.92
13	2022	68 851 037.66	44 181 691.79	1 988 131.33
14	2023	74 109 771.25	47 556 218.92	2 129 954.70

15	2024	79 350 342.35	50 919 091.10	2 279 685.00
16	2025	84 521 826.64	54 237 630.15	2 429 639.60
17	2026	89 652 401.30	57 529 917.66	2 578 657.35
18	2027	94 884 946.66	60 887 639.76	2 728 271.48
19	2028	99 805 582.09	64 045 209.13	2 878 919.11
20	2029	104 997 733.42	67 377 010.11	3 021 824.60
21	2030	109 814 057.91	70 467 643.07	3 171 561.81
22	2031	114 603 273.39	73 540 880.57	3 323 775.04
23	2032	119 520 794.31	76 696 451.22	3 475 381.02
24	2033	124 463 797.74	79 868 373.66	3 627 188.28
25	2034	129 294 242.03	82 968 066.90	3 774 352.46
26	2035	133 975 947.53	85 972 314.16	3 935 952.33
27	2036	138 732 243.19	89 024 425.75	4 078 388.02
28	2037	143 517 124.03	92 094 880.59	4 225 346.26
29	2038	148 385 871.65	95 219 152.61	4 367 159.57
30	2039	153 159 465.19	98 282 364.18	4 510 366.27
31	2040	158 055 109.37	101 423 895.82	4 647 742.90

3.3.2.4 Emissions from Leakage Prevention Activities

The proposed activities were designed to reduce deforestation inside both, Project Area and Leakage Belt, given that the latter is principally formed by other Brazil nut concessions. Thus, the activities cannot be divided in leakage prevention activities and project activities inside PA.

The emissions arising from the implementation of these activities were estimated ex-ante according to E-FFC Module and were already included in the GHG project activity emissions in Section CL2. Therefore, the GHG emissions from leakage prevention activities ($GHG_{LK, E}$) were set to zero. The ex-post calculations will also be included as emissions from project activities.

The total GHG emissions due to total leakage are finally calculated with the following equation. The results are shown in Table 105 for baseline period.

$\Delta C_{LK-AS, \text{unplanned}} = \Delta C_{LK-ASU-LB} + \Delta C_{LK-ASU, OLB} + GHG_{LK, E}$ (Eq. N° 13 LK-ASU Module, VSC Modular Methodology)

Where,

$\Delta C_{LK-AS, \text{unplanned}}$ Net GHG emissions due to activity shifting leakage for projects preventing unplanned deforestation Net CO₂ emissions; tCO₂e

$\Delta C_{LK-ASU-OLB}$ Net CO₂ emissions due to unplanned deforestation displaced outside the Leakage Belt; tCO₂e

$\Delta C_{LK-ASU, LB}$ Net CO₂ emissions due to unplanned deforestation displaced from the Project Area to the Leakage Belt; tCO₂e

$GHG_{LK, E}$ GHG emissions as a result of leakage of avoided deforestation activities; tCO₂e

TABLE 88. Total leakage due to the displacement of unplanned deforestation

T	Year	Net CO ₂ emissions due to displaced unplanned deforestation from PA to LB $\Delta C_{LK-ASU-LB}$	Net CO ₂ emissions due to displaced unplanned deforestation outside LB $\Delta C_{LK-ASU, OLB}$	Emissions from leakage prevention activities $GHG_{LK, E}$	Total Leakage due to displacement of unplanned deforestation (tCO ₂ e) $\Delta C_{LK-AS, \text{unplanned}}$
1	2010	152 950.83	72 213.96	-	225 164.80
2	2011	306 330.68	140 448.68	-	446 779.36
3	2012	457 233.91	211 719.40	-	668 953.31
4	2013	625 949.68	281 897.87	-	907 847.55
5	2014	787 540.32	349 983.64	-	1 137 523.97
6	2015	953 951.53	420 502.68	-	1 374 454.21
7	2016	1 109 510.90	495 440.08	-	1 604 950.98
8	2017	1 259 063.39	569 798.68	-	1 828 862.07
9	2018	1 414 736.94	641 521.15	-	2 056 258.09
10	2019	1 558 316.29	715 672.79	-	2 273 989.08
11	2020	1 698 581.06	790 577.33	-	2 489 158.39
12	2021	1 839 306.92	864 621.53	-	2 703 928.45
13	2022	1 988 131.33	938 099.88	-	2 926 231.21

14	2023	2 129 954.70	1 009 750.50	-	3 139 705.20
15	2024	2 279 685.00	1 081 153.65	-	3 360 838.65
16	2025	2 429 639.60	1 151 615.50	-	3 581 255.10
17	2026	2 578 657.35	1 221 519.95	-	3 800 177.30
18	2027	2 728 271.48	1 292 813.75	-	4 021 085.23
19	2028	2 878 919.11	1 359 857.77	-	4 238 776.88
20	2029	3 021 824.60	1 430 601.21	-	4 452 425.81
21	2030	3 171 561.81	1 496 223.99	-	4 667 785.80
22	2031	3 323 775.04	1 561 477.39	-	4 885 252.43
23	2032	3 475 381.02	1 628 478.98	-	5 103 860.00
24	2033	3 627 188.28	1 695 827.78	-	5 323 016.06
25	2034	3 774 352.46	1 761 642.96	-	5 535 995.42
26	2035	3 935 952.33	1 825 431.57	-	5 761 383.91
27	2036	4 078 388.02	1 890 236.49	-	5 968 624.51
28	2037	4 225 346.26	1 955 430.87	-	6 180 777.13
29	2038	4 367 159.57	2 021 767.95	-	6 388 927.53
30	2039	4 510 366.27	2 086 808.55	-	6 597 174.82
31	2040	4 647 742.90	2 153 512.10	-	6 801 255.00

3.3.3 Leakage Mitigation (CL3.2)

As mentioned before, many of the proposed activities have been designed so that, in addition to preventing deforestation in PA, they also face up leakage. This will be done by including the different stakeholders from the Project Zone into the project activities. Thus, there are no activities meant for leakage management per se.

Below is a summary of these activities, whose effectiveness will be evaluated constantly throughout the project's life. If necessary, new activities could be implemented during the project life span.

Project Activities that include leakage prevention measures:

- o Implementation of the Forest Monitoring and Surveillance System. This is not just limited to the project area, but also includes the leakage belt. The Checkpoints are to be located in the most critical access points throughout the area.
- o Training in sustainable activities among neighboring residents, where especial interest will be given to Agro-forestry, usage of non-timber forest resources, Fish farming, etc. to encourage the rational use of forest resources, on which many people depend. For people involved in the mining sector, it will include waste management training.
- o Development of local environmental education campaigns.
- o Creation of alliances with local NGOs or Technical Institutes to develop pilot projects for alternative activities.
- o Improvement of the organizational capacity of FEPROCAMD, given that it comprises all Brazil nut concessions, not only the ones associated to the project.

Since the deforestation agents are migrants and residents doing farming and mining activities, it is to be supposed that migrants and miners in general are the actors who are most difficult to include - and convince of participating - in the project activities. Nonetheless, from the proportion of migrants undertaking deforestation activities very few are involved in mining (7%), hence we expect to reach everybody but miners.

3.4 Climate Impact Monitoring

The Monitoring Plan has been developed following the guidelines of M-MON module. Its aim is to establish the parameters to be monitored and to guide the collection of all necessary information for assessing the development of the project activities and especially, for estimating the real (ex-post) net GHG reductions attributable to the project activity.

The monitoring for verification will be conducted maximum every 5 years, and for revisiting the Baseline, it will happen every 10 years as required by the methodology. During this time, some parameters will be recorded according to their occurrence (i.e. PRA, training courses), and others by the end of each monitoring event (i.e. deforested area through satellite images).

In the same way, the project will monitor some parameters directly in field and others by gathering indirect information, like satellite images as well as representative studies of the area and official information, if necessary.

3.4.1 Climate Monitoring Plan (CL4.1)

This section defines the Monitoring Plan that will be periodically undertaken to evaluate the carbon stock changes and GHG emissions that could occur along the project lifespan. This plan will also allow the project to calculate and report the carbon reductions attributable to the project activity, through the verification processes under the VCS Standard in order to claim carbon credits.

The Monitoring Plan is detailed below:

3.4.1.1 Monitoring Parameters

Each monitoring event will produce the following pre-results:

Parameter	SI Unit	Description
$\Delta C_{p,defPA,i,t}$	tCO ₂ e	Net carbon stock change due to deforestation in the Project Area in the project case
$\Delta C_{p,Deg,i,t}$	tCO ₂ e	Net carbon stock change due to degradation in the Project Area in the project case
$\Delta C_{p,DistPA,i,t}$	tCO ₂ e	Net carbon stock change due to natural disturbance in the Project Area in the project case
GHG _{p-E,i,t}	tCO ₂ e	Greenhouse gas emissions due to deforestation and degradation within the Project Area in the project case
$\Delta C_{p,DefLB,i,t}$	tCO ₂ e	Net carbon stock change due to deforestation in Leakage Belt in the project case

The last parameter from the table, referred to emissions in LB, is used to estimate the leakage emissions caused by the project activities (procedures described in CL3); while the first four parameters are combined (using Equation N°1 M-MON module) to finally obtain:

Parameter	SI Unit	Description
ΔC_P	tCO ₂ e	Net greenhouse gas emissions within the project area under the project scenario

As can be inferred, the previous parameters are each one the result of several calculations framed in the Modular Methodology. Therefore, in order to get any of them, the parameters under monitoring (according to the objective) are:

Data and Parameters Monitored for Baseline Renewal

Parameter:	Regional Forest Cover/ Non-Forest Cover Benchmark Map
Data unit:	n/a
Description:	Map showing the location of forest areas in the Reference Region (RRD) at the beginning of the crediting period
Source of data:	Landsat satellite images or similar and ground truth
Justification of choice or description of measurement methods/procedures applied:	The Landsat images have an adequate resolution and they are an available tool. The map shall have a minimum accuracy of 90%. At minimum 3 times over the baseline period
Any comment:	The forest cover will be stratified using the Forest Classes of the Ecologic and Economic Zoning (ZEE) of the Madre de Dios Region, developed by the IIAP and GOREMAD in 2009

Parameter:	A_i
Data unit:	Ha
Description:	Area of stratum i
Source of data:	
Justification of choice or description of measurement methods/procedures applied:	At a minimum every 10 years prior to baseline renewal
Any comment:	n/a

Parameter:	$ARRD_{unplanned,hrp}$
Data unit:	Ha
Description:	Total deforested area during the Historical Reference Period in the RRD
Source of data:	Analysis of Landsat satellite images
Justification of choice or description of measurement methods/procedures applied:	The Landsat images have the adequate resolution and they are a free and available tool to all public
Any comment:	Monitored for baseline revisions

Parameter:	CF
Data unit:	$t\ C\ t^{-1}\ d.m$
Description:	Carbon fraction of dry matter
Source of data:	Value taken from IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.3
Justification of choice or description of measurement methods/procedures applied:	Equal to $0.47\ t\ C\ t^{-1}\ d.m.$ for non-trees species
Any comment:	n/a

Parameter:	CF_j
Data unit:	$t\ C\ t^{-1}\ d.m.$
Description:	Carbon fraction of biomass for tree species j
Source of data:	Value taken from IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.3
Justification of choice or description of measurement methods/procedures applied:	Equal to $0.49\ t\ C\ t^{-1}\ d.m.$ for trees in Tropical Forests
Any comment:	n/a

Parameter:	D_j

Data unit:	t d.m. m ⁻³
Description:	Basic wood density for species <i>j</i>
Source of data:	National species-specific densities For species-specific wood densities not available, it was used the regional average wood density value (0.60 t d m m ³ - tropical America) from Reyes 1992 and Brown, S. 1997
Justification of choice or description of measurement methods/procedures applied:	Species densities have been taken from different sources of national species-specific researches being the main ones: Evaluation of mechanical and physical properties and probable uses of the wood of 20 species in Jenaro Herrera, Loreto – Peru (Aróstegui and Acevedo) Summary of technical information of 32 tree species. Peruvian Confederation of Wood. 2008. CPM. CITE Madera Global wood density database (Chavé et al., 2009)
Any comment:	n/a

Parameter:	$f_j(X,Y)$
Data unit:	t d.m. tree ⁻¹
Description:	Allometric equation for species <i>j</i> linking measured tree variable (s) to aboveground biomass of living trees
Source of data:	The Chavé equation for trees and Winrock equation for palm trees
Justification of choice or description of measurement methods/procedures applied:	Both formulas have been taken from: Pearson, T., Walker, S. and Brown, S. 2005. Sourcebook for Land Use, Land-Use Change and Forestry Projects. Winrock International and the World Bank Biocarbon Fund. 57pp Chave, J, et. Al. 2005. Tree allometry and improved estimation of carbon stocks and balance in tropical forests. Oecologia 145: 87-99
Any comment:	

Data and Parameters Monitored for Verification

Parameter:	Project Forest Cover Monitoring Map
Data unit:	n/a
Description:	Map evidencing location of forestland in the Project Area at the beginning of each verification period.
Source of data:	Remote sensing
Justification of choice or description of measurement methods / procedures applied:	Described below
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	ERDAS Software, GIS Software, available satellite images
QA/QC procedures to be applied:	Accuracy assessment through ground truth or high-resolution satellite images
Any Comment:	This map will be updated after each monitoring event. The base forest area for the first monitoring period will be equal to the Project boundary. It is also called Project Forest Cover Benchmark Map when is used for Baseline renewal

Parameter:	Leakage Belt Forest Cover Monitoring Map
Data unit:	n/a
Description:	Map evidencing location of forestland in the Leakage Belt at the beginning of each verification period.
Source of data:	Remote sensing
Justification of choice or description of measurement methods / procedures applied:	Described below
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	ERDAS Software, GIS Software, available satellite images
QA/QC procedures to be applied:	Accuracy assessment through ground truth or high-resolution satellite images
Any comment:	This map will be updated after each monitoring event. The base forest area for the first monitoring period will be equal to the Leakage Belt boundary. It is also called Leakage Belt Forest Cover Benchmark Map when is used for Baseline renewal

Parameter:	Degradation PRA Results

Data unit:	n/a
Description:	Potential pressure of illegal extraction of trees inside PA
Source of data:	PRA
Justification of choice or description of measurement methods / procedures applied:	Interviews and/or surveys to local actors to identify potential existence of illegal extraction inside PA due to: ·Extraction of firewood ·Illegal logging If the $\geq 10\%$ of the surveys show possible degradation, then on-the-ground surveys will be executed. Additionally, a penetration distance should be obtained
Frequency of monitoring/recording:	Every 2 years
Value applied:	n/a
Monitoring equipment:	n/a
QA/QC procedures to be applied:	Templates for surveys and/or interviews
Any comment:	Degradation is considered 0 at the beginning of the project

Parameter:	Results of Limited Degradation Survey
Data unit:	n/a
Description:	Verification of degradation processes in the project area
Source of data:	Field measurements
Justification of choice or description of measurement methods/procedures applied:	Sampling transects with known length and width, distributed across the buffer to identify existence of new tree-stumps. Transects should cover $\geq 1\%$ of the buffer area
Frequency of monitoring/recording:	Each time the PRA indicates potential degradation in PA
Value applied:	n/a
Monitoring equipment:	GPS, field notebooks
QA/QC procedures to be applied:	Trained staff for field measurement
Any comment:	n/a

Parameter:	$A_{DefPA,iu,t}$
Data unit:	Ha
Description:	Area of recorded deforestation in the Project Area in stratum i converted to land use u at time t
Source of data:	Remote sensing imagery

Justification of choice or description of measurement methods/procedures applied:	Described below
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	GIS Software, available satellite images
QA/QC procedures to be applied:	n/a
Any comment:	Ex-ante estimation equal to zero in the with-project case

Parameter:	$A_{DefLB,iu,t}$
Data unit:	Ha
Description:	Area of recorded deforestation in the Leakage Belt in stratum i converted to land use u at time t
Source of data:	Remote sensing imagery
Justification of choice or description of measurement methods/procedures applied:	Described below
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	Software GIS, available satellite images
QA/QC procedures to be applied:	n/a
Any comment:	Ex-ante values calculated according to M-MON module

Parameter:	$A_{DegW,i}$
Data unit:	Ha
Description:	Area potentially impacted by degradation process
Source of data:	GIS delineation and ground truth
Justification of choice or description of measurement methods/procedures applied:	The length is obtained from the PRA results, and the width shall be equal to the length
Frequency of monitoring/recording:	Must to be repeated each time the PRA indicate a potential for degradation
Value applied:	n/a
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	n/a
Any comment:	n/a

Parameter:	$A_{DECKS,i,t}$
Data unit:	Ha
Description:	Area of logging decks in stratum i at time t
Source of data:	Field measurements or post-harvest reports
Justification of choice or description of measurement methods/procedures applied:	Described below
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	GPS MAP 60 CSX, Arc GIS Software
QA/QC procedures to be applied:	Randomly verification of 10% field data
Any comment:	n/a

Parameter:	$A_{DistPA,q,i,t}$
Data unit:	Ha
Description:	Area impacted by natural disturbance in the project stratum i converted to natural disturbance stratum q at time t
Source of data:	Satellite images and ground verification
Justification of choice or description of measurement methods / procedures applied:	Minimum monitoring unit equal to a minimum of 11 Landsat pixels or one hectare
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	GIS Software, available satellite images
QA/QC procedures to be applied:	Contrast the information from the Remote sensing with field verification
Any comment:	Ex ante estimated as zero hectares

Parameter:	$A_{ROAD,i,t}$
Data unit:	Ha
Description:	Area of roads in stratum i at time t
Source of data:	Post-harvest assessment reports and maps or field measurements
Justification of choice or description of measurement methods / procedures applied:	The area of roads is based on the length of roads times the average width of roads. Systematic samplings may be used to estimate the width of roads, achieving a precision equal or less than 15% of the mean at 95% confidence interval
Frequency of monitoring/recording:	Every ≤ 5 years

Value applied:	n/a
Monitoring equipment:	GPS MAP 60 CSX, Arc GIS Software
QA/QC procedures to be applied:	Randomly verification of 10% field data
Any comment:	n/a

Parameter:	$A_{RRL,forest,t}$
Data unit:	Ha
Description:	Remaining area of forest in RRL
Source of data:	Satellite images and ground verification
Justification of choice or description of measurement methods/procedures applied:	Described below
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	GIS Software, available satellite images
QA/QC procedures to be applied:	n/a
Any comment:	n/a

Parameter:	AP_i
Data unit:	Ha
Description:	Total area of degradation sample plots in stratum i
Source of data:	Ground measurement
Justification of choice or description of measurement methods/procedures applied:	Systematically placed plots, covering at least 3% of the buffer zone
Frequency of monitoring/recording:	Every time the Limited Degradation Survey indicates degradation (existence of stumps), or at least every 5 years
Value applied:	n/a
Monitoring equipment:	GPS, field equipment: tape line, compass and field staff
QA/QC procedures to be applied:	Trained staff for field measurement
Any comment:	Ex-ante , there is no evidence of degradation within PA

Parameter:	$C_{DegW,i,t}$
Data unit:	t CO ₂ -e
Description:	Biomass carbon of trees cut and removed through illegal logging and charcoal extraction degradation process from plots measured in stratum i at time t
Source of data:	Field measurement

Justification of choice or description of measurement methods/procedures applied:	Described below
Frequency of monitoring/recording:	Every time there is a degradation event or at least every 5 years
Value applied:	n/a
Monitoring equipment:	GPS, field equipment: tapeline, compass and field staff
QA/QC procedures to be applied:	n/a
Any comment:	Ex-ante estimated as zero

Parameter:	$C_{AB\_tree\_dest,i}$
Data unit:	t CO ₂ -e ha ⁻¹
Description:	Carbon stock in aboveground tree biomass assumed to be killed per unit area resulting from the creation of the skid trail in stratum i
Source of data:	Forest carbon inventory
Justification of choice or description of measurement methods/procedures applied:	n/a
Frequency of monitoring/recording:	Carbon stocks will be re-assessed for baseline renewal
Value applied:	$C_{AB\_tree\_dest,i} = C_{AB\_tree,i}$
Monitoring equipment:	n/a
QA/QC procedures to be applied:	n/a
Any comment:	n/a

Parameter:	$C_{BB\_tree\_dest,i}$
Data unit:	t CO ₂ -e ha ⁻¹
Description:	Carbon stock in belowground tree biomass assumed to be killed per unit area resulting from the creation of the d trail in stratum i
Source of data:	$C_{AB\_tree\_dest,i}$
Justification of choice or description of measurement methods / procedures applied:	Root-to-shoot used in baseline (0.24)
Frequency of monitoring/recording:	Carbon stocks will be re-assessed for baseline renewal
Value applied:	$C_{BB\_tree\_dest,i} = C_{AB\_tree\_dest,i} * 0.24$
Monitoring equipment:	n/a
QA/QC procedures to be applied:	n/a
Any comment:	n/a

Parameter:	L_{sk}
Data unit:	m
Description:	Length of skid trail
Source of data:	Post-harvest assessment reports and maps or field measurements
Justification of choice or description of measurement methods/procedures applied:	A systematic sampling may also be used, if reports are insufficient
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	GPS MAP 60 CSX
QA/QC procedures to be applied:	Randomly verification of 10% field data
Any comment:	n/a

Parameter:	$V_{EXT,z,i,t}$
Data unit:	m^3
Description:	Extracted volume from logging stratum z in stratum i at time t
Source of data:	Records and post-harvest reports
Justification of choice or description of measurement methods / procedures applied:	Described below
Frequency of monitoring/recording:	Gathering of records every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	Designed forms for FSC certification
QA/QC procedures to be applied:	Training of concessionaries in wood volume measurement
Any comment:	n/a

Parameter:	$V_{EXT,j,z,i,t}$
Data unit:	m^3
Description:	Volume of timber extracted of species j for logging stratum z in stratum i at time t
Source of data:	Records and post-harvest reports
Justification of choice or description of measurement methods / procedures applied:	Same procedures applied in the estimation of $V_{EXT,z,i,t}$
Frequency of monitoring/recording:	Gathering of records every ≤ 5 years
Value applied:	n/a

Monitoring equipment:	Designed forms for FSC certification
QA/QC procedures to be applied:	Training of concessionaries in wood volume measurement
Any comment:	n/a

Parameter:	W_{SKID}
Data unit:	m
Description:	Mean width of skid trails
Source of data:	Post-harvest assessment reports and maps or field measurements
Justification of choice or description of measurement methods/procedures applied:	Described below
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	n/a
Monitoring equipment:	GPS MAP 60 CSX
QA/QC procedures to be applied:	Randomly verification of 10% field data
Any comment:	n/a

Monitoring Deforestation

The changes in forestland, detection, and mapping of deforestation inside the Reference Regions, and Project Area and Leakage belt (ergo Project Zone) will be periodically monitored through the analysis of satellite images. As for baseline validation, the entity in charge of said analysis will be the Instituto de Investigaciones de la Amazonía Peruana (IIAP), who developed the ZEE for Madre de Dios. This public institution is well renowned for their continuous research and work in the Amazon basin.

The mapped boundaries are selected according to the monitoring objectives:

- o For verification purposes: Project Area, Leakage Belt and RRL.
- o For baseline renewal: RRD, in the same year of baseline renewal or no further in the past than a year prior to it.

The mapping products expected are the areas of change (from forest stratum i to post-deforestation land-use u) and the updating of the Forest Cover Benchmark Maps, for all mentioned boundaries.

To carry out the analysis the next steps will be followed:

Selection and Analysis of Sources of Land-Use and Land-Cover (LU/LC) Change Data

The remotely sensed spatial data to be used are Landsat images from sensors 5TM and 7TM, which have a resolution of 30x30 m. The selection and acquisition of the most adequate satellite images will be accomplished by:

- o Search of images in the web sites of National Institute for Space Research from Brazil (INPE) and USGS Global Visualization Viewer.
- o Selection of 5TM and Landsat 7TM satellite images, with less than 10% cloud cover over the desired areas. This will be achieved by comparing quick looks and their %CC reported for each quadrant, shown in both websites. If not possible, then images with the lowest overall percentage of cloud cover will be selected and a mosaic constructed.

As stated in the methodology, if a new source with higher resolution becomes available or if the used source is no longer available, then a change of source will only occur if the new data complies with the requirement these requirements.

Processing LU/LC Change Data

The pre-processing techniques to be used met all recommendations given in the Sourcebook on REDD (GOFC-GOLD, 2009) and follows the Manual for Elaboration of Mosaics developed by IIAP. The process is detailed below:

Image conditioning

The images are generally acquired in compressed TIFF format. Decompression and export to ERDAS IMAGINE matrix format (*.img) will be done, to proceed to the union of spectral bands.

Geo referencing

The geo-referencing locates the image according to a coordinate system. It can be done by either using the National Charter vector data of the National Geographic Institute (IGN) in 1:100,000 scale as a reference, or the Image-to-Image technique, which consists of using an image that already has a projection system. However, the latter needs a reference for validation and the IGN National Charter can be used for it.

The RMSE (Root Mean Square Error) is used to measure if there is image shift at the time of the junction with another adjacent image, as by definition it shows the variation between an actual observation and a calculated value. Larger RMS error indicate poor correspondence, therefore RMSE must be minimal in all cases, complying with all the requirements for this step as explained in ERDAS field guide.

Detection and removal of clouds and shadows

Satellite images with less than 10% cloud cover shall be selected. The remaining corrections will be made by making up a mosaic, explained on the next step. According to the Sourcebook on REDD (GOFC-GOLD, 2009), the preferred method for analyzing images with cloud cover is the visual interpretation.

Radiometric enhancement

It will be performed with ERDAS IMAGINE software if visual appearance of images needs to be improved.

Mosaic construction

It is necessary to merge of all the scenes collected to cover the entire area (especially in the case of RRD). Consideration will be given to the date of the image, to allow the information in the overlapped area to be the most current.

If in the resulting images, the remaining areas with cloud cover ($\leq 10\%$) are not removed by doing a mosaic (with multiple images of the same 12-month period), then the indications set forth in modules BL-UP (section 2.1.3) and M-MON will be considered. That is to say, only the visible areas from both images will be used when calculating the rate of deforestation of the new baseline period. Then the maximum forest cover at the start of the new period will be multiplied by this rate, to obtain the total area of deforestation during the period.

Interpretation and Analysis

After completing the former actions, the following will be done:

- o Generation of vector data by visual interpretation of patterns of deforestation

One of the main analysis methods for moderate resolution images is Visual Interpretation (Sourcebook on REDD GOFC-GOLD, 2009). According to this document, it is a simple and robust method but time consuming, which also requires that an experienced interpreter perform the image analysis. As for the historical-period images, the work will be done by the GIS department of IIAP. This step will consist of interpretation, digitizing, editing and encoding of deforestation.

- o Map accuracy assessment

An accuracy assessment of maps will be carried in order to produce credible results of deforestation. Ground-truthing and/or high-resolution images will be used to assess the classified images, and the results will be analyzed by using a Confusion Matrix. A minimum of 90% is the targeted accuracy for both, forest and non-forest land.

TABLE 89. Example of Confusion Matrix

Predicted Class	Actual Class		Σ	Commission Errors %
	A	B		
A	nAA	nAB	nA+	
B	nBA	nBB	nB+	
Σ	n+A	n+B	n	
Omission Errors %				

As BAM is the map's user, attention is focused on the commission errors and a user's accuracy shall be estimated. It can be done with the following formula⁷¹ for every map class:

$$\text{User's Accuracy} = (n_{ii} / n_{i+}) * 100\%$$

Once the classification of images is completed, the BAM's GIS expert will estimate the following parameters for the monitored period:

- o Area of change (deforestation) in the PA ($A_{\text{DefPA},u,i,t}$) and LB ($A_{\text{DefLB},u,i,t}$) per stratum
- o Update of Forest Cover Monitoring Maps for PA and LB
- o Update the remaining area of forest in RRL ($A_{\text{RRL},\text{forest},t}$)
- o Total area deforested during the baseline in RRD ($A_{\text{RRD},\text{unplanned},\text{hrp}}$), only for baseline renewal

The Area of Change data should specify to which post-deforestation land use (u) forest strata (i) was converted, so by the end of baseline period the fixed proportions of u types used for ex-ante baseline estimations can be reassessed.

Finally, the deforested areas are multiplied by the emission per unit area, to get the Net carbon stock change for the period. Nonetheless, the following criteria will be considered:

- o The forest strata will remain the same during baseline period
- o The selected pools for the baseline estimation will be maintained during baseline period. All carbon pools excluded are counted as zero
- o The carbon stocks in the forest strata and the post-deforestation land-uses will be constant during baseline period

The next equations, taken from M-MON module and already described in Section CL1, will be used to that end:

$$\Delta C_{p,\text{DefPA},i,t} = \sum (A_{\text{DefPA},u,i,t} * \Delta C_{\text{pools},P,\text{Def},u,i,t})$$

$$\Delta C_{p,\text{DefLB},i,t} = \sum (A_{\text{DefLB},u,i,t} * \Delta C_{\text{pools},P,\text{Def},u,i,t})$$

$$\Delta C_{\text{pools},P,\text{Def},u,i,t} = C_{\text{BSL},i} - C_{P,\text{post},i} - C_{\text{WP},i}$$

3.4.1.3 Monitoring Degradation

The project will account for any emissions due to degradation activities, which are represented by:

⁷¹ Strahler, A. *et al.* Global Land Cover Validation: Recommendations for Evaluation and Accuracy Assessment of Global Land Cover Maps. GOFC-GOLD. 2006.

Degradation through extraction of trees for illegal timber or fuelwood and charcoal ($\Delta C_{P,DegW,i,t}$)

Degradation through extraction of trees for selective logging from forest management areas possessing FSC certificate ($\Delta C_{P,SelLog,i,t}$)

Where:

$$\Delta C_{P,Deg,i,t} = \Delta C_{P,DegW,i,t} + \Delta C_{P,SelLog,i,t}$$

This equation was explained in detail in Section CL2. The parameters inside it are explained next.

Degradation by Illegal Extraction or Fuel Wood and Charcoal

Tracking this type of degradation activity has many steps. First, a possible pressure on the PA from illegal extraction of trees shall be assessed. In this sense, a Participative Rural Assessment (PRA) will be developed with the concessionaries given that, for being users of the project areas, they can identify the occurrence of any disruption in their areas. The PRA will consist of interviews and/or surveys.

If the PRA results show there is no considerable pressure over PA ($\geq 90\%$ of surveys indicate no pressure), then degradation is assumed to be zero and no field survey is needed. On the contrary, if PRA suggests potential degradation, the project will carry out the following sub-steps:

A Penetration Distance should be obtained (distance that degradation agents can entry from all access points) from PRA.

All Access Points were identified and can be seen in Map 33. Nonetheless, after every PRA we could identify new points or determine if any of the existent ones are not relevant for the period and should not be monitored.

From each point, Buffer Areas will be established with wide and longitude equal to the penetration distance.

A Limited Sampling of transects will be carried to evaluate the buffer zone. The evaluated area should be no less than 1% of the buffer area.

If tree-stumps are not found or barely found (exploited trees) then it would be assumed that $\Delta C_{P,Deg,i,t} = 0$ and the limited sampling repeated every time a PRA indicates potential of degradation.

If the tree-stumps are found, then a Systematic Sampling should be made. To this purpose, an area $\geq 3\%$ of the buffer area will be assessed with plots systematically placed.

The diameter of all tree-stumps will be measured and assumed to be equal to DBH. If they are too big, (i.e. due to buttress roots) the specie should be identified and other individuals of the same species standing next to it should be measured. Their DBH and tree-stumps diameter will be recorded, and a ratio DBH /tree-stump diameter will be calculated. With this data, DBH of cut trees should be estimated.

Once DBHs are known, the carbon stock of cut individuals will be estimated with the allometric equation of Chave for moist tropical forest (used in baseline carbon stocks estimations). It will be assumed that all carbon stock (in AG and BG biomass) are emitted and lost in the atmosphere.

Finally, the carbon stock changes due to degradation by illegal extraction of trees are calculated with the equation:

$$\Delta C_{P,DefW,i,t} = A_{DegW,i} * C_{DefW,i,t} / AP_i \text{ (Equation N° 8 of M-MON Module, VCS Modular Methodology)}$$

Where:

$\Delta C_{P,DefW,i,t}$ Net carbon stock changes as a result of degradation in stratum i in the project area at time t; tCO₂e

$A_{DegW,i}$ Area potentially impacted by degradation processes in stratum i, ha

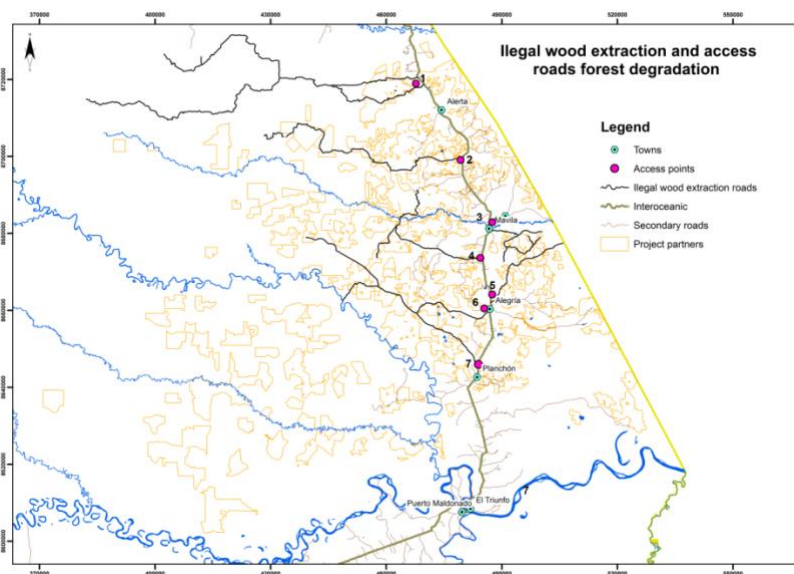
$C_{DefW,i,t}$ Biomass carbon of trees cut and removed through degradation process from plots measured in stratum i at time t; tCO₂e

AP_i Total area of degradation sample plots in stratum i, ha

i 1,2,3 ... M strata

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

MAP 34. Access Points of degradation identified for the Project Area



The Access Points identified for the Project Area consists of 7 points located along the Interoceanic Highway. These points were identified by the Brazil nut concessionaires and local experts (Brazil nut leaders) to be the access points for illegal logging inside the Brazil nut region, and were generally created for wood extraction by timber concessionaires located beyond the Brazil nut

concessions (especially in the north-west). Parting from these 7 access points, we will do the respective survey every time the results suggest there is degradation.

These seven Access Points are:

- o Road 01: Locally called Schipper road, named after one of the best-known wood extractors of the zone who has a saw-mill on the access point to the highway. Today, this road is included in the project folder by the Ministry of Transport and Commerce to be enlarged and improved.
- o Road 02: Locally called Mono Mejia, named after another well-known wood extractor in the area. This road articulates the production of the La Novia sector to the Brazil nut concessions, the wood products and other agriculture products.
- o Road 03: Locally called Mavila-Aposento road, it branches and runs parallel to the road Mavila-Shiringayoc. This network of roads is being articulated by the growth of rural properties and the trade with the border of Bolivia, place from where smuggled goods enter such as Brazil nuts and timber.
- o Road 04: Locally known as Nueva Vista Road, it is connected to the Miraflores road. It is projected to be articulated with the system of roads Varsovia-Lucerna-Loreto.
- o Road 05: Locally known as San Juan-Piñal road, is one of the roads that is recently articulating to the border zone with Bolivia. The town of Alegria is projecting a rapid growth to different fronts; one of those fronts is driving this road.
- o Road 06 and 07: Locally called Alto Malecon - San Carlos road and Varsovia-Lucerna-Loreto road. These two roads go inside the northwest of the Brazil nut sector, the first road, has an efficient maintenance system and the second was driven by the Municipality of Las Piedras. Both are projected as main roads of trade of agricultural and forest products.

The project will conduct a PRA every two years even if there are longer gaps of time between verification events. Field technicians will record all information created during each PRA and samplings. Survey and sampling templates will be available for them to use, and all information will be saved in physical records and in the digital database.

Degradation due to Selective Logging of Forest Management Areas

This source of degradation accounts for the loss of carbon stock due to removal of trees for timber purposes and the derived damage in non-commercial trees during harvest (logging gap), and due to the logging infrastructure created. These emissions, however, will be discounted for any stock retained in wood products resulting from timber extraction. The following equation resumes the procedure:

$$\Delta C_{P, SelLog, i, t} = \sum (C_{LG, i, t} * C_{LR, i, t} - C_{WP, i, t}) \quad (\text{Equation N}^{\circ}9 \quad \text{M-MON} \quad \text{Module, VCS} \quad \text{Modular Methodology})$$

Where:

$\Delta C_{P, SelLog, i, t}$	Net carbon stock change as a result of degradation through selective logging of FSC certified forest management areas in the PA in stratum i at time t; tCO _{2e}
$C_{LG, i, t}$	Actual net project emissions arising in the logging gap in stratum i at time t; tCO _{2e}
$C_{LR, i, t}$	Actual net project emissions arising from the logging infrastructure in stratum i at time t; tCO _{2e}
$C_{WP, i, t}$	Carbon stock in wood products pool from stratum i at time t; tCO _{2e}
i	1,2,3 ... M strata
t	1,2,3 ... t* years elapsed since the start of the REDD project activity

The resulting emissions will be excluded if found not significant by using the T-SIG module.

It is worth noting that not all Brazil nut concessionaires harvest timber from their areas. Indeed, around 30% of concessionaires do selective logging as a complementary activity⁷², for which they are compelled to sub-divide their concessions into several parcels – called Parcelas Anuales de Corta (PCA) – and use only one of them each year. Thus, a much smaller area than PA is actually degraded by logging every year.

The monitoring of these areas will occur before every verification event or at least every 5 years.

Emissions Arising in the Logging Gap

These are the emissions occurring due to the death of the timber tree and the death of all trees incidentally killed during felling. For estimating the biomass of the total volume extracted, we will collect the concessionaires' field records when possible. Forms have been developed to correctly measure all necessary variables for this end. Otherwise, we will use the official information gathered yearly in the extraction balances of each ATFFS. From these balances it is possible to get the totalized extracted volume and also the detailed volume per specie, of each concessionaire.

Once volumes are known, the emissions will be estimated using the following equations:

$$C_{LG, i, t} = \sum (C_{EXT, z, i} + (LDF_{z, i} * V_{EXT, z, i, t} * 44/12)) \text{ (Eq. N° 10 M-MON module, VCS Modular Methodology)}$$

Where:

$C_{LG, i, t}$	Actual net project emissions arising in the logging gap, in stratum i at time t; tCO _{2e}
$C_{EXT, z, i}$	Biomass carbon stock of timber extracted within the project boundary for logging stratum z, in stratum i at time t; tCO _{2e}
$LDF_{z, i}$	Logging damage factor for logging stratum z, in stratum i at time t; tC/m ³

⁷² Balance de Extracción 2011. Administración Técnica Forestal y de Fauna Silvestre (ATFFS) of Tambopata-Manu and Tahuamanu provinces.

$V_{EXT,z,i,t}$	Volume extracted from logging stratum z, in stratum i at time t; m^3
i	1,2,3 ... M strata
t	1,2,3 ... t* years elapsed since the start of the REDD project activity

And,

$$C_{EXT,z,i} = \sum (V_{EXT,j,z,i,t} * D_j * CF_j * 44/12) \quad (\text{Eq. N° 11 M-MON module, VCS Modular Methodology})$$

$V_{EXT,j,z,i,t}$	The volume of timber extracted of species j for logging stratum z, in stratum i at time t; m^3
D_j	Basic wood density of species j; t d.m. / m^3
CF_j	Carbon fraction of biomass for trees; t C/ t d.m
z	1,2,3 ... Z logging strata

The Carbon Fraction (CF) is equal to 0.49 t C/t d.m., value used in baseline calculations.

The Logging Damage Factor (LDF) is equal to 0.67 t C per unit of extracted timber (m^3), value for broadleaf and mixed forest.

Emissions by Logging Infrastructure

The logging infrastructure includes skid trails, logging roads and logging decks, needed for transporting the logs. To monitor the emissions due to their creation, we will use field reports when available; otherwise, we will make field measurements to estimate accurately the cleared area. In this case, as no guidance is available for monitoring extraction of wood in BN concessions, we will use some of the criteria from the methodology proposed by Sabogal et al (2007).

Said methodology was developed to monitor the logging impacts in timber concessions whose working conditions differ from ours in scale, used technology and management among other variables. Still, it is the only tool with defined procedures. It poses the use of transects to monitor 0.5% or 1% depending if the affected area (sum of PCAs) is larger or smaller than 500 ha, respectively.

The resulting monitoring area will be distributed in a number of no less than 5% of PCAs, which will be randomly selected. Transects could measure 10m x 500m but the final size may vary to ease the work. Such change could only take place before the fieldwork per se, and will be applied to all transects. Inside them, we will evaluate the dimensions of roads, skid trails and decks. The specific considerations and the equations for estimating emissions from the field measures are:

Skid Trails

The mean length per unit area (m/ha) and the mean width (W_{SKID}) will be produced. The total length (L_{sk}) is obtained by multiplying the mean length by the total area logged.

In addition, it is assumed that all carbon stocks in above- and belowground biomass are lost during the creation of skid trails. Since tree biomass was the only pool considered, the mean live carbon stock assumed to be killed is equal to: $C_{dest, i} = C_{tree\_AB, i} + C_{tree\_BB, i}$.

The emissions from the soil pool ($\Delta C_{SOC\_sk, i}$) will not be included in the calculation since its exclusion is considered conservative.

The equation for estimating total emissions from the creation of skid trails is:

$$\Delta C_{SKID, i, t} = L_{SKID, i, t} * SK_i \text{ (Eq. N°13 M-MON module, VCS Modular Methodology)}$$

Where:

$\Delta C_{SKID, i, t}$	Change in carbon stock resulting from skid trail creation in stratum i at time t; tCO ₂ e
$L_{SKID, i, t}$	Length of skid trails in stratum i at time t; m
SK_i	Skid trail emissions factor (average emissions resulting from dead wood created in the process of skid trail creation per length of skid trail) in stratum i at time t; tCO ₂ e/m
t	1,2,3 ... t* years elapsed since the start of the REDD project activity

And,

$$SK_i = (C_{dest, i} + \Delta C_{SOC\_sk, i}) * 1/10\ 000 * W_{SKID} \text{ (Eq. N°14 M-MON module, VCS Module Methodology)}$$

$C_{dest, i}$	Mean live carbon stock of trees and non-trees biomass assumed to be killed per unit area in creation of skid trails in stratum i; t CO ₂ e/ha
$\Delta C_{SOC\_sk, i}$	Carbon stock change in organic carbon resulting from skid trail creation in stratum i; tCO ₂ e/ha
W_{SKID}	Mean width of skid trails in stratum i; m

Logging Roads

Generally, in large-scale operations there are two types of roads created during a harvest period, determined by their width and use, which are the Principal Roads and the Secondary Roads. This may not be the case in BN concessions given the low-intensity exploitation inside them but we will indicate the type, if applicable.

We will measure the widths and lengths of road sections inside the transects, which will produce a mean width value and a total estimated length. The estimated total area of road is obtained by multiplying said values.

Once the total area is known, the following equation will be used to calculate the emissions caused by road creation.

$$\Delta C_{ROAD,i,t} = A_{ROAD,i,t} * C_{BSL,i} \quad (\text{Eq. N}^\circ 17 \text{ M-MON module, VCS Modular Methodology})$$

Where,

$\Delta C_{ROAD,i,t}$ Change in carbon stock resulting from logging road creation in stratum i at time t; tCO₂e

$A_{ROAD,i,t}$ Area of roads in stratum i at time t; ha

$C_{BSL,i}$ Carbon stock in all pools in baseline case in stratum i at time t; t CO₂e/ha

Logging Decks

We will estimate a value of logging deck area per unit area from the widths and lengths that were measured inside transects. Then, it will be multiplied by the total area logged to produce the estimated total area of decks. The emissions caused by deck creation are estimated with:

$$\Delta C_{DECKS,i,t} = A_{DECKS,i,t} * C_{BSL,i} \quad (\text{Eq. N}^\circ 18 \text{ M-MON module, VCS Module Methodology})$$

Where,

$\Delta C_{DECKS,i,t}$ Change in carbon stock resulting from logging road creation in stratum i at time t; tCO₂e

$A_{DECKS,i,t}$ Area of roads in stratum i at time t; ha

Finally, the total emissions arising from logging infrastructure will be estimated by adding the change in carbon stocks from the creation of skid trails, logging roads and logging decks:

$$C_{LR,i,t} = \Delta C_{SKID,i,t} + \Delta C_{ROAD,i,t} + \Delta C_{DECKS,i,t} \quad (\text{Eq. N}^\circ 12 \text{ M-MON module, VCS Module Methodology})$$

The uncertainty of the emissions estimates will be included in the uncertainty analysis of with-project scenario, made by using the X-UNC Module.

Emissions from Harvested Wood Products

The module “Estimation of carbon stocks in the long-term wood products pool - CP-W” (VMD0005) will be used to calculate ex-post the carbon stock in the wood products pool per stratum.

$$C_{WP,i} = \sum C_{XB,ty,i} * (1 - WW_{ty}) * (1 - SLF_{ty}) * (1 - OF_{ty}) \quad (\text{Eq. N}^\circ 2 \text{ CP-W module, VCS Modular Methodology})$$

Where,

$C_{WP,i}$ Carbon stock in wood products pool (stock remaining in wood products after 100 years); tCO₂e

$C_{XB,ty,i}$ Mean stock of extracted biomass carbon by class of wood product ty from stratum i; tCO₂e/ha

WW_{ty} Wood waste. The fraction immediately emitted

SLF_{ty} Fraction of wood products that will be emitted to the atmosphere within 5 year of timber harvest by class of wood product ty; dimensionless

OF_{ty} Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest by class of wood product ty; dimensionless

ty Wood product class

The expected wood products are sawn wood, sold in the local sawmills or markets; therefore, the values for the equation parameters are:

TABLE 90

Data	Value	Observation
WW	0.24	Developing countries
SLF	0.2	Sawn wood
OF	0.84	Tropical / Sawn wood

Source: CP-W Module

3.4.1.4 Monitoring Areas Undergoing Natural Disturbance

The areas under natural disturbance will be identified at the same time monitoring deforestation occurs and by using the same procedures.

The areas disturbed will be delineated and emissions calculated. The net carbon stock change equals the area disturbed times the emission per unit area.

$$\Delta C_{P,DistPA,i,t} = \sum (A_{DisPA,q,i,t} * \Delta C_{P,Dist,q,i,t}) \quad (\text{Eq. N}^\circ 20 \text{ M-MON module, VCS Modular Methodology})$$

Where,

$\Delta C_{P,DistPA,i,t}$ Net carbon stock change as a result of natural disturbance in the project case in the project area in stratum i at time t; t CO₂-e

$A_{DisPA,q,i,t}$ Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i at time t; ha

$\Delta C_{P,Dist,q,i,t}$ Net carbon stock changes in pools as a result of natural disturbance; t CO₂-e

The disturbed areas will result from the overlap between the area disturbed and the summed area of unplanned deforestation in the PA (to the year where the disturbance occurred). If the natural disturbance is fire, then the area burned will be assumed to be equal to A_{DistPA} . In this case, emissions will be calculated using module E-BB.

It will be conservatively assumed that the post-natural disturbance pools are equal to zero. Carbon stock in wood products won't be considered as the disturbance most likely to happen is fire and no harvest will follow this natural disturbance.

In addition, the uncertainty will be included in the estimation of ex-post with-project scenario uncertainties calculations (using X-UNC).

Monitoring of Project Emissions

When significant, it will be calculated GHG emissions different to CO₂ with the following equation (described in Section CL1):

$$GHG_{P,E,i,t} = E_{FC,i,t} + E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t} \quad (\text{Eq. N}^\circ 30 \text{ M-MON module, VCS Modular Methodology})$$

All sub calculations and assumptions made for estimating each parameter are presented also in Section CL1. Thus, extra details are mentioned below. After their estimation, each parameter will be addressed using T-SIG module to determine whether the emission sources are significant.

N₂O and CH₄ Emissions from Agriculture and Forest Biomass Burning

It is performed on areas that suffer a change in land use. To estimate ex-ante biomass burnt in forests, it was calculated (according to MINAM, 2009) that 55% of the deforested forest is burnt. This index will be the same for the entire baseline period. Nevertheless, it should be corroborated (based on measures made of the own experience or a new bibliographic search) for baseline renewal.

For the case of agriculture biomass burnt, it has been determined based on traditional management of farmland that stubble burning is made every year in all parcels at the end of the harvest period. In the calculations ex-ante, Corn is used as farmland reference because is the most representative crop of the area. However, for real estimations the crop that is actually in the parcel or the one with major representation in the area could be taken as reference, when known. This reference crop should be corroborated for baseline renewal.

Emissions from Fossil Fuel Combustion

The implementation of project activities will result on emissions, mainly due to the use of fuel for transporting goods and materials and of the patrolling personnel activities. Another considerable source of emissions is the use of fuel for the plant's energy demand. Registries of fuel demand per activity will be carried, and with the total amount of used fuel we will estimate the total emissions using E-FFC module.

Direct N₂O Emissions as a Result of Nitrogen Applications

Nitrogen applications will not occur inside the Project Area, with the exception of the fertilizer applications inside the Project's tree nursery which will be located outside the PA. Therefore direct

N₂O emissions resulting from these applications are not accounted⁷³ as they do not exist in the project area.

Responsibilities

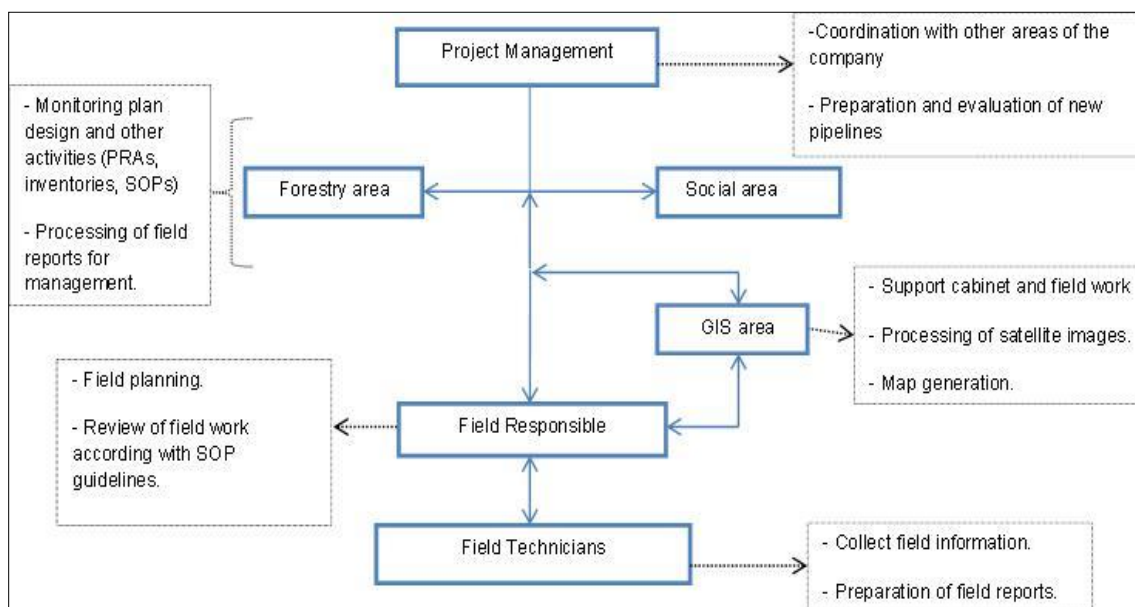
The design and execution of the Project and its Monitoring is handled by a multidisciplinary technical team, duly qualified and with experience in Project development. In addition, it is supported by recognized institutions related to the Amazon investigation as the IIAP.

Specialists in forest, social, and economic areas lead the team, who are in charge of defining the objectives and provide guidelines to the correct development of the activities. The Head of Monitoring is in charge of the implementation. He organizes the work and staff in field and keeps the Specialists informed about everything that is in progress through periodic reports of the activities and permanent communication about the outcome and contingencies arising out.

The field staff is in charge of gathering all parameter information that will be monitored to evaluate the performance of the project. They will be constantly trained to improve their skills in the use of: standard procedures to collect information, measurement instruments, and outcome processing, etc.

It is worth to mention that all staff will be permanently in contact to coordinate the activities, discuss problems and difficulties arising out and take relevant decisions, so there will be a feedback at all level. The organizational chart is presented hereunder:

FIGURE 14: Organizational chart of the team in charge of monitoring



Information Management

⁷³ E-NA module sets out that when the only source of N₂O emissions is due to the application of fertilizer in tree nurseries outside the PA, then these emissions may be considered as negligible

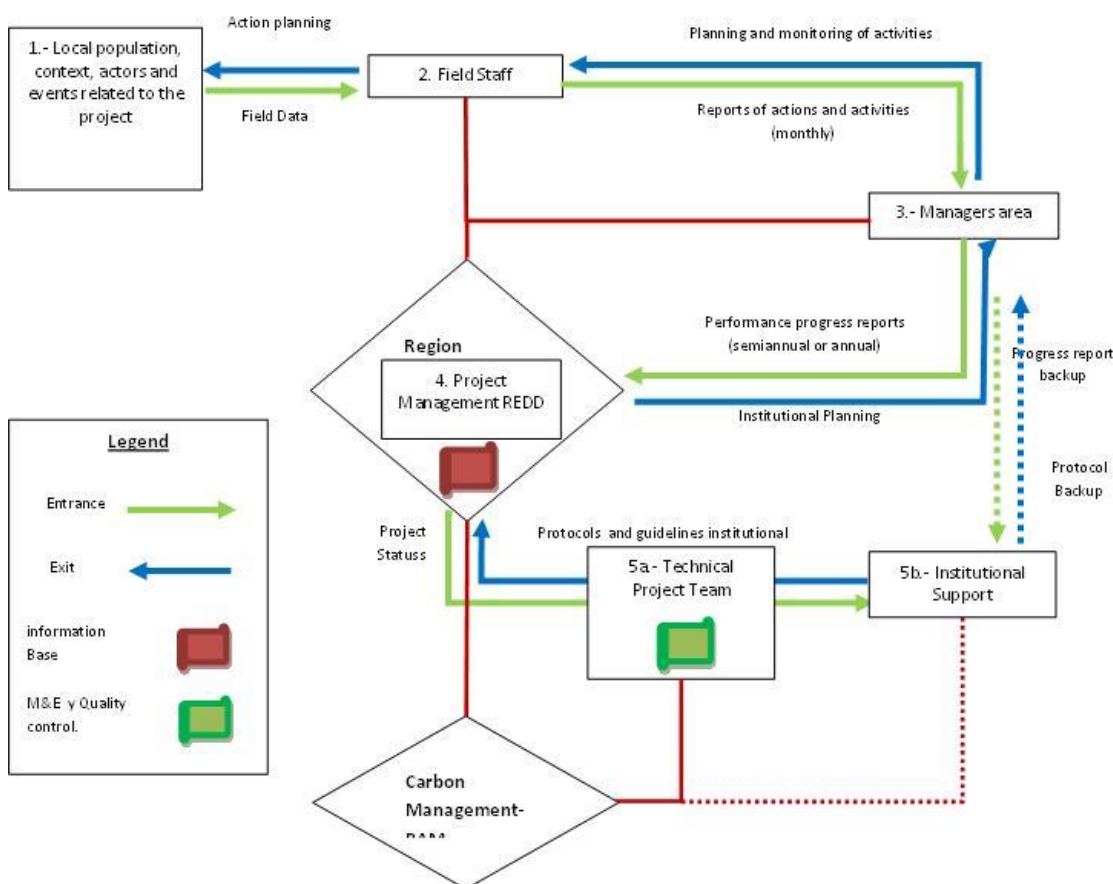
There will be Standard Operating Procedures (SOPs) that will guide the monitoring activities, limiting the change that the incorporation of new staff members would cause. There will also be forms and templates for each parameter that will allow documenting them clearly and consistently through time. Additional information considered as relevant by the field operator would be included.

Furthermore, unique procedures will be fixed (SOPs Quality Control) for the management, processing and archive of the gathered information with the purpose to secure information and availability to any subsequent revision.

To that end, it has been determined that all physical data of field forms and reports generated will be stored in a safe space specially enabled to the purposes thereof, as well as using a codification that will avoid errors in time and/or activities referred thereto.

Likewise, all data shall have to be digitized in Excel or Word documents, according to each type and following the forms format, saved in files with the same code used in all hard copies, sent to the headquarters of the company and regularly updated. Information flow is presented herein below:

FIGURE 15: Information Flow among the staff in charge of Monitoring



In-House Audit

The use of SOPs will minimize the error information to handle the project, both in terms of procurement (field survey) as well as in processing and storage. It will also allow us to estimate the uncertainty in the monitoring of each parameter, as required by module X-UNC, and keep it within the allowed range.

As additional information conservation measures, there will be:

Training

It includes training of the staff in general in different roles to play within the structure of the project. However, in the aim to always have quality information, training will be prioritized at the critical points of management, which are the field collection and processing (head of evaluation and monitoring, field staff and GIS specialist). All staff must pass an induction process prior to execution of any activity related to monitoring.

Field Verification

For each measurement made directly in the field, especially in the case of inventory (carbon stock, growth, degradation, etc.) or use of satellite images, verification will be designed to meet the statistical criteria allowing corroborating reliability of the information.

It will also be verified that the staff using the SOPs in their daily activities would do it without any difficulty.

Reviewing Monitoring Reports before Delivery and Storage

Prior to the delivery of the reports to the headquarters, the Head of Monitoring and Evaluation will review all reports that have been made in field and by sub processing, in order that the information reaching the next team is completely cleared.

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

The Monitoring Plan was already explained in the previous sub-section. Nonetheless, the project commits to include or adapt monitoring criteria if deemed necessary in the future, based on the results as they are obtained from continuous monitoring, with the aim to improve the analysis and reporting of impacts.

The plan and the monitoring results will be disseminated among the concessionaires, so they are aware of the activities and their impacts on their concessions. To do that, we will post these documents in BAM's website; we will give digital and hard copies to FEPROCAMD, its grassroots organizations and other local organizations (i.e. farming organizations), as well as to the forest offices of Tambopata and Tahuamanu. In addition, we will hold extra meetings if needed to ensure that the project communities and other stakeholders are kept informed.

3.5 Optional Criterion: Climate Change Adaptation Benefits

Not applicable

3.5.1 Regional Climate Change Scenarios (GL1.1)

Not applicable

3.5.2 Climate Change Impacts (GL1.2)

Not applicable

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

Not applicable

4. COMMUNITY

4.1 Without-Project Community Scenario

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

The Brazil nuts production area in Peru is located in the department of Madre de Dios, in the extreme southeast of Peru, on the border with Brazil and Bolivia. The Brazil nut Forest occupies more than 350 thousand hectares. This activity represents an important source of economic income for the population of the region. Around 6500 families are directly and indirectly involved to its extraction, which represents 22% of the total population of the department (Sánchez 2015: 2).

The local populations in the Project Area are mainly composed of people engaged in economic activities such as Brazil nut harvesting, timber extraction and alluvial mining, as well as agriculture, livestock, services and local employment. These communities are located in the main population centers, housing associations and other types of dispersed settlements.

The main Brazil nut-growing areas are located in the basin of the Lower Madre de Dios river, as well as the Tambopata, Pariamanu, Paríamarca and Las Piedras rivers (IIAP 2006). They occupy the current provinces of Tambopata and Tahuamanu.

Socio-economic Diagnosis

According to the results obtained in the social diagnosis prepared in March 2021 to update the status and characteristics of the project partners, the following characteristics were found:

Population Characteristics

The most vulnerable population, meaning those who are more likely to be poor or to suffer harm, based on a certain risk or threat, are the children and adolescents on one hand and older adults on the other (Cecchini y Martínez, 2011).

In the context of the Project, the following results were found according to the age of the beneficiaries:

The ages of the partners are between the age ranges of 30 to 80 years, however, a large number is located in a life stage between 50 to 75 years, representing 65% of the total of the partners. With 37% of the total members, it is located as a vulnerable population aged 65 to older (elderly).

As can be seen, there is a large number of beneficiary population (more than 35%) of the project that is in the stage of life recognized as elderly and therefore is a vulnerable population and is associated (this problematic) with situations that older adults experience in Peru (according to the National Plan for the Elderly 2013-2017), which include the lack of access to health services, education and pension services, as well as low levels of social participation and violence and age discrimination.

Migration

Internal migration is the component of the demographic dynamics that reacts most quickly in response to variations in the socioeconomic situation that occurs in a country or in certain areas or regions. From this perspective, one of the purposes is to highlight some of the changes that occurred in their behavior as an expression of the transformations in the economic and social structure. Within the framework of the project, we appreciate as indicated in the economic and social diagnosis, the population benefiting from the project belongs 48.6% to the Madre de Dios region and 51.4% dispersed in different regions, highlighting Cusco (22.9%) and Puno (11.4%), which are regions that are located adjacent to Madre de Dios but that from a sociocultural perspective have other characteristics (Puno is Sierra and Cusco combines Sierra and jungle in its territory).

Regarding these two indicators, then, we can point out that the Brazil nut-tree members present a high percentage of the population of elderly age (65 years and over) and that they come (50%) from other regions of Peru, generating a cultural mix and traditional cultural changes that already they show a cultural miscegenation when we appreciate and characterize this group.

Education

The field of education has had its place in different economic development agendas. In the SDGs (Sustainable Development Goals) one of the main objectives is to ensure an inclusive and equitable quality education by 2030, as well as to promote learning opportunities for all (UN 2015). This interest is due to the recognition of education as a relevant factor in aspects such as social mobility, increased productivity and economic growth (CAF 2007); as proposed by the theory of human capital initially developed by Schultz (1961), Becker (1964) and Mincer (1974).

Under this approach, there is a limited capacity and level of learning acquired (from a development and learning perspective) both beneficiaries and of their respective partners.

Analyzing and evaluating the educational level of the project partners, the results show a low educational level, with the result according to the diagnosis: that 20% are located in an incomplete primary education level and a cumulative 60% are located in secondary incomplete (for both men and women). That is, we have 80% who have not been able to complete basic education and have a deficiency that puts them in a condition of inequality with minimal levels of literacy.

As we can see, internet access is still a technology that does not have a large number of households (42.9%) and its access is via cell phone. The difficulty in accessing and using technology by older adults was also mentioned.

Economical – productive

It is important to bear in mind that the productivity of Brazil nuts is different from other products where more intensive or acceleration technologies are applied that allow changing or shortening production periods in the case of Brazil nut, we must bear in mind that:

- o The economic viability of this activity is linked to the productivity of the forest.
- o The international market requires Brazil nuts that meet safety and quality standards.
- o The organic market is a niche with many possibilities.

Due to these characteristics of the demand (commodities), their price depends mainly on two factors: The price of other nuts and almonds; and the quantity available for sale which depends on natural production.

Next, the results obtained in relation to the family income of the Brazil nuts concessionaires are presented in order to generate an analysis of the living conditions:

Family income

As we can see almost 75% of the income is located in an interval between 350 soles per month to 1500 soles per month and making an average, it could be said that annually it would be registering an income of approximately 11 100 soles, that is, a monthly income less (925) than the salary current minimum of the Peruvian government (Minimum Vital Remuneration established by the Peruvian government is 930 soles). Having a family burden per household on average greater than 4 (according to the diagnosis of partners) and according to the National Institute of Statistics of Peru in 2020 it indicated that, “the Poverty Line is the monetary equivalent to the cost of a basic consumption basket of food and not food, which for 2020 amounts to S / 360 per month per inhabitant, the person whose monthly expenditure is less than S / 360 is considered poor; for a family of four the cost of a basic consumption basket is S / 1,440 per month”. In this context, we have that many of the project's partner families are in a situation of vulnerability (monetary poverty).

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

According to the conversations carried out with the directors of the Federation of Castañeros de Madre de Dios and the presidents of the Associations (description in G2.1), the Brazil nut harvesters or the Brazil nut sector does not have specific agreements or agreements with institutions or other groups. productive within the Madre de Dios region.

In this sense, the interaction and only support that the Federation of Castañeros de Madre de Dios currently has is with the REDD + Project, executed by 405 partners with BAM.

The Project partners correspond to 405 Brazil nut concessionaires who are currently part of the Federation of Brazil nut producers in Madre de Dios (FEPROCAMD).

Next, the groups identified by productive activity in neighboring areas and in the Brazil nut-growing areas themselves:

Brazil nut concessionaries organizations

The Brazil nut concessionaires have had diverse and different organizations over time. Some were created by public entities, projects, community organizations, etc. Currently, they are grouped in a single second-level organization called the Departmental Federation of Brazil nut Producers of Madre de Dios - FEPROCAMD.

FEPROCAMD was founded on November 18, 2009 and registered in SUNARP on April 15, 2010 with a certificate registration number 11016791. This organization represents 11 Brazil nut associations and constitutes the superior organization, representing most of the BN concessionaires of Madre de Dios.

TABLE 101

Departmental Federation Of Brazil Nut Producers Of Madre De Dios Based Associations		
Nº	Name	Nº Of Certificate in Public Records
1	Asociación de Productores de Extractores de Castaña de Planchón	11016567
2	Asociación de Productores y Extractores de Castaña de Shiringayoc	11016632
3	Asociación Castañera Agroforestal de Carmen Rosa	11016658
4	Asociación de Productores y Extractores de Castaña de Mavila	11016615
5	Asociación Agroforestal Alegría, Alto Malecón San Carlos y Anexos	11015063
6	Asociación de Productores Castañeros y Agroforestales de Alerta	11016540
7	Asociación de Castañeros de Alegría	11000665
8	Asociación de Productores y Extractores de Castaña de Río Paríamanu y Afluentes	11016654
9	Asociación Castañera Agroforestal de Varsovia	11016652

10	Asociación de Productores y Extractores de Castaña de Loreto	11016672
11	Asociación de Extractores Productores Forestales y Agropecuario de La Novia	11006728

Additionally, in the Project Zone there is the Peruvian Amazon Nut Collectors Association - RONAP, founded in 2003. RONAP groups together 58 Brazil nut producers from Madre de Dios and has its own Organic Certification and Fair-Trade Certification programs. Even though, this organization is not member of FEPROCAMD nor the REDD project.

Organizations of the forest logging concessionaires

Many of these companies are affiliated with the department's Forest Stewardship Committee. On the other hand, as entrepreneurs, they are affiliated with the Forest Management Committee of the Madre de Dios and the Timber Federation of Madre de Dios

Agricultural organizations

The farmers are organized according to the agricultural agencies distributed in each district.

At the departmental level, the farmer has the Departmental Agrarian Federation of Madre de Dios.

Mining Organizations

The mining concessionaires are organized into associations by district, sector or rivers. In the Project Zone, no relevant mining associations have been identified. At the departmental level, all miners and miners' associations are affiliated with the Federation of Miners of Madre de Dios - FEDEMIN, an organization that groups 24 miners' associations in Madre de Dios. This organization is at the same time affiliated with the Federation of Artisanal Mining of Peru (FENAMARPE), which groups 198 associations of miners in 18 regions of the country.

Ranchers Organizations:

They are not properly organized as a group. They are handled in private properties.

Relationships and links generated with the partners (BN harvesters) of the project:

As can be seen in the following table, influential relationships are based on individual interests or problems and not as organized groups:

TABLE 102

Groups by productive activity	Organizational structure: Regional Federation	Group Problematics	Relations with the Brazil nut farmers (Good, regular, bad)	Problems with Brazil nut farmers

Brazil nut Organization	Yes	Legal: They are duly recognized by the state. Update permits and authorizations every year. Economic and Social: Limited income that determines their quality of life.		
Farmer Organization	Yes	Legal: Private properties. Socio-economic: poor soil and monoculture techniques limit incomes and increase agricultural frontiers.	Bad due to possible conflicts	Agricultural expansion and boundary problems (territorial limits).
Miners Organization	Yes	Legal: Problems of formalization and recognition of the state for its activity. Socio-economic: Illegal markets and permanent socio-environmental problems because it is an activity in the process of being formalized.	Bad due to possible conflicts	In the area of the Río Piedras, impacts on nature due to the use of mercury in alluvial mining
Organization of logging forest concessions	No	Legal: Recognized by the state and need to update their management plans every year. Socio - economic: Illegal traffic of wood on the route and corruption of officials.	Regular (neutral)	Invasions for illegal logging affect both forest concession aires and Brazil nut growers.
Ranchers Organization	No	Legal: Grouped by individual properties, there are associations formed for the benefit of regional and national projects. Socio - economic:	Regular (neutral)	Some partners are also interested in livestock farming as an economic alternative.

		Limited access to markets and transformation of products (meat and milk).		

Within the Objective of the project Strengthen the organization and capabilities of Brazil nut concessionaires for sustainable management and monitoring of their concessions, it is planned to strengthen the governance process including the improvement and organizational strengthening that will also allow to improve the relations between the Brazil nut harvesters and the other groups that coexist in the territory. Additionally, measures will be included to guarantee that the project does not have negative repercussions on interactions with organized groups in the territory.

4.1.3 High Conservation Values (CM1.2)

Brazil nut forests are HCV areas as they are vital areas for the communities. This species is categorized as vulnerable, so the activities of the Brazil nut forest, Forest Management project seek its conservation and good management ensures the maintenance and improvement of the ecosystem. Likewise, considering the connectivity between landscapes and habitats, the conservation of these areas will contribute to maintaining the HCVs, since the Vilcabamba-Amboró Conservation Corridor and other conservation areas identified in the Project Zone ensure the maintenance and improvement of their attributes.

TABLE 103

High Conservation Value	Brazil nut forest is located in the Tropical Andes hotspot and in the Vilcabamba Amboro Conservation Corridor (CCVA)
Qualifying Attribute	Madre de Dios is the only region of Peru where there are Amazon Brazil nut trees in sufficient density that allows the economic use of their nut. <u>Community benefits:</u> The project partners depend (financially) directly on Brazil nut production. It is the main economic activity as indicated by the baseline study prepared in March 2021. Main natural resource as a way of life for the partners (405 families) of the project. The collection of Brazil nuts as the main economic activity of the families that are members of the project.
Focal Area	The area is located in the south of the project zone, the forests between the Madre de Dios, Los Amigos and Las Piedras rivers.

High Conservation Value	Species of high conservation value with some degree of threat in mammals of the families Felidae and Tapiridae and Dasypus variegata.

Qualifying Attribute	Mammals are essential elements for the connectivity of ecological processes in a landscape as they are important seed dispersers. <u>Community benefits:</u> The loss of biodiversity has a direct impact on the food security of the beneficiary population because a change modifies the ecosystem and would also affect the Brazil nut forest
Focal Area	Brazil nut forest in the project area.

High Conservation Value	Species of high conservation value with some degree of threat in mammals of the families Felidae and Tapiridae and Dasyprocta variegata.
Qualifying Attribute	Mammals are essential elements for the connectivity of ecological processes in a landscape as they are important seed dispersers. <u>Community Benefits</u> The loss of biodiversity has a direct impact on the food security of the beneficiary population because a change modifies the ecosystem and would also affect the Brazil nut forest
Focal Area	Brazil nut forest in the project area.

High Conservation Value	Water bodies.
Qualifying Attribute	The bodies of water are essential for the maintenance of the Brazil nut forest and the ecosystem in general. <u>Community Benefits</u> Under these attributes its conservation is vital and relevant for the development and improvement of the production and maintenance of Brazil nut forests. Livelihood for partners (included food safety).
Focal Area	Bodies of water rivers, streams and lakes located in the project area.

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

For a description of the characteristics of the communities in the scenario without a project, see Sections 2.1.4 and 4.1.1.

Also we can say, it is observed the existence of continuity (linear of time) in the Brazil nut dealer with economic income that does not increase or improve to provide a better quality of life in the current conditions of production and sale. In the study carried out in March 2021, the productive activity of the Brazil nut was indicated by themselves, as an insufficient economic activity to cover their basic needs. In addition, more than 40% of the project's partner population is in the stage of life called the elderly, being a vulnerable population and of a conditioned age to project major transformations in their living conditions.

Brazil nut production is currently presented as an unstable economic activity (prices regulated by international markets) and under current conditions as developed by the project partners without transformation and added value of the production is an economic activity that does not improve living conditions current if not more of a subsistence activity.

4.2 Net Positive Community Impacts

4.2.1 Expected Community Impacts (CM2.1)

Methodology to estimate the net benefits of the project

Methodological Approach:

The Castañero REDD Project proposes an impact evaluation known as the Causal Model Approach or Theory of Change. A specific methodology with potential in use in terrestrial carbon projects will be applied (with some adaptations), which is the Review of Results to Impacts (ROtI) approach. Although this approach (ROtI) develops a methodology designed mainly for ex post evaluation, it is possible to adapt it for evaluation in the validation phase as is the case with this project.

This approach aims to follow along the chain of cause and effect, or "chain of results" based on the project strategy towards a set of desirable impacts. The fundamental premise of the approach (ROtI) is that when the Theory of Change is developed and the data for the indicators is collected, it will be possible to confirm that the project is on the right track and will be able to generate the expected impacts.

The ROtI approach consists of three main stages:

- Identification of the expected impacts of the project
- Review of the logical framework of the project
- Analysis of the results-impacts pathways of the Project

Stage 1: Identification of the expected impacts of the project

TABLE 107

Socio environmental impacts	Project activities									
	Implementation of monitoring and surveillance of areas	Nursery Implementation	FEPROCAMD Strengthening	Implementation of complaints protocol	Brazil nut processing Brazil nut plant	By-products certification	Establishment of cooperation agreements and alliances	Campaigns for conservation of forest and environmental goods and services	Coaching plan	Forest management of Brazil nut areas
Improved organization for sustainable forestry activities	B	B	B	B	NA	NA	B	B	B	B
Increase of Brazil nut harvesters' incomes	NA	B	NA	NA	B	B	NA	B	B	B
Change of subsistence traditional activities with sustainable activities	NA	B	NA	NA	B	B	B	B	B	B
Forest conservation and ecosystem flows for local families	B	B	NA	B	NA	B	B	B	B	B
Control of activities causing deforestation (miners, farmers, etc.)	B	NA	NA	NA	NA	NA	NA	NA	NA	NA

B: Positive impact

NA: Does not apply (has no impact)

M: Negative impact

Description of impacts:

The community impacts of the project have been estimated based on ongoing consultations and coordinated work with the project's concessionaires. As a result of this dissemination and consultation work, the following impacts have been identified:

Sustainable Forest Management:

As consequence of the activities of legal formalization, organizational strengthening, alliances, and promotion campaigns, learning and empowerment of the leaders, the Brazil nut organizations will be prepared to manage the Brazil nut forests. In addition, they will be co-managers in the implementation and monitoring of the Brazil Nut REDD Project.

Community group	Project partners: 405 Brazil nut collectors
Impacts	Impacts Increase in the capacity of local territorial governance and sustainable and sustainable management of natural resources
Type of benefit, cost or risk	Direct benefit on the project partners. What are expected to be obtained from the transfer of information and the promotion of technical knowledge for the maintenance and management of Brazil nut forests through the development of theoretical-practical workshops and the implementation of awareness campaigns.
Change in well-being	Change in well-being Positive impact that will contribute to: • Permanence of activities to reduce deforestation. • Permanence of activities for the conservation of biodiversity.

Increase in the economic income of the Project partner concessionaires:

As a consequence of the improvement in the use of Brazil nuts and other forest resources, the implementation of the Brazil nut processing plant and the certification processes, the Brazil nut producer will increase his income due to the improvement of his Brazil nut activity.

Community group	Project partners: 405 Brazil nut collectors
Impacts	Impacts Increase in the capacity of local territorial governance and sustainable and sustainable management of natural resources
Type of benefit, cost or risk	Direct benefit on the project partners. Improved living conditions aimed at education and health in the project's partner families.
Change in well-being	Change in well-being Positive impact that will contribute to: • Permanence of activities to reduce deforestation.

	• Reduction of social barriers related to poverty (improvement in livelihoods or income and reduction of economic inequality) and reduction of barriers due to economic dependence on forestry or other exploitation activities. Permanence of activities for the conservation of biodiversity.

Shift from traditional subsistence activities to sustainable activities.

Because of the forestry technical assistance, the organizational strengthening, the Brazil nut processing plant and the certification processes, it is considered that the traditional strategies of extraction of forest resources will change to sustainable and environmentally friendly livelihood strategies, with the improvement of the quality of life of Brazil nut families and community development.

Community group	Project partners: 405 Brazil nut collectors
Impacts	Economic empowerment of community groups and increase of job opportunities in the project area.
Type of benefit, cost or risk	Direct benefit on the project partners.
Change in well-being	Change in well-being Positive impact that will contribute to: • Permanence of activities to reduce deforestation. • Reduction of social barriers related to poverty (improvement in livelihoods or income and reduction of economic inequality) and reduction of barriers due to economic dependence on forestry or other exploitation activities.

Forest and ecosystem conservation for local families

The set of project activities will help conserve forests, their goods and services, which will be resources for the current and future population.

Community group	Project partners: 405 Brazil nut collectors
Impacts	Brazil nut forest maintenance

Type of benefit, cost or risk	Direct benefit on the project partners. Main economic resource protected and taken care of Activities for the rehabilitation and restoration of forests (training, cleaning and maintenance of access for Brazil nut concessions (estradas)
Change in well-being	Change in well-being Positive impact that will contribute to: • Permanence of activities to reduce deforestation. • Permanence of activities for the conservation of biodiversity.

Control of activities that cause deforestation

The set of activities related to control and supervision: legal defense, conflict resolution mechanisms, planning the use of Brazil nuts, delimitation, etc., together with a training process in agroforestry management in spaces outside the project area, will control and / or mitigate the entry of deforestation activities.

Community group	Project partners: 405 Brazil nut collectors
Impacts	Maintenance of Brazil nut forests and sustainability of natural resources within the project area
Type of benefit, cost or risk	Direct benefit on the project partners. What are expected to be obtained from the transfer of information and the promotion of technical knowledge for the maintenance and management of Brazil nut forests through the development of theoretical-practical workshops and the implementation of awareness campaigns.
Change in well-being	Change in well-being Positive impact that will contribute to: • Permanence of activities to reduce deforestation. • Permanence of activities for the conservation of biodiversity

Stage 2: Review of the Logical Framework

The second step is to review and modify (if necessary) the logical framework of the project, since this demonstrates the hierarchy between the goal (highest level), the purpose of the project, the products and the activities. The logical framework provides a good basis for developing the causal

model, but its logic may be unclear, in which case a modification would be necessary - which should be possible if this exercise is performed at the design stage or at an initial point in the implementation phase.

TABLE 108. Logical Framework of the project

Components	Intervention Logic	Verifiable Indicators
Climate Results	RCL1 The GHG emissions caused by deforestation of the Brazil nut forest have been reduced	Every five year, a significant decrease in GHG emissions due to deforestation, in comparison to the projected emissions is monitored
	RCL2. Eventual leakage of deforestation activities has been controlled in the project	Every five year, minimal negative alterations in relation to the projected deforestation in the project area is monitored
Climate Activities	RCL1A1 Implementation of the Monitoring and Surveillance System	At the end of the third year of the project the monitoring and surveillance system was implemented and launched, with the control posts, the necessary equipment and with the trained and adequate personnel
	RCL1A2 Training to deforestation agents in productive alternatives, sustainable projects (farmers), Environmental Education and PAMAS (miners)	Every year the participation in training workshops for Brazil nut producers, farmers and miners in the area have been recorded
	RCL2A1 Implementation of nursery	At the end of the fifth year a permanent nursery has been implemented for management activities and enrichment of the project area
Community Results	RC1 FEPROCAMD has a formal organization and efficient management of its concession areas under a REDD mechanism	At the end of the fifth year of the project, all concessionaires are organized and have management tools for running adequately their concessions
	RC2 The income generated from the use of Brazil nut forests have increased	At the end of the fifth year of the project, the income of the Brazil nut producers has increased in more than 10% of the baseline
	RC3 Communities in the project area and the government of Madre de Dios have strengthened their capacities for sustainable forest management and the	At the end of the fifth year and in subsequent years the implementation of sustainable development policies and the increase of sustainable activities in the project area can be verified

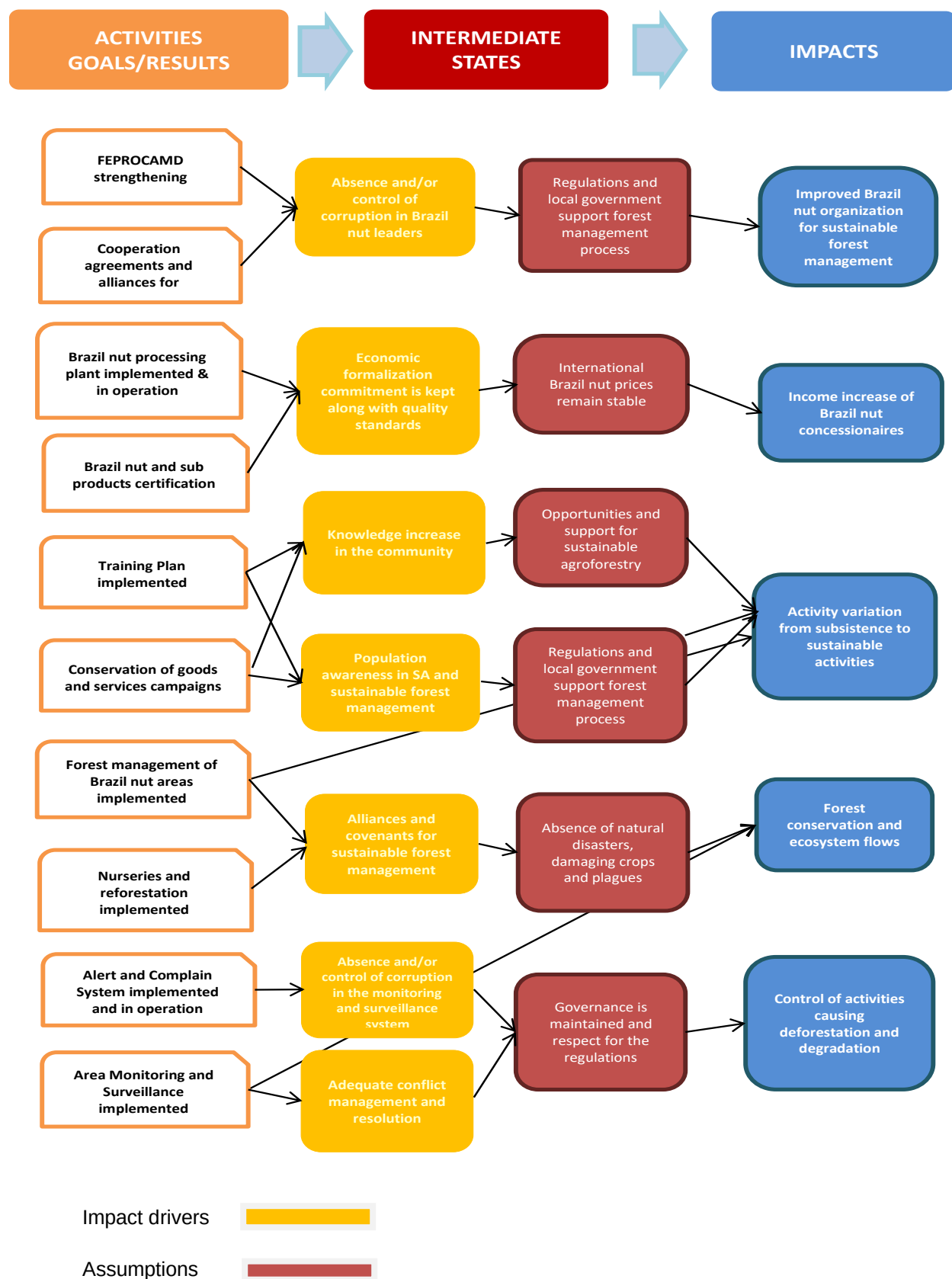
	project contributes to improving the quality of life of local people	
Community Activities	RC1A1 Organization and legal formalization of FEPROCAMD	At the end of the first year, the Brazil nut producers have a legally formalized organization
	RC1A2 Implementation of the Alert System	At the end of the third year, the Brazil nut producers have an organizational structure to call and respond to threats in their areas with immediacy
	RC1A3 Implementation of the Conflict Resolution and Complaint System	At the end of the third year, FEPROCAMD has a structure to resolve conflicts and complaints during the project implementation
	RC2A1 Implementation and start-up of the Brazil nut Processing Plant	At the end of the fourth year, a Brazil nut Processing Plant has been implemented and begun its operations
	RC2A2 Forest, Brazil nut, and sub products certification	At the end of the fifth year, management and processing of Brazil nut has been certified organically
	RC3A1 Training in forest management, reduced impact logging, monitoring and alert system of forest concession areas, farmers, miners, etc.	Annually, at least 4 technical workshops have been carried out with the participation of the population of the project area
	RC3A2 Cooperation agreements, alliances and training signed with the Government of Madre de Dios and other public and private stakeholders	Every two years, at least two agreements or contracts are signed that benefit the Brazil nut producers of the project
	RC3A3 Local campaigns for conservation of forests and environmental goods and services	Annually, at least 2 dissemination and promotional campaigns of Brazil nut forests, conservation and REDD project activities have been launched
	RC3A4 Training in sustainable projects: Agroforestry, tourism and aquaculture	Annually, at least 2 training workshops for the population of the project area have been carried out
Biodiversity Results	RB1 Biodiversity in the project area has remained in quality and quantity	At the end of the fifth year and within a period of every three years, the wildlife monitoring report presents maintenance of biodiversity stock.

	RB2 The HCV identified in the project area are recognized and valued by the settler	At the end of the fifth year, the HCV in the project area are identified and valued by the local population
Biodiversity Activities	RB1A1 Forest management of Brazil nut concessions	At the end of the fifth year forestry (Brazil nut and timber) activities of the project area meet the technical criteria committed with the Peruvian State
	RB1A2 Control of hunting and other environmental crimes in the project area	At the end of the fourth year, the area monitoring system runs with poaching and environmental crime control protocols
	RB2A1 Dissemination and training on HCV to the communities of the project area	As from the fourth year, each year at least one dissemination or training campaign is launched destined for local people in the project area
	RB2A2 Training in recognition of endangered wildlife species, environmental crimes and care for the environment applied to local people	As from the fourth year, each year at least one dissemination or training campaign is launched destined for local people in the project area

Stage 3. Analysis of the results-impacts pathways of the project

The ROTl analytical framework or causal model is presented in the following diagram. Once a good understanding of the project logic has been achieved, the focus should be on the processes involved in converting project results to impacts. The ROTl methodology involves an analysis of 'assumptions', 'intermediate states' and 'impact drivers'.

FIGURE 16



Once this identification and distinction of the intermediate states between results and impacts has been carried out, the degrees to be achieved in each of the points of the flow diagram will be scored, according to the following evaluation table:

TABLE 109

Qualification	Description	Rating system
0	Not reached	There is no clearly recognizable theory of change and the conditions for future progress are not in place.
1	Poorly achieved	There are no adequate mechanisms to achieve the project's theory of change, although the conditions for future progress may be in place.
2	Partially reached	The project has a recognizable theory of change, but the mechanisms to achieve it are insufficient; Moderate progress is being made to deliver the impacts.
3	Fully achieved	There is a clearly recognizable theory of change, and substantial progress is being made towards achieving it with the appropriate mechanisms clearly in place. The project is strongly positioned to deliver its products.

Source: Evaluation of the Social Impact of Terrestrial Carbon Projects (1.0) - Part II

4.2.2 Negative Community Impact Mitigation (CM2.2)

The negative impacts of the project were identified by the community during the consultation meetings carried out in the process of socialization and formulation of the project.

Negative impacts	Mitigation strategy
Institutional problems and conflicts between communities or associations	<u>Mechanism for handling cases</u> Within the mechanism, the project will have the responsibility of receiving all requests related to institutional problems or conflicts between institutions, community associations or the general population associated with the project to meet and determine a strategy for the mitigation or resolution of the conflict and communicate the actions to the applicant.

Negative impacts	Mitigation strategy
Lack of planning of activities	<u>Strategic plan, strategic lines and implementation schedule of project activities</u> The project will have a clear schedule for the implementation of the activities, which will be socialized and validated by the partners for their knowledge. The project has always developed, and will continue to develop, informative meetings prior to the implementation of the activities in order to ensure their proper execution. Additionally, through the complaint handling mechanism, the project will also receive requests for planning and coordinating activities in the territory.
Socialization processes and ineffective communication channels	The project has had, and will continue to have, a series of meetings and socialization workshops to guarantee access to information for all project partners. The project has specific communication channels, which have been adapted according to the project dynamics and the needs created in the initial phase of implementation of the activities. The means of communication used with the project partners, contact in the field, telephone calls and social platforms such as WhatsApp for the project (group).

Comparison between: "With project" scenario and "Without project" scenario

According to the projection of future scenarios worked between BAM and the Brazil nut producers, the following projections of scenarios with the project and without the project are described:

TABLE 110

N°	Impact	Indicator	Scenario without project			Scenario with project	
			Existing conditions	Impacts without project	Results	Impacts with project	Results
1	Sustainable forest management	FEPROCAMD has a formal and efficient organization	FEPROCAMD does not have development skills	Neutral	The current conditions are maintained. Concessionaires	Positive	FEPROCAMD strengthened and organized management of

			or capacities to manage the forest		do individual management and are sporadically organized.		Brazil nut concessionaires
		Brazil nut concessionaires are organized and comply with the agreements with the state	Forest concessionaires with problems before OSINFOR with fines and sanctions due to improper management of the concession	Negative	increase in penalties, sanctions and termination of contracts with the state. Areas are left vulnerable to deforestation and activities	Very positive	Criteria and concessionaire commitment are met before the state
2	Increase in harvester revenue	Annual income as a result of the economic activities carried out in its concessions.	The average annual income per concession amounts to 7204.22 selling conventional and non-value-added Brazil nuts.	negative	Income from Brazil nut harvesters remains stable or low	Very positive	Increased income and certification of Brazil nuts with added value under management that increases productivity
3	Variation from traditional subsistence activities to sustainable activities.	Number of agro forestry, agriculture, tourism companies are implemented	local people develop single crop agriculture, slash and burn and extraction of forest resources	negative	Increase in agricultural perimeters and eroded areas. The qualities and the forest decrease	Very positive	The family economy increases with sustainable economic alternatives.
4	Forest conservation and ecosystem flows for local families	keep the amount of wildlife	Poaching, deforestation and the indiscriminate use of forests reduce the existing wildlife reserve	negative	Wildlife reserve decreases due to poaching deforestation and indiscriminate use of forests	Positive	The amount of wildlife (large mammals) is maintained
		maintain the integrity of the Brazil nut ecosystem	The inappropriate use of forests and the advance of deforestation fragment the forest ecosystem	negative	Fragmentation of the forest ecosystem increases	Positive	Forest ecosystems are maintained and regenerated

5	Control of activities that cause deforestation	resolved cases versus unresolved cases from the monitoring and surveillance system	there is no defense system for areas in danger of being deforested	negative	Increase in incursions and invasions in Brazil nut areas	Very positive	The projection of deforestation decreases in the project area
		resolved cases versus unresolved cases from the conflict resolution and leak management system	growing conflicts between concessionaires and deforestation agents	negative	The vulnerability and loss of Brazil nut areas increases due to conflicts between concessionaires and deforestation agents	Very positive	conflicts decrease and the escape of deforestation agents is mitigated

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

As indicated by the objectives and expected results of the Project (CM2.2), improvements are expected in the living conditions of the 405 project partners.

The measures adopted to safeguard the impacts of climate change are referred to the following indicators:

TABLE 111

Indicator	Measures to mitigate the impact of climate change in the project area
Sustainable forest management	Compliance with the rules and management plans of the forestry sector by the partners. Forest conservation with sustainable management and compliance with national regulations.
Improved income for project partners	Improving the quality of life of the members is linked to not looking for extractive economic alternatives or that damage the environment.
Shift from traditional subsistence activities to sustainable activities	Less anthropic pressure and changes in land use in the project area.
Forest conservation and ecosystem flows for local families	Ecosystems are maintained

Control of activities that cause deforestation	Conflict management and improve socio-environmental conditions.

4.2.4 High Conservation Values Protected (CM2.4)

The project will not negatively affect any High Conservation Value; on the contrary, the project aims to preserve the ecosystem and the environmental services it provides with a minimal, but efficient intervention of the forest by improving the traditional activity of the Brazil nut. Brazil nut activity is mainly harvesting and in a seasonal period, therefore it will not affect the soil (compaction and discharge of fuel or mercury) or the regeneration of the forest (intense logging, slash and burn) or Brazil nut production. In addition, this activity is not a threat to fauna as are other activities such as livestock, agriculture or mining.

4.3 Other Stakeholder Impacts

4.3.1 Impacts on Other Stakeholders (CM3.1)

The project, according to its results and proposed activities, does not present negative impacts within its area of direct influence (405 Brazil nut forest concessions) and in turn on other groups that live and coexist in territorial management, neither does it present negative impacts.

The groups of farmers and forest concessions in the territory will not be affected by the activities of the project and if they will be able to benefit from the positive impacts related to the protection and conservation of the forests.

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

Displacement of activities that cause deforestation or leakage.

This is a probable direct effect of the control and monitoring activities of areas that occurs when deforestation agents (invaders, illegal loggers, informal miners and other agents), unable to affect the project area, move to other areas or territories. that are not within the project area (with the intention of carrying out the same deforestation activities).

One aspect to consider will be that these "leaks" may generate a conflict with deforestation agents:

These conflicts can be from a legal or social position:

Legal conflict: It could occur with a mining concessionaire that has (or obtains) titles overlapping with the Brazil nut area, as well as with farmers and other concessionaires who have not made milestones or area tax relief.

Social conflict: In this case, it would be a conflict with invaders to the Brazil nut concessions, among them would be informal miners, farmers, illegal loggers, hunters, among others.

4.3.3 Net Impacts on Other Stakeholders (CM3.3)

The project will mitigate these social conflicts through the Dispute and Complaints Resolution System. It is worth mentioning that to significantly improve the effectiveness; This system will have the participation of governmental entities related to the subject such as: The Ombudsman's Office, the prosecutor's office, among others.

Although the project has an area delimited by the 405 Brazil nut concessions that are added to the project, the control and surveillance strategy will cover the entire Brazil nut concession area (around a thousand concessions, including those that are not project partners), which will benefit from defending your forest.

In this sense, forest protection activities, technical assistance and legal advice protocols and agreements with forest authorities will benefit all concessionaires. This is the strategy to mitigate the risk of leaks.

In addition, the joint work with FEPROCAMD, which represents most Brazil nut concessionaires (including some that are not part of the project), which is being strengthened through the project, will also be a benefit that will not distinguish the concessionaire that is a member. of the project and the concessionaire that is not.

4.4 Community Impact Monitoring

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

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

The Project, for the community component, has the objective of generating positive impacts on the social and economic well-being of the groups involved in the project and ensuring that the costs and benefits are shared equitably among the members during the life of the project.

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

Forest protection activities, technical assistance and legal advice protocols, and agreements with forest authorities will benefit all concessionaires. This is the strategy to mitigate the risk of leaks.

This system is organized in the present Community Impact Monitoring Plan of the Brazil Nut REDD project. The Community Impact Monitoring Plan (CIMP) is based on the fact that indicators have already been identified that will bring about the processes and changes planned for the project. The first measurement of these indicators is recorded prior to the start of the project; this is known as the Community Baseline.

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

4.1 Impact indicators on the community component

BAM has identified the community impact to be achieved through the activities to be implemented with the REDD project of the Brazil Nut. These impacts will be obtained and achieved gradually throughout the project.

TABLE 112

Impacts	Implementation of monitoring and surveillance of areas	Nursery Implementation	FEPROCAMD Strengthening	Implementation of complaints protocol	Brazil nut processing Brazil nut plant	Establishment of cooperation agreements and alliances	Campaigns for the conservation of forest and environmental goods and services	Coaching plan	Forest management of Brazil nut areas
Best organization for sustainable forestry activities	B	B	B	B	NA	B	B	B	B
Increase in the economic income of the Concessionaires	NA	B	NA	NA	B	NA	B	B	B
Shift from traditional subsistence activities to sustainable activities.	NA	B	NA	NA	B	B	B	B	B
Forest conservation and ecosystem flows for local families	B	B	NA	B	NA	B	B	B	B
Control of activities that cause deforestation (miners, farmers, etc.)	B	NA	NA	NA	NA	NA	NA	NA	NA

The Brazil Nut REDD project starts from the premise that the 10 activities identified will generate 5 impacts (expected).

To monitor the achievement of these impacts, the indicators that will drive said impacts have been identified.

Improved Organization for Sustainable Forest Management

This impact refers to the improvement of the organizational capacity of Brazil nut producers in order to coexist and thrive as a collective, as well as to cover its needs as an organization and solve their organizational and management problems. These capabilities are required to contribute to the sustainable management of the concessions of each associate, as well as to manage the forest agenda (collective actions) of Brazil nut producers.

Indicators

The indicators are:

- a) Brazil nut regional organization formally constituted developing its organic institutional life.
 - 01 regional organization legally constituted
 - Number of management tools applied
 - Number of interagency agreements

- b) Brazil nut organization successfully monitoring areas with forest custodians certified by a competent authority
 - Surveillance organization implemented
 - Number Custodians certified by competent authority
- c) Brazil nut producers organized on the basis of a system of organic certification.
 - 01 Brazil nut organization leading the certification
 - Number Brazil nut producers organized with certification
- d) One Brazil nut regional organization formally constituted developing its organic institutional life.
 - 01 regional organization legally constituted
 - Number of management tools applied
 - Number of campaigns in defense of the Brazil nut sector
 - Number of campaigns with proposals and agenda of the Brazil nut sector

Collection Technique and Schedule

The data collection techniques to monitor this impact would privilege the document review and FEPROCAMD files and the project. These reviews will be periodic (biannual) according to the management periods established by Brazil nut organizations. The techniques and schedule for each indicator are detailed in the following table.

Income Increase

The income is the cash flow received by local people (among them, the Brazil nut producers) as remuneration (in case of sale or lease) and salary (if working). In general, the income⁷⁴ may take the form of extra wages, interest, dividends or rents to be achieved with the implementation and start-up of the project.

As already mentioned herein, the Brazil nut producers obtain income from selling the Brazil nut collected from the forests (in some cases from logging). Sales prices of the Brazil nut regularly are determined by several factors, among the most important ones: 1) external demand conditions, 2) the prices established by intermediary companies which process and trade the Brazil nut in Madre

⁷⁴ They are not considered complementary revenues from other grant resources as timber harvesting and other sources such as work or business of the holder, wife, children or other external.

de Dios, 3) the competition from Brazil and Bolivia, and 4) the phyto-sanitary management at the time of harvest and post-harvest of the Brazil nut.

The project, by improving the conditions of numerals 2 (implementing a Brazil nut processing and trading company) and 4 (improving the Brazil nut harvest and post-harvest management) will increase the Brazil nut price.

The project will impact on these factors (especially in factor 1) by promoting the regional competition, which will bring better prices. The proposal implies to transform Brazil nut producers (along with BAM) into Brazil nut entrepreneurs at an international level. Then the Brazil nut producers will increase their dividends because they will receive better prices for their Brazil nut and because they will receive profits as they are shareholders of the Brazil nut processing and marketing company.

Likewise, it will improve the income of Brazil nut families through the job offers provided by the project throughout the process of implementation of REDD activities and in special, job offers in the construction area, implementation and start-up of the Brazil nut processing plant and the nursery. It is considered that at least 50 % of the project's workers will be local people (especially coming from Brazil nut families).

On the other hand, the project will also generate more income from materials procurement (wood, seeds, fruits, leaves, etc.), goods, supplies (fuel, energy, etc.) and various products offered by the department of Madre de Dios and especially the communities in the project area.

Indicators

a) Percent of increase of Brazil nut price

Refers to the price increase of the Brazil nut produced by the organic certification and higher market valuation for the competition generated.

b) Number of job offers created

Refers to the generation of stable and temporary jobs offered for construction, implementation and start-up of the Brazil nut processing plant. Also, at the stage of implementation and operation of the nursery, temporary and stable jobs created for locals.

c) Investment in goods and services

Refers to the funds disbursed to local residents to purchase local inputs and services specially commissioned for the implementation of the Brazil nut processing plant and implementation and operation of the nursery.

d) Number of income from the Brazil nut company profits

Refers to the profits to be obtained with the Brazil nut company (plant), these profits can be assumed as an increase in the share value or as profits distributed.

Collection Technique and Schedule

The data collection techniques to monitor this impact will be located mainly in the administration of the project and the Brazil nut Company. It will be revised the status of the investments in salary, workers, acquisition of assets and income from the sale of Brazil nut (for the case of the Brazil nut company).

The collection period will be systematized and will be adjusted annually (according to the accounting closing period of BAM and the Brazil nut Company).

Further information and knowledge to the communities

The project will promote the capacity building through the increase in the information flow and knowledge related to the sustainable management of the concessions, the technical forest harvesting and the micro entrepreneurial development of the Brazil nut producer.

These trainings will be provided to Brazil nut concessionaires, project workers and local people in general (farmers, miners, loggers, government officials, etc.). The topics will be decided according to the stakeholders and aligned with the objectives and the stages of the project. Among these, REDD issues, the promotion of sustainable alternative activities such as agroforestry and organic agriculture, environmental education, low impact forest management, biodiversity valuation, among others.

This impact considers generating knowledge and practical skills for sustainable forest management and awareness and environment and biodiversity assessment.

Indicators

- a) Number of Brazil nut leaders trained in management, leadership and direction.
- b) Number of Brazil nut producers trained in surveillance – forest custodians.
- c) Number of Brazil nut producers trained in nursery management and reforestation.
- d) Number of Brazil nut producers trained in entrepreneurship.
- e) Number of Brazil nut producers trained in Brazil nut organic management.
- f) Number of Brazil nut producers trained in timber certified management.
- g) Number of Brazil nut producers trained in Brazil nut harvest and post-harvest.
- h) Number of Brazil nut producers and local people trained in alternative economic activities (agroforestry, ecotourism, handicrafts, etc.).
- i) Number of Brazil nut producers and local people trained in REDD and carbon issues.

Collection Technique and Schedule

The monitoring collection technique of this impact will be mainly the revision of reports of training activities reported by the project (community area). The reports will be organized and scheduled in accordance with the training plan designed by the community area of the project.

Change from traditional subsistence activities to sustainable activities

The project will promote a change in strategies and livelihoods, passing from subsistence to sustainable livelihood. In that sense, there are 2 strategies to be implemented:

- a) Improvement of Forest Management. This will be sought in the BN concessions and forested areas of farms, to improve or, in some cases, to introduce a technical exploitation of the forestry resources, adding to the productivity and value of the forestlands and creating more economic and environmental benefits.
- b) Development of Agroforestry Projects. To boost the sustainability of economic activities of local people, the Project will encourage and facilitate the design and implementation of agroforestry projects by creating micro-entrepreneurial initiatives, strengthening productive units, improving productivity and quality of forested areas.

Therefore, the following indicators will help to monitor the results:

Indicators

- a) Increment in number of projects / agroforestry business plans implemented by farmers
- b) Income increment (%) from agroforestry activities
- c) Increment in number of productive organizations
- d) Increment in the productivity of forest products: Brazil nuts, timber, etc.

Collection technique and schedule

The monitoring collection technique of this impact will be mainly reviewing field reports of the technical assistance activities and training in productive activities reported by the project. Additionally, it will consider the revision of management reports of Brazil nut associations and events and executed projects and/or projected in the project area (detecting the initiatives facilitated by the Brazil Nut REDD project). The reports will be organized and scheduled in accordance with the project's annual operating plan.

Forest conservation and ecosystem flows for local families

The project will manage to maintain the sustainable forest management, ensuring the compliance with the technical criteria, according to the requirements of the Peruvian forest regulations. This application of technical criteria for forest management ensures the adequate access to resources coming from the forest and maximizes the benefits to the local population.

Good Brazil nut concessions management will improve the forest performance and valuation, achieving greater environmental benefits.

Indicators

- a) Number of hectares with planning (land marking) of Brazil nut concessions
- b) Number of management documents prepared and approved by the competent authority
- c) Number of reforested and/or under enrichment hectares
- d) Number of certified forest areas (BPMF, FSC)

Collection technique and schedule

The monitoring collection technique of this impact will be mainly reviewing field reports of technical assistance activities and reforestation reported by the project.

Conflictive displacement activities causing deforestation

The implementation of the project and in particular the implementation of the control and surveillance system of the project areas will generate impacts that affect (limiting and preventing the access) to the deforestation agents within the project area. This displacement constitutes the leakage of the project. This displacement could trigger tensions with the project.

This eventual conflict presence in the area, generated by the presence and activities of the project will be differentiated between those that are handled as from a social awareness and conviction (with MARCS⁷⁵ techniques) and those demanding legal and judicial attention. Given this impact the project will develop control activities and conflict mitigation.

Indicators

- a) Number of social and legal interventions against deforestation agents
- b) Number of alerts and complaints addressed
- c) Number of conflicting events with deforestation agents

Collection technique and schedule

The displacements, tensions and conflicts generated by the project will be identified and registered by the community early alert system, the control and surveillance program and the community relations area of the project. The systematization of this information will be executed each year after the start-up of each concerned area.

⁷⁵ Alternative Ways for Solving Conflicts

TABLE 114

Indicators	Collection technique	Period	SCHEDULE																			
			YEAR 01		YEAR 02		YEAR 03		YEAR 04		YEAR 05		YEAR 06		YEAR 07		YEAR 08		YEAR 09		YEAR 10	
			Sem. 01	Sem. 02	Sem. 03	Sem. 04	Sem. 05	Sem. 06	Sem. 07	Sem. 08	Sem. 09	Sem. 10	Sem. 11	Sem. 12	Sem. 13	Sem. 14	Sem. 15	Sem. 16	Sem. 17	Sem. 18	Sem. 19	Sem. 20
01 regional organization legally constituted.	Documentary Review: testimony, preliminary deed and registration in public registries	Every 02 years (under management period)	X				X				X				X				X			
# of management tools applied.	Documentary Review: Strategic Plan, minute book, register and rules of procedure. Annual project report. Annual management report of FEPROCAMD	Every 01 year of FEPROCAMD management	X		X		X		X		X		X		X		X		X		X	
# of interagency agreements.	Document review of FEPROCAMD: Proceedings of agreements signed	Every 2 years (closing period of FEPROCAMD management)					X				X				X				X			
Surveillance organization implemented	Review of project files: Act of incorporation, field report, field verification, equipment, surveillance posts, and invested resources.	Every 01 year, since its creation					X		X		X		X		X		X		X		X	

# Custodians certified by competent authority.	File review: Application to the Forestry Directorate, workshops report, resolution of custodians, reports of the activities of custodians.	Every 01 year, since its recognition						X		X		X		X		X		X		X		
01 constituted organization.	File review: Act of incorporation, registration in public registries.	Every 02 years, since its recognition								X				X					X			
# Brazil nut producers organized with certification.	Documentary review: relationship of partners in the register	Every 02 years, since its recognition								X				X					X			

Assessment Plan for High Conservation Values

The project considers the revaluation of the Brazil nut forests and, therefore, of the Brazil nut concessionaires and / or producers, as a regional cultural identity typical of Madre de Dios. In this sense, it will influence the integral promotion of the Brazil nut at the regional and national level. In the Biodiversity Monitoring Program, as here, the improvement of biodiversity in their areas will be measured.

TABLE 115

Indicator	Methodology	Frequency
High conservation values identified	Annual digital magazine	Every year. Send via a free access network to each partner the conservation results and benefits achieved.
	1 participatory workshop showing the results achieved (relating the biodiversity and climate component with social well-being).	Every 2 years

4.4.2 Monitoring Plan Dissemination (CM4.3)

The dissemination of the monitoring plan for community benefits will take into account what is described in Sections 2.3.2 and 3.3.4 on dissemination of the project summary documents and dissemination of the climate monitoring plan.

The development of the community impact monitoring plan is based on the Theory of Change approach (Richards & Panfil, 2011), which proposes the construction of a path of change based on the analysis of the situation that it is desired to modify with the implementation of project activities. A set of primary, secondary, and tertiary outcomes is identified that jointly make it possible to achieve the desired change in the long term.

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

The monitoring plan to assess impacts on the community consists mainly of the indicators and techniques presented above. BAM is committed to completing it within six months of validation against the standard. BAM also commits to publicize the full plan and results after each monitoring period with communities and the general public by posting them on the BAM website, delivering hard copies to FEPROCAMD, its grassroots organizations and other local organizations. (That is, agricultural organizations) as well as the Tambopata and Tahuamanu forestry offices. In addition, we will hold additional meetings if necessary to ensure that the project community and other stakeholders are informed.

TABLE 116

Indicator	Methodology	Frequency	Recommendation

Best organization for sustainable forestry activities	Prepare an institutional plan.	Annual meeting of the FEPROCAMD (board of directors to evaluate the operation and goals.	The institutional plan must be participatory and representative in its preparation.
Increase in the economic income of the Concessionaires	Descriptive survey of project partners to measure level and changes in their economic income and productive activity (405 partners)	Once a year	Surveys with closed questions and the total of the universe. Generate a database to do a comparative study per year.
Shift from traditional subsistence activities to sustainable activities.	Decentralized workshops by sector to evaluate the conditions and forms and develop their productive activity	Once a year 12 decentralized workshops.	The results obtained as inputs for the diagnosis and generate the expected changes.
Forest conservation and ecosystem flows for local families	In the biodiversity assessment, consider presenting your results	Biannual.	
Control of activities that cause deforestation (miners, farmers, etc.)	01 Participatory workshop that shows the annual rate of deforestation of the project.	Annual	Thematic maps

In addition, an annual report aid of the project will be made with all the results obtained from the digital monitoring plan that will be sent to each partner via a free access social network and posted on the website of BAM.

4.5 Optional Criterion: Exceptional Community Benefits

The project seeks to be validated at the Gold Level to obtain exceptional benefits for the community.

4.5.1 Exceptional Community Criteria (GL2.1)

According to the World Bank, “an individual is defined in a state of vulnerability if the probability of falling into poverty in the next five years is greater than 10 percent. This produces an upper limit of \$ 13 per person per day in 2011 PPP”. This upper limit also serves as the lower limit for the classification of individuals in the middle class. The upper limit for the middle class is set at \$ 70 per person per day in the 2011 PPPs. The key consideration here is to choose an upper limit so that slight changes in this upper limit

generate changes in a significant proportion in and out. of the middle class. All of these income classifications are used throughout the LAC Equity LAB."

Under this analysis, the 405 partner concessionaires of the project are in a state of vulnerability and likely to be poor in the coming years if living conditions do not improve or change. In this context, the REDD + project is not only appropriate but is projected as the great possibility of change in the face of circumstances (scenario without a project described in 4.1.1).

The project is directed by the 405 Brazil nuts concessionaires who, as described in section 4.1.1, are families composed of more than 4 members, have community associations and are explicitly in favor of the vulnerable population with regard to the orientation of the Benefits.

The Project partners are made up of 405 Brazil nuts concessionaires that according to the Peruvian Forest Supervision Agency are classified as Concessions for Forest Products Other than Wood, these concessions are aimed at the use of other forest products other than wood such as fruits, latex, resins, gums, flowers, medicinal and ornamental plants, fibers, among others; whose extraction does not lead to the removal of the forest cover.

They are valid for up to forty years, renewable in a maximum area of ten thousand hectares.

For the management of each concession each year according to the forestry law No. 29763, and the Wildlife Law of the Peruvian government in its article 56 of the Regulations, it considers the Management Declaration - DEMA as a management plan, and defines it as the instrument of simplified short- or medium-term planning, applicable for low harvesting intensities with practices that do not significantly affect the resilience of the ecosystem or the species under management. Every year each concessionaire has to update its Declaration of Management (DEMA) and in each of these plans the following structure is considered:

1. General information of the concession holder
2. Area information
3. Internal organization (distribution and use of the productive space of the concession)
4. Information on resources, species and services
5. System of management, exploitation and silvicultural work
6. Protection measures of the Forest Management Unit
7. Identification of negative environmental impacts and establishment of prevention and mitigation measures

The project, within the framework of its activities, strengthens and advises, within the framework of the law, the compliance and proper management of each of the 405 partners that make up the project. In addition, this advice and compliance with the regulations also favors other members of the FEPROCAMD.

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

Considering the conditions of and vulnerability in the project partners, it is expected to generate community impacts related to the strategic lines (objectives) and project activities in each families of the 405 partners, which will directly impact more than 1500 people (average of 4 people per family), considering as exceptional benefits the same positive impacts described in Section 4.2.1 with respect to an improvement in the management and care of natural resources within each of

the Brazil nut concessions and the economic empowerment of community groups and increase of job opportunities in the project area.

The expected short-term and long-term benefits with respect to these impacts are described in Section 4.2.3.

Within the framework of the expected results of the Project in the short and medium term, it is expected to achieve the following:

Results	Indicators
RC2 The income generated from the use of Brazil nut forests have increased	At the end of the fifth year of the project, the income of the Brazil nut producers has increased in more than 10% of the baseline
RC3 Communities in the project area and the government of Madre de Dios have strengthened their capacities for sustainable forest management and the project contributes to improving the quality of life of local people	At the end of the fifth year and in subsequent years the implementation of sustainable development policies and the increase of sustainable activities in the project area can be verified
RC1A1 Organization and legal formalization of FEPROCAMD	At the end of the first year, the Brazil nut producers have a legally formalized organization
RC1A2 Implementation of the Alert System	At the end of the third year, the Brazil nut producers have an organizational structure to call and respond to threats in their areas with immediacy
RC1A3 Implementation of the Conflict Resolution and Complaint System	At the end of the third year, FEPROCAMD has a structure to resolve conflicts and complaints during the project implementation
RC2A1 Implementation and start-up of the Brazil nut Processing Plant	At the end of the fourth year, a Brazil nut Processing Plant has been implemented and begun its operations
RC2A2 Forest, Brazil nut, and sub products certification	At the end of the fifth year, management and processing of Brazil nut has been certified organically
RC3A1 Training in forest management, reduced impact logging, monitoring and alert system of forest concession areas, farmers, miners, etc.	Annually, at least 4 technical workshops have been carried out with the participation of the population of the project area
RC3A2 Cooperation agreements, alliances and training signed with the Government of Madre de Dios and other public and private stakeholders	Every two years, at least two agreements or contracts are signed that benefit the Brazil nut producers of the project
RC3A3 Local campaigns for conservation of forests and environmental goods and services	Annually, at least 2 dissemination and promotional campaigns of Brazil nut forests, conservation and REDD project activities have been launched
RC3A4 Training in sustainable projects: Agroforestry, tourism and aquaculture	Annually, at least 2 training workshops for the population of the project area have been carried out

4.5.3 Community Participation Risks (GL2.3)

The risks of community participation in the implementation of project activities were identified in the framework of the public socialization meeting (see Section 2.3.3.2). For each risk factor or negative impact identified by project stakeholders, a mitigation strategy was defined within the project implementation framework.

The project guarantees, as far as possible, the effective participation of the partners in decision-making both in the socializations and in the activities (see Section 2.3.10) and all the processes of socialization or consultation and participation in the Project activities are promoted directly between Amazonian Forests and the 405 project partners that co-execute the Project.

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

Community Group 1	Brazil nuts concessionaires
Net positive impacts	The expected benefits are framed in generating better living conditions for each of the families that make up the 405 partners of the project. The result the income generated from the use of Brazil nut forests have increased expects to achieve a significant change from the year 2021 where it has already begun to give an economic bonus to each concessionaire.
Benefit access	Organizational Strengthening of the representative body that makes up the FEPROCAMD allows transparency and strength to access and achieve benefits under this tutelage that is part of the objective to strengthen the organization and capabilities of Brazil nut concessionaires for sustainable management and monitoring of their concessions.) This allows no partner to be omitted and also a representative organization made up of the partners safeguards and monitors all the processes and goals of the project.
Negative impacts	As indicated in point 4.3.1 The project, according to its results and proposed activities, does not present negative impacts within its area of direct influence (405 Brazil nut forest concessions) and in turn on other groups that live and coexist in territorial management, neither does it present negative impacts. The groups of farmers and forest concessions in the territory will not be affected by the activities of the project and if they will be able to benefit from the positive impacts related to the protection and conservation of the forests.

4.5.5 Net Impacts on Women (GL2.5)

The project will generate net positive impacts on the well-being of women, whether they participate in the implementation of project activities or in decision-making. These impacts will be guaranteed through:

- The implementation and compliance of the equal opportunities and anti-discrimination policy described in Section 2.3.11. With this, it will seek to put an end to all forms of discrimination against all women during the implementation of the project and promote strategies to enforce and monitor equality and non-discrimination based on gender.
- The full and effective participation of women and equal leadership opportunities at all levels of the project, including in managerial positions; as long as it does not conflict with the cultural characteristics of the communities.

The project has the direct participation of 150 female concessionaires who represent 37% of the total number of partners (405). Equality in participation is promoted, as well as the empowerment of women as leaders.

As part of the organizational strengthening, it is proposed to increase the participation of women in decision-making processes. In the institutional plan of the FEPROCAMD table 116 of the point Monitoring Plan Dissemination (CM4.3) (it will be done under a gender perspective that allows free and adequate representation).

4.5.6 Benefit Sharing Mechanisms (GL2.6)

The only source of income is the sale of carbon credits generated from the Project's conservation efforts. With the proceeds achieved from sales of carbon credits, the policy is firstly to provide the necessary funding to cover all activities proposed, required and budgeted by the Project, in order to achieve its conservation and sustainability goals. This is required for the optimal planning, implementation and monitoring of the Project strategies with the goal of keeping REDD+ Brazil-nut concessions as one of the most important REDD+ programs worldwide. This budget covers activities such as: area monitoring, reporting and control; info systematization; admin and logistic equipment; admin, accounting and operational costs; human resources; community relations; training workshops for strengthening concessionaire's capacities in sustainable forestry management; general communication; technical and legal advice for members; concession ordering and bordering, among others. This budget includes the activities necessary for the correct development of the community in relation to the sustainable management of the concessions. Each year the project defines a budget that includes the activities to be carried out in the year and the amount needed to cover these activities. The annual budget is worked on by BAM in conjunction with FEPROCAMD leaders and is approved by both parties.

In this sense, the project includes the opinion and approval of the community in the definition of the strategies and activities to be implemented. Likewise, community leaders have access to biannual progress reports on project execution, which are shared within their organizational structure. Additionally, the development and achievement of the implemented activities is communicated in the workshops and meetings that the Project (team responsible for the execution of project activities) and shared with the entire community regularly not only in the meetings but also through communication tools such as periodic bulletins.

After covering all project costs, the surpluses are shared between the Project Partners, BAM and the concessionaire families (FEPROCAMD) the distribution of benefits is in accordance with the

framework agreement established between the parties. This general agreement is the property of the representatives of FEPROCAMD and is fully known to the members.

With respect to carbon credit revenues, BAM, as the entity responsible for the commercialization of the credits, has the agreement to send a complete sales report every six months (volumes, prices, commissions on sales, etc.) to the FEPROCAMD leadership, which socializes this information among its members.

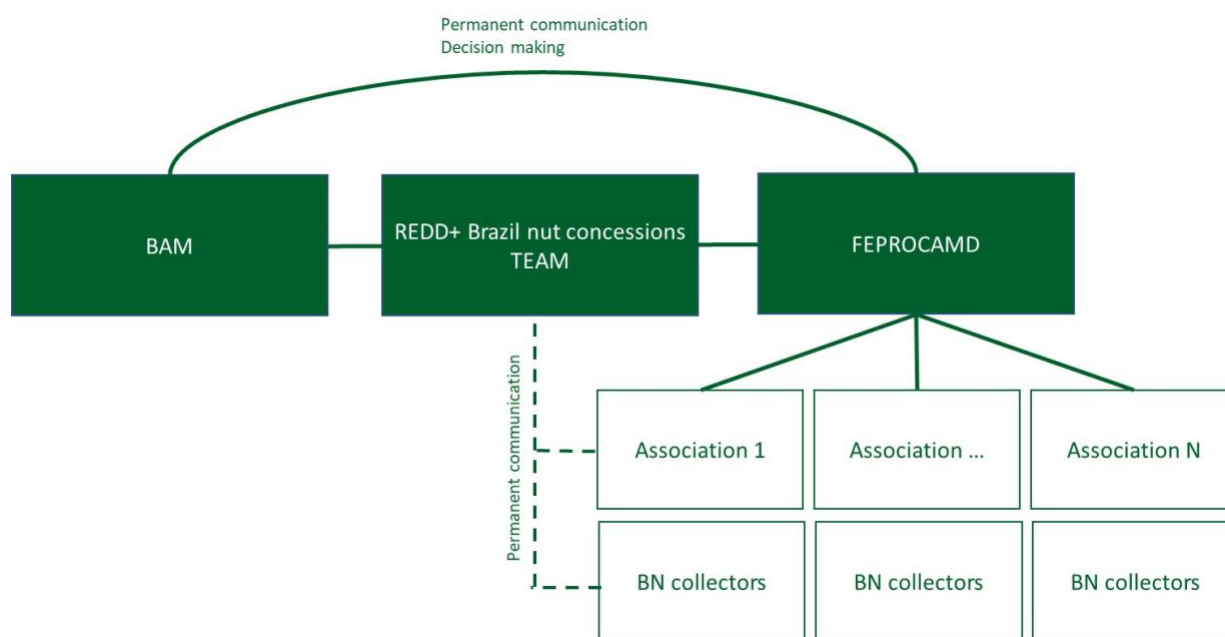
4.5.7 Benefits, Costs, and Risks Communication (GL2.7)

According to the project monitoring plan, the following actions are foreseen to keep informed and have information spaces between the partners and BAM.

As specified in point 2.3.4 Community Costs, Risks and Benefits. The benefits from REDD + are not only known but, they have received the share of benefits that corresponds to them during the time of implementation of the project.

In addition, there will be workshops and / or meetings (contemplated in the monitoring plan for the community component) where the costs, benefits and risks of the project will be presented annually with all 405 partners in addition to the communication platforms mentioned above.

4.5.8 Governance and Implementation Structures (GL2.8)



BAM is structured as a company and in the Madre de Dios region it has an office with a team made up of a project coordinator and support staff.

In the case of Brazil nut partners, they are spatially articulated in their territory according to the location of their concessions and make up a local association distributed as follows:

Departmental Federation Of Brazil Nut Producers Of Madre De Dios Based Associations		
Nº	Name	Nº Of Certificate In Public Records
1	Asociación de Productores de Extractores de Castaña de Planchón	11016567
2	Asociación de Productores y Extractores de Castaña de Shiringayoc	11016632
3	Asociación Castañera Agroforestal de Carmen Rosa	11016658
4	Asociación de Productores y Extractores de Castaña de Mavila	11016615
5	Asociación Agroforestal Alegría, Alto Malecón San Carlos y Anexos	11015063
6	Asociación de Productores Castañeros y Agroforestales de Alerta	11016540
7	Asociación de Castañeros de Alegría	11000665
8	Asociación de Productores y Extractores de Castaña de Río Paríamanu y Afluentes	11016654
9	Asociación Castañera Agroforestal de Varsovia	11016652
10	Asociación de Productores y Extractores de Castaña de Loreto	11016672
11	Asociación de Extractores Productores Forestales y Agropecuario de La Novia	11006728

These associations from the FEPROCAMD who represents both of the 405 partners of the Project as well as other Brazil nut concessionaries in the Madre de Dios Region.

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

The strengthening of the organization of Brazil nuts concessionaries in the Madre de Dios region FEPROCAMD is a pillar of the project to achieve and generate active, effective and independent participation that allows the partners to have as support a strengthened organization and with the capacity to provide the advice they need to each project partner.

Training and learning are part of the objectives and expected results of the project.

5. BIODIVERSITY

5.1 Without-Project Biodiversity Scenario

5.1.1 Existing Conditions (B1.1)

For the evaluation of the existing conditions of the project area, it was based on information from primary and secondary sources, referring to studies at the regional level. Madre de Dios is designated "The Capital of Biodiversity of Peru" as part of the Biodiversity Center of the Tropical Andes (Myers, 2001) (Federal Law 26311). The southwestern Amazon is within the priority terrestrial ecoregion (ETP) or hotspot known as the tropical Andes, which contains the greatest richness of species, biological diversity and endemism on the planet. Located between Venezuela and Argentina, it contains approximately 15% of the biodiversity and 50% of the endemism of vascular plants in the world, respectively. It contains not only a great diversity, but also a great endemism of vertebrates: 73% amphibians, 46% reptiles, 41% birds and 16% of the world's endemic mammals. The protected areas of the Tropical Andes conserve some of the most

important remains of this hotspot, the areas of greatest relevance being represented by: 1) the Manu, the largest tropical rainforest biosphere reserve on the planet, and 2) the complex ejo de protected areas Tambopata-Madidi, located on the border between Peru and Bolivia in the richest part of this hotspot, which has the greatest biodiversity on earth and whose creation constitutes an important achievement for the conservation of biodiversity (Myers, 1988; Myers et al., 2000; Myers, 2003; Mittermeier et al., 2004).

5.1.1.1 Strategic ecosystems

The Brazil nut forests within the project area are unique in Peru. However, there are few studies of fauna. Kirkby (1999) points out that medium and large-sized species such as Tapir (*Tapirus terrestris*), Black Capuchin Monkey (*Cebus apella*), Tamarin (*Saguinus fuscicollis*), Titi Monkey (*Callicebus brunneus*) and Tiger (*Leopardus pardalis*) are negatively affected by the pressure of the hunt. On the other hand, other species are favored by the reduction of their natural predators such as the Squirrel Monkey (*Saimiri boliviensis*), Kinkajou (*Potos flavus*), Deer (*Mazama americana*) and Red Squirrel (*Sciurus spadiceus*).

The book "Standard for the Certification of Forest Management for Brazil nut Production Purposes in Peru" indicates that the fruits and seeds of the Brazil nut are frequently consumed by Macaws (*Ara ararauna*, *Ara macao*, *Ara chloropterus*), Agouti (*Dasyprocta variegata*), Picuro (*Cuniculus paca*), Southern Red Squirrel (*Sciurus spadiceus*), Bolivian Squirrel (*Sciurus ignitus*), Wild Pig (*Tayassu tajacu*), Wild Boar (*Tayassu pecari*), Black Capuchin (*Cebus apella*) and White Capuchin (*Cebus albifrons*). The seedlings are mainly consumed by Tapir (*Tapirus terrestris*), Red Deer (*Mazama americana*) and Ash Deer (*Mazama gouazoubira*). In addition, the Brazil nut tree is frequently used by the harpy eagle (*Harpia harpyja*) and the crested eagle (*Morphnus guianensis*) as a nesting site.

Madre de Dios is also recognized worldwide as a conservation priority due to its relatively intact forests, exceptionally high levels of biodiversity, strategic location in the connection of large natural parks in Peru, Bolivia and Brazil, and projected resistance to climate change (Malhi, 2008 projects; Killeen et al, 2008; Rosenthal et al, 2012). In addition to the high biological value of the Madre de Dios and the western Amazon in general, the region is also home to a rich mosaic of cultural diversity, including some of the last uncontacted indigenous peoples living in voluntary isolation (Wessendorf, 2008; Shepard et. al, 2010).

Before the mid-1960s, Madre de Dios had few inhabitants and little development. This changed after the construction of a highway leading to the province. Since then, human population and land cover conversion have increased substantially and the region has experienced comparatively high levels of forest disturbance and deforestation in Peru (Oliveira et al., 2007). During the 1980s and 1990s, the loss of natural forests in Madre de Dios was mainly due to government-subsidized agricultural expansion (Alvarez and Naughton-Treves, 2003; Chávez, 2012). In the 2000s, gold mining became a major driver for regional LULC following the discovery of gold deposits and the increase in its price internationally (Swenson et al, 2011; Asner et al, 2013.). Since the discovery of gold, an estimated 30,000 artisanal miners have migrated to Madre de Dios (Webster, 2012). ~ 95% of gold mining operations in the region would be illegal either because miners lack the necessary permits to run their operations or because they are working outside of authorized mining concessions (Keane, 2009).

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In addition, the Brazil nut tree is frequently used by the harpy eagle (*Harpia harpyja*) and the crested eagle (*Morphnus guianensis*) as a nesting site.

5.1.1.2. Fauna

The Brazil nut forests of the project area are ecosystems that serve as habitats for multiple species of birds, mammals, reptiles and amphibians. Based on the data obtained in the baseline that applied the methodology, the development of the biological baseline was Conservation International's Rapid Assessment (RAP) carried out in the wet season in March 2021 in three zones in forests of Brazil nut concessions located in the populated centers of Mavila (zone 1), Alert (zone 2) and Alegría (zone 3), using a total sampling effort of six effective evaluation days with 140 hours and 143.9 kilometers. The taxonomic groups that represent the diversity of species and at the same time respond to the objectives of the project were evaluated (Warman et al., 2004). These taxa were selected considering their ecological importance, ease of sampling, performance in biodiversity assessments, sensitivity to habitat alterations, taxonomic knowledge, and frequent use in baselines, biological monitoring, and environmental impact studies. The groups evaluated larger mammals, less flightless and flying, ornithofauna and amphibians and reptiles.

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As a result of the ornithofauna evaluation, 547 records (direct and indirect) were obtained, a total of 441 individuals seen, divided into 17 orders, 38 families, 156 genera and 224 species, registering

for zone 1, 156 species, for the for the zone 2, 128 species and for zone 3, 109 species. The mammozoology evaluation registered 35 species in the Brazil nut concessions of which 30 were reported in Mavila, 23 in Alert and 23 in Alegría.

The results of the evaluation of flora record of a total of 175 Individuals, 82 species, 69 Genera, and 31 Families present the predominance of juvenile species, with diameters between 0.10 and 0.29 meters of DBH.

They found several species of threatened wildlife. For Peruvian legislation, wild fauna resources are non-domesticated animal species that live freely and specimens of domesticated species that by abandonment or other causes are assimilated in their habits to wildlife, except species other than amphibians that are born in marine and continental waters that are governed by their own laws (Law 27308 Forestry and Wild Fauna), however the biological definition has a broader meaning: Fauna is the set of animal species that inhabit a geographic region, which They are typical of a geological period or that can be found in a specific ecosystem.

For this reason, work was carried out on the systematization of the list of threatened species and included in national protection lists (Supreme Decree No. 004-2014-MINAGRI), which approves the updating of the list of classification and categorization of threatened species. of legally protected wildlife, approved by (DS N ° 034-2004-AG)

Category	Siglas
Extinct	EX
Extinct in wildlife	EW
Critically endangered	CR
Endangered	EN
Vulnerable	VU
Near threatened	NT
Less concern	LC
Defficient data	DD
Not evaluated	NE

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

Appendix I. Includes all endangered species that are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulations so as not to endanger their survival and will be authorized only under exceptional circumstances.

Appendix II.

a) Includes all species that, without being currently in danger of extinction, could reach that situation unless the trade in specimens of said species is subject to strict regulations to avoid use incompatible with their survival.

b) Those other species not affected by trade, which must also be subject to regulation in order to allow effective control of trade in the species referred to in paragraph a).

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

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, in the IUCN.

From the Composition of mammalian species, it was possible to demonstrate the high diversity of species in the Brazil nut concessions with 35 species of large and minor non-flying mammals found during the evaluation and Three (03) species of minor flying mammals (Bats)

As a result, 31 species were found with some degree of threat, being the species with the highest degree of threat and importance for its conservation, *Primolius couloni*, it is protected by both the Peruvian state and international legislation. *Pionites leucogaster* was also registered as an important conservation species according to the IUCN, as it is endangered (EN). The main cause of the decline of their populations in Peru is illegal traffic, for the same reason that it is considered Appendix I in CITES; and for *leucogaster pionites*, deforestation is also a factor that directly affects their population.

The study area presented a total of 29 species of herpetozoa, of these, 18 belong to the Amphibia class and 11 to the Reptilia class, registering *Boa constrictor* and *Paleosuchus trigonatus*, categorized National in Supreme Decree No. 004-2014 MINAGRI and internationally in CITES found in Appendix II

TABLE 117. Mammalian species with some degree of threat

ORDER	Family	Specie	Local name	DS N° 004-2014-MINAGRI	IUCN	CITES
		<i>Priodontes maximus</i>	Yungunturo	VU	EN	I
PRIMATES	Cebidae	<i>Saguinus fuscicollis</i>	Mono fraile			II
PRIMATES	Aotidae	<i>Aotus vociferans</i>	Musmuqui			II

PRIMATES	Atelidae	Alouatta seniculus	Mono coto	VU	NT	II
CARNIVORE	Felidae	Panthera onca	Otorongo	NT	NT	I
CARNIVORE	Felidae	Puma concolor	Puma	NT	NT	I
CARNIVORE	Felidae	Leopardus pardalis	Tigrillo			I
CARNIVORE	Mustelidae	Pteronura brasiliensis	Lobo de río	EN	EN	I
PERISSODACTYLA	Tapiridae	Tapirus terrestris	Sachavaca	VU	VU	II
ARTIODACTYLA	Tayassuidae	Pecari tajacu	Sajino			II
ARTIODACTYLA	Tayassuidae	Tayassu pecari	Huangana			II

TABLE 118: Ornithofauna species with some degree of threat

SCIENTIFIC NAME (Plengue 2019)	DS N° 004-2014-MINAGRI	IUCN	CITES
Lophotrix cristata		LC	II
Megascops watsonii		LC	II
Pulsatrix perspicillata		LC	II
Glaucidium hardyi		LC	II
Glaucidium brasilianum		LC	II
Phaethornis hispidus		LC	II
Phaethornis malaris		LC	II
Phaethornis ruber		LC	II
Thalurania furcata		LC	II
Ramphastos tucanus		VU	II
Ramphastos vitellinus		VU	II
Pteroglossus beauharnaesii	NT		
Falco ruficularis		LC	II

Ibycter americanus		LC	II
Micrastur semitorquatus		LC	II
Micrastur ruficollis		LC	II
Micrastur gilvicollis		LC	II
Amazona farinosa		LC	II
Amazona ochrocephala		LC	II
Ara chloropterus	NT	LC	II
Ara macao	NT	LC	I
Ara severus		LC	II
Aratinga weddellii		LC	II
Psittacara leucophthalmus		LC	II
Brotogeris cyanoptera		LC	II
Forpus modestus		LC	II
Pionites leucogaster		EN	II
Pionus menstruus		LC	II
Primolius couloni	VU	VU	I
Pyrrhura rupicola		NT	II
Touit huetii		VU	II

TABLE 119: Herpetofauna species with some degree of threat

N°	SPECIES	CONSERVATION STATUS		
		D.S.004 -2014	CITES	IUCN
1	Boa constrictor	EN	II	-
2	Paleosuchus trigonatus	NT	II	-

5.1.1.2. Flora

Based on the baseline sampling of March 2021 were identified 82 species during the evaluation, of the 82 species registered during the evaluation, only four species are within the list of species protected by Peru (D.S. 043-2006-AG), each one in different categories, species such as *Clarisia racemosa* Ruiz & Pav. (Species in Near Threatened (NT)) timber species, *Copaifera paupera* (Herzog) Dwyer Vulnerable species (VU)), timber and medicinal species and *Manilkara bidentata* (A. DC.) A. Chev (Vulnerable species (VU)) the fruit it is food for fauna and timber.

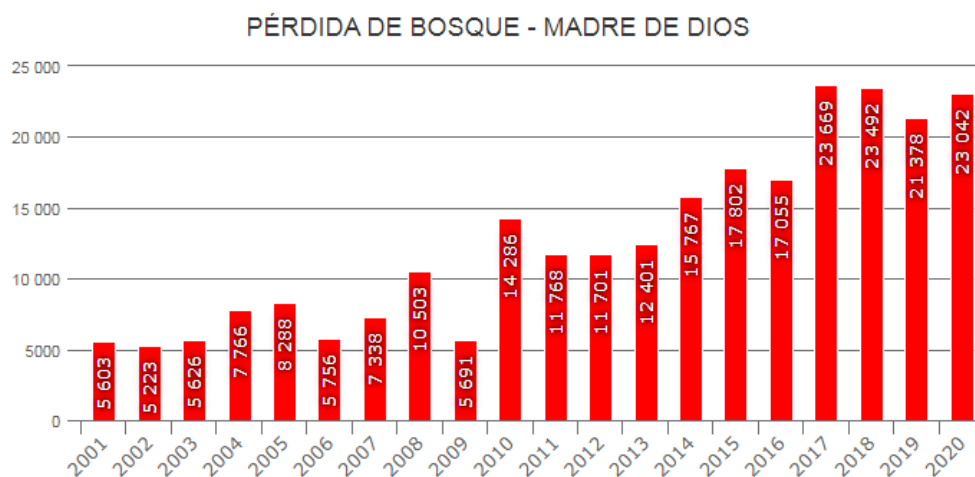
TABLE 120: Flora species with some degree of threat

N°	SCIENTIFIC NAME	D.S. 043-2006-AG	UICN**	CITES***
1	<i>Bertholletia excelsa</i> Bonpl.	-	VU	-
2	<i>Clarisia racemosa</i> Ruiz & Pav.	NT	LC	-
3	<i>Copaifera paupera</i> (Herzog) Dwyer	VU	LC	-
4	<i>Minquartia guianensis</i> Aubl.	-	NT	-

5.1.1.3. Threats to Biodiversity

In the region, the main cause of the deterioration of biodiversity is the loss of forest caused by the expansion of the network of roads, the expansion of mining, agriculture, ranching and population growth. The loss of forests generates the fragmentation of ecosystems, affecting their structure and functioning, which may lead to the loss of habitats and cause the extinction of species (Aguila & Martinez, 2000); as well as the loss of the ecosystem services they provide.

According to the MINAM GEOBOSQUES portal, the surface of Madre de Dios is covered by 7.9 million hectares of forest, that is, 93% of the region's surface, which has 8.5 million hectares. The accumulated deforestation until the year 2000 was 2.2% of the surface of Madre de Dios, with 184 065 hectares. Between the years 2001 to 2020, there was a cumulative deforestation of 254,153 hectares, equivalent to 2.9% of the total area of the region.



This deterioration of the forests causes alterations in the trophic chain and in the natural interactions between fauna, flora and the physical environment, causing a geographical redistribution due to the limitation of the reproduction spaces of many species that need vegetation cover to build their nests, as well as shelter for reptiles and mammals. Another major threat is logging in the area. According to OSINFOR 2018, during the 2012-2016 period, 435 supervisions were carried out for Brazil nut concessions, of which 311 supervisions (71.5%) were for supplementary annual management plans for timber extraction; modality through which some holders access, in a complementary way, the use of Brazil nuts.

5.1.2 High Conservation Values (B1.2)

The applied methodology was detection of High Conservation Values (HCV), or 'screening', in English. HCV detection is a desk exercise that uses the six definitions of species diversity, ecosystem landscape or mosaic level, ecosystems and habitats, system services, community need, and HCV cultural values to characterize the environmental and social aspects of HCV. a landscape or jurisdiction. Detection considers the probability of the presence of HCV, identifies the threats to these HCV, and indicates which values need to be addressed most urgently through discussions and follow-up actions. The Biodiversity-related High Conservation Values that were identified for the project area are presented below.

TABLE 121 High Conservation Value

High Conservation Value	Brazil nut forest ecosystem

Qualifying Attribute	Brazil nut forests play an important role that contributes to the protection and ecological connectivity and the subsistence of thousands of species of flora and fauna. These forests are located in the Tropical Andes hotspot contain approximately 15% and 50% of the world's vascular plant biodiversity and endemism, respectively. It contains not only a great diversity, but also a great endemism of vertebrates: 73% amphibians, 46% reptiles, 41% birds and 16% of the endemic mammals of the world. The protected areas of the Tropical Andes conserve some of the most important remains of this hotspot, the most important areas being represented by: 1) the Manu, the largest tropical rainforest biosphere reserve on the planet, and 2) the Tambopata-Madidi protected area complex, located on the border between Peru and Bolivia in the richest part of this hotspot, which has the greatest biodiversity on earth and whose creation constitutes an important achievement for the conservation of biodiversity (Myers, 1988; Myers et al., 2000; Myers, 2003; Mittermeier et al., 2004). The protected areas in this forest ecosystem form a biodiversity corridor that maintains a remarkable biological and cultural diversity. These complexes include public and private land, which are either on untouched land or on land severely devastated by anthropic activities.
Focal Area	The area is located in the south of the project zone, the forests between the Madre de Dios, Los Amigos and Las Piedras rivers.

High Conservation Value	Species of high conservation value with some degree of threat in mammals of the families Felidae and Tapiridae and <i>Dasyprocta variegata</i> .
Qualifying Attribute	Mammals are essential elements for the connectivity of ecological processes in a landscape as they are important seed dispersers. In general, the larger in size, the greater their territorial needs and their movements, and the greater the degree of dispersion they offer. Large mammals occupy a great variety of habitats and do not require specialized or continuous habitats for their displacement, however several studies suggest that this group is the most sensitive and prone to disappear in the face of a landscape fragmentation process, due to its Population densities are naturally low, as they require large areas to move freely away from the advance of man-made barriers (Terborgh and Winter 1980; Diamond 1984; soulé et al.), as a result of the biological baseline in the three Study Areas, the presence of three (03) species was determined in the IUCN list and in the list of endangered species of Peru, which are in a situation of Near Threatened (<i>Alouatta seniculus</i>, <i>Panthera onca</i> and <i>Puma concolor</i>). In addition, one (01) species was found that is in a Vulnerable situation (<i>Tapirus terrestris</i>). Likewise, it was found that ten (10) species are included in the appendices of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES): Appendix I (<i>Priodontes maximus</i>, <i>Panthera onca</i>, <i>Puma concolor</i> and <i>Leopardus pardalis</i>) and Appendix II (<i>Saguinus fuscicollis</i>, <i>Aotus vociferans</i>, <i>Alouatta seniculus</i>, <i>Tapirus terrestris</i>, <i>pecari tajacu</i> and <i>Tayassu pecari</i>).

	These large species are classified as "umbrella species" or "landscape species" because they utilize large and ecologically diverse areas and have significant impacts in the structure and function of natural ecosystems. Their habitat requirements in time and space make them particularly vulnerable to human practices of land use and resource harvesting. (WCS, 2002). The project area is in the area of the country with the most concentrated jaguar population. 1988; Laurance et al. 2009; Bennet, 1998; Miller et al., 2001). In the case of the species <i>Dasyprocta variegata</i> or añuje, it is the main disperser of the Brazil nut seed, it gnaws and leaves the seed exposed. In addition, the Añuje buries the fruit of the Brazil nut, allowing environmental factors to disintegrate the hard shell of the Brazil nut to get food with the least amount of energy, but sometimes the Añuje forgets where it stored the fruit, allowing in many cases the seed germination
Focal Area	Brazil nut forest in the project area.

High Conservation Value	Species of high conservation value with some degree of threat in birds of the Psittacidae family.
Qualifying Attribute	Peru is considered one of the most important countries in richness of bird species worldwide. According to Valqui et al. (2011) the country has 1742 confirmed bird species, in addition to 91 hypothetical species; According to these figures, we would currently rank third in the world, however, if all the aforementioned species are confirmed, we would rank second after Colombia. The area with the highest number of bird species in Peru is the east, where the forests of the Amazon basin are located; in these areas is the Madre de Dios Region, in the southeastern Amazon of Peru, where the largest and least disturbed area of the ecosystems of the upper Amazon and lower part of the Andes still remains (Foster et al., 1994 in Kirkby et al. 2000). The Madre de Dios region contains extraordinary levels of bird species richness, around 570 species have been recorded in just two locations, Cocha Cashu in the Manu National Park (PNM) and Explorer's Inn in the Tambopata river (Lloyd & Palomino, 2000). In the area you can also find many habitats of great importance for the existence of some species of birds, which depend completely or partially on some of these habitats, as is the case of bamboo specialists, a group of sensitive species associated with at some point in the successional development of the bamboo forest and that they are grouped as obligated, quasi-obligated and facultative specialists, depending on their "dependence on this habitat" (Kratter, 1997). Also in the area, fundamental places for the reproduction of some species can be found, such as aguajales for the blue and yellow macaw <i>Ara ararauna</i> or key tree species such as the "shihuahuaco" for the scarlet macaw <i>Ara macao</i> (Brightsmith, 2005).

	In the biological baseline evaluation, Pionites Leucogaster or white-bellied parrot were found; This species currently has the IUCN category of EN (endangered), its main threat being the illegal trafficking of wildlife and the loss of its habitat, due to deforestation due to livestock, farms, wood and gold mining, this This species prefers forests with large trees, which is why it is a good indicator of a primary forest and Primolius couloni or blue-headed macaw, a species protected by both the Peruvian state and international legislation, the main cause of population decline in Peru is illegal traffic, for the same reason it is also considered Appendix I in CITES. During the evaluation it was possible to report data showing that the birds find food and shelter without difficulty in the evaluated areas. Species that are important due to their conservation status, such as Psittacids (parrots and macaws), find nesting sites in trees and feed on the young fruits of Brazil nuts. Its ecological niche related to the population control of Brazil nuts can be clearly determined during the evaluation. The presence of large species such as the harpy eagle was not found, however the possibility of finding it is not ruled out if the search is more exhaustive, because there are emerging trees that have sufficient conditions to serve as a nesting site for this species.
Focal Area	Brazil nut forest in the project area.

High Conservation Value	Water bodies
Qualifying Attribute	Water bodies are complex ecosystems that host habitats for countless species. The continuous contamination of water as a consequence of insufficient or uncontrolled unsustainable activities impacts on hydro biological processes, triggering the reduction of biodiversity and the resilience capacity of ecosystems. In this sense, the monitoring of indirect indicators will be carried out through the analysis of the Herpetofauna, with the presence / absence of species that lead the food chain such as Boa constrictor (boa) in this evaluation and in the previous evaluation in 2013, they recorded Eunectes murinus (anaconda), Boa constrictor (boa) and Lachesis muta (shushupe) large species that lead the trophic chain in Amazonian forests, determining the good state of conservation of the evaluated sites. It also highlights the presence of Pteronura brasiliensis in the sampling area, which are traversed by streams large enough to host the species and their presence indicates that the water quality in these streams is favorable and that there are enough aquatic resources in the streams to their feeding.
Focal Area	Water bodies of rivers, streams and lakes located in the project area.

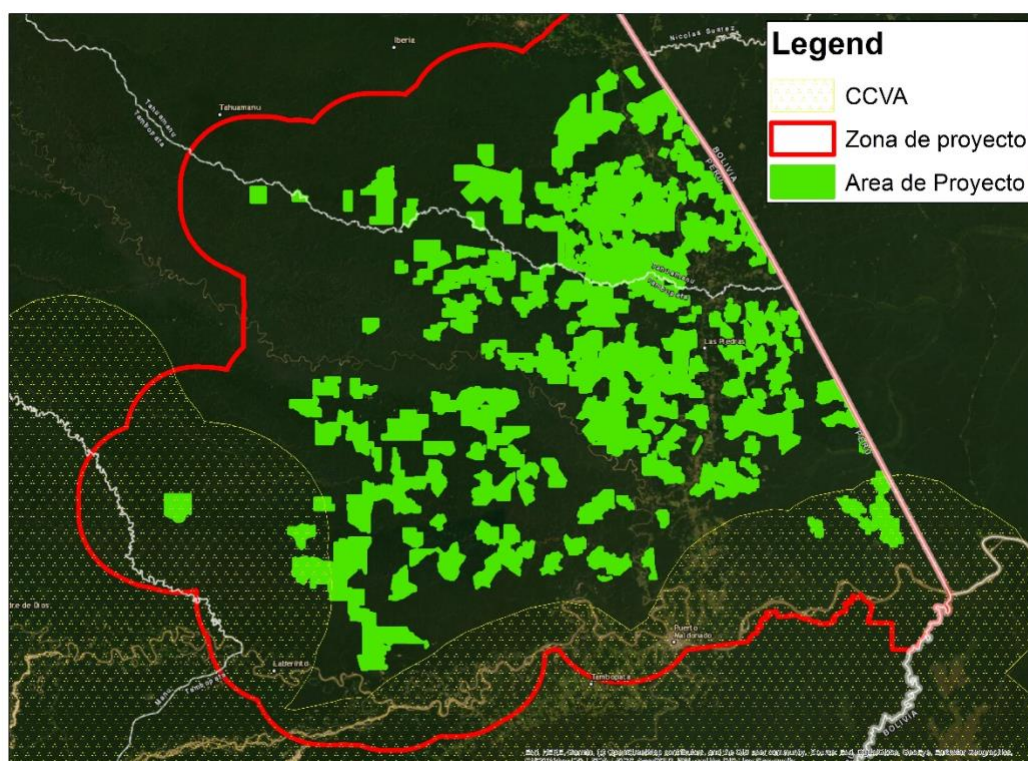
The project area has Brazil nut forest located in the Vilcabamba Amboró conservation corridor - CCVA is a binational area, since it extends from the Vilcabamba mountain range in Peru to the

Amoró National Park in Bolivia, making up a total of 30 million hectares which include 19 protected areas. This contributes to the protection and ecological connectivity of the world's best-preserved mountainous forests and tropical plains and to the subsistence of thousands of species of flora and fauna.

The protected areas of this forest ecosystem form a biodiversity corridor that maintains a remarkable biological and cultural diversity. These complexes include public and private land, which are either on untouched land or on land severely devastated by anthropic activities.

The CCVA plays a fundamental role in the regulation of ecosystems at the regional level since it includes areas of high-density rainfall, headwaters of the Amazon basin and other basins that regulate temporary floods. In addition, there are indigenous villages in voluntary isolation.

MAP 35: The Vilcabamba Amoró Conservation Corridor and the project area.



5.1.3 Areas to be Managed to maintain or improve HCV.

High Conservation Value	Brazil nut forest
Qualifying Attribute	Brazil nut forests are important because host a great diversity of species of birds, mammals, reptiles and amphibians, and also species of flora. The resources that

	these forests provide to the population are mainly the Brazil nut industry, the use of wood, agriculture, livestock and fishing.
Focal Area	According to the project, it is required to conserve the current area through monitoring and surveillance control activities, sustainability to the use of Brazil nut and recovery of soils degraded by agriculture and livestock.

High Conservation Value	Water bodies
Qualifying Attribute	The continuous contamination of water as a consequence of insufficient or uncontrolled unsustainable activities impacts on hydro biological processes, triggering the reduction of biodiversity and the resilience capacity of ecosystems. In this sense, the monitoring of indirect indicators will be carried out through the analysis of the Herpetofauna, with the presence / absence of species that lead the food chain such as Boa constrictor (boa) in this evaluation and in the previous evaluation in 2013, they recorded Eunectes murinus (anaconda), Boa constrictor (boa) and Lachesis muta (shushupe) large species that lead the trophic chain in Amazonian forests, determining the good state of conservation of the evaluated sites. It also highlights the presence of Pteronura brasiliensis in the sampling area, which are traversed by streams large enough to host the species and their presence indicates that the water quality in these streams is favorable and that there are enough aquatic resources in the streams to their feeding.
Focal Area	According to the project, it is required to preserve the quality of the water, mitigating the negative effects of agricultural activities, promoting the sustainability and profitability of the exploitation of Brazil nuts.

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

Roads in the Amazon are unstoppable vectors of the disorderly occupation of the territory, of the invasion of protected areas and indigenous lands, of deforestation for agricultural purposes where this is not legal, of the expansion of mining and timber extraction illegal and, obviously, facilitators of cocaine production and drug trafficking (Dourojeanni, 2015).

According to the deforestation model, by 2040 a projection of 107,980.7 hectares would be lost, which represents 34.9% of the total Project area. This expected loss caused by uncontrolled traditional activities (agriculture, livestock, illegal mining, etc.) would affect the biological processes of flora and fauna species, causing the degradation of ecosystems.

The permanent loss and fragmentation of habitat would cause the isolation of flora and fauna species, cutting off connectivity. This would increase inbreeding (reducing genetic diversity), infertile or unviable population (reducing total population), the number of threatened species and

their degree of threat (from uncontrolled hunting or exploitation); and feeding and nesting sites would be damaged. All these impacts would be negative for the biodiversity of the project area.

The loss of Brazil nut forests and lower Brazil nut production would negatively affect the local economy, since it is a source of employment for more than 35% of the project population (social baseline, 2021). This would increase the risk of Brazil nut pickers switching to other economic activities such as illegal logging, illegal mining, etc. The loss of these forests would damage river basins, water and climate regulation, biological control, climate change, etc.

The paving of the Interoceanic Highway between Peru and Brazil. This path crosses through connecting forests, and if its implementation is associated with the deforestation strips that usually accompany this type of infrastructure in the tropics, it would be threatening to annul the existing connectivity of the forests with the highest biodiversity value on the planet (Killeen, 2007). Connectivity is a condition referred to the link or nexus that facilitates the movement of organisms between habitat patches present in the landscape. A highly connected landscape is one in which individuals of a given species can move freely between the habitats they require to feed and protect themselves. It is a property of the territory for a species or group of similar species from the point of view of its ecological requirements and dispersive capacity and it is a critical condition that guarantees the viability of the populations to be conserved.

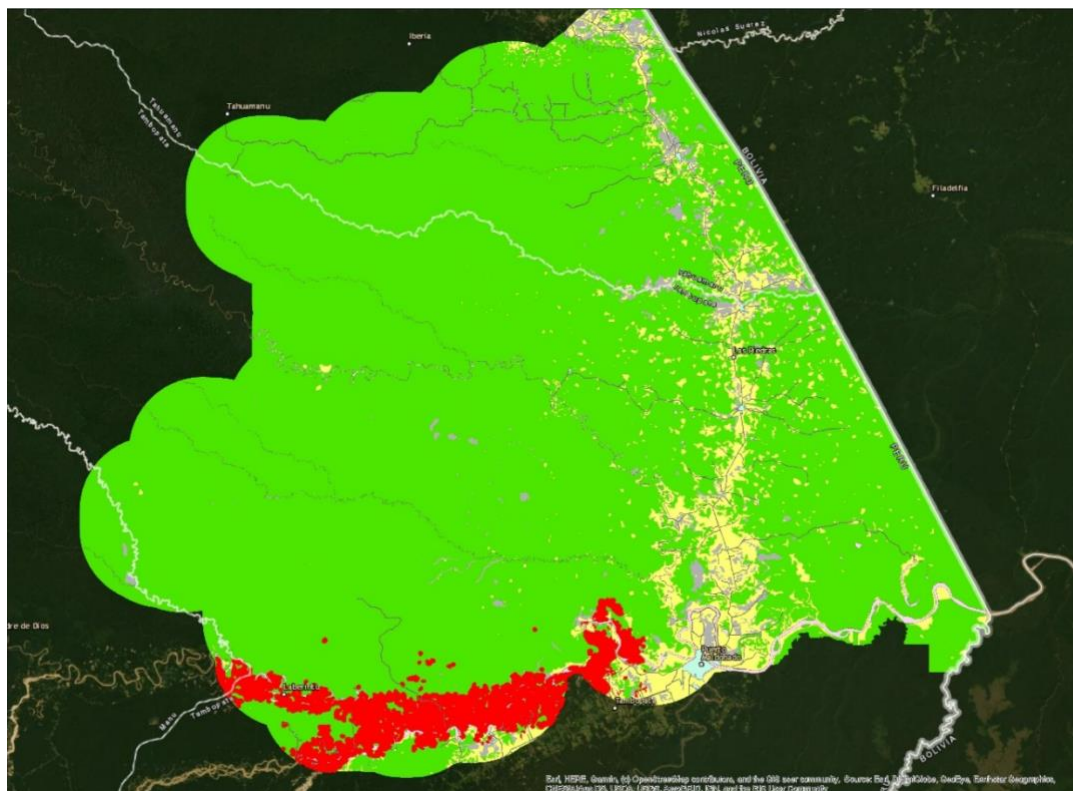
Three types of roads were found in the project area: (1) Penetration roads. - that lead from the interoceanic highway to the evaluated concessions. (2) Roads for Brazil nut harvesting. - made up of roads and paths and that join the Brazil nut trees, they are used by the Brazil nut growers during the Brazil nut harvest. (3). Timber forest extraction roads. - are used for the extraction of wood from Brazil nut groves and surrounding areas. It is necessary to assess in more detail the impact of each of these roads on the biodiversity of Brazil nut forests.

The expansion of the agricultural frontier is caused by the continuous and accelerated pressure on the lands on both sides of the South Interoceanic 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 xxx in reduction of primary forest and xxx% of secondary forest. Likewise, the implementation of pastures for livestock registers the highest annual growth rate, reaching xxxx% in reduction of secondary forest and grasslands.

Informal mining registered a growth rate of xxx% per year. This increase is stimulated by the international price of gold and the lack of control and tax inspection mechanisms, 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 the quality of surface waters 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 habitat due to the movement of vehicles and heavy machinery.

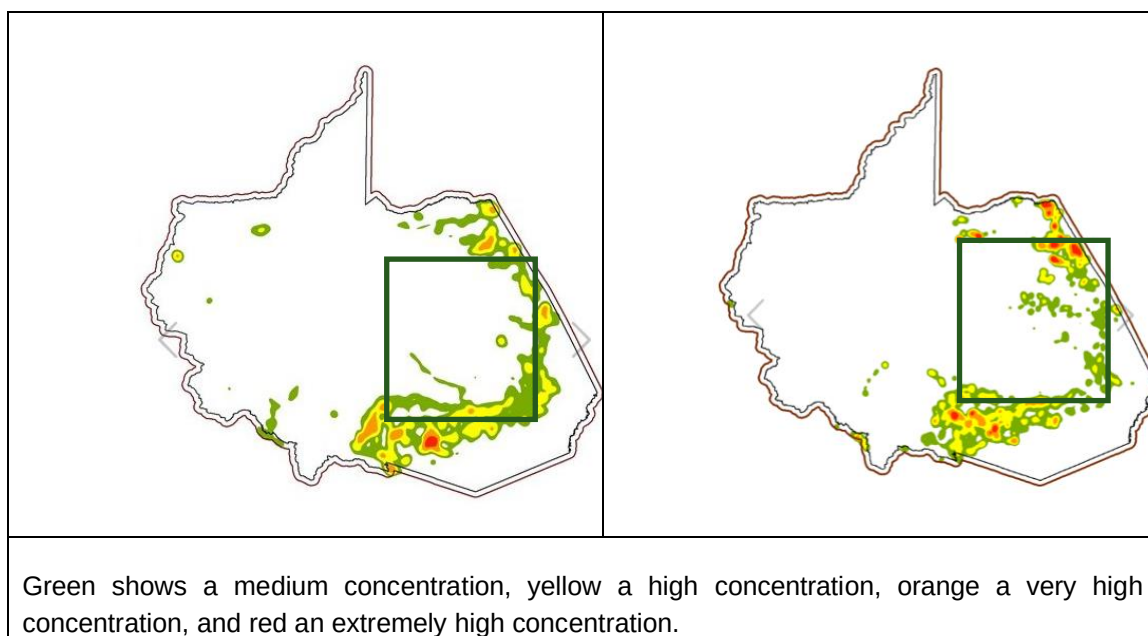
MAP 36: Scenario of main activities in the project area.



In the figure, we can see the spatial behavior of the main activities that promote deforestation, in red the mining located south of the project area and in yellow the agricultural and livestock frontier. The first has fluvial concentration, settling in the main rivers and the second, the expansion of the agricultural frontier is caused by the continuous and accelerated pressure on the lands on both sides of the South 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.

According to the MINAM GEOBOSQUES portal, the concentration of forest loss in Madre de Dios has increased in the project area during the 2014-2019 period. As can be seen in the following figure, the project area has presented an increase in forest loss in the northern area.

2014	2019



5.2 Net Positive Biodiversity Impacts

5.2.1 Expected Biodiversity Changes (B2.1)

Biodiversity Element	Brazil nut forests
Estimated Change	Maintain the ecological integrity of Brazil nut forests
Justification of Change	In the project scenario, the ecological integrity within the Brazil nut concessions will be guaranteed and maintained, which in turn will allow the protection of biodiversity within the Project Area. This means that the project will ensure that 100,297 ha of forest (PA) will maintain their ecological functions under sustainable management. Additionally, the project will seek to avoid an increase in deforestation activities by committing to reduce the trend of the deforestation rate, thus maintaining biodiversity levels. Project activities such as monitoring and surveillance and implementation of the alert system will prevent and control negative impacts on Brazil nut forests, which are the most diverse forests in the Madre de Dios region and present a great diversity of plant communities.

Biodiversity Element	Fauna
Estimated Change	Positive

Justification of Change	As in any trophic chain, if we have a good plant cover, it is expected to have an adequate habitat for fauna species, since mangrove forests are the habitat of a great variety of local and migratory birds, mammals, amphibians and reptiles from there they obtain food and it is a place of shelter and nesting Project activities such as monitoring and surveillance and implementation of the alert system will prevent and control negative impacts on Brazil nut forests, allowing the habitat and food of the main species to be maintained.

Biodiversity Element	Water bodies
Estimated Change	Positive
Justification of Change	By conserving the Brazil nut forests, the bodies of water are protected and with it the resources for the development of activities such as fishing, transportation and direct consumption

5.2.2 Mitigation Measures (B2.3)

The project has no negative impacts on biodiversity. The activities described previously in the section 2.1.2, monitoring and surveillance that will allow the reduction of deforestation and forest degradation will be implemented under the premise of a sustainable production of Brazil nut forests.

Control of the illegal trade in game and flora

The concessionaires of the Project Area were granted concessions by the Ministry of Agriculture for Brazil nuts to practice the management and use of Brazil nuts and the use of low intensity forest wood up to 5 m³ / ha / year.

Training and dissemination of HCV to the communities in the project area and training in environmental crimes, project for the recognition of Fauna in danger of extinction to the project worker and the local resident (all the communities in the Project Area identified). These two activities will be developed annually in training workshops and through the dissemination of brochures where endangered species of fauna are visualized to identify them by the project workers, especially those who enter the forest and the local inhabitant in general (communities of the area).

Forest management

- o Improvement and redesign of Forest Management Plans and Intermediate Forest Management Plans for the Use of Forest Products Other than Wood, after a diagnosis of concessions. The actions of the first stage or primary processing of the Brazil nut that is carried out in the forest will also be supervised and the actions of this first stage on the site

are verified and that they follow the required quality standards. They must also observe the compliance with the authorized volumes and the implementation of the Reduced Impact Exploitation, in the case of wood extraction.

- o Establishment and development of activities in each concession or concession groups.
- o Determination and implementation of reforestation areas.
- o Determination and implementation of permanent plots and tree monitoring and measurement of established species.
- o Determination for the development of commercial species.
- o The quality, number and location of the roads that the concessionaires have implemented must be established, considering that they are concessions for the use of Brazil nuts.
- o Use of timber forest species (maximum 5m³ / ha / year)

Management of the Brazil nut, efficient and standardized actions will be carried out before processing:

- o Conditioning and construction of camps and storage places. The activities begin with the conditioning of small areas generally near rivers or streams where the camps are located for the camp staff and the sheds or "Payoles" to store the Brazil nut. Mitigation and / or prevention measures are:
 - Construction of camps and storage areas preferably in pre-existing clearings or by removing forest cover from areas of less than 50 m² approximately.
 - Build silos for hygienic services and organic waste. At the end of the stay in the camp, the silos will be closed and closed.
 - Avoid opening unnecessary gaps.
 - Prohibit the hunting, capture and possession of wild fauna.
 - Reduce the generation of noise, especially in areas near clay licks, drinking fountains, nesting places, etc.
- o Inventories or censuses. Brigades of 6 people usually participate in this operation, led by an expert in the area, and he is in charge of the location of the Brazil nut trees, he is known by the name of "mateo". This group locates between 20 and 40 trees per day. Mitigation and / or prevention measures:
 - Avoid the excessive use of plastics and other inorganic materials.
 - The width of trails or areas for marking vertices should occupy the smallest possible area.

- Prohibit the hunting, capture and possession of wild fauna.
- Reduce the generation of noise, especially in areas near clay licks, drinking fountains, nesting places, etc.
- o Opening and maintenance of trails, paths, etc. The "Trocheros" are generally very skilled people in the use of the machete, he is responsible for opening the "entrances" (paths or paths) that connect the bare trees that vary in length according to the population density of the Brazil nuts. Mitigation and / or prevention measures are:
 - Avoid opening the road network through low areas or areas at risk of flooding.
 - Use the existing roads and avoid the opening of paths or unnecessary roads in the UMF.
 - Do not use heavy machinery.
 - Cleaning of channels, sewers and bridges.
 - Discharge of bodies of water that are obstructed
 - Prohibit the hunting, capture and possession of wild fauna.
 - Reduce the generation of noise, especially in areas near clay licks, drinking fountains, nesting places, etc.
- o Extraction or Collection. The falling fruit is collected by hand and piled up in piles according to their number and dispersal distance. In this activity a basket is used, which once filled is poured into the pile. The "pod" should not remain in the soil for more than three months to avoid rotting. Mitigation and / or prevention measures:
- o The fruits are broken. This operation is carried out in the same pile, using a machete for the fractionation, in order to avoid taking them to the camp. A worker can break 600 to 800 coconuts per day (1.5 to 2 jute bags). Once extracted, the seed is placed in jute bags for transport to the camp. In payoles, a drying and aeration process is carried out to prevent the growth of fungi responsible for contamination; At this point, the Brazil nuts should reach a moisture content between 18% and 20%.
 - Avoid the excessive use of plastics and other inorganic materials.
 - Clean and disinfect the cutting tools before starting the work day.
 - Avoid the use of cutting tools on sick individuals.
 - Avoid excessive use of the resource (respect the established percentages)
 - Prohibit the hunting, capture and possession of wild fauna.

- Reduce the generation of noise, especially in areas near clay licks, drinking fountains, nesting places, etc.
- o o Primary Processing Plants. Brazil nuts are transferred from the camp to the primary processing plant using tractor-drawn carts for transportation. Eventually, in the processing plant, the nuts can continue to be aerated to dry to prevent fungal growth.

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

The project will not adversely affect any conservation value; on the contrary, the project aims at the preservation of the ecosystem and the sustainable management of the forest with respect to the traditional activities of the partners, Brazil nut and wood.

Project activities such as monitoring and surveillance and implementation of the alert system will prevent and control negative impacts on Brazil nut forests, maintaining the conditions for the conservation of habitats for birds, large mammals and amphibians and reptiles. The main positive impacts on biodiversity are identified below:

- o Maintain the ecological integrity of Brazil nut forests
- o Protection of the habitats of mammalian species of the families Felidae and Tapiridae.
- o Protection of bird habitats with some degree of threat from Psittacidae families.
- o Improvement of water quality.

5.2.4 High Conservation Values Protected (B2.4)

The project will not adversely affect any conservation value; on the contrary, the project aims at the ecological integrity of the ecosystem and the sustainable management of the forest with respect to the traditional activities of the partners, Brazil nut and wood.

Brazil nut extraction is carried out in undisturbed natural forests for a period of up to 4 months a year, as it is considered a low-impact activity that promotes forest conservation, since the activity is profitable only in non-forest forests. disturbed. Attempts to establish plantations have been unsuccessful; For this reason, it is essential to safeguard productive Brazil nut forests, strengthening forest management techniques and providing resources to increase the value of Brazil nut products and by-products, as well as holding workshops on wildlife hunting, solid waste management, among others. others. Likewise, the Brazil nut activity is regulated by the State and requires a General Management Plan for the Brazil nut harvest that must be approved by the Regional Directorate of Silviculture and Wildlife (DRFFS) and the annual operating plans must be authorized annually.

Likewise, the project will promote the enrichment of forest areas with native species such as Brazil nut, shihuahuaco and screw, among others, to add value to the forest. In this sense, the negative impacts on the high conservation values will be minimal in the project area.

Logging is an emerging activity complementary to the Brazil nut activity, carried out by only a third of the Brazil nut producers to obtain higher annual income and it is not carried out by the same Brazil nut producers who harvest continuously in the following years. The extraction of wood requires special permits together with its respective intermediate management plan approved by the DRFFS for its execution; the plan details which tree is to be felled (georeferenced), the minimum cutting diameter for each species, the volume to be harvested, etc. to ensure the regenerative capacity of the forest. As such, the project will provide ongoing advice on how to improve Reduced Impact Exploitation (EIR) techniques; construction of roads, cleaning of tree canopies and lianas; operational safety, chainsaw handling; solid waste management, etc., to ensure the maintenance of forests, biological processes, wildlife biodiversity and the integrity of Brazil nut operators and producers.

5.2.5 Species Used (B2.5)

It will be enriched with native species of high economic value; In these the species to be planted are detailed:

Brazil nut (*Bertholletia excelsa*). It lives in the high forests of the Peruvian, Bolivian and Brazilian Amazon floodplain. It is a large tree, reaching 60 m in height and a diameter greater than 2 m; cylindrical shaft, smooth and without branches up to the crown; dark and split bark; deciduous leaves, bright green on the underside and pale green on the underside; Incomplete, spherical or slightly flattened capsular fruit of the pyx type, with a hard and woody shell, with a diameter of 10-25 cm and with an average of 18 seeds. Fruit production occurs only during the eighth year, requiring an average of 15 months to ripen the fruit, the harvest season begins in mid-December and lasts until March. Seed dispersal is produced mainly by Añuje, which gnaws and leaves the seed exposed. In addition, the Añuje buries the fruit of the Brazil nut, allowing environmental factors to disintegrate the hard shell of the Brazil nut to get food with the least amount of energy, but sometimes the Añuje forgets where it stored the fruit, allowing in many cases the seed germination.

Shihuahuaco (*Dipteryx micrantha*). Typical species of the Amazon basin, it is found in Brazil, Venezuela, Guyana, Peru and Colombia. Large tree, reaching heights of 50 m diameters greater than 1 m; cylindrical trunk, without branches to the top of the tree; compound leaves; flowers with terminal panicle inflorescence, drupe-shaped pulpy fruit. Fruiting occurs at 4 years and dispersal is carried out by smaller rodents. It is considered a medicinal plant widely used by indigenous peoples; the seed oil is used to combat earaches and inflammations, the seed dipped in alcohol is used for snake bites, cuts, bruises, coughs, rheumatism, etc. and the cortex for feverish patients.

Tornillo (*Cedrelinga cateniformis*). Species with wide distribution found in tropical, subtropical and very subtropical humid forests and in tropical dry forests; It is also considered a flexible species in relation to height, since it can be found from 120 meters above sea level to 800 meters above sea level. Dominant stratum tree, between 25 to 40 m in height and diameters in the range of 60 to 150 cm; tubular roots, straight trunk with fissured bark; small head terminal inflorescence; hermaphrodite flowers; flowering occurs mostly at the end of the dry season, between November-December, fruiting at the beginning of the rainy season, between December-February. Fruiting is annual in most of the trees while some have flowering and fruiting with an interval of two to three years and irregularly. The fruits are produced from December to March in Peru. It is a rustic species due to its high resistance to physical damage, to the attacks of pests and diseases due to its

competition for light because in its initial stage it is a semi-shade-loving plant and in maturation it becomes a demanding species of light.

5.2.6 Invasive Species (B2.5)

Not applicable.

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

Only native species will be used in forest enrichment such as the Shihuahuaco, the Tornillo and the Brazil nut, so there will be no negative effect on their use.

5.2.8 GMO Exclusion (B2.7)

The project will not use any Genetically Modified Organism within the forest enrichment; the seeds used will come from seed trees in the area. Also, this enrichment will not be considered in GHG reductions.

5.2.9 Inputs Justification (B2.8)

Not applicable.

5.2.10 Waste Products (B2.9)

The use of Brazil nut generates low negative impacts, inventory activities, opening of roads, conditioning and construction of camps and places of collection and extraction or collection of Brazil nut generate contamination by solid waste for which the following measures are recommended for the management of solid waste:

- o Inorganic waste (batteries, plastics, cans, etc.) must be deposited in public or private collection centers for treatment.
- o Ban the burning of inorganic waste.
- o Build silos for sanitation services and organic waste. At the end of the stay in the camp, the silos will be closed and closed.
- o Collect inorganic waste (batteries, plastics, etc.) to deposit them in collection centers for treatment.
- o Do not dump organic or inorganic waste into water courses
- o Avoid excessive use of plastics and other inorganic materials

5.3 Offsite Biodiversity Impacts

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

Negative impacts on biodiversity outside the project area are not expected.

TABLE 122

5.3.2 Net Offsite Biodiversity Benefits (B3.3)

TABLE 123

Benefits	In project zone	Outside project zone
Wildlife refuge areas	Brazil nut management activities will not generate negative impacts outside the site, however, Brazil nut collectors will be trained to implement better measures for the conservation of biodiversity, as well as training in the use of wildlife to Brazil nut collectors..	The control and monitoring activities in the project area will cause the displacement of deforestation and degradation agents, conserving large Brazil nut forests and with them the ecological connectivity that allows the displacement of umbrella species and indicators of good conservation status..
Green connectivity	Monitoring and surveillance will allow the conservation of Brazil nut forests, which are ecosystems that are home to a large species of wild fauna, considered as an umbrella because they require large areas of territory for their movements..	The protection and conservation of the Brazil nut forests in the project area allows for the maintenance of large areas of standing forests harboring endangered species of terrestrial tapirus or sachavaca and umbrellas such as Panthera onca and Puma concolor.

5.4 Biodiversity Impact Monitoring

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

The monitoring plan is focused on obtaining data over a period of time, in order to detect changes in population structures and to be able to determine whether an area is being impacted or not. The monitoring must be led by specialists or trained to avoid a bias in the data and homogenize the effort in sampling and methods, to obtain robust data for the analysis to be carried out, which is why we propose a standardized methodology.

The objective of biodiversity monitoring will be to analyze and interpret changes in biodiversity due to the strategies and activities proposed in the project. In this regard, the biodiversity variables were determined considering the following criteria:

- Component of Biodiversity Objectives and Goals, Maintain and Conserve Biodiversity in the Project Area; Safeguard the High Conservation Values of the project.
- Key elements that reflect the state of biodiversity, threatened species, fragile ecosystems, important sites for breeding, feeding or wildlife refuge, resources traditionally used by the local population (Brazil nut, hevea, aguaje, etc.).

- c) Criteria for the measurement of indicators, Abundant, easily identifiable species, Indicator species (easily react to changes in the environment), Accessibility for data collection and measurement equipment.

Biodiversity monitoring will focus on obtaining information at a given moment at the landscape level, such as the analysis of forest and forest loss and flora inventories at the stem level; and in fauna in its components Herpetofauna, Ornithofauna and Mastozoofauna in different Brazil nut concessions. The methodology used for data collection was proposed by the Rapid Assessment Program (RAP) of Conservation International. The results obtained will be contrasted with the reference data for the analysis, which will focus on the diversity patterns as follows:

- a) Loss of forest. Main indicator to monitor since it is the forest that contains all the ecological processes; The change in the deforestation rate will be evaluated by analyzing satellite images.
- b) Presence / absence of threatened species. According to the conservation status of the IUCN, CITES and at the national level by the List of Endangered Species mentioned in the Supreme Decree No. 004-2014 for Wildlife and the S.D. 043-2006-AG for Flora.
- c) Relative abundance of species. Expressed as individuals by sampling effort in one place.
- d) Alpha diversity (α). Indicator that relates relative wealth through indices -Shannon-Wiener, Simpson Dominance, Margalef.

TABLE 124

Biodiversity Variables	Sampling methods	Method description	Monitoring zones	Indicators	Monitoring frequency
Brazil nut forests	Forest monitoring / forest loss	Remote sensing tool using satellite images with high spatial and spectral resolution	The entire Project area.	Deforestation / loss of forest. Forest. Land use changes.	Annual
	Carbon and flora inventory	Gentry's method of plots consists of surveying, in an area of 0.1 ha, all the trees whose stem has a diameter at breast height (DBH) greater than or equal to 0.10 m. For this, 10 transects of 50 m were made. x 2 m. for each zone	Brazil nut forests	Presence / absence Relative abundance Biodiversity index Umbrella species Endangered Species	Annual flora inventories / Carbon inventory monitoring should be 5 years
Large threatened mammals / umbrella species	Transects	Line transect records with indirect records (including fresh footprints, feces, hair, burrows, excavation, and partially consumed fruit / seeds) and complementary methods such as camera traps, fog nets, and traps	Brazil nut forests	Presence / absence Relative abundance Biodiversity index Umbrella species Endangered Species	biannual
Threatened birds	Counting points	the observer remains in a fixed point for 10 minutes where he recorded all the birds seen and heard inside and outside the 30-meter radius. Points were systematically set 200 meters between points	Brazil nut forests	Presence / absence Relative abundance Biodiversity index Umbrella species Endangered Species	biannual
Water bodies	Evaluación de herpetofauna mediante transectos de banda fija	transects per sampling area of 50 m long by 4 m wide, separated from each other by approximately 100 m, each one was evaluated for an average time of 30 minutes in	Water bodies	Presence / absence Relative abundance Biodiversity index Umbrella species Endangered Species	biannual

		order to standardize the sampling effort, as a complementary method, records will be used timely.			

5.4.2 Biodiversity Monitoring Plan Dissemination (B4.3)

The dissemination will be carried out through an annual informative workshop on the results of the biological monitoring plan in the populated center with the greatest presence of members. The workshops would be aimed at making known the importance of the areas of high conservation value under a didactic method accompanied by dissemination materials. Another dissemination tool will be the BAM website, where photographic panels of the main species of fauna and flora to be conserved will be added to maintain the integrity of the Brazil nut forests.

5.5 Optional Criterion: Exceptional Biodiversity Benefits

5.5.1 High Biodiversity Conservation Priority Status (GL3.1)

According to the CCB standard, it is to demonstrate that, anywhere in the project area, there is the presence of at least a single individual of a species from the Red List of the International Union for Conservation of Nature (IUCN) that is critically endangered (CR) or endangered (EN). Although, the mentioned species are in the CR or EN categories on the IUCN red list, if any degree of vulnerability has been identified at the national level considering the provisions of the Resolution *DS N° 004-2014-MINAGRI* and *D.S. 043-2006-AG* of the Ministry of Agriculture.

In the registry, species of mammals that are under some category of threat according to national legislation under the supreme decree *D.S. 004-2014 MINAGRI* and international as the International Union for Conservation of Nature (IUCN). Under national legislation, the presence of 01 endangered species (EN) *Pteronura brasiliensis* and three (03) Vulnerable species (VU) were determined: *Priodontes maximus*, *Alouatta seniculus* and *Tapirus terrestris*. In some category of international conservation, the presence of three (03) species in the list of endangered species of Peru was determined, two (02) that are in Endangered situation; *Priodontes maximus* and *Pteronura brasiliensis* and a species under Vulnerable status (VU): *Tapirus terrestris*.

As a result, 31 species were found with some degree of threat, being the species with the highest degree of threat and importance for its conservation, *Primolius couloni*, it is protected by both the Peruvian state and international legislation. *Pionites leucogaster* was also registered as an important conservation species according to the IUCN, as it is endangered (EN).

The study area presented a total of 29 species of herpetozoa, of these, 18 belong to the Amphibia class and 11 to the Reptilia class, registering *Boa constrictor* categorized National in Supreme Decree No. 004–2014 MINAGRI.

Of the 82 species registered during the evaluation flora, only two species are within the list of species protected by Peru (*D.S. 043-2006-AG* and *from the Red List of the International Union for Conservation of Nature (IUCN)*).

a). Vulnerability. Regular presence of a globally threatened species (according to the IUCN Red List) at the site:

i) Critically Endangered (CR) and Endangered (EN) Species - presence of at least one individual;

ii) Vulnerable Species (VU) - presence of at least 30 individuals or 10 pairs.

SCIENTIFIC NAME	Local name	DS N° 004-2014-MINAGRI	IUCN	CITES
Priodontes maximus	Yungunturo	VU	EN	I
Alouatta seniculus	Mono coto	VU	NT	II
Pteronura brasiliensis	Lobo de río	EN	EN	I
Tapirus terrestris	Sachavaca	VU	VU	II

SCIENTIFIC NAME (Plengue 2019)	DS N° 004-2014-MINAGRI	IUCN	CITES
Pionites leucogaster		EN	II
Ramphastos tucanus		VU	II
Ramphastos vitellinus		VU	II
Primolius couloni	VU	VU	I
Touit huetii		VU	II

N°	SPECIES	CONSERVATION STATUS		
		D.S.004 -2014	CITES	IUCN
1	Boa constrictor	EN	II	-

SCIENTIFIC NAME	D.S. 043-2006-AG	UICN**	CITES***
Bertholletia excelsa Bonpl.	-	VU	-

Copaifera paupera (Herzog) Dwyer	VU	LC	-

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

Trigger Species	Bertolletia excelsa H.B.K. (the Brazil nut tree), an emblematic symbol of Madre de Dios. Its presence is a signal of healthy of this ecosystem.
Population Trend at Start of Project	Brazil nut fruits are source of food of wildlife as the anuje (Dasyprocta fuliginosa), a rodent that is the only one that may break the Brazil nut pod and is the natural seed disperser in the forest. Trees canopies are the habitat of harpy eagle (Harpyia harpyja) and other birds that use the canopies for nesting in the first years of life (Piana, 2007). It is an heliophyte specie that maintains the equilibrium in the ecological system. The extinction of the specie or an inadequate extraction may alter this equilibrium. There are 1.086.988 ha of Brazil nut forests and 329.564 ha are located in concessions that are part of the REDD project. As an average, there are 0.67 trees per hectare. It implies that there is an estimate of 220.808 trees that are being protected by the project.
Without-project Scenario	The without-project scenario implies a continuation of the deforestation rates, that will produce an elimination of 30% of the project area, and around 67.126 trees. As the deforestation is not continuous but has a mosaic pattern, the negative impact on the biological connectivity will be higher than 30%. As this is an umbrella specie, many species that depend on their fruits and canopies will be affected too.
With-project Scenario	All the measures defined in the theory of change are directly addressed to protect the Brazil nut tree as it is the base of the economy of the BN collectors, the partners of the current project. As the project plans the reforestation of cleared areas with BN trees, the project may expect more trees than the initial number of existing trees.

6. APPENDICIES

The following appendices may be used if appropriate. Delete the instruction and heading if not used.

6.1 Appendix 1: Stakeholder Identification Table

Use this appendix, if necessary, to identify stakeholders and fulfill the requirements of Section 2.1.7 above. Modify the table, if necessary, to suit the project activities, or delete if not used.

Stakeholder <i>Identify communities and any community groups within them, any cross-cutting community groups, and list other stakeholders</i>	Rights, Interest and Overall Relevance to the Project

6.2 Appendix 2: Project Activities and Theory of Change Table

Use this appendix, if applicable, to identify project activities and fulfill the requirements of Section 2.1.8 above. This is an example of just one method of representing the theory of change. Results chains/flow diagrams are another effective way to represent the theory of change. Modify the table, if necessary, to suit the project activities, or delete if not used.

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	

6.3 Appendix 3: Project Risks Table

Use this appendix, if necessary, to identify project risks and fulfill the requirements of Section 2.1.12 above. Modify the table, if necessary, to suit the project activities, or delete if not used.

Identify Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk

6.4 APPENDIX 4: CONSULTATION PROCESS

CONSULTATION PROCESS WITH BRAZIL NUT STAKEHOLDERS OF MADRE DE DIOS – REDD BRAZIL NUT FARMERS PROJECT				
N	WORKSHOP / MEETING	PARTICIPANTS	DATE	PLACE
1	Meeting with FEDECAM leaders. Coordination and planning of the consultation.	14 Brazil nut farmers (3 women), leaders of Brazil nut farmers associations	Monday, July 13 th , 2009	Puerto Maldonado
2	Meeting with FEDECAM. Presentation of the REDD Brazil nut Farmers Project.	Board of Directors of the FEPROCAMD	Tuesday, July 14 th , 2009	Puerto Maldonado
3	Meeting with Brazil nut farmers of Alto Malecon San Carlos and Varsovia	28 Brazil nut farmers (5 women)	Sunday, July 26 th , 2009	Community center of San Carlos town
4	Meeting with Brazil nut farmers of Planchon	10 Brazil nut farmers (2 women)	Sunday, August 2 nd , 2009	Amphitheatre of Las Piedras municipality, Planchon town
5	Meeting with Brazil nut farmers of Alto Malecon San Carlos and Varsovia	18 Brazil nut farmers (3 women)	Sunday, August 2 nd , 2009	Community center of San Carlos town
6	Meeting with Brazil nut farmers of Pariamanu.	14 Brazil nut farmers (3 women)	Monday, August 3 rd , 2009	Pump house of Madre de Dios. Puerto Maldonado
7	Meeting with Brazil nut farmers of Sabaluyoc	11 Brazil nut farmers (2 women)	Sunday, August 30 th , 2009	House of a settler of Sabaluyoc town
8	Participation in Assembly with Brazil nut farmers. Election of FEPROCAMD Board of Directors.	42 Brazil nut farmers (6 women) representatives of different Brazil nut farmers associations	Saturday, September 12 th , 2009	Puerto Maldonado
9	Assembly between Brazil nut farmers of Alerta and FEPROCAMD. Presentation of the REDD Brazil nut Farmers Project.	36 Brazil nut farmers (12 women) and Board of Directors of the FEPROCAMD	Saturday, September 26 th , 2009	Premises of ECOMUSA, Alerta town
10	Presentation of the REDD Brazil nut Farmers Project to leaders of the Brazil nut sectors.	56 Brazil nut farmers' leaders from different sectors and associations.	Wednesday, October 07 th , 2009	Amaru Mayu Hotel, Puerto Maldonado.
11	Presentation of the REDD Brazil nut Farmers Project to Brazil nut farmers of Monterrey. Revision of the agreement of carbon rights transfer.	14 Brazil nut farmers (7 women)	Saturday, November 21 st , 2009	Community center of Monterrey
12	Meeting with Brazil nut farmers of Boca Paríamarca and Ashipal. Presentation of the REDD Brazil nut Farmers Project.	7 Brazil nut farmers (3 women)	Saturday, 21 st , 2009	House of a Brazil nut farmer in Boca Ashipal
13	Presentation of the REDD Brazil nut Farmers Project and absolution of consultations to Brazil nut farmers of Alegria	12 Brazil nut farmers (4 women)	Sunday, November 22 nd , 2009	Community center, Alegria town
14	Meeting with Brazil nut farmers of Sabaluyoc	9 Brazil nut farmers (2 women)	Saturday, November 28 th , 2009	Office of Bosques Amazonicos. Puerto Maldonado

15	Exposition of the REDD Brazil nut Farmers Project to Brazil nut farmers of La Novia	9 Brazil nut farmers (5 women)	Friday, December 4 th , 2009	Community center of La Novia
16	Presentation of the REDD Brazil nut Farmers Project to the Brazil nut farmers Association of Alerta	26 Brazil nut farmers (5 women)	Saturday, December 12 th , 2009	Premises of ECOMUSA, Alegria
17	Participation in the event organized by OSINFOR and CAMDE PERU. The REDD Brazil nut Farmers Project was disseminated.	38 Brazil nut farmers (9 women), representatives of the Forest Management of Madre de Dios and OSINFOR	Friday, June 4 th , 2010	Premises of CASAL SAC. Alegria town
18	Meeting with Brazil nut farmers of Shiringayoc	7 Brazil nut farmers (1 woman)	Sunday, June 6 th , 2010	Shiringayoc town
19	INFORMATIVE WORKSHOP ON PROGRESS AND RESOLUTION OF CONSULTATIONS REGARDING THE REDD PROJECT – Alerta town	32 Brazil nut farmers	Sunday, June 13 th , 2010	Premises of ECOMUSA, Alerta town
20	INFORMATIVE WORKSHOP ON PROGRESS AND RESOLUTION OF CONSULTATIONS REGARDING THE REDD PROJECT – Alegria town	53 Brazil nut farmers	Sunday, June 20 th , 2010	Premises of ECOMUSA, Alegria town
21	INFORMATIVE WORKSHOP ON PROGRESS AND RESOLUTION OF CONSULTATIONS REGARDING THE REDD PROJECT – Brazil nut farmers of Pariamanu.	11 Brazil nut farmers	Saturday, July 3 rd , 2010	Premises of BAM in Puerto Maldonado
22	INFORMATIVE WORKSHOP ON PROGRESS AND RESOLUTION OF CONSULTATIONS REGARDING THE REDD PROJECT – Planchon Sector	21 Brazil nut farmers (2 women)	Friday, July 09 th , 2010	Amphitheatre of Las Piedras municipality, Planchon town
23	FIRST MEETING OF REDD BRAZIL NUT FARMERS PROJECT PARTNERS, taken place in Puerto Maldonado city to show the progress of the project and the business plan of the Brazil nut company of the Project, property of all partners.	400 Brazil nut farmers, representatives of BAM, representatives of the FEPROCAMD, local authorities and MINAM.	Sunday, July 18 th , 2010	Premises of Cabaña Tropical in Puerto Maldonado
24	TRAINING WORKSHOP “Agreement of Brazil nut Concessions, Liabilities and Responsibilities”, Technical assistance for the elaboration of AOP and presentation of OSINFOR to Brazil nut farmers – Alerta town	39 Brazil nut farmers	Saturday, August 14 th , 2010	Premises of ECOMUSA – Alerta town
25	TRAINING WORKSHOP “Agreement of Brazil nut Concessions, Liabilities and Responsibilities”, Technical assistance for the elaboration of AOP and presentation of OSINFOR to Brazil nut farmers – Mavila town	27 Brazil nut farmers	Friday, August 20 th , 2010	Community center, Mavila town
26	TRAINING WORKSHOP “Agreement of Brazil nut Concessions, Liabilities and Responsibilities”, Technical assistance for the elaboration of AOP and presentation of OSINFOR to Brazil nut farmers – Planchon town	33 Brazil nut farmers	Thursday, August 26 th , 2010	Amphitheatre of Las Piedras municipality, Planchon town

27	TRAINING WORKSHOP “Agreement of Brazil nut Concessions, Liabilities and Responsibilities”, Technical assistance for the elaboration of AOP and presentation of OSINFOR to Brazil nut farmers – Alto Malecon San Carlos and Varsovia	33 Brazil nut farmers	Saturday, August 28 th , 2010	Amphitheatre of Las Piedras municipality, San Carlos town

REUNION DE CONSULTA DEL PROYECTO REDD CASTAÑEROS

Coordinación con la FEDECAMD, 13 de Julio del 2009



Participación de dirigentes castañeros de la FEDECAMD en el proyecto REDD Castañeros



Exposición acerca del proyecto, a cargo de la representante de CAMDE PERU

REUNION CON REPRESENTANTES DE BASES CASTAÑERAS Y DE LA EMPRESA BAM

Inicio de negociaciones para la ejecución del Proyecto REDD Castaño, 14 de Julio de 2009



Presentación y explicación del Proyecto REDD a desarrollar con los castañeros de MDD



Firma del Memorándum de Entendimiento entre representante de la FEDECAMD y la empresa BAM



Representantes de bases castañeras y de la empresa SFM-BAM, luego de la firma del Memorándum de entendimiento

REUNION DE CONSULTA EN EL SECTOR DE SAN CARLOS

Presentación del Proyecto REDD Castañero, 26 de Julio del 2009



Presentación del Proyecto REDD Castañero a cargo de representante de CAMDE PERU



Participación de castañeros del Sector de San Carlos interesados en el proyecto

REUNION DE CONSULTA EN EL SECTOR DE VARSOVIA

Presentación del Proyecto REDD Castañeros, 02 de Agosto del 2009



Participación de castañeros del sector de Varsovia interesados en el proyecto



Exposición del proyecto REDD Castañeros a cargo del presidente de la FEPROCAMD

REUNION DE CONSULTA EN EL SECTOR DE PLANCHON

Presentación del Proyecto REDD Castañeros, 02 De Agosto De 2009



Participación de dirigente castañeros del Sector de Planchón interesados en el proyecto



Exposición del proyecto REDD Castañero por parte de representante de CAMDE PERU

REUNION DE CONSULTA CON CASTAÑEROS DEL SECTOR PARIAMANU

Exposición del Proyecto REDD Castañeros, 03 De Agosto De 2009



Participación de castañeros interesados en el proyecto



Explicación de los beneficios y requisitos de participación en el proyecto REDD

PASANTIA DE REPRESENTANTES CASTAÑEROS PARA VISITAR PROYECTO REDD DE BAM

Pucallpa, 16-20 de Agosto de 2009



**Visita de los representantes castañeros a la
plantación del proyecto REDD Campo Verde
de Bosques Amazónicos**



**Visita al vivero forestal del proyecto REDD
Campo Verde de BAM**



**Vista panorámica de los viveros del fundo
Bosques Amazónicos**



**Explicación de los viveros manejados por el
proyecto REDD BAM en Pucallpa**



**Reunión para socializar el plan de acción del
proyecto REDD Castañero de MDD**



**Explicación del plan de acción del proyecto
REDD Castañero**

REUNION DE CONSULTA EN EL SECTOR DE SABALUYOC

Exposición del Proyecto REDD Castañeros, 30 de Agosto de 2009



**Participación de castañeros de Sabaluyoc
interesados en el proyecto REDD**



**Explicación sobre el proyecto REDD a cargo
del presidente de la FEPROCAMD**

ASAMBLEA DE LA FEDERACION DE CASTAÑEROS DE MADRE DE DIOS - FEPROCAMD

Puerto Maldonado-Hotel Amarumayo, 12 de Setiembre de 2009



**Reunión de elección del Consejo Directivo de la nueva
Federación de Castañeros de Madre de Dios**



**Dirigentes castañeros de los diferentes
sectores del departamento**

REUNION DE CONSULTA EN EL SECTOR ALERTA

Exposición del Proyecto REDD Castañeros, 26 de Setiembre de 2009



**Participación de castañeros de Alerta
interesados en el Proyecto REDD**



**Explicación de la participación de la
FEPROCAMD en el proyecto REDD**

REUNION DE CONSULTA EN EL SECTOR LA NOVIA

Exposición del Proyecto REDD Castañero, 03 de Octubre de 2009



Explicación del proyecto REDD a los castañeros del sector de la Novia, a cargo de representante de CAMDE PERU



Socialización y firma de los contratos de cesión con los castañeros de la Novia

ASAMBLEA AMPLIADA DE CONSULTA CON DIRIGENTES DE ASOCIACIONES DE CASTAÑEROS

Exposición del Proyecto REDD Castañero, 07 de Octubre de 2009



Explicación del proyecto REDD por parte del gerente general de BAM ante dirigentes de castañeros



Participación de dirigentes de asociaciones de castañeros de diferentes sectores de Madre de Dios

REUNION DE CONSULTA EN EL SECTOR ALEGRÍA

Sector de Alegría, 08 de Octubre de 2009



Castañeros del sector Alegría interesados en el proyecto REDD



Presentación de los involucrados en el proyecto: BAM, FEPROCAMD Y CAMDE PERU

REUNION DE CONSULTA EN EL SECTOR DE ALERTA

Sector de Alerta, 08 de Octubre de 2009



Representantes de BAM explican el proyecto REDD a los castañeros del sector Alerta



Castañeros de Alerta participan en proceso de consulta

REUNION DE CONSULTA EN EL SECTOR DE LA NOVIA

Sector de Mavila, 08 de Octubre de 2009



Representantes de BAM, FEPROCAMD y CAMDE PERU explica proyecto REDD a castañeros de Mavila



Representantes absuelven consultas del proyecto REDD Castañeros

REUNION DE CONSULTA EN EL SECTOR MONTERREY

Exposición del Proyecto REDD Castañeros, 21 de Noviembre de 2009



**Castañeros del sector Monterrey
interesados en el proyecto REDD**



**Revisión de contratos de cesión de derechos
del proyecto REDD Castañeros**

REUNION DE CONSULTA EN EL SECTOR PARIAMANU

Sector de Boca Paríamarca y Ashipal, 21 y 22 de Noviembre de 2009



**Explicación de Proyecto REDD a cargo de
representante de la FEPROCAMD**



**Castañeros participante de Boca
Paríamarca y Ashipal**

REUNION DE CONSULTA EN EL SECTOR DE ALERTA

Sector de Alerta, 08 de Octubre de 2009



REUNION DE CONSULTA EN EL SECTOR DE ALEGRIA

Exposición del Proyecto REDD Castañero, 22 de Noviembre de 2009



Explicación de Proyecto REDD a cargo de representante de Bosques Amazónicos



Participación de castañeros del sector de Alegría

REUNION DE CONSULTA CON EL SECTOR DE SABALUYOC

Exposición del Proyecto REDD Castañero, 28 de Noviembre de 2009



Explicación de Proyecto REDD a cargo de representante de la FEPROCAMD



Participación de castañeros del sector de Sabaluyoc

REUNION DE CONSULTA EN EL SECTOR DE LA NOVIA

Exposición del Proyecto REDD Castañero ,04 de Diciembre de 2009



REUNION DE CONSULTA EN EL SECTOR DE ALERTA

Exposición del Proyecto REDD Castaño ,12 de Diciembre de 2009



Consejo Directivo de la Asociación de Castañeros de Alerta



Participación de dirigente castaño de Alerta

PARTICIPACION EN DIFUSION FORESTAL CASTAÑERA EN EL SECTOR DE ALEGRIA

Exposición del Proyecto REDD Castaño ,04 de Junio de 2009



REUNION DE CONSULTA EN EL SECTOR DE PLANCHON

Exposición del Proyecto REDD Castaño ,09 de Junio de 2010



6.5 APPENDIX 5: public dissemination of the REDD project

PROCESS OF COMMUNICATION AND DISSEMINATION OF THE BRAZIL NUT FARMERS PROJECT OF MADRE DE DIOS					
N	COMMUNICATION ACTIVITY	QUANTITY	PUBLIC	DATE	PLACE
1	MADRE DE DIOS RADIO, 1 p.m. newscast: Explanatory interview regarding the Project to the General Manager and Technical Manager of BAM.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Monday, January 11 th , 2010	Puerto Maldonado
2	“EL JAQUE” NEWSPAPER: Explanatory interview regarding the Project to the General Manager of BAM.	2 pages	Brazil nut farmers of Madre de Dios and institutions	Monday, January 11 th , 2010	Puerto Maldonado
3	PROMOTIONAL SPOTS of the REDD BRAZIL NUT FARMERS PROJECT in Radio Madre de Dios, La Exitosa and Radio Sinfonia.	172 spots during one month	Brazil nut farmers of Madre de Dios and institutions	Monday, January 11 th , 2010	Puerto Maldonado
4	H VISION TV, newscast “Ver para creer” (<i>seeing then believing</i>): Explanatory interview regarding the Project to the General Manager of BAM.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
5	H VISION TV, newscast “Ver para creer” (<i>seeing then believing</i>): Interview to the President of FEPROCAMD regarding the position of the Brazil nut farmers towards the project.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
6	H VISION TV, newscast “Realities”: Explanatory interview regarding the Project to the General Manager of BAM.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
7	LA EXITOSA RADIO, newscast “La Voz de Madre de Dios” (<i>the voice of Madre de Dios</i>): Explanatory interview regarding the Project to the General Manager of BAM.	30 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
8	H VISION TV, Magazine Program “LA PALABRA” (<i>the word</i>): Explanatory interview regarding the Project to the general manager of BAM	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
9	H VISION TV, regional newscast “INTERCAMBIO” (<i>exchange</i>): Explanatory interview regarding the Project to the general manager of BAM	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, January 12 th , 2010	Puerto Maldonado
10	SINFONÍA RADIO, newscast “La Voz Dirigencial” (<i>the managerial voice</i>): Explanatory interview regarding the Project to the General Manager of BAM	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, January 13 th , 2010	Puerto Maldonado
11	H VISION TV, prime-time newscast “Tiempo de Cambio” (<i>time for a change</i>): Explanatory interview regarding the Project to the General Manager of BAM	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, January 13 th , 2010	Puerto Maldonado
12	H VISION TV, prime-time newscast “Tiempo de Cambio” (<i>time for a change</i>): Explanatory interview regarding the Project to the General Manager of BAM.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, January 13 th , 2010	Puerto Maldonado
13	Publishing in GESTIÓN Newspaper: The Ecologic gold. Article that suggests the projects of BOSQUES AMAZÓNICOS as sustainable alternatives to the development of the Amazon, with regard to gold extraction.	30 thousand	At national level	Monday, May 10 th , 2010	At national level
14	Participation in the event organized by the Forestry Engineering Faculty of the UNAMAD	20 minutes	Professors and students	Friday, June 25 th , 2010	University population
15	Printing of the informative and explanatory graphic material (Triptych) regarding the REDD Brazil nut Farmers Project: what are carbon bonds, the agreements of rights transfer, the benefits of the project.	1 thousand	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Madre de Dios

16	GRAPHIC MATERIAL: Poster of the First Meeting of REDD Brazil nut Farmers Project Partners	200 units	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Puerto Maldonado
17	GRAPHIC MATERIAL: Banner of the First Meeting of REDD Brazil nut Farmers Project Partners	10 units	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Puerto Maldonado
18	GRAPHIC MATERIAL: Flyer of the First Meeting of REDD Brazil nut Farmers Project Partners	2 thousand	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Puerto Maldonado
19	INFORMATIVE BULLETIN: of FEPROCAMD with information for all members of such institution.	2 thousand	Brazil nut farmers of Madre de Dios and institutions	Thursday, July 1 st , 2010	Puerto Maldonado
20	PRENSA REAL TV PROGRAM: Interview to Biologist Juan Carlos Flores, Regional Manager of BAM to explain about the Brazil nut in Madre de Dios and the REDD Brazil nut Farmers Project.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Monday, July 12 th , 2010	Community center of San Carlos town.
20	PRENSA REAL TV PROGRAM: Interview to Ant. Marco Villegas, Social Specialist of BAM, to explain the process of consultation and the social problematic of the Brazil nut farmers within the framework of the REDD Brazil nut Farmers Project.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Monday, July 12 th , 2010	Community center of San Carlos town.
21	PRENSA REAL TV PROGRAM: Interview to Biologist Juan Carlos Flores, Regional Manager of BAM to explain about the Project and invite to the First Meeting of REDD Brazil nut Farmers Project Partners.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, July 13 th , 2010	Community center of San Carlos town.
22	PRENSA REAL TV PROGRAM: Interview to the President of FEPROCAMD, to comment about the favorable position of the Brazil nut farmers towards the REDD Brazil nut Farmers Project and invite all its affiliates to the FIRST MEETING OF REDD BRAZIL NUT FARMERS PROJECT PARTNERS.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Tuesday, July 13 th , 2010	Community center of San Carlos town.
23	PRENSA REAL TV PROGRAM: Interview to the Technical Manager of BAM, to absolve doubts concerning the REDD Brazil nut Farmers Project and to explain about all the information which will be given in the FIRST MEETING OF REDD BRAZIL NUT FARMERS PROJECT PARTNERS.	20 minutes	Brazil nut farmers of Madre de Dios and institutions	Friday, July 16 th , 2010	Community center of San Carlos town.
24	LA EXITOSA RADIO: Interview to the President of FEPROCAMD concerning the Project and its perspectives and to invite to the First Meeting of REDD Brazil nut Farmers Project Partners.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Friday, July 16 th , 2010	Puerto Maldonado
25	IDENTITY ARTICLES: T-shirts of the project given to all the Brazil nut farmers partners to promote the identity with it.	500 units	Brazil nut farmers of Madre de Dios	Sunday, July 18 th , 2010	Madre de Dios
26	DISSEMINATION FAIR: Dissemination stand of the REDD Brazil nut Farmers Project and identity of the Brazil nut in the region of Madre de Dios, within the framework of the Fair organized by the Ombudsman's Office	1 stand with 8 explanatory gigantographies	General population of Puerto Maldonado	Friday, July 23 th , 2010	Plaza Mayor (Main Square) of Puerto Maldonado
27	Reprinting of the informative and explanatory graphic material (Triptych) concerning the REDD Brazil nut Farmers Project: what are carbon bonds, the agreements of rights transfer, the benefits of the project.	2 thousand	Brazil nut farmers of Madre de Dios and institutions	Sunday, August 15 th , 2010	Madre de Dios
28	Publishing in GESTION Newspaper: Map for carbon quantification, its relation with the REDD projects. Article which comments the development experience in REDD of BOSQUES AMAZONICOS in Madre de Dios.	30 thousand	At national level	Tuesday, September 07 th , 2010	At national level
29	Publishing in CARETAS Magazine: Article in the supplement concerning the conservation of Forests, edited by the Environmental Ministry.	30 thousand	At national level	Thursday, September 09 th , 2010	At national level

30	LA EXITOSA RADIO: Interview to the president of FEPROCAMD concerning the Project and all paperwork that must be done by the Brazil nut farmers to accomplish with their commitment with the State.	15 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, September 15 th , 2010	Puerto Maldonado
31	LA EXITOSA RADIO: Interview to William Moreno, Regional Coordinator of CAMDE PERU, NGO in charge to give support in the technical work to all the Brazil nut farmers partners of the REDD project, explaining about all the requirements and dates of attention to the Brazil nut farmers partners.	10 minutes	Brazil nut farmers of Madre de Dios and institutions	Wednesday, October 6 th , 2010	Puerto Maldonado

DIFUSION DEL PROYECTO REDD CASTAÑEROS EN EL SECTOR DE ALERTA

13 de Junio de 2010



EVENTO: PRIMER ENCUENTRO ANUAL DE SOCIOS DEL PROYECTO REDD CASTAÑEROS

Puerto Maldonado 18 de Julio de 2010



DIFUSION DEL PROYECTO REDD CASTAÑEROS EN EL SECTOR DE MAVILA

20 de Agosto de 2010



CASTAÑEROS EN EL SECTOR DE ALEGRIA

20 de Julio de 2010



DIFUSION DEL PROYECTO REDD CASTAÑEROS EN EL SECTOR DE ALERTA

14 de Agosto de 2010



DIFUSION DEL PROYECTO REDD CASTAÑEROS EN EL SECTOR DE MAVILA

20 de Agosto de 2010



DIFUSION DEL PROYECTO REDD CASTAÑEROS EN EL SECTOR DE PLANCHON

26 de Agosto de 2010



DIFUSION DEL PROYECTO REDD CASTAÑEROS EN EL SECTOR DE SAN CARLOS

28 de Agosto de 2010



**ATTENDANCE LIST TO HEARINGS AND CONSULTATIONS PERFORMED
FOR THE REDD BRAZIL NUT CONCESSIONERS PROJECT**



Participación en Reunión para Difusión y Programación de Trabajos de Campo

LISTA DE ASISTENCIA

Beneficiarios: Castañeros de Alerta y anexos
Lugar: Salón de ECOMUSA - Alerta

Fecha: 13 de Junio del 2010
Hora: 10:00 a.m.

Nº	Nombres y Apellidos	Sector	DNI	Firma
1	Cipriano Puma Puma	Alerta	04809183	[Firma]
2	Santiago Torres Cueva	Alerta	10440120	[Firma]
3	MARTIN LAURA HERRERA	Alerta	05063316	[Firma]
4	MAXIMO CAHUAN	Alerta	05063324	[Firma]
5	Alberto Garcia Rojas	Alerta	05063556	[Firma]
6	Rodolfo Lima Mamani	Shiringayoc	04811367	[Firma]
7	Angel B. Capales Tapia	Shiringayoc	04819789	[Firma]
8	Plumante Carlos Chango	Alerta	04696486	[Firma]
9	Glafel Supanqui Quena	ALERTA	05063228	[Firma]
10	ANA JAVIERO Quipa	Alerta	04700494	[Firma]
11	Gerardo Flores Castillejos	ALERTA	04308266	[Firma]
12	Ygnacio Nori Guita	Alerta	05063291	[Firma]
13	Ylario Gito Jairo	Alerta	05063321	[Firma]
14	DAVID Grita Rodriguez	Alerta	05063331	[Firma]
15	Eustaquio Lara Cayo	Shiringayoc	04809112	[Firma]
16	Edmundo Palomino Reda	Sta. Helena	04812530	[Firma]
17	Walter Macchao Tapia	Alerta	04828101	[Firma]
18	Ember Macchao Huaman	Alerta	46715996	[Firma]
19	Orlando Macchao Nori	Alerta	05063604	[Firma]
20	Edmundo Macchao Nori	Alerta	05063608	[Firma]
21	Manuel Andujar Tepez	Shiringayoc	04808907	[Firma]
22	David Rodriguez Torrey	Alerta	05069285	[Firma]
23	Valentin Davila Yerba	Alerta	04826375	[Firma]
24	Regina Palla Dca	Alerta	05063347	[Firma]
25	Juan B. Palla P.	Alerta	04804458	[Firma]
26	Cesar Delgado Andia	Alerta	05063255	[Firma]
27	Alexis Shyda Rodriguez	Alerta	02554329	[Firma]
28	Carlos Alberto Mamani Cahuana	ALERTA	05063273	[Firma]
29	Enrique Tito Arasaize	Alerta	05063371	[Firma]
30	Ylario Gito Jairo	Alerta	05063321	[Firma]
31	Ygnacio Nori Guita	Alerta	05063291	[Firma]
32	DAVID Rodriguez Grita	Alerta	05063331	[Firma]
33				
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LISTA DE ASISTENCIA A REUNIÓN

Proyecto: "REDD CASTAÑERO"
Lugar: Centro Poblado de Novia
Fecha: 04 de Setiembre de 2010

N°	Nombres y Apellidos	Asociación	Cargo	Telefono	Firma
1	Hector Pizarro N.	LA NOVA			<i>[Signature]</i>
2	OSWALDO BORDINI SETHURICA	LA NOVA			<i>[Signature]</i>
3	ALFARO ZAMBRANO TAPIA	LA NOVA			<i>[Signature]</i>
4	LUCIO PIZANGO NAVI	LA NOVA			<i>[Signature]</i>
5	Ricardina Sutillana una no	LA NOVA			<i>[Signature]</i>
6	Alejandrina Mendoza Cuenca	LA NOVA			<i>[Signature]</i>
7	Miguel Henbozo Reategui	LA NOVA			<i>[Signature]</i>
8	Miguel Henbozo DE VARGAS	LA NOVA			<i>[Signature]</i>
9	Herminia Rodriguez Flores	LA NOVA			<i>[Signature]</i>
10	Miguel Morfán Gómez	LA NOVA			<i>[Signature]</i>
11	Braulio Valencia	LA NOVA			<i>[Signature]</i>
12	Corona Pizarro N.	LA NOVA			<i>[Signature]</i>
13	Aliso Asimyr Srip	LA NOVA			<i>[Signature]</i>
14	Marcelino Cruz Pizarro	Nuevo Poblado			<i>[Signature]</i>
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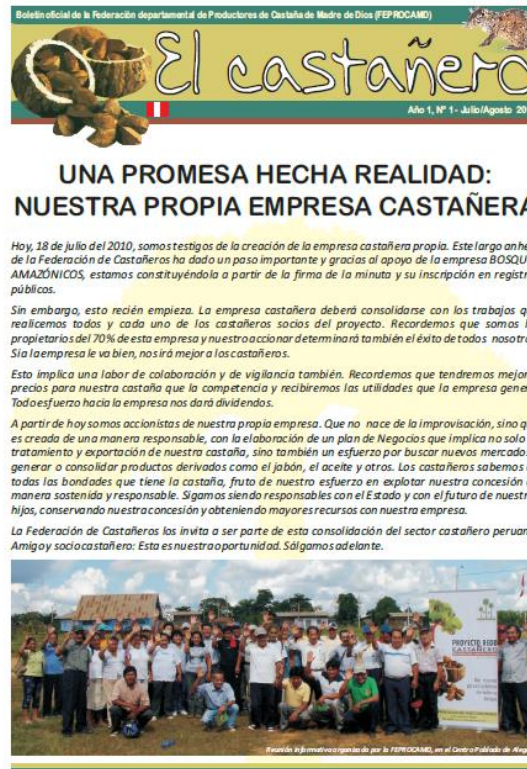
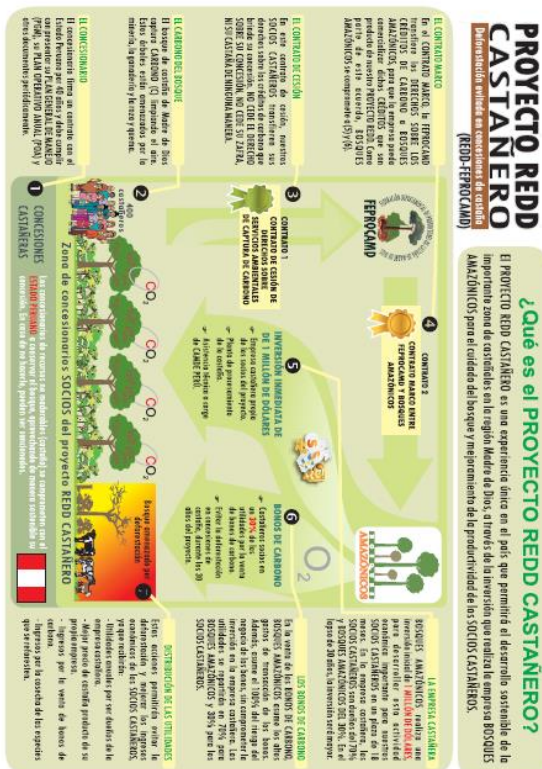


LISTA DE ASISTENCIA A REUNIÓN

Proyecto: "SFM-BAM"
Lugar: Centro Poblado alerta
Fecha: 14 de agosto de 2010

N°	Nombres y Apellidos	Asociación	Firma
1	Gerónimo Quiro		<i>[Signature]</i>
2	Alfonso García Rojas		<i>[Signature]</i>
3	Juan Saavedra Moya		<i>[Signature]</i>
4	David Rodríguez Grijal		<i>[Signature]</i>
5	Encarnación Huamani Larco		<i>[Signature]</i>
6	Maximo Cahuana Rivera		<i>[Signature]</i>
7	David Rodríguez Tenry		<i>[Signature]</i>
8	Jose Cahuana Saravina		<i>[Signature]</i>
9	Cesar Salgado Andia		<i>[Signature]</i>
10	Santiago Taype Chuima		<i>[Signature]</i>
11	Melchor Vasquez Bolin		<i>[Signature]</i>
12	Consuelo Cahuana Saravina		<i>[Signature]</i>
13	Olivia Diaz Herrera		<i>[Signature]</i>
14	Fabrizio Catalayud Curo		<i>[Signature]</i>
15	Fidel Yupanqui Quispe		<i>[Signature]</i>
16	Melchor Huascha Yauri		<i>[Signature]</i>
17	Pascual Flores Castillejos		<i>[Signature]</i>
18	Emrique Ruiz Arzavira		<i>[Signature]</i>
19	Helio Grijal. Palla		<i>[Signature]</i>
20	Valentin Jaque Maque		<i>[Signature]</i>
21	Ana Jacinto Quiro		<i>[Signature]</i>
22	Valentin Palla Yorra		<i>[Signature]</i>
23	Ignacio Noa Grijal		<i>[Signature]</i>
24	Enlio Macocha Noa		<i>[Signature]</i>
25	Magdalena Sumpaco Armas		<i>[Signature]</i>
26	Raimundo Rosas Huascha		<i>[Signature]</i>
27	José Calqui Quiro		<i>[Signature]</i>
28	Yana Palla Panduro		<i>[Signature]</i>
29	Arilo Sanchez Cruz		<i>[Signature]</i>
30	Felipe Dea Grijal		<i>[Signature]</i>

31	Victor Macocha Macchoa.		
32	Nancy Rosendo Macocha Tapia.		~~Macchoa~~
33	María Zaida Rodríguez Tapia		María
34	Clemente Colque Champa		Colque
35	Marcelino Sandoz Ortega.		Colque
36	Juliana Perilla Quispe		Quispe
37	Pam Yura Quispe		Quispe
38	César G. Macocha Noa.		Quispe
39	Carlo A. Mamani Cahuana		Quispe
40			



El castañero

Palabras del Presidente

Amigo castañero:

Estamos orgullosos de hacer llegar a tus manos el primer número de nuestro boletín oficial: El castañero, órgano de comunicación de la Federación departamental de Productores de Castaña de Madre de Dios - FEPROCAMD.

En el Consejo Directivo de nuestra Federación estamos convencidos en el desarrollo de nuestro sector y venimos trabajando a diario para consolidarlo. Que este boletín sirva para comunicarnos más e integrarnos de manera sólida.

Es nuestro deseo que estas noticias lleguen a ustedes de manera directa y sencilla, la transparencia en gestión es nuestro objetivo. Ya tenemos un local institucional donde puedan acercarse y conversar. los esperamos para conversar y seguir haciendo nuestro trabajo: Representar al sector castañero de manera integral. Éxitos a todos y sigamos avanzando.



Hector Cardiel Pérez

FEPROCAMD inaugura local institucional propio en la ciudad de Puerto Maldonado

Par atender de mejor manera a nuestros asociados, la FEPROCAMD ahora cuenta con un local institucional propio en la ciudad de Puerto Maldonado. Se encuentra en la Av. Sinchi Roca Mz. 116, lt. 1. A dos cuadras del cruce del Río Caribe. Fue inaugurado el 7 de mayo de este año. Los esperamos.




FEPROCAMD participa en el debate de la nueva ley Forestal, defendiendo los intereses de los castañeros

El debate por la nueva ley Forestal se está dando a nivel nacional y especialmente en el Congreso de la República. La FEPROCAMD viene participando del debate, donde hemos solicitado la inclusión de algunos artículos referente a beneficios por servicios ambientales para los concesionarios, especialmente los castañeros. Esto se ha logrado mediante la presentación de nuestro presidente en la comisión de elaboración de la nueva ley, en Abril y Mayo. La última versión de esta ley incluye nuestros aportes en beneficio del castañero.

Actualmente se encuentra en la última fase de debate para su posterior aprobación. Además, la FEPROCAMD ha participado en el debate sobre el cambio de pago por derecho de aprovechamiento, donde nos oponemos a la determinación de pagos de derecho por área, y no por volumen, como ha sido hasta ahora. Solicitamos mayor información técnica para sustentar dicho cambio para saber cuál nos conviene.

Otro punto importante fue nuestra enérgica oposición a la restricción que quieren poner para el aprovechamiento de madera en concesiones de castaña. No demuestran la razón para aplicar esta restricción, sabiendo que nosotros los castañeros, si podemos hacer un aprovechamiento responsable de madera sin dañar nuestra concesión castañera.

El debate continúa. Mientras la FEPROCAMD está alerta para proteger los intereses de nuestro sector.

LA FEPROCAMD EXPLICA: ¿QUÉ ES UN PROYECTO REDD?

Es sabido que actualmente la FEPROCAMD viene liderando junto con la empresa BOSQUES AMAZÓNICOS el proyecto REDD CASTAÑERO. Pero ¿Qué significa esa palabra REDD? Veamos el siguiente texto:

El planeta tierra se está calentando lo que es un gran riesgo para la vida humana. Para combatir este fenómeno, es importante conservar los bosques ya que ellos capturan el componente que hace que la tierra se caliente. Es por eso que nace REDD, como una alternativa para la conservación de los bosques.

Al inicio se llamó solo RED, que significaba: **Reducción de Emisiones por Deforestación**. Esto quiere decir, que evitando la deforestación del bosque se disminuye la contaminación (emisión) del ambiente. Luego se agrega la alternativa de que también se pueda evitar la degradación de los suelos y así donde se adhiere la segunda letra D, quedando como REDD.

Para nosotros, REDD es una oportunidad de tener mayores recursos sin dañar nuestro bosque. En la página continúa tenemos una explicación sobre el funcionamiento de nuestro PROYECTO REDD CASTAÑERO. La FEPROCAMD considera que esta es la mejor alternativa para nuestro sector.

LOS MIEMBROS DE LA FEPROCAMD

A continuación mencionamos a las asociaciones miembros de la FEPROCAMD:

- 1) Asociación de Productores y Extractores de Castaña de Planchón.
- 2) Asociación Castañera Agroforestal de Carmen Rosa.
- 3) Asociación Agroforestal Alegría Alto Malecón San Carlos.
- 4) Asociación de Productores Castañeros y Agroforestales de Alería.
- 5) Asociación de Castañeros de Alegría.
- 6) Asociación de Productores y Extractores de Castaña de Río Pastamayo y Afluentes.
- 7) Asociación Castañera Agroforestal de Varsovia.
- 8) Asociación de Productores y Extractores de Castaña de Loreto.
- 9) Asociación de Extractores Productores Forestales y Agropecuarios de La Novia.
- 10) Asociación de Productores y Extractores de Castaña de Shringayoc.
- 11) Asociación de Productores y Extractores de Castaña de Mavila.

De esta manera, la FEPROCAMD se consolida como organismo representativo del sector. Si eres castañero y no estás afiliado a alguna de estas organizaciones o tu organización no está afiliada, te invitamos a agremiarte: solo juntos los castañeros, podemos defender nuestros intereses y nos haremos más sólidos.



FEDERACIÓN DEPARTAMENTAL DE PRODUCTORES DE CASTAÑA DE MADRE DE DIOS

Fundada el 12 de septiembre del 2009 - R.R.P.R. Nº 11016791 - Q.R. MDD

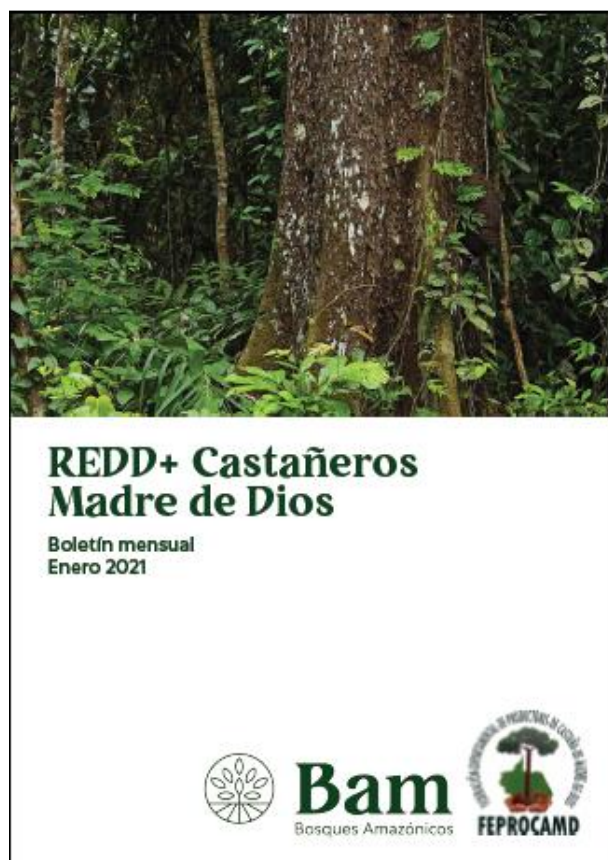
DIRECCIÓN: Av. Sinchi Roca Mz. 116, Lt. 1, Puerto Maldonado (a dos cuadras del Río Caribe).

TÉLEFONO: 794211

EMAIL: feprocamd@yahoo.com

EL CASTAÑERO es el boletín informativo de la Federación departamental de productores de castaña de Madre de Dios - FEPROCAMD. Busca transcribir los sistemas y programas que vienen trabajando en su gestión como sector representativo de los castañeros de toda la región. Solicita publicar algo en este boletín, con gusto lo atenderemos.

BULLETIN JANUARY 2021



Aliados estratégicos: **BP Gas Limited**

En agosto de 2020, iniciamos una alianza estratégica con la empresa internacional BP, consolidando una venta record de 1100,000 créditos de carbono que asegura la ejecución del presupuesto de REDD+ Castañeros por los siguientes dos años.



Principales actividades realizadas en el mes:

Entrega de beneficios económicos a nuestros socios.

Desde el mes de diciembre venimos realizando la entrega de beneficios económicos a nuestros socios, en reconocimiento al compromiso demostrado por conservar los bosques de sus concesiones. A la fecha, hemos realizado la entrega de S/. 1,500 soles por persona a un total de 222 socios. Continuaremos con esta labor a lo largo del mes de febrero.

Durante las sesiones, generamos espacio para conversar sobre el proyecto, nuestra historia y planes a futuro. Asimismo, para tomar nota sobre los requerimientos y expectativas de nuestros socios a fin de dar apertura a la mejora constante.



Ordenamiento y linderamiento de las concesiones.

En enero iniciamos el proceso de linderamiento (demarcación de límites) de 48 concesiones pertenecientes al proyecto. Este proceso, fundamental para el correcto saneamiento de las áreas, está -en esta primera etapa- a cargo de la empresa Teledetections.



Acondicionamiento de la oficina y compra de equipos.

Realizamos el acondicionamiento de la oficina bajo las medidas sanitarias correspondientes a fin de atender a nuestros socios de manera eficiente y segura. Asimismo, compramos los equipos necesarios para la ejecución de las diferentes actividades del proyecto. La compra de activos continuará en febrero.

OFICINA

- Acondicionamiento e implementación del plan COVID - 19 para uso de oficinas.
- Señalización total del local.
- Compra de materiales de higiene.
- Uso obligatorio de implementos de bioseguridad: máscara facial, mascarilla, alcohol en gel.
- Monitoreo de temperatura y niveles de oxígeno.



EQUIPOS

- Materiales de oficina.
- Computadoras desktop.
- Impresoras.
- Proyector.
- Estabilizadores.
- Escritorios + sillas.
- Mesa de trabajo + sillas.
- Sillas para asambleas.



Boletín mensual

Enero 2021

Proceso de verificación período 2017 - 2020 bajo el estándar VCS + re-validación del estándar CCB.

Iniciamos el proceso de verificación del proyecto bajo el estándar VCS (Verified Carbon Standard) para el período comprendido entre los años 2017 y 2020. Actualmente, el equipo técnico se encuentra realizando el Reporte de Monitoreo correspondiente.

Asimismo, iniciamos el proceso de re-validación del proyecto bajo el estándar CCB (Climate, Community and Biodiversity). El equipo técnico se encuentra realizando la definición de la línea base (comunidad + biodiversidad) y los análisis para el desarrollo del Documento de Proyecto CCB.



Equipo REDD+ Castañeros

Personal dedicado a la administración y gestión del proyecto

Eduardo Galindo (BAM)
Ronald Rojas (BAM)
David Asturima Huamantla
Raúl Andy Huanaco Huanca
Walter Flores Casanova
Ronald Cisneros Castro
Elmer Racua Qulspe
Daisy Chávez Puma

Fabiola Villanueva Paredes
Douglas Vergara
Luis Salas

Soporte BAM
Jorge Torres
Carlos Gameros
María Alejandra Cantuarias
Alvaro Guerrero

Director regional BAM
Jefe de proyecto BAM
Coordinador social del proyecto
Asesor legal
Asesor técnico
Comunicador social
Asistente administrativo y contable
Apoyo administrativo y limpieza
Seguridad (L-V)
Seguridad (S-D)

Asesor técnico carbono
Desarrollador técnico
Marketing
Planeamiento financiero



Si eres socio del proyecto y aún no has recibido los beneficios económicos correspondientes o si quieres ser parte de REDD+ Castañeros, por favor comuníquese con la administración a los siguientes números:

+51 951 386 171
+51 964 102 622

Contáctate con nosotros:

info@bosques-amazonicos.com
facebook: Fepracam Mdd

Nuevas oficinas: Av. Universitaria
Al lado de la Gerencia Forestal
ex Inrena, Puerto Maldonado



Bam
Bosques Amazónicos





REDD+ Castañeros Madre de Dios

Boletín Junio 2021



Bam
Bosques Amazónicos



Talleres informativos

A fin de compartir más información sobre REDD+ Castañeros, el equipo viene desarrollando una serie de talleres llamados **"Conservemos y protejamos nuestros bosques de castaña"**. A la fecha, se han realizado dos talleres: uno en Alegría (40 asistentes) y otro en Mavila (42 asistentes), con la participación de concesionarios de los sectores aledaños a Alegría (San Carlos, Bajo Alegría, Carmen Rosa, El Piñal, Virgen del Carmen, Cafetal, San Juan de Aposento, Varsovia y Loreto); y de los sectores aledaños a Mavila (Cafetal, Shiringayoc, La Novia, Manuripe, Santa Rosa, Miraflores).

Durante las sesiones, el equipo de REDD+ Castañeros expone sobre el proyecto: su historia, beneficios y planes a futuro. Asimismo, el equipo comunica las diferentes actividades que el proyecto viene implementando para sus socios: **ordenamiento y linderamiento de concesiones, asesoría técnica y legal, sistema de monitoreo para proteger las áreas y detectar amenazas de deforestación, entre otras.**

Además, se da espacio para que los socios puedan realizar preguntas, así como hacer llegar sus dudas y requerimientos para el proyecto. Estos talleres se llevarán en las diferentes localidades del proyecto. Próximamente en Alerta, Planchón y Río Parímanu. Para ello, se informará previamente a través de los dirigentes de la FEPROCAMD y de la difusión en otros medios como el grupo de Whatsapp del proyecto.

Asimismo, el equipo viene preparando diferentes talleres para todo el año, a realizarse en los diferentes sectores castañeros, sobre temas de interés como: manejo sostenible de los bosques de castaña y desarrollo de alternativas sostenibles que ayudan a conservar los ecosistemas y a la vez generan alternativas de ingresos económicos.



Para cualquier consulta, ya sea a nivel técnico, legal, administrativo o si está interesado en formar parte del proceso de ordenamiento y linderamiento de las concesiones castañeras, por favor contactar al equipo a los números de teléfono brindados al final del documento.

Boletín REDD+ Castañeros

Junio 2021

Ordenamiento y Linderamiento

Seguimos avanzando con el proceso de ordenamiento y linderamiento (demarcación de límites) de las concesiones de nuestros hermanos castañeros en colaboración con una empresa consultora contratada. Este proceso es fundamental para el correcto saneamiento de las áreas de nuestros socios y su registro ante las autoridades competentes.



¡Sigamos con el compromiso de cuidar nuestros bosques ancestrales y la gran biodiversidad de nuestra Amazonía!

Boletín REDD+ Castañeros

Junio 2021

Biodiversidad

En mayo se realizó un estudio de biodiversidad (mastozoología, ornitofauna, anfibios, reptiles, flora) en las concesiones castañeras de Alegría, Mavila y Alerta con el objetivo de evaluar el estado de nuestros bosques y seguir logrando los más altos estándares de calidad para nuestro proyecto REDD+ Castañeros.

Tras hacer un diagnóstico para determinar la composición, riqueza, abundancia y frecuencia de la biodiversidad presente en el área, el equipo de expertos concluyó que los bosques de castaña están preservados y conservados en buen estado. Este resultado refleja la gran labor de los socios castañeros por conservar los bosques de sus concesiones.



Resultados importantes:

- **Avifauna:** se registraron (directos e indirectos) un total de **441 individuos** vistos, divididos en 17 órdenes, 38 familias, 156 géneros y 224 especies.
- **Mastozoología:** en la evaluación de mamíferos mayores y menores no voladores se registraron 35 especies: 28 en Mavila, 23 en Alerta y 24 en Alegría. La familia con más especies registradas es Cebidae (05 especies) del Orden Primates.
- **Anfibios y reptiles:** se registró un total de **29 especies de herpetozoos**, de estos, 18 pertenecen a la clase Amphibia, distribuidas en 5 familias, y 11 a la clase Reptilia, distribuidas en 8 familias.
- **Flora:** se registró de un total de 175 Individuos, 82 Especies, 69 Géneros, y 31 Familias.

Boletín REDD+ Castañeros

Junio 2021

Comunidad

Entre mayo y junio realizamos entrevistas personales para escuchar a nuestros socios: les preguntamos qué esperan del proyecto, cuáles son sus requerimientos y necesidades a fin de seguir avanzando en el desarrollo de actividades que nos permitan generar el mayor impacto posible. Para ello, el equipo se acercó a 78 socios, realizando encuestas sobre su percepción con el objetivo de seguir mejorando en conjunto.



Evaluación externa: verificación cosecha 2017-2020



Para cumplir con las normas y requerimientos del mercado de carbono mundial, el proyecto REDD+ Castañeros, liderado por el equipo técnico, está pasando por un proceso de evaluación por una consultora externa. Así como los castañeros son visitados por autoridades como el OSINFOR o SERFOR para asegurar que se esté cumpliendo con los compromisos establecidos, el Proyecto REDD+ Castañeros es visitado y evaluado por las autoridades encargadas del estándar VCS (el estándar internacional bajo el cual el proyecto está registrado). Este proceso es necesario para demostrar el impacto de REDD+ Castañeros y verificar que los socios estamos cumpliendo objetivo de conservar los bosques de castaña de Madre de Dios.

Boletín REDD+ Castañeros

Junio 2021

Asesoría a los socios y monitoreo de los bosques

El equipo de REDD+ Castañeros viene brindando **asesoría técnica y legal de forma permanente** a los socios del proyecto, con el fin de **prevenir la deforestación y hacer frente a amenazas en nuestros bosques** como: incendios, quemas, invasiones de ajenos para hacer chacra, cultivos o ganadería, tala ilegal, minería ilegal, apertura de caminos, etc.

Además, el equipo viene implementando un **sistema de monitoreo completo para identificar amenazas de deforestación y minería ilegal**. Este sistema nos ayuda a cumplir el objetivo de nuestro proyecto: evitar la deforestación y conservar nuestros bosques de castaña.

Si observas alguna amenaza de deforestación en tu concesión, por favor no dudes en contactarte con el equipo del proyecto REDD+ Castañeros para poder ayudarte en el proceso.



¿Eres concesionario de castaña y todavía no perteneces al proyecto REDD+ Castañeros?

Acércate a nuestras oficinas Pasaje Luis Perez Valera o llama a alguien del equipo para poder brindarte información sobre cómo participar.

Boletín REDD+ Castañeros

Junio 2021

Beneficios económicos por conservar los bosques



Seguimos entregando beneficios económicos a todos los socios del proyecto REDD+ Castañeros.

Además de los diferentes beneficios que REDD+ Castañeros ofrece para sus socios -como asesoría técnica y legal permanente, sistema de monitoreo, proceso de ordenamiento y linderamiento de las concesiones, talleres de capacitación, entre otros- REDD+ Castañeros brinda beneficios económicos a cada uno de los socios titulares del proyecto, como resultado de las ventas de créditos de carbono en el año. A diferencia de otros proyectos, REDD+ Castañeros busca generar, además de las actividades necesarias para conservar los bosques, que los beneficios del proyecto lleguen directamente a cada uno de los socios.

A la fecha, **329 socios** han recibido **S/. 1,500 (mil quinientos soles)** con motivo del adelanto de utilidades por la venta de créditos de carbono del año. Aún hay socios que no se han comunicado para recibir su beneficio. A ellos, les pedimos se comuniquen con el equipo del Proyecto para coordinar la entrega correspondiente.

En **Julio de 2021** se repartirá un total de **S/. T215,000 (un millón doscientos quince mil soles)** entre los socios, con motivo de un **segundo adelanto de utilidades**. En esta ocasión, **cada socio recibirá S/. 3,000**.

Luego de hacer el balance de las ventas del año 2021, se entregará el saldo de utilidades para los socios. El equipo estará comunicándose con todos los socios para mayor detalle sobre las próximas reuniones de entregas de beneficios.

Boletín REDD+ Castañeros

Junio 2021

Proyecto REDD+ Castañeros

Contacto:

Daisy Chavez: +51 951 386 171

Fabiola Villanueva: +51 964 102 622

Grupo en Facebook: Proyecto REDD+ Castañeros MDD - Bam - Fepracmd

Grupo de Whatsapp: contactarse con Elmer Racua Quispe: +51 941 247 962

Oficina: Pasaje Luis Pérez Valera, Mza. 2F lote 4 urb San Luis (al lado de la gerencia forestal, Av universitaria).



Sistema de Monitoreo, Control y Vigilancia (SMCV)

Siguiendo nuestro compromiso de conservación, venimos implementando el SMCV de REDD+ Castañeros: un sistema integral que busca identificar y frenar las amenazas de deforestación que puedan ocurrir en nuestro proyecto o en las zonas cercanas al mismo.

¿Cómo funciona?

1. Identificación de la amenaza

Como primer paso, nuestro equipo de especialistas analiza información satelital generada por GEOBOSQUES y la NASA aplicada al área del proyecto. En esta etapa, el equipo visualiza diariamente si existen alertas de fuego dentro de las concesiones forestales. Luego, el equipo elabora un mapa de cada concesión castañera, marcando los puntos en donde se detectaron los focos de calor. Este mapa se envía por Whatsapp a cada socio concesionario, para que tenga conocimiento de lo que está sucediendo, investigue y remita información al equipo del proyecto.

Adicionalmente, las amenazas de deforestación son identificadas y reportadas por los mismos socios concesionarios del proyecto utilizando la aplicación de celular Nolecam.

2. Evaluación en campo

Una vez identificadas las amenazas de deforestación, el equipo técnico del proyecto REDD+ Castañeros realiza las visitas correspondientes a las concesiones posiblemente afectadas para asesorar a los socios en el proceso, recoger pruebas de las amenazas de deforestación ocurridas y, posteriormente, para hacer las denuncias respectivas del caso.

3. Denuncia y seguimiento

Una vez recopilada la información, el equipo técnico y legal del proyecto acompañan a los socios concesionarios en los procesos de denuncias frente a las autoridades competentes.



Boletín mensual

Setiembre 2021



Monitoreo Satelital

La mayoría de amenazas en las concesiones se deben al cambio de uso de suelo por chacra, quemas, invasiones o minería ilegal. Estas **amenazas deben ser controladas inmediatamente**, ya que ocasionan la pérdida de nuestros bosques, contaminan el ambiente e impiden cumplir el objetivo de conservación del proyecto.

Gracias al sistema de monitoreo, los especialistas del proyecto REDD+ Castañeros, junto con todos socios concesionarios, venimos **identificando** oportunamente las **amenazas** de deforestación y **actuando rápidamente** para **prevenirlas y frenarlas**.

Recuerda: si estás - o conoces a alguien que esté - siendo afectado por cualquier amenaza de deforestación, recurre al equipo del proyecto REDD+ Castañeros para recibir la ayuda necesaria en el proceso.

Boletín mensual **Setiembre 2021**



Talleres Informativos

Iniciamos la segunda ronda de nuestros talleres de capacitación descentralizados, los que se están llevando a cabo los días viernes en los distintos sectores del proyecto REDD+ Castañeros.

Nuestro Taller # 2 "Vigilemos nuestros Bosques", busca **capacitarnos en la correcta vigilancia (monitoreo, control)** de las concesiones castañeras, para **prevenir y frenar cualquier amenaza de deforestación** en la zona del proyecto. Durante estos talleres, el equipo de REDD+ Castañeros viene compartiendo con todos los socios el detalle del funcionamiento y avances del Sistema de Monitoreo, Control y Vigilancia (SMCV) del proyecto. Asimismo, para fortalecer el trabajo de vigilancia, el equipo de REDD+ Castañeros viene capacitando a los socios en el **uso de la Aplicación (App) Notecam** (utilizando un smartphone o teléfono inteligente), la cual permitirá que los socios concesionarios se conviertan en el **primer eslabón del SMCV**.

¿Qué es la App Notecam y cómo funciona?
Esta aplicación permite la **toma de fotografías** acompañadas de sus respectivas **coordenadas UTM** para **tomar evidencia directa en el campo de cualquier amenaza** para sus concesiones. No necesita el uso de señal de internet, basta con activar la ubicación (GPS). Solo se necesitará para poder enviar las imágenes al equipo del proyecto via Whatsapp.

Estas imágenes son las pruebas para **iniciar la denuncia** ante la autoridad forestal y fiscalía ambiental. El equipo técnico y legal te acompañará en todos los procesos ante las autoridades.





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Linderamiento de concesiones

Seguimos avanzando con el proceso de linderamiento para definir y mantener los límites exactos de las concesiones de cada socio.

¿Por qué debemos realizar el proceso de linderamiento?

Para que los socios del proyecto puedan cumplir con su obligación como titulares de concesión (establecida en la Ley Forestal y de Fauna Silvestre #29763) y así no reciban infracciones administrativas.

Para tener las concesiones saneadas y que así puedan ser correctamente inscritas en registros públicos.

¿Qué pasa luego de realizar el proceso de linderamiento?

Se está contemplando una segunda etapa donde se incorpore el trabajo de ordenamiento castañero. Para esto, es crucial que los castañeros cuenten con sus linderos definidos y así poder hacer un mejor ordenamiento; manejando así un área ya demarcada, definida y sin conflictos.

¿Cuánto cuesta el proceso de linderamiento?

Este proceso es totalmente gratuito para el concesionario castañero.

Si eres socio del proyecto y estás interesado en llevar a cabo el beneficio de linderamiento, por favor no dudes en ponerte en contacto con el equipo mediante los números indicados al final del boletín.



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Entrega de beneficios económicos

Además de los diferentes beneficios que REDD+ Castañeros ofrece para sus socios -como asesoría técnica y legal permanente, sistema de monitoreo, proceso de ordenamiento y linderamiento de las concesiones, talleres de capacitación, entre otros- REDD+ Castañeros brinda **beneficios económicos a cada uno de los socios** titulares del proyecto, como resultado de las ventas de créditos de carbono en el año. A diferencia de otros proyectos, REDD+ Castañeros busca generar, además de las actividades necesarias para conservar los bosques, que los beneficios del proyecto lleguen directamente a cada uno de los socios.

A la fecha, los socios han recibido **dos adelantos de utilidades** por la venta de créditos de carbono del año:

S/ 1,500 en mayo a 336 socios y **S/ 3,000** en julio a 341 socios hasta la fecha.

Aún hay socios que no se han comunicado para recibir su beneficio. A ellos, les pedimos se comuniquen con el equipo del proyecto para coordinar la entrega correspondiente.

Luego de hacer el **balance de las ventas** del año 2021, se entregará el **saldo de utilidades** para los socios. El equipo estará comunicándose con todos los socios para mayor detalle sobre las próximas reuniones de entregas de beneficios.



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Nueva identidad de marca REDD+

¡Nos renovamos!

La **identidad de marca** del proyecto REDD+ Castañeros se ha reinventado y está siendo estrenada con el presente boletín.

Creamos la nueva identidad de marca del proyecto REDD+ Castañeros con el objetivo de **refrescamos y consolidamos como grupo**. Sabemos que esto facilitará el reconocimiento y fortalecerá el **compromiso** que todos tenemos con la conservación de nuestros bosques de castaña. Así, reforzamos la **identificación** de todos nuestros socios con las estrategias y actividades que plantea el proyecto.

Además, fortalecemos nuestro **posicionamiento** en el mercado internacional de carbono, como **proyecto de conservación de categoría mundial**.



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Contacto

Daisy Chavez: 951 386 171

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Grupo Facebook: Proyecto REDD+ Castañeros MDD - Bam - Feprocamd

Grupo Whatsapp: contactar con Elmer Racua Quispe: 941 247 962

Oficina: Pasaje Luis Pérez Valera, Mza. 2F lote 4 urb San Luis (al lado de la gerencia forestal, Av universitaria)

Horario de atención: 7am - 3pm, de corrido.