

ABC NORTE REDD PROJECT



Ecológica

Document Prepared By Ecológica Assessoria Ltda.

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Project Proponent(s)	ABC Agropecuária Brasil Norte S.A. - Produção e Exportação (Primary PP) Ecológica Assessoria Ltda.
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GHG Accounting Period	13-September-2017 to 12-September-2047; 30 years lifetime
History of CCB Status	First Validation
Gold Level Criteria	Not applicable
Expected Verification Schedule	Annual

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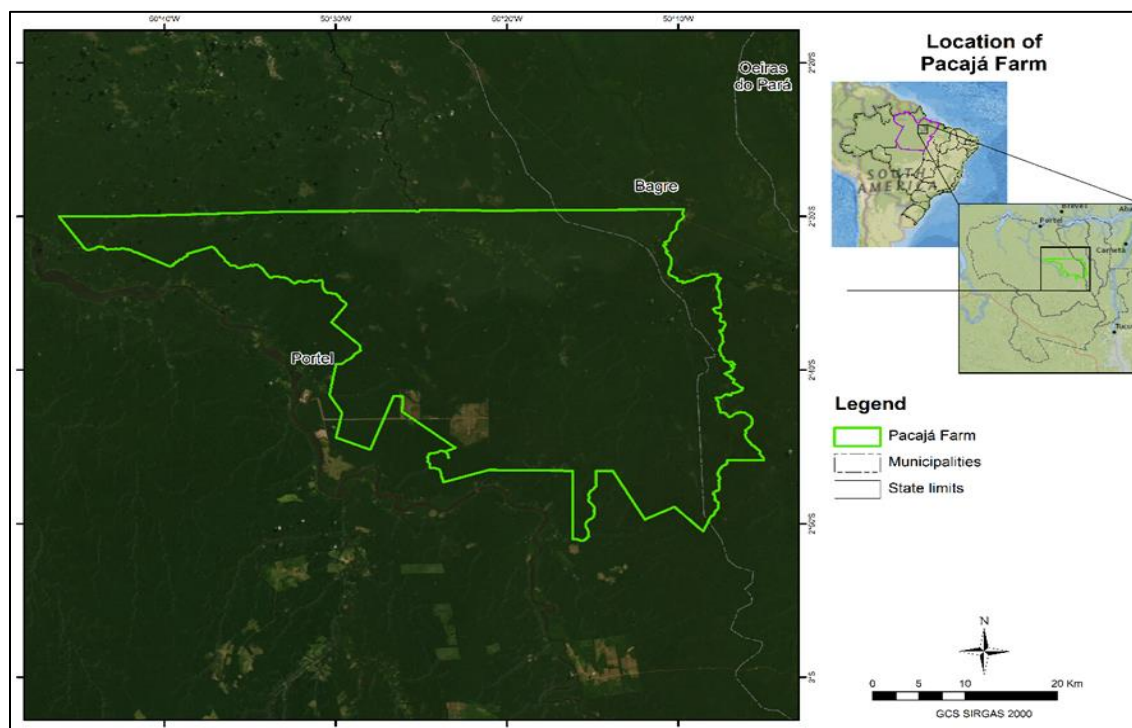
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1 SUMMARY OF PROJECT BENEFITS

In Brazil, 58.39% of its entire 851,029,591.4 ha territory¹ is covered by forests, representing almost 497 million hectares of forest area ² and putting it in second place for nations with most forest area worldwide. Brazil has also been at times the country with the highest levels of deforestation in the world, having lost almost 15 million hectares of its forest area from 2010 to 2020³. The expansion of the agriculture frontier due to cattle ranching, soy farming, timber collection, infrastructure and colonization by subsistence agriculturalists has contributed to this historically high deforestation rate, which is concentrated in the northern portion of the country, where the Amazon Rainforest lies.

In this context, primary objective of the ABC Norte REDD Project is to avoid the unplanned deforestation (AUD) of the 140,432.27 ha project area, consisting of 100% Amazon Rainforest. The project area (Figure 1) is located within a private property named “Fazenda Pacajá”, which is located between the municipalities of Portel and Bagre, in the State of Pará, Northeast Amazon.

Figure 1 - ABC Norte REDD Project: Project area



Source: VCS Standard REDD ABC Norte Project⁴

¹ IBGE - Instituto Brasileiro de Geografia e Estatística. Brazil. 2021. Available at: <<https://www.ibge.gov.br/cidades-e-estados>>. Accessed on: 21 Oct. 2021.

² FAO and UNEP. 2020. The State of the World's Forests 2020. Forests, biodiversity and people. Rome. Available at: <<https://www.fao.org/3/ca8642en/ca8642en.pdf>>. Accessed on: 15 Dec. 2024.

³ FAO - Food and agriculture organization of the United Nations. 2020. Global Forest Resources Assessment 2020: Main report. Rome. Available at: <<https://doi.org/10.4060/ca9825en>>. Accessed on: 15 Dec. 2024.

⁴ Available at: <<https://registry.verra.org/app/projectDetail/VCS/2558>>. Accessed on: 04 Jun. 2023.

The project proponent, ABC Agropecuária Brasil Norte SA Produção e Exportação, leased the area to a forestry company that carried out the sustainable forest management activities during almost 20 years. On 13-September-2017, despite a recurrent negative balance over the last years and an increasing deforestation pressure from external agents, the project proponent decided to maintain the Sustainable Forest Management Plan (SFMP) in Fazenda Pacajá through ceasing the contract with the former forestry company, and the investment in a certified reduced impact logging SFMP with other company (Madeira J&Y) combined with the expansion of social activities to local communities and enhanced surveillance in the project area. Carbon credits revenues are an important income source for making such activities feasible.

In addition, the company also opted to maintain an internal team to take over the management in case there is any problem with the tenant, with a team formed by forest engineers, besides to already having all the monitoring control and verification of compliance with the SFMP. This was initiated to ensure the forestry activity and the forest standing, as it is the company's main activity. ABC Norte, recently integrated by Algar Farming, encompasses Forest Management and the Carbon Market, which is directly related to the ABC Norte REDD Project. Thus, 13-September-2017 was defined as the project start date of the present project activity.

Furthermore, the project is located in the State of Pará, in priority areas for conservation, according to the Ministry of Environment⁵. The main agents of deforestation and degradation in the reference region during the historical period were: cattle ranching, primarily for beef production; and timber harvesters, operating both legally and illegally. Deforestation in the region involves spatially overlapping activities: firstly, the extraction of commercially valuable tree species for sale to timber companies. The final step is the slash-and-burn deforestation of the area for pasturelands and cattle ranching.

The increasing complexity and costs associated with the sustainable operation of the forest, along with other factors such as bureaucratic constraints and fluctuations in certified timber prices, make sustainable forest management less competitive than illegal logging. Therefore, revenue from the sales of Verified Carbon Units (VCUs) is essential for the project activity to compete with more lucrative alternative land use scenarios.

In addition to the project's carbon, a portion of the credits generated will be allocated to improving the socio-environmental conditions of the project area, contributing to the well-being of the communities residing in the project zone based on the demands expressed by the residents themselves and to the maintenance of

⁵ MMA - Ministério do Meio Ambiente. 2007. Áreas prioritárias para conservação, uso sustentável e repartição de benefícios da biodiversidade brasileira. Brazil. Available at: <<https://www.sema.rs.gov.br/upload/arquivos/201707/04142907-areas-proritarias-para-conservacao-da-biodiversidade-ministerio-do-meio-ambiente.pdf>>. Accessed on: 08 Jan. 2024.

biodiversity in native forest areas within the project area through the periodic monitoring of fauna and flora and the impact of the project's activity on the remaining flora.

Moreover, the ABC Norte REDD Project also contributes to the long-term conservation of the region by establishing a barrier against the advancement of deforestation, making it a significant contribution to biodiversity conservation in the Northeastern Amazon and to climate regulation in Brazil and South America.

The present REDD project is estimated to avoid a predicted 82,994.27 ha of deforestation, equating to 30,138,794 tCO₂e in emission reductions over the 30 year of project lifetime (13-September-2017 to 12-September-2047), with an annual average of 1,004,626 tCO₂e.

1.1 Unique Project Benefits

Table 1 - Outcome or impact estimated by the end of Project Lifetime

Outcome or Impact Estimated by the End of Project Lifetime	Section Reference
1) Diversity in production, encompassing: quantitative increase per product already produced by the communities; expanded access to local markets and sales channels; improved logistics efficiency; improvement in product quality; reduction of waste in the production chain; diversification of products produced by communities; effective adoption of new cultivation techniques and improvement in production efficiency.	2.1.8 and 4 - CCB Standard
2) Structured and effective governance in communities, encompassing: strengthening physical structures for community use; effective participation of communities in collective activities; capacity building for community management; development of community-led community initiatives and projects; implementation of deliberations in a representative manner and strengthening community trust.	2.1.8 and 4 - CCB Standard
3) Generate income through alternative sources, encompassing: greater participation of people from the communities in the proposed activities; implementation of techniques that enable the processing of products and increase in the diversity of skills acquired by people in communities.	2.1.8 and 4 - CCB Standard
4) Conservation of local biodiversity, encompassing: greater knowledge about the species existing in the region; implementation of activities that reinforce the conservation of local fauna and flora; monitor the impact of the project on the remaining flora and implementation of actions with low impact on the remaining flora.	2.1.8 and 5 - CCB Standard

Source: Ecologica team based on information gathered during the development of the Theory of Change

1.2 Standardized Benefit Metrics

Table 2 - Standardized Benefit Metrics

Category	Metric	Estimated by the end of Project Lifetime	Section Reference
GHG emission reductions or removals	Net estimated emission removals in the project area, measured against the without-project scenario	Not applicable	-
	Net estimated emission reductions in the project area, measured against the without-project scenario	30,138,794 tCO ₂ e	1.10 - VCS Standard ⁶
Forest ⁷ cover	For REDD ⁸ projects: Estimated number of hectares of reduced forest loss in the project area measured against the without-project scenario	82,994.27 ha	4.1 - VCS Standard
	For ARR ⁹ 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 ¹⁰ practices are expected to occur as a result of project activities, measured against the without-project scenario	Not applicable	-
	Number of hectares of non-forest land in which improved land management practices are expected to occur as a result of project activities, measured against the without-project scenario	Not applicable	-

⁶ Available at: <<https://registry.verra.org/app/projectDetail/VCS/2558>>. Accessed on: 08 Jan. 2024.

⁷ 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*).

⁸ 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*).

⁹ 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*).

¹⁰ Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood and fuelwood (*VCS Program Definitions*).

Category	Metric	Estimated by the end of Project Lifetime	Section Reference
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	Potentially 595 people from the 5 communities	2.1.8 and 4.4.1 - CCB Standard
	Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	Potentially all adult women from the 5 communities	2.1.8 and 4.4.1 - CCB Standard
Employment	Total number of people expected to be employed in project activities, ¹¹ expressed as number of full-time employees ¹²	Not applicable	-
	Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	Not applicable	-
Livelihoods	Total number of people expected to have improved livelihoods ¹³ or income generated as a result of project activities	Potentially 595 people from the 5 communities	2.1.8 and 4.4.1 - CCB Standard
	Number of women expected to have improved livelihoods or income generated as a result of project activities	Potentially all adult women from the 5 communities	2.1.8 and 4.4.1 - CCB Standard
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	Not applicable	-

¹¹ 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.

¹² 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]).

¹³ 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 for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	Not applicable	-
Education	Total number of people for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Not applicable	-
	Number of women and girls for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Not applicable	-
Water	Total number of people who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	-
	Number of women who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	-
Well-being	Total number of community members whose well-being ¹⁴ is expected to improve as a result of project activities	Potentially 595 people from the 5 communities	2.1.8 and 4.4.1 - CCB Standard
	Number of women whose well-being is expected to improve as a result of project activities	Potentially all adult women from the 5 communities	2.1.8 and 4.4.1 - CCB Standard
Biodiversity conservation	Expected change in the number of hectares managed significantly better by the project for	Not applicable	-

¹⁴ 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, ¹⁵ measured against the without-project scenario		
	Expected number of globally Critically Endangered or Endangered species ¹⁶ benefiting from reduced threats as a result of project activities, ¹⁷ measured against the without-project scenario	3 species ¹⁸	5.1.2 - CCB Standard

Source: CCB Standard

It is worth noting that actions related to health and education, for example, have been implemented since the beginning of the project, but under the perspective of the SOCIALCARBON Standard methodology. Thus, the absence of filling out these fields does not imply a lack of implementation of activities to improve these areas and provide benefits to the communities. On the contrary, the non-identification of these aspects as community demands during the development of the Theory of Change - which involved the participation of members from communities located in the project zone - may be evidence of the effectiveness of the project's actions developed so far. More detailed information on this matter can be found in sections "2.1.8 - Project Activities and Theory of Change" and "2.1.9 - Climate, Biodiversity, and Community Benefits Assessment Period".

2 GENERAL

2.1 Project Goals, Design and Long-Term Viability

2.1.1 Project Proponent (G1.1)

Table 3 - Information about ABC Agropecuária Brasil Norte S.A.

Organization name	ABC Agropecuária Brasil Norte S.A. - Produção e Exportação (Primary PP)
Contact person	Luciana Di Paula Assunção Pereira
Title	Executive Forestry Manager

¹⁵ 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.

¹⁶ Per IUCN's Red List of Threatened Species.

¹⁷ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit.

¹⁸ Number of endangered species according to the last fauna monitoring. Threat categories evolve over time which may lead to a species recategorization or added.

Address	Travessa Manoel Evaristo, 449, sala 005-06, Ed. Centro de Negócios Umarizal Office, Umariza. Postal Code: 66.050-290
Telephone	+ 55 34 99992-4484
Email	luciana.pereira@algarfarming.com.br

Source: CCB Standard

Table 4 - Information about Ecológica Assessoria Ltda.

Organization name	Ecológica Assessoria Ltda.
Contact person	Stefano Merlin
Title	CEO
Address	Rua Doutor Bacelar 368, cj. 23, São Paulo – SP. Postal Code: 04026-001
Telephone	+55 (63) 3219-7100
Email	team@ecologica.earth

Source: CCB Standard

2.1.2 Project Objectives (G1.2)

The climate, community, and biodiversity objectives of the ABC Norte REDD Project are as follows:

Climate: conserve 140,432.27 hectares of the Amazon rainforest, avoiding unplanned deforestation (AUD) and the emission of 30,138,794 tCO₂e over the 30-year project credit period. In addition to reducing emissions and avoiding illegal deforestation, the project foresees climate benefits related to monitoring forest coverage, monitoring fire outbreaks, and strengthening partnerships for firefighting plans.

Community: improve the well-being of the communities residing in the project zone, based on the demands expressed by these communities themselves, contemplating the improvement and structuring of local governance, implementation of initiatives aimed at generating income through alternative sources and the expansion of the diversity of products produced in the localities.

Biodiversity: the project benefits biodiversity by maintaining biodiversity in native forest areas within the project area through periodic monitoring of fauna and flora, as well as the monitoring of the project activity impact on the remaining flora. Periodic monitoring contributes to the analysis of species existing in the region, allowing the project to develop conservation actions for these species and carry out activities with low environmental impact, with a focus on endemic, threatened and vulnerable species of the region.

2.1.3 Physical Parameters (G1.3)

Conditions prior to the project initiation as well as general characteristics of the project area and reference region are described below.

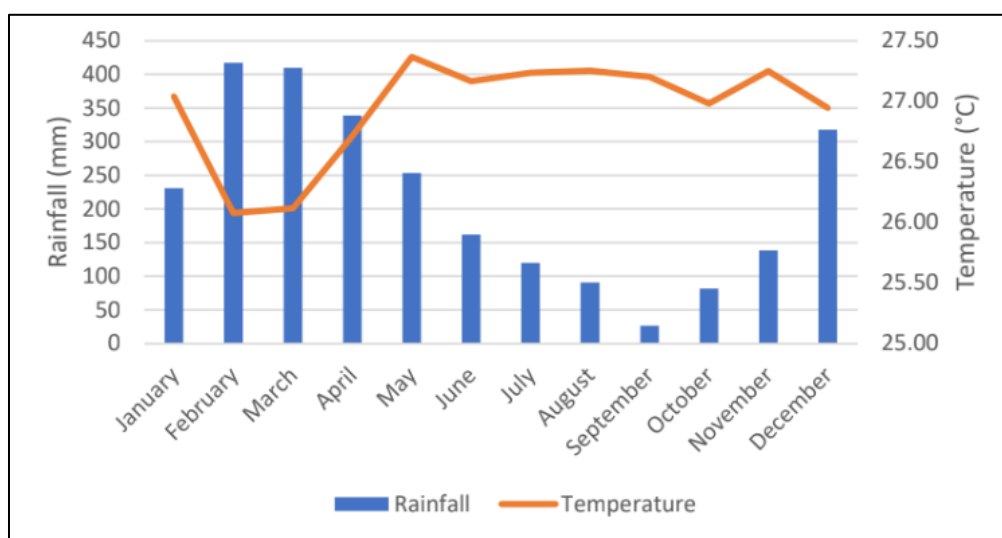
Climate

According to the Köppen classification, the project region has a dominant hot and humid climate, characteristic of Tropical Forests. Furthermore, the region maintains heavy rainfall rates (around 2,400mm of rain), high average air temperature (26°C) and relative humidity above 85%. The average annual temperature varies from 26°C to 27°C, highs between 31°C and 33°C and lows between 21°C and 24°C.

Regarding the pluviometry regime, the region has annual totals between 1800mm and 2800mm and is subject to significant fluctuations. Rainfall is not evenly distributed throughout the year, characterized by a distinct division: a period of heavy rains from January to July, and another with low precipitation from August to December.

The figures below depict the temperature and pluviometry precipitation in 2007 and 2017¹⁹. It is evident that there were no major climate changes between these years. The period between June and November is the driest with the highest temperatures. From January to March, the rainfall reaches 400mm per month, with temperatures ranging between 26°C and 27°C. The figures present data from the municipality of Breves as it is the closest climatic station to the project area.

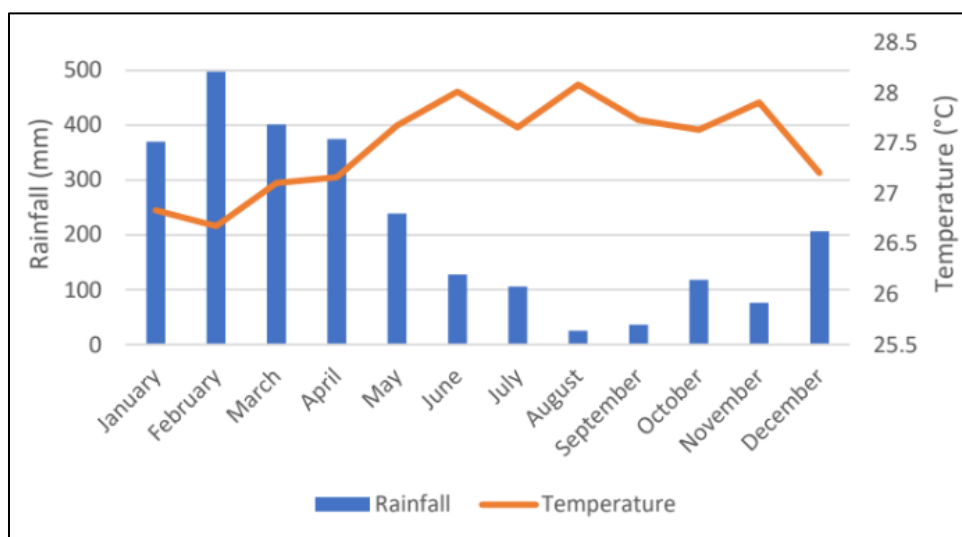
Figure 2 - Climograph from year 2007 in Breves



Source: VCS Project Description ABC Norte REDD Project

¹⁹ Available at: <<https://bdmep.inmet.gov.br/>> for Breves/Pará, conventional station. Accessed on: 17 Jan. 2024.

Figure 3 - Climograph from year 2017 in Breves

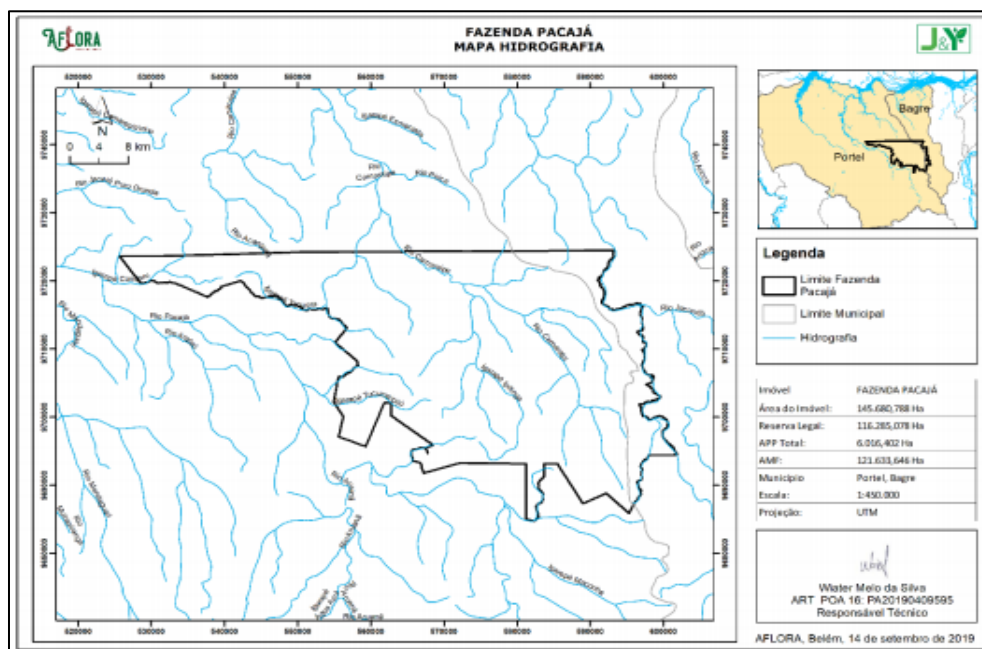


Source: VCS Project Description ABC Norte REDD Project

Hydrography

The municipality of Portel has a hydrography rich in rivers, however, with regard to the use of regional hydrography, the most prominent river is the Pacajá River. According to the description of the RADAM-BRASIL Project of 1974²⁰, the management area is located in the region of the Lower Plateau of the Amazon (Baixo Amazonas), in the Portel hydrographic region - Marajó.

Figure 4 - Hydrography of Fazenda Pacajá



Source: VCS Standard REDD ABC Norte Project (constructed by J&Y)

²⁰ Available at: <<https://www.sgb.gov.br/publique/Geologia/Sensoriamento-Remoto-e-Geofisica/RADAM-D-628.html>>.

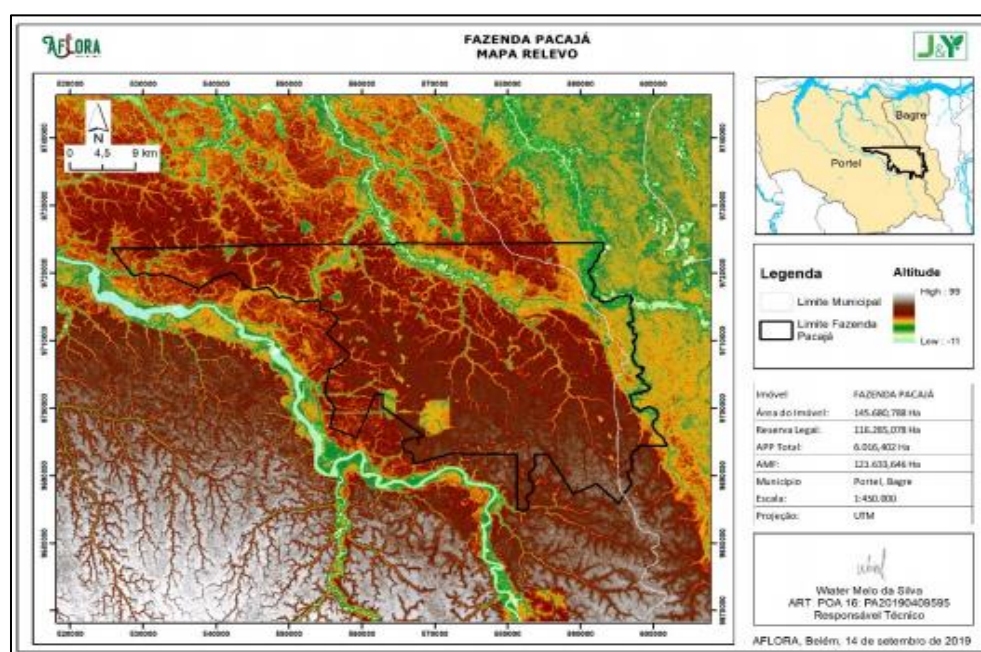
Within the managed forest area, there are the following main rivers: Pacajá Candirú, Raquerá, Camaraipi, Jacundá, Repartimento, Arraia, and Castanha, in addition to many other small streams such as Conderu, Taquera, and Ipitinga.

Between 2007 and 2017 there were no constructions or dams that could alter the supply of water resources in the region or the natural regime of the rivers.

Geology, Topography and Soils

The lower Amazon Plateau is an extensive surface of the Pleistocene Pediplano that borders the riverbanks of the river with the Amazon plain. To the south, there is the peripheral depression of southern Pará, and to the north, the plateau of the Amazon sedimentary basin. In the region in question, the Pediplano is preserved, despite the dense forest cover. Additionally, in Cametá, isolated and depressed areas appear on the left bank of the Tocantins River, subject to floods and covered by undergrowth²¹.

Figure 5 - Relief of Fazenda Pacajá



Source: VCS Standard REDD ABC Norte Project (constructed by J&Y)

The northern region originated in the Quaternary period, with sandy and clayey sediments formed by rivers, or sometimes by the sea. To the south, it originates from the Tertiary period, with sediments primarily consisting of clay, along with sand and layers of sandstone. Furthermore, rocks of the Mesozoic sedimentary cover constitute the Alter do Chão formation of Cretaceous age and represents the most widely distributed

²¹ Available at: <<https://www.sgb.gov.br/publico/Geologia/Sensoriamento-Remoto-e-Geofisica/RADAM-D-628.html>>.

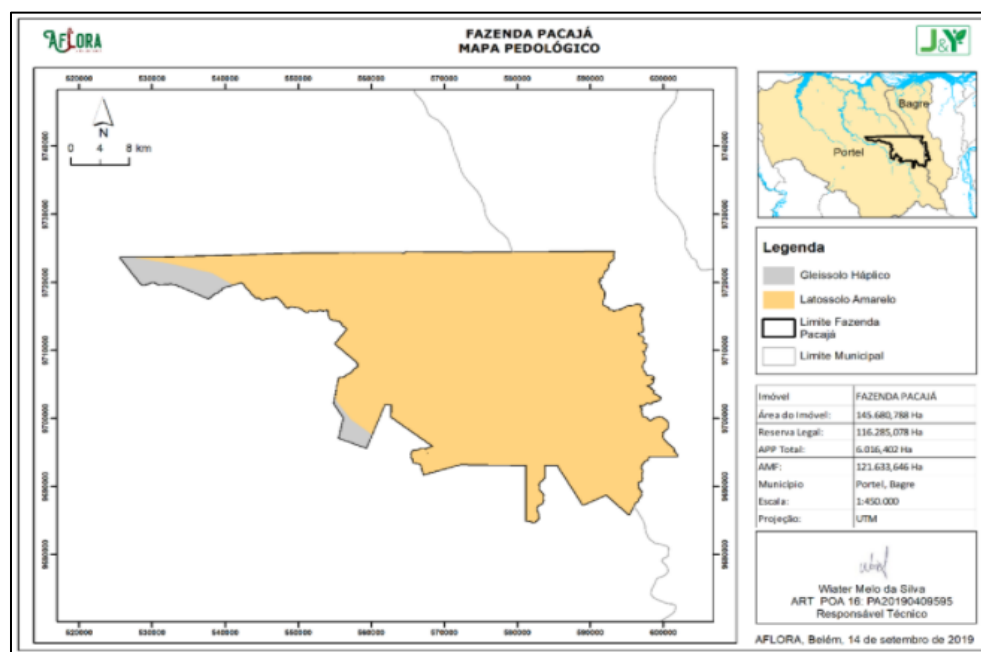
mapping unit in the plateau area of the Amazonian sedimentary basin. This formation supports the reliefs of the lowered plateau of the Amazon in which the area of the plan is inserted.

In accordance with the Brazilian Soil Classification System²², the municipality's soils are composed of the following types:

- Dystrophic Yellow Latosol;
- Dystrophic Yellow Latosol Concretionary;
- Dystrophic Yellow Argisol;
- Hydromorphic Carbic Spodosol;
- Ferrocarbic Spodosol;
- Quartzarenic Neosol.

In the area of Fazenda Pacajá there is a predominance of soil classified as Yellow Latosol, as show in figure below.

Figure 6 - Soil map included in the SFMP



Source: VCS Standard REDD ABC Norte Project (constructed by J&Y)

There were no changes in these conditions between 2007 and 2017. This classification was used in 2007 and it is still valid currently.

²² EMBRAPA - Sistema Brasileiro de Classificação de Solos, 2ª Edição. Brasília, DF. 2006. Available at: <<https://ainfo.cnptia.embrapa.br/digital/bitstream/item/93143/1/sistema-brasileiro-de-classificacao-dos-solos2006.pdf>>. Accessed on: 17 Jan. 2024.

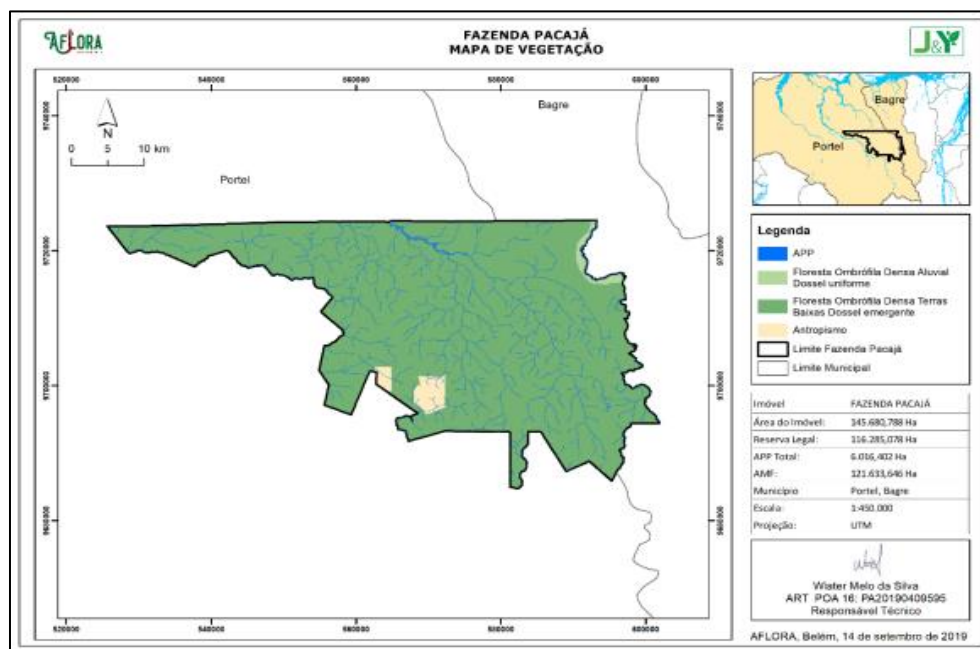
Vegetation Cover

The project area is covered by native Amazonian vegetation, as per internationally accepted definition of forest²³. The Region has several types of vegetation groups, which vary depending on the types of soils and water drainage.

The areas related to native vegetation are the most representative element and occur preferentially along the main hydrographic basins that cross the region. Thus, the regions of Portel and Bagre, comprise two large groups of forest cover, which are:

- Group 1 - Dense Ombrophilous Lowland Forest emergent canopy: formation typical of the Amazon region, is also known as rainy tropical forest. It is characterized by its large trees, usually with one or two species that protrude from the uniform tree layer, between 30m to 50m height. It occurs in almost every area of Fazenda Pacajá.
- Group 2 - Alluvial Dense Ombrophilous Forest uniform canopy: the high floodplains have a greater diversity of species than the low floodplain and igapó. It has a low density of large trees. Most species have rapid growth. It has a good occurrence in the area covered by the Project, bordering rivers and streams.

Figure 7 - Vegetation Cover of the Project Area

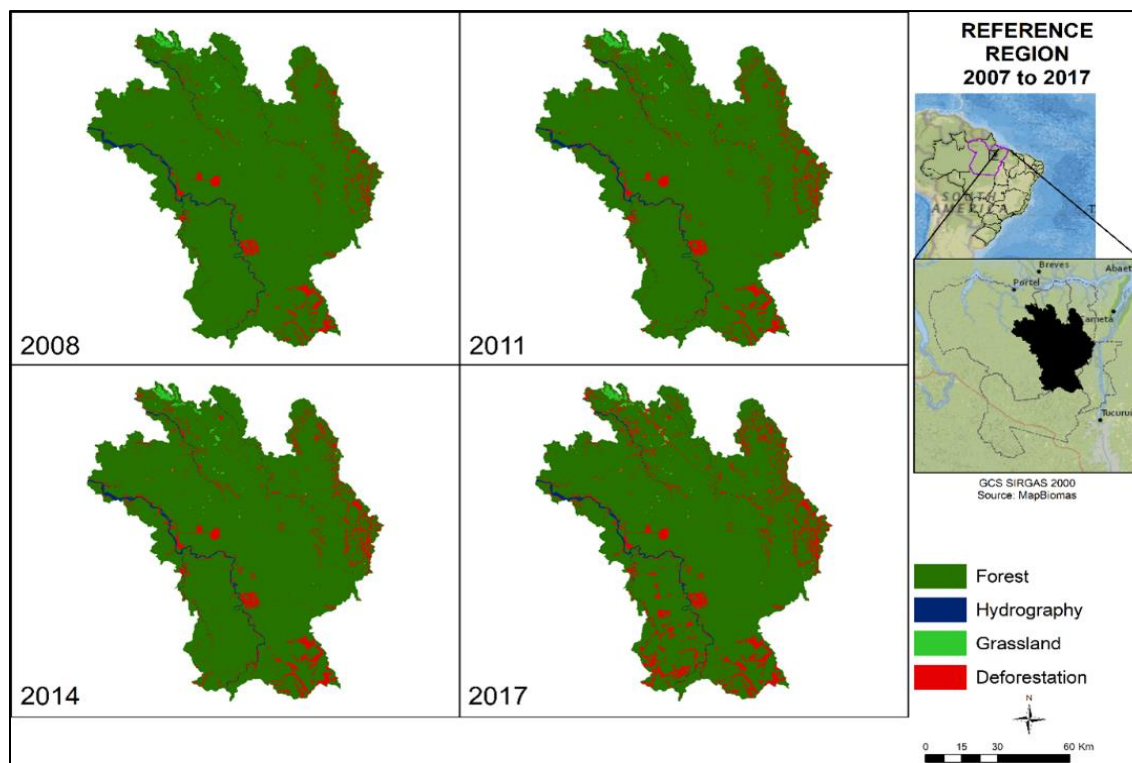


Source: VCS Standard REDD ABC Norte Project (constructed by J&Y)

²³ SILVA, W. M. M. Plano de Manejo Florestal Sustentável: Fazenda Pacajá. Belém: Aflora Engenharia, 2019. 106p. Available in the personal collection of ABC Agropecuária Brasil Norte S.A.

Finally, the figure below presents the comparison of deforestation and vegetation cover in the Reference Region during the historic period.

Figure 8 - Deforestation in the Reference Region between 2007 and 2017



Source: VCS Standard REDD ABC Norte Project

It is possible to observe the advance of deforestation in the years prior to the project start date, indicating the land use change.

2.1.4 Social Parameters (G1.3)

The social parameters highlighted in this context include information related to the municipalities of Portel and Bagre. The inclusion of these two locations is justified by the link to the coverage area and the reference region of the Project, respectively. This approach aims not only to highlight the specific characteristics of the local population in the region in question, but also to provide comparative analyses that support the development of actions more targeted to common territorial demands. For this, information from IBGE (mainly from 2010 and 2022)²⁴ and FAPESPA (2022)²⁵ was used.

²⁴ IBGE - Instituto Brasileiro de Geografia e Estatística. Brazil. 2021. It is worth noting that it was not possible to rely on the same historical period for data collection. This survey was conducted based on the availability of information from the Institute. Available at: <<https://cidades.ibge.gov.br/brasil/panorama>>. Accessed on: 20 Nov. 2023.

²⁵ FAPESPA - Fundação Amazônia de Amparo a Estudos e Pesquisas. Amazon Foundation for the Support of Studies and Research. Brazil. 2022. Available at: <<https://www.fapespa.pa.gov.br/>>. Accessed on: 19 Nov. 2023.

Both municipalities, located in the State of Pará, present significant distinctions in their geographical, historical and cultural characteristics. Portel, with a more extensive territorial area of 25,384.960 km², corresponding to 2.04% of the territory of Pará, belongs to the Marajó integration region. In the geographical division, it integrates the Marajó mesoregion and Portel microregion, with geographic coordinates of latitude 01°56'08" south and 50°49'16" west. Portel's history dates back to an indigenous village reorganized by Father Antônio Vieira in 1653, and its elevation to a village occurred in 1758, officially becoming a municipality on 24-January-1758, according to Law N°. 110. The restoration as a village took place in 1845, with the official reinstallation on 7-January of the same year. The city went through administrative oscillations, including annexation to other municipalities and the creation of the municipality of Pacajá in 1988. The feast of the patron saint Nossa Senhora da Luz is a remarkable tradition, and the local handicrafts stand out for the making of pieces in splint and clay, such as panniers, vases and bowls.

On the other hand, Bagre covers a territorial area of 4,397.321 km², corresponding to 0.35% of the total in Pará. Located in the integration region of Marajó, it integrates the Marajó mesoregion and Portel microregion, with specific geographic coordinates of latitude 01°53'54" south and 50°12'13" east.

Its history dates back to the Proclamation of the Republic and it was officially elevated to a municipality on 11-November-1891, according to Decree N°. 210. Over the years, Bagre has maintained relations with several municipalities, such as Portel, Curralinho and Oeiras. Of particular note is the feast of Santa Maria, patron saint of the municipality, celebrated with a river candle, a festival, a litany and a dance party. The Town Hall maintains cultural facilities, such as the Library and the House of Culture.

When comparing these two municipalities, one observes not only differences in their territorial areas and historical trajectories, but also in the cultural diversity manifested in their religious festivities and handicraft practices. Bagre, with its smaller area, has in Santa Maria its remarkable cultural expression, while Portel, with a longer history, reveals traditions rooted in the feast of the patron saint and in the making of handicrafts in splint and clay. Portel's administrative oscillations, recorded in specific laws, add layers to the understanding of his evolution. These elements thus contribute to a more comprehensive analysis of the municipalities.

Below is some information regarding aspects that, together, contribute to the understanding of both municipalities contemplated in this study.

Social Organization

In Portel, a municipality that stands out for its vast territorial extension, the total population is 25,384 inhabitants. During the period analyzed, the population density ranged between 2.38 and 2.51 inhabitants per km² (see Table 5), indicating a low population concentration. The more dispersed distribution of the population over time suggests that the communities in Portel are widely distributed, characterizing a demographic dynamic that is aligned with the extensive geography of the municipality.

In contrast to Portel, Bagre has a total population of 4,397. The population density, in turn, varies from 6.78 to 7.27 inhabitants per km² over the period analyzed. These numbers point to a higher population concentration compared to Portel, suggesting that Bagre has a greater agglomeration of people per unit area.

Table 5 - Number of inhabitants and population density of the municipalities of Portel and Bagre

Year	Portel		Bagre	
	Population (inhab.)	Density (inhab./km ²)	Population (inhab.)	Density (inhab./km ²)
2017	60,322	2.38	29,808	6.78
2018	31,126	2.41	30,009	6.82
2019	62,043	2.44	30,673	6.98
2020	62,945	2.48	31,325	7.12
2021	63,831	2.51	31,967	7.27
2022	62,503	2.46	31,892	7.25

Source: created by the authors

Gender

The demographic comparison between the municipalities of Portel and Bagre, considering age groups and genders, reveals interesting nuances about the population dynamics in both locations, as evidenced in Table 6.

Table 6 - Demographics of the population of Portel and Bagre by gender and age

Age group	2022			
	Portel		Bagre	
	Gender Male	Gender Female	Gender Male	Gender Female
0 to 4 years	3,697	3,569	1,940	2,094
05 to 09 years	3,510	3,298	2,198	2,243
10 to 14 years	3,661	3,450	1,857	1,860
15 to 29 years old	10,028	9,348	4,978	4,759
30 to 49 years old	7,739	6,691	3,595	3,217

50 years to 59 years	1,811	1,626	796	737
60 years or older	2,181	1,894	889	729
Total	32,627	29,876	16,253	15,639

Source: created by the authors

In Portel, the most expressive age group for both men and women is 15 to 29 years old, indicating a significant presence of young adults. This demographic suggests a dynamic landscape, which may have implications for both the educational context and the potential workforce.

In Bagre, the demographic dynamics differ in some respects. The age group of 15 to 29 years also stands out, indicating a significant concentration of young adults, although the total population is smaller compared to Portel.

Both municipalities share the relevance of the economically active population between 30 and 49 years old, pointing to a demographic profile that directly influences local economic dynamics. Understanding these demographic patterns is essential to guide public policies and investments that meet the specific needs of each community, contributing to the development of the municipality.

Race and ethnicity

Regarding the racial composition in the municipalities of Portel and Bagre, significant nuances are revealed that deserve attention, considering the self-identification, ethnic diversity and historical invisibility of indigenous communities (see Table 7).

Table 7 - Race/Ethnicity of the population of Portel and Bagre

Race or Ethnicity	2010	
	Portel	Bagre
White	8,365	4,456
Black	3,437	1,994
Yellow	184	202
Brown	40,136	17,212
Indigenous	50	-

Source: created by the authors

In Portel, there is an expressive presence of the brown population (40,136), while the white (8,365), black (3,437), yellow (184) and indigenous (50) categories show a diversity that reflects possible historical

influences and migrations. However, it is crucial to ponder racial self-identification, especially in the black group, where underestimation can occur, given the complexity of racial identities. The Bagre data suggest the same pattern. Notably, the absence of records of the indigenous population raises concerns about the historical erasure of these communities.

Both municipalities share challenges and opportunities related to racial self-identification, emphasizing the need for inclusive policies and recognition of the ethnic diversities present. Special attention to the indigenous population, historically invisible, is crucial to promote social justice and respect for ethnic plurality, contributing to the construction of more inclusive communities that are aware of their cultural roots.

Religion

Regarding the data on religion in the two municipalities, similar patterns can be observed (see Table 8).

Table 8 - Main religions present in the municipality of Portel and Bagre

Religion	2010	
	Portel	Bagre
Catholic Apostolic Rome	31,574	12,633
Evangelical	15,567	8,235
Other Christian Religiosities	843	326
Jehovah's Witnesses	139	16
No religion	3,821	2,612
Not determined	217	37

Source: created by the authors

In Portel, the Roman Catholic Church predominates in a significant way, with 31,574 followers. Evangelical denominations also have a strong presence, totaling 15,567 adherents, which demonstrates the remarkable coexistence of religious traditions in the region. Other expressions of Christianity have 843 followers, while Jehovah's Witnesses have 139 followers. It is also interesting to note a considerable portion of people who declare that they do not have a specific religious affiliation (3,821). In Bagre, although the Roman Catholic Church is also predominant, with 12,633 followers, its presence is smaller compared to Portel. Evangelical denominations stand out in an expressive way, gathering 8,235 adherents, which represents a significant representation in the community. Other expressions of Christianity have 326 followers, while Jehovah's Witnesses have 16 followers. Similar to Portel, Bagre also has a sizable portion of people without a specific religious affiliation (2,612).

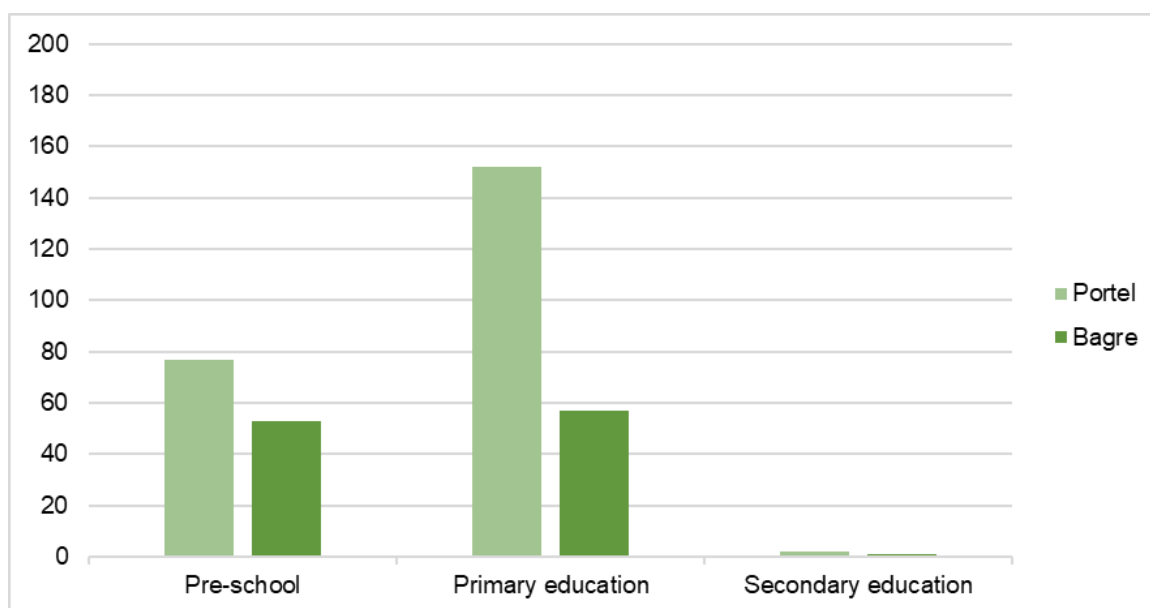
The comparison reveals interesting nuances, indicating that while both communities share a strong Catholic presence, Portel stands out for the magnitude of his followers of that faith. On the other hand, Bagre presents a significant representation of evangelical denominations in relation to its population. This deeper understanding of religious dynamics is crucial to guide local strategies and promote respect for cultural and religious diversity in each municipality.

Education

An analysis comparing the educational data of Bagre and Portel highlights contrasts in terms of literacy and school dropout rates. In Bagre, according to 2010 IBGE data, 23.98% of individuals aged 15 or older are illiterate. The school dropout rate, according to 2021 INEP data, is significant, reaching 6.9% in elementary school and rising to a substantial 13.30% in high school. In Portel, on the other hand, the data indicates a higher illiteracy rate, with 30.10% of individuals aged 15 or older, according to 2010 IBGE data. However, it is noteworthy that the school dropout rates are considerably lower when compared to Bagre. In elementary school, the dropout rate is minimal, registering only 0.1%, and in high school, there are no records of dropout.

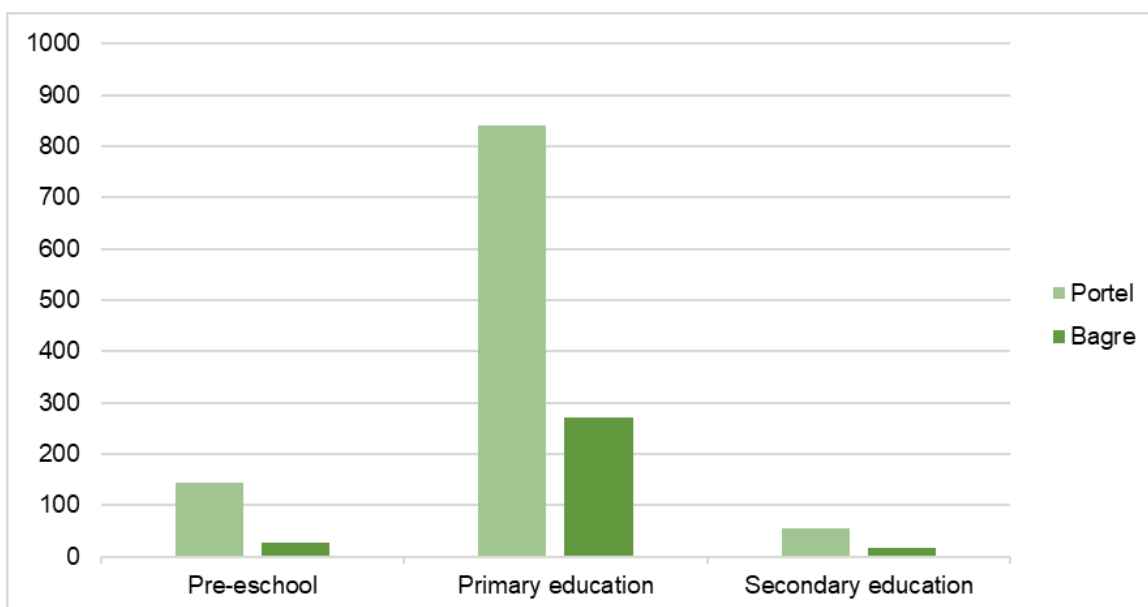
In Portel, for the year 2021, there are 77 pre-school education establishments, 152 for primary education and only 2 for secondary education. As far as pre-school is concerned, there are 144 teachers available, 841 for primary education and 56 for secondary education. In Bagre, 53 pre-school education establishments were identified, 57 for primary education and only 1 for secondary education. With regard to pre-school, there are 26 teachers available, 270 for primary education and 18 for secondary education (see Graphs 1 and 2).

Graph 1 - Number of educational establishments in the municipality of Portel and Bagre



Source: created by the authors

Graph 2 - Number of teachers by educational level in the municipalities of Portel and Bagre



Source: created by the authors

It is relevant to note that, despite educational disparities, the proportion of the population that completed high school is relatively close, with 6.9% in Portel and 6.2% in Bagre. However, a more significant discrepancy arises in the percentage of the population with higher education, being only 1.9% in Portel and 0.6% in Bagre. These figures indicate that access to higher education is a considerable challenge in both locations, but more pronounced in Bagre.

In addition, the analysis of the Basic Education Development Index (2021)²⁶ in the initial grades reveals that in Portel, the grade is 3.2, while in Bagre it is slightly higher, reaching 3.8. In the final series, the disparity becomes more pronounced, with Portel recording a score of 2.8 and Bagre reaching 4.2. This difference highlights specific challenges in the quality of education, especially in the final stages, which require a more in-depth analysis to guide educational improvement strategies in both municipalities.

Health

In terms of health services, the region has a total of 47 establishments registered in the CNES - National Registry of Health Establishments of Brazil²⁷ - for the year 2021. Among these, the Basic Health Units²⁸ and health centers stand out, totaling 12 in Portel and 6 in Bagre. Regarding the contingent of professionals, the data indicate the presence of 226 in Portel and 127 in Bagre. This distribution results in an average of 3

²⁶ It was created in 2007 by the National Institute of Educational Studies and Research Anísio Teixeira (INEP) and aims to measure the quality of national learning and establish goals for improving education. It is an indicator with a scale ranging from zero to ten.

²⁷ MS - Ministério da Saúde. CNES. ElastiCNES: 2021 - Overview Panel. Brazil. 2021. Available at: <<https://elasticnes.saude.gov.br/geral>>. Accessed on: 22 Nov. 2023.

²⁸ It is a primary healthcare unit responsible for providing basic, preventive, and curative medical care to the population, with a healthcare team that includes doctors, nurses, nursing technicians, dentists, among others.

health professionals for every 1000 inhabitants for the first municipality, while in the second the average is 4 professionals for the same population contingent.

These professionals encompass several specialties, including physicians, dentists, nurses, physiotherapists, speech therapists, nutritionists, pharmacists, social workers, psychologists, nursing assistants and nursing technicians, as well as community health agents. It is important to emphasize that these professionals play crucial roles in primary health care, playing a fundamental role in the prevention of diseases and illnesses, especially for the population in vulnerable situations.

Access to Water and Energy

In Portel, among the population living in permanent private households (9,606), 62.51% have access to piped water from various sources, including the general network (2,052 households) and wells or springs (3,953 households). In Bagre, the reality is different. Of the population living in private households (3,711), 43.17% have access to piped water from various sources, including the general network (1,475 households) and wells or springs (127 households).

As for access to electricity, 50% of the population in the permanent private households of Portel were served, according to data from FAPESPA (2022) referring to the 2010 Census. In the case of Bagre, this service covers 40.2% of the population in households. This discrepancy indicates significant challenges in the provision of basic services in Bagre, which may have direct implications for quality of life and local development.

Economic Activities

In both Portel and Bagre, the economic base is based on agricultural activities, with a focus on cassava cultivation, livestock, timber extraction and açaí harvesting. Cassava stands out as one of the main sources of food, covering a total area of 18,800 hectares in the region in 2020, with Portel leading the participation, contributing 16,500 hectares of harvested area.

Beef cattle represented a significant contingent in the region, with more than 130 thousand head in 2021, with approximately 92% in Portel and 8% in Bagre. Between 2017 and 2021, there was a notable increase in the number of chicken herds (43,130 animals), indicating a change in agricultural practices, replacing beef production with poultry, as evidenced in Table 9.

Table 9 - Number of cattle in Portel and Bagre in 2017 and 2021

Herds	Cattle					
	2017			2021		
	Portel	Bagre	Total	Portel	Bagre	Total
Bovine	15,900	1,596	17,496	38,470	914	39,384

Equine	167	22	189	600	9	609
Buffalo	1,105	490	1,595	940	329	1,269
Swine	7,020	6,600	13,620	6,140	5,300	11,440
Goat	148	64	212	78	15	93
Sheep	124	-	124	240	-	240
Chicken	35,100	1,420	36,520	75,500	4,150	79,650
Milked cows	702	102	804	1,830	80	1,910

Source: created by the authors

Regarding the extraction of food products, açaí stands out, with a total production of around 1,080 tons in 2017, increasing to 2,310 tons in 2021. Brazil nuts had a slight reduction in production, from 281 to 229 tons. In the timber sector, sawn timber production decreased significantly, totaling 1,009,175 m³ and 377,479 m³ in 2017 and 2021, respectively (a reduction of approximately 62%). Portel is the municipality with the greatest contribution to the production of these plant extraction products.

Table 10 - Plant extraction of Portel and Bagre in the years 2017 and 2021

Products	Production quantity (tonnes)					
	2017			2021		
	Portel	Bagre	Total	Portel	Bagre	Total
Acai Berry	900	180	1,080	1,300	240	2,310
Brazil Nuts	270	11	281	210	8	229
Wood (m ³) ²⁹	993,775	15,400	1,009,175	366,629	10,850	377,479

Source: created by the authors

Income

In 2021, the average monthly wage in Portel reached 2.2 minimum wages, representing a proportion of employed persons in relation to the total population of 7.95%. When considering households with a monthly income of up to half a minimum wage per person, it can be seen that 51% of the population falls into this category, placing Portel in 63rd place among 144 cities in the state. In Bagre, in the same year, the average monthly wage was 1.4 minimum wages, with a proportion of employed persons in relation to the total population of 2.61%. Analyzing the households with a monthly income of up to half a minimum wage per person, it was found that 52.9% of the population was in this condition, placing Bagre in 45th place among

²⁹ It includes charcoal, firewood, and raw charcoal.

the 144 cities in the state. Thus, it is evident that economic vulnerability is a challenge shared by both locations.

With regard to economic indicators, the GDP per capita in Portel reaches R\$ 13,985.99, in contrast to the lower value of R\$ 7,433.19 in Bagre. In relation to the Gini index³⁰, Portel recorded a value of 0.40 in 2003, indicating significant income inequality in the region. In Bagre, the value of this indicator was 0.37 in the same year, suggesting a smaller disparity between the incomes of the different social strata. The discrepancy in the Gini indices between Portel and Bagre reveals significant differences in the pattern of income distribution, pointing to the need for specific approaches to face the different socioeconomic challenges faced by each municipality.

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

The ABC Norte REDD project is located in a private property named “Fazenda Pacajá” covered almost in its totality by native vegetation, totaling 145,680.7882 ha. It is located between the municipalities of Portel and Bagre, in the State of Pará, Northeast Amazon.

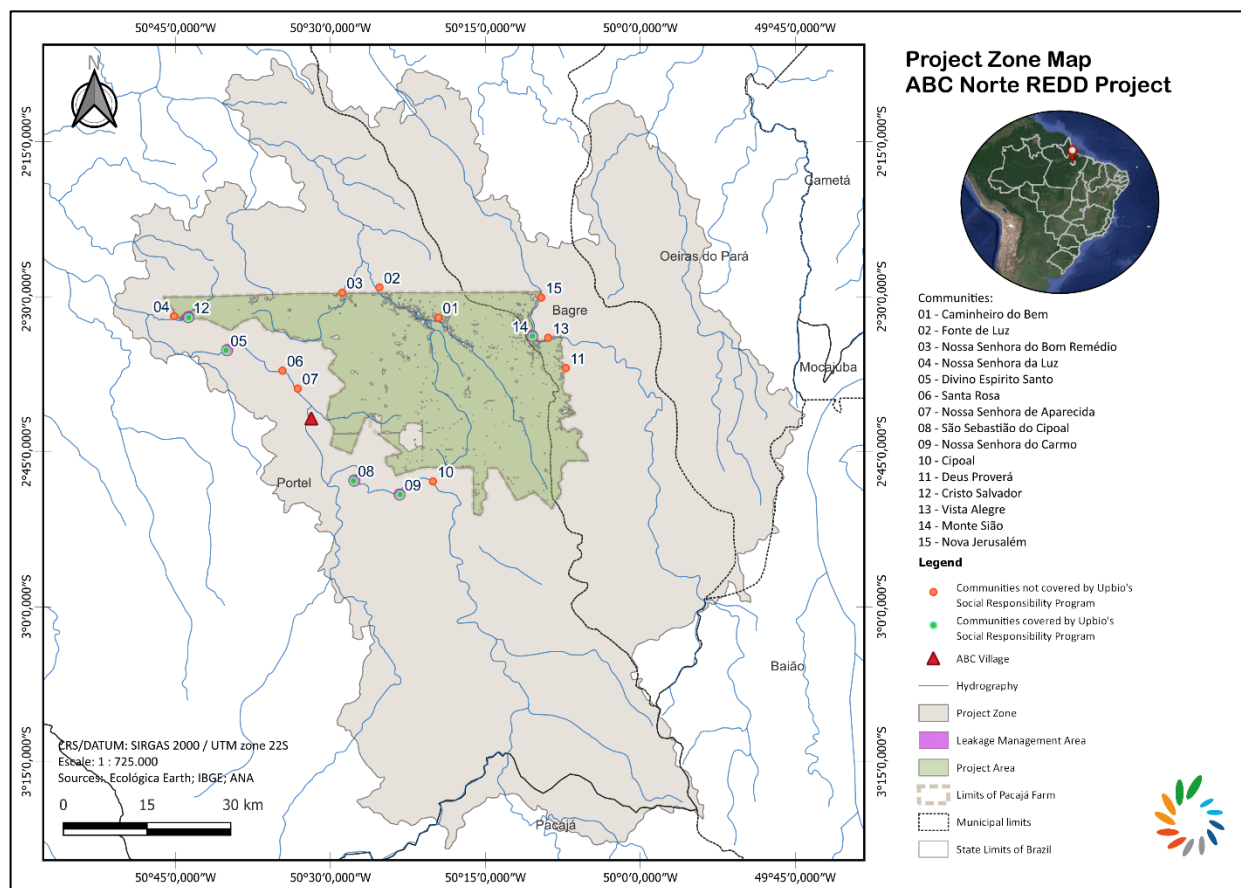
In order to satisfy the definitions of the methodology, the project area may only include areas composed of “forest”³¹ for a minimum of ten years prior to the project start date. Therefore, satellite images between 2007 and 2017, were analyzed and classified. The areas within the property that were defined as forest in 2017 and in 2007 were separated and utilized to compose the project area. In addition, some non-forest areas were also excluded, such as rivers, rocks, and non-forest vegetation.

Furthermore, the methodology used to define the Project Area, Reference Region, Leakage Belt, and Leakage Management Area (LMA) that underpinned the construction of the map below can be accessed in section “3.3 - Project Boundary” of the VCS PD.

³⁰ The Gini Index is a tool used to measure the degree of income concentration within a specific group. It highlights the difference between the incomes of the poorest and wealthiest members. Numerically, it ranges from zero to one, where zero represents a situation of complete equality, meaning everyone has the same income, and one is at the opposite extreme, signifying that a single individual holds all the wealth.

³¹ Brazil adopts FAO forest definition: “land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ”. Available at: <<http://www.fao.org/3/x6896e/x6896e0e.htm>>. Accessed on: 08 Nov. 2023.

Figure 9 - Project Zone Map



Source: created by the authors

2.1.6 Stakeholder Identification (G1.5)

Stakeholders were identified through research and previous visits in the project region. Therefore, stakeholders were identified considering the Reference Region and Project Area communities, government agencies and protection and research entities in the Pará State and the Amazon biome, in addition to NGOs. Sustainable development and Rural development agencies were also contacted. It is important to highlight that, despite the project start date is September-2017, the first formal consultation on the carbon project was held in 2021.

However, one of the main activities carried out by ABC Norte, related to the development of the REDD project, was the rapprochement with the communities and carrying out diagnoses, both for the evaluation of suggestions and comments on the conduct of the management plan, social management and illegal activities in the surroundings of Fazenda Pacajá, as well as to understand the needs of the families. These consultations and technical visits started in 2017 also influenced the delimitation of stakeholders.

This approach is implemented through the Social Responsibility Program (PRS, Portuguese acronym) and is conducted by Upbio Soluções Ambientais. The program aims to promote local development and improve

the quality of life in neighboring communities. Its actions seek to stimulate productive activities, provide information for the sustainable use of natural resources, and strengthen the communities' relationship with the environment, encompassing social, economic, and environmental dimensions.

Developed in collaboration with residents from communities such as Monte Sião, Nossa Senhora do Carmo, São Sebastião do Cipoal, Divino Espírito Santo and Cristo Salvador, the activities include participatory methods such as oral presentations, field visits, informative lectures, and practical exercises. The central objective is to contribute to a more sustainable local development, aiming to improve the residents' quality of life. The program has three intervention axes:

- Promotion of sustainable productive activity: boosting the production of family farming to generate income and promote healthy eating habits.
- Educational and informative actions: raising awareness among community residents by providing information and promoting socioenvironmental development.
- Social assistance to communities: promoting actions for health care, citizenship, and improvement of the quality of life.

In this way, dimensions related to the PRS will encompass, to a greater or lesser extent, the highlighted axes and initiatives above. Therefore, for the REDD Project consultation, the main stakeholders of this project are:

Government agency and/or representatives - Direct public administration (State and Municipality)

- Prefeitura de Portel;
- Secretaria Estadual de Meio ambiente e Sustentabilidade;
- Secretaria Municipal de Meio Ambiente - Portel;
- Secretaria de Educação de Portel;
- ITERPA - Instituto de Terras do Pará;
- Programa Municípios Verdes;
- CEPAM - Centro de Estudos e Pesquisas de Administração Municipal.

Public Administration Company (Autarchy)

- INCRA - Instituto Nacional de Colonização e Reforma Agrária;
- IBAMA - Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais (IBAMA);
- ICMBio - Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio);
- SFB - Serviço Florestal Brasileiro.

Private companies

- NBX Serviços Florestais;
- AMPLA Consultoria Financeira;

- M&D Advogados;
- Sysflor Certificações Florestais;
- Upbio;
- Madeireira J&Y;
- JPR;
- Grupo Martins.

Communities involved in the PRS of Pacajá Farm in partnership with Upbio

- São Sebastião do Cipoal Community;
- Nossa Senhora do Carmo Community;
- Divino Espírito Santo Community;
- Cristo Salvador Community;
- Monte Sião Community³².

Communities to be involved in the PRS of Pacajá Farm in partnership with Upbio

- ABC Norte employees - Vila ABC;
- Caminheiro do Bem;
- Fonte Luz;
- Nossa Senhora do Bom Remédio;
- Nossa Senhora da Luz;
- Santa Rosa;
- Nossa Senhora de Aparecida;
- Cipoal;
- Deus Proverá;
- Vista Alegre;
- Nova Jerusalém.

Universities and education institutes

- Universidade Federal Rural da Amazônia - UFRA.

Non-governmental Organizations (NGOs)

- WWF Brasil;
- Instituto Florestal Tropical - IFT.

³² Until the last SOCIALCARBON check (monitoring report: 01-January-2021 to 31-March-2023), the community in question was also referred to as Santa Terezinha. However, during the visit for the development of the Theory of Change on 07-December-2023, the community was no longer identified as Santa Terezinha and was instead referred to as Monte Sião.

It is important to note that, although there are 16 communities in the vicinity and area of the Farm, data collection did not cover all of them. Additionally, Vila ABC, formed by the workers of the Farm, was not included in the socioeconomic diagnosis (2023), despite having a more developed infrastructure compared to other communities.

Among the plans of Algar Farming and Upbio is the expansion of their activities to new locations in future monitoring, with the aim of ensuring that their actions positively impact an increasing number of communities within the PRS. It is relevant to mention that this limitation stems from conflicts that some communities had with the former company responsible for the farm's Sustainable Forest Management Plan (PMFS).

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

Table 11 - Stakeholder description

Stakeholder	Rights, Interest and Overall Relevance to the Project
Government agency and/or representatives - Direct public administration (State and Municipality)	It is believed that the carbon project is of interest to the public sector, as it can assist the state and municipalities in achieving their goals for mitigating greenhouse gas emissions and combating illegal deforestation. Additionally, are crucial for the development of activities throughout the project.
Public Administration Company (Autarchy)	These are agencies related to the project's activities. INCRA is the institute responsible for the regularization of all rural properties and public lands owned by the Union, and it can also assist in verifying the ownership of properties included in the project. ICMBio, on the other hand, is an institution linked to the Ministry of the Environment that works in the administration and conservation of protected areas. Since REDD projects are focused on conservation, communication with this stakeholder is crucial.
Private organizations	It is believed that the carbon project is of interest to private organizations both because it can impact and be impacted by their activities. Moreover, these companies may contribute to and/or facilitate the development of certain project activities, always aiming for the generation of co-benefits for the communities.
Universities and education institutes	It is believed that the involvement of educational and research institutions throughout the project is crucial in the pursuit of sustainable technological innovations, as well as in the development of monitoring of fauna and flora, training of employees and communities, carbon stock research etc.

Communities involved in the PRS of Pacajá Farm in partnership with Upbio	The people living in the communities affected by the project's activities are crucial stakeholders as they provide the real perspective on the main challenges that may arise with the project's development. Moreover, it is from them that the indicators can be defined, aiding in the construction of the monitoring plan for the co-benefits generated.
Communities to be involved in the PRS of Pacajá Farm in partnership with Upbio	The people living in the communities located in the project zone but are not considered in the PRS of Pacajá Farm in partnership with Upbio yet. These communities will be included in the PRS throughout the project life cycle.
Non-governmental Organizations (NGOs)	NGOs, especially because they do not have ties to public government entities, can bring a perspective to the project's activities that considers the needs of the communities, both from a social, environmental, and economic standpoint. Communication is essential in providing transparency to the project's activities. In addition, they are key agents for the development of partnerships to strengthen the project activity and enhance socio-environmental co-benefit.

Source: CCB Standard

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

The Theory of Change is considered an approach that describes how a program generates specific long-term outcomes through a causal sequence of intermediate outputs³³. This tool was utilized in the ABC Norte REDD Project with the aim of contributing positively to the continuous improvement of the well-being of the involved communities, the perpetuity of biodiversity, and the mitigation of climate change.

Furthermore, the methodology will allow for the ongoing analysis of results through indicators, providing a basis for potential adjustments focused on meeting the demands of local communities and effecting positive changes to enhance the quality of life for people and the preservation of biodiversity. The socioenvironmental impacts generated by the project will be continuously assessed through a monitoring plan in order to identify ways to enhance the actions, initiatives, and practices adopted by the organization that lead to effective and positive transformations throughout the project's life cycle.

It's worth noting that the tool is developed and applied in collaboration with the project's stakeholders precisely to establish good communication and relationships between the proponents and the communities, ensuring alignment with the project and the actions that will be carried out within the local communities. The

³³ BREUER, E. et al. Using theory of change to design and evaluate public health interventions: a systematic review. Implementation Sci 11, 63 (2015). Available at: <<https://doi.org/10.1186/s13012-016-0422-6>>. Accessed on: 17 Jan. 2024.

conservation of the Amazon Rainforest and the achievement of other goals can only be attained through the engagement of all stakeholders, coupled with effective monitoring of the forested area.

The ABC Norte REDD project aims to contribute not only to the improvement of the quality of life of the communities populations living around the project area and located inside the project zone but also to try to decrease the collaboration of these communities to illegal deforestation in the region. For this purpose, the Theory of Change of the ABC Norte REDD Project was developed based on a participative methodology proposed by the Social and Biodiversity Impact Assessment (SBIA) Manual for REDD Projects³⁴.

The main focus of the methodology presented on the SBIA material is to do a participatory process to raise, from the perspective of the stakeholders somehow involved in the project, their desires, needs, and demands that are possible for the carbon project to improve the quality of life.

The methodology proposed by the SBIA material is composed of seven main topics: 1. study of initial conditions and identification of stakeholders; 2. social and biodiversity projections “without project” (baseline); 3. project design and theory of change; 4. negative impact, risks, and mitigation measures; 5. definition of indicators; 6. development of the monitoring plan, and 7. data collection, analysis, and reporting.

The SBIA points out that, ideally, up to topic four should be done together with community representatives and representatives of other stakeholders’ groups. From topic five onwards, the project’s technical team can conduct, based on the information collected through the dynamics made over the previous topics.

Owing to the complexity of the SBIA methodology and considering the reality of the Amazon communities, the Ecologica socioenvironmental team adjusted the methodology proposed, so it could be possible to be developed in a participative form.

The communities located in the project zone of the ABC Norte REDD Project lives in a considerable distance of the Pacajá Farm (the main office of the Farm where the carbon project is located), about 2 to 4 hours by car and, in most cases, by boat. For this reason, the Ecologica’s technical team, with the support of Upbio (a local consultant responsible for the Project of Socioenvironmental Responsibility of the Pacajá Farm) and the project proponent carried out a visit between 4-December-2023 to 10-December-2023 to apply with the communities the activities proposed by the SBIA methodology.

The dynamic happened during the end-of-year social action promoted by Fazenda Pacajá and Upbio within Vila ABC for all communities in the project zone, including those not covered by Upbio’s PRS (see section “2.1.6 - Stakeholder Identification”), on 7-December-2023, between 8am to 3pm. This action happened inside the Vila ABC, in partnership with Portel city hall, health secretary, J&Y and Algar Farming. During the

³⁴ SBIA - Social and Biodiversity Impact Assessment Manual for REDD Projects Part 1 - Core Guidance for Project Proponents, September 2011. 2011. Available at: <<https://verra.org/wp-content/uploads/social-and-biodiversity-impact-assessment-sbia-manual-for-redd-projects-part-1.pdf>>. Accessed on: 03 Dec. 2023.

action, it is offered for the present people (including the residents of Vila ABC who are, for the most part, employees/or family members of the Farm) different basic services, such as the issuance of documents (RG, CNH, student card), vaccines, dental appointments, hairdressing services, games for children and also allows the communities members to bring their crafts or productions (food, sweets and juices) for sale.

Figure 10 - Invitation to the social action organized by Algar Farming and Upbio



Source: project proponent's collection

Given this scenario, one of the activities made during the social action with some representatives of the local communities was carried out by Ecologica's socioenvironmental team inside a classroom at the Vila ABC school, called Walter Garcia, with the presence of six representatives of four of five communities involved in the Project of Socioenvironmental Responsibility of the of the Pacajá Farm. In addition to community members, the workshop was guided by two members of Ecológica Assessoria's socio-environmental technical team, Júlia Batista and Lucas Freitas, and had the support the forest supervisor from Algar Farming, Pamela Bahia.

The invitation was sent through the WhatsApp channel, a widely used means of communication to engage with communities by Upbio. The company also took on the responsibility of reinforcing the invitation with community leaders, acknowledging their representative role on behalf of local members. Details regarding the invitation used to publicize the activity can be viewed in the figure below.

Figure 11 - Invitation to the activity on the REDD ABC Norte Project



Source: project proponent's collection

Below is presented the list of those present at the workshop, the community they belong to, and the position they represent within it.

Table 12 - Workshop attendance list

Name	Community	Position
Jobison Terra Preto	São Sebastião do Cipoal	President of the Association of Quilombola Remnants of São Sebastião do Cipoal
Raimunda Alves	Cristo Salvador	Member of the Local Evangelical Church
Elson do Socorro de Oliveira Chaves	Cristo Salvador	Member of the Local Evangelical Church
Dilma Valente Ribeiro	Cristo Salvador	Member of the Local Evangelical Church
Jaqueline da Silva Araújo	Nossa Senhora do Carmo	Member of the Catholic Church of the Nossa Senhora do Carmo Community
Creusa da Conceição Loureiro	Divino Espírito Santo	School community worker at Escola do Divino Espírito Santo

Source: created by the authors

Aiming to achieve the main objective proposed by the SBIA methodology, some adjustments were made from the official methodology, considering the community members' reality, availability, and the short time available to conduct the dynamic. Below is presented the activities that were held with six representatives of the communities:

1. Presentation of the ABC Norte REDD Project and contextualization about the climate change, carbon credits and REDD projects;
2. Participative timeline;
3. Raising problem questions - understanding of the demands;
4. Elaboration of "Scenario in case the actions currently carried out ceased to occur"³⁵;
5. Elaboration of "What future do we want?"
6. Understanding of how will we achieve it - problem issue in a positive form;
7. Elaboration of scenario with project continuity - strategies to be carried out by the project, aiming to impact positively on the communities well-being;
8. Collective validation;
9. Identification of risks and impacts: "What might we face along the way?"

³⁵ The initiatives aimed at promoting the improvement of well-being in the communities identified in Section "2.1.6 - Stakeholder Identification" have been planned and developed since 2017, the start date of the project, by the PRS of Upbio. Thus, instead of using the expression "scenario without the project" with the communities, as recommended by the Social and Biodiversity Impact Assessment (SBIA), it was decided to use "scenario in case the actions currently carried out ceased to occur".

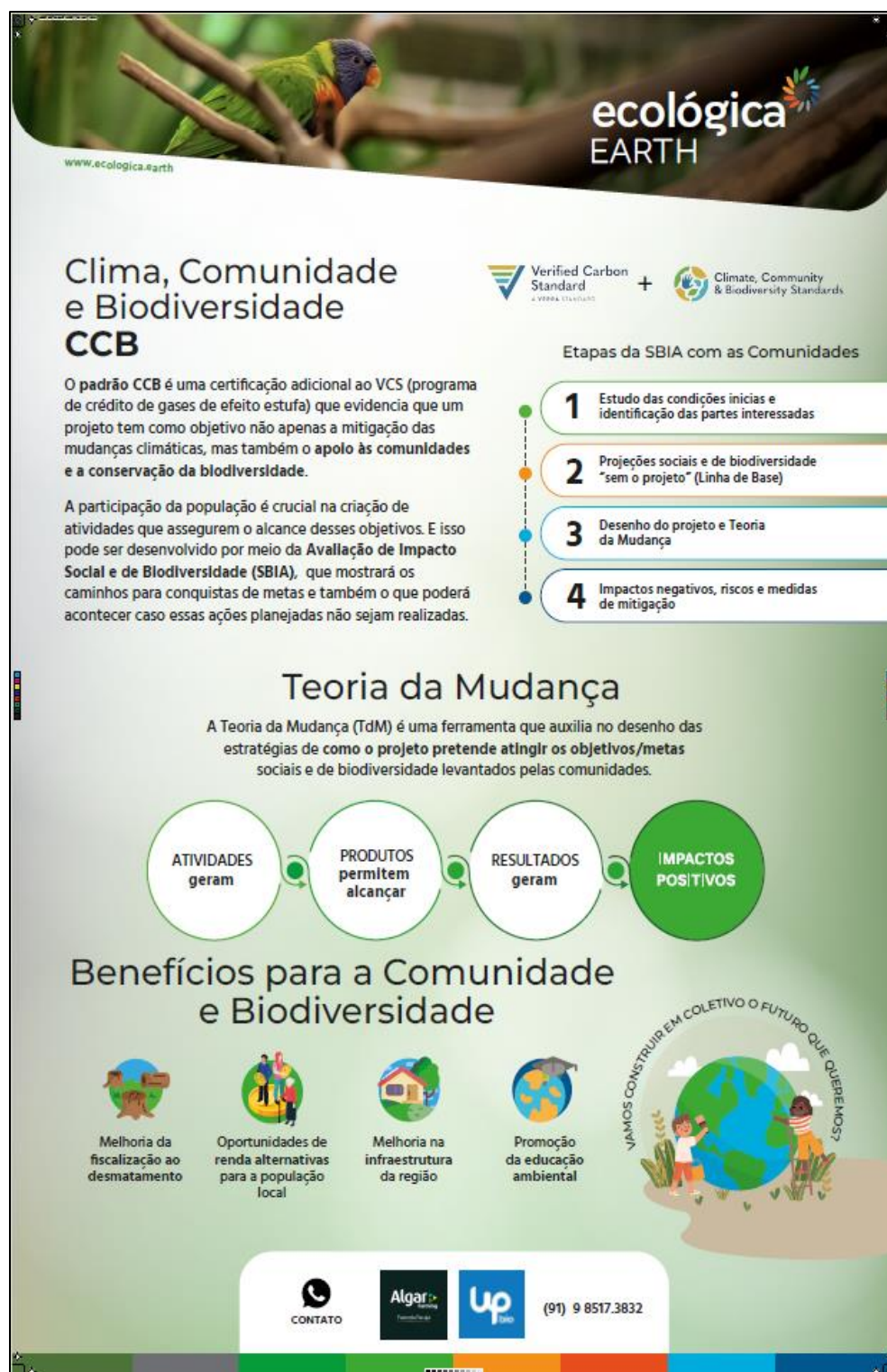
To elucidate and clarify what the ABC Norte REDD Project is, the technical team started the activity by explaining climate change, the importance of forest conservation, how the carbon credits are generated, and enlightening the ABC Norte REDD Project, including the Sustainable Forest Management Plan that is implemented inside the farm. The technical team also explained the SBIA methodology, how it would be held, its importance for the project, along with its benefits for the communities.

Figure 12 - Explanatory banner 1 presented to representatives of the communities present during the workshop



Source: project proponent's collection

Figure 13 - - Explanatory banner 2 presented to representatives of the communities present during the workshop



Source: project proponent's collection

After the process described above, all the community representatives were reunited around a table to start elaborating the timeline. The elaboration of the timeline is important to build a better understanding of the history of each community, remembering aspects of the past that can justify current events in different areas, such as: economy, use and occupation of land; culture; infrastructure and communication; education and health. Despite the people present pointing out, for the most part, recent facts, and milestones, there emerged some relevant information during this step:

- Most communities plant subsistence crops or for occasional sales;
- Most of those present commented on a perception of improvement in their poultry farming and pisciculture after technical training actions carried out by Uppbio, since 2019;

Subsequently, the stage of identifying communities' demands took place (raising problem issues). The participants were encouraged to reflect on the main problems identified in the territories which a) the carbon project could address in the search for improvements; b) they were preferably common to all communities; and c) impacts negatively on the promotion of the quality of life and well-being of the residents. After the period of discussion and deliberation, were raised three problem questions:

1. Production stagnation;
2. Lack of community governance structuring;
3. Limitations involving income generation through alternative sources.

Afterward, participants were asked which of the three issues raised negatively affect most of the communities present. The issue raised by most representatives was the "Stagnation of production". Due to the other predicted activities during the Social Action, the elaboration of the scenarios without and with the project was developed considering only the issue identified as the most relevant for all the presents. The scenarios for the other two problem questions were developed by Ecológica's socio-environmental technical team, considering all the information mentioned throughout the workshop by community members.

Once the problem issue (demand) has been identified, the next step in the workshop methodology is the "Elaboration of the scenario in case the actions currently carried out ceased to occur" which is the development of the scenario for this specific problem issue without continuing the project. In other words, develop a scenario for the demand raised if the project does not exist. As the number of participants was considerably low (largely due to the heavy rain that occurred during the night and early morning, making it difficult for many community members to get to the farm) and, taking into consideration the time available to implement the workshop, both this stage and the next ones were carried out together with everyone present, having the two members of Ecologica's socio-environmental technical team as facilitators.

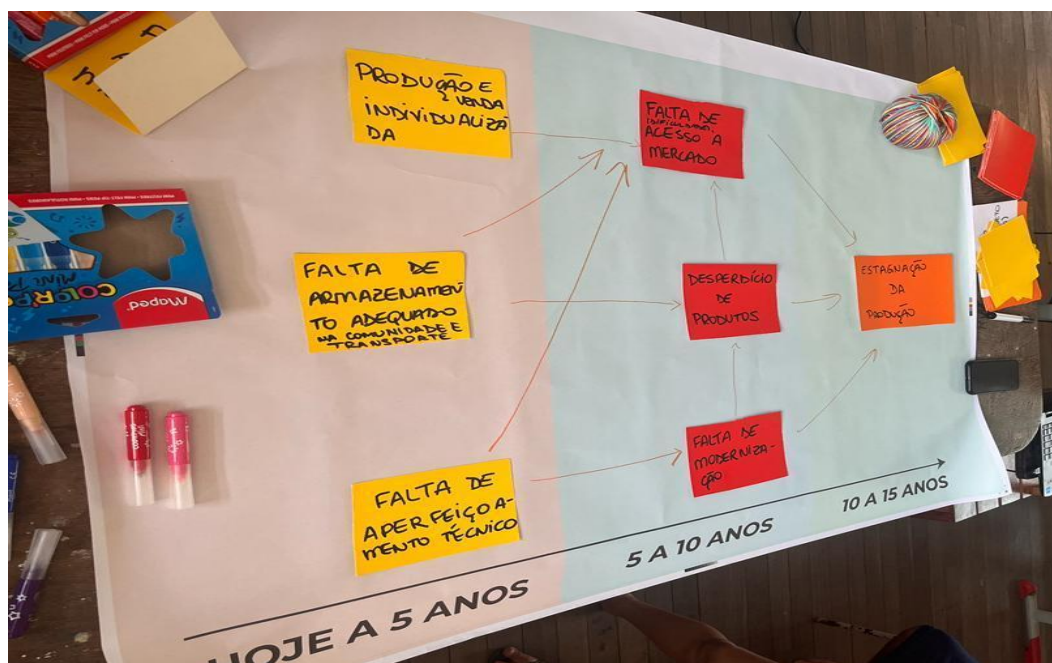
The results from this workshop step are detailed in the section "4.1 - Without-Project Community Scenario". However, it is valuable to detail the development process of the scenario without the project once it

represents a primary role in building the scenario with the project and, consequently, allowing a better understanding of the Theory of Change.

Based on the main problem issue presented by community members, Ecológica's socio-environmental technical team prepared some graphic materials for carrying out the activity (color papers, template and colorful pens). In a template containing three columns representing short (currently up to 5 years forward), medium (5 to 10 years), and long-term (10 to 15 years), community members were asked to position the paper containing the problem issue mentioned in the right column (long term) in an orange card. Based on this thought, participants were encouraged to think about possible primary and secondary characteristics (or causes) that led to this problem issue and write them down on a piece of paper with a different color than the problem issue. The primary and secondary characteristics were positioned along the first (short-term; yellow card) and second (medium-term; red card) columns. The main idea of this first part of the workshop is to carry out an exercise that encourages those present to think about possible causes for the problem (or demand) they are facing.

Aiming to create a precise causal relationship for each of the characteristics (or causes) mentioned, participants were asked to think about possible causalities between the mentioned characteristics, drawing arrows that indicate what leads one to the other.

Image 1 - Results of the elaboration of the “without project scenario”, with “production stagnation” as problem issue



Source: project proponent's collection

After the stage described above, the next activity was the development of “What future do we want?”. During this stage, the idea was to develop a desire for the future for the community members regarding the problem

issue that has been identified. For this process, the community members present were encouraged to think about a positive form of the problem issue mentioned in the previous stage. In other words, they had to think about how they imagined the future for that problem issue they had identified and positioned a blue card with their idea for the future next to the orange card (both in the long-term column). It is worth noting that "What future do we want," as evidenced by the communities, corresponds to the "impact" in the Theory of Change.

Subsequently, the next stage was to identify solutions to the causes and consequences raised as well as strategies that are possible to be carried out by the project, aiming to impact positively on the community's well-being. Using green cards the participants were encouraged to write their strategies for improvements and position them next to the respective cause or consequence to be improved. These strategies will be used in the actions and activities to be developed by the project proponents and will be presented within the Theory of Change.

The last two steps described above will result in the development of the with-project scenario. In other words, based on what was identified by the participants as an ideal future for the problem issue, as well as the identification of strategies for the causes and consequences, this would result in the elaboration of a scenario in which the carbon project carries out actions aimed at improving the quality of life of communities by the demands and actions that were raised.

Then, the two workshop facilitators conducted a brief validation with everyone present to obtain everyone's consent on the process that had been built so far.

Image 2 - Results of the elaboration of the "what future do we want"



Source: project proponent's collection

After and based on the development of the previous stages, the next stage of the workshop would be the identification of risks and impacts that could be generated from the strategies that were identified (green card). Due to the restricted time that the Ecológica socioenvironmental technical team had to implement the activity with the participants, this stage was not possible to develop. In collaboration with community members. For this reason, upon returning from the field visit, the technical team developed this step, which will be validated with the community on the next visit to be carried out by Upbio. The risks and impacts raised will be detailed in section “2.3.4 - Community Costs, Risks and Benefits”.

It is worth mentioning that, the entire construction was based on the report of the leaders present at the workshop, as well as the information made available in Upbio's PRS. Namely:

- A significant portion of what is produced in the communities is used for subsistence.
- Production techniques are limited, which means that the resource is not used for the production of a variety of products. For example, there is chocolate production in the Nossa Senhora do Carmo community; however, the producers would like to learn how to generate value for this chocolate through the production of chocolates (processing techniques).
- Not all communities have organized collectives/associations, such as Divino Espírito Santo - Agricultores Agroextrativistas do Médio Pacajá association and Produtores Rurais do Divino Espírito Santo association - and São Sebastião do Cipoal - Remanescentes Quilombolas de São Sebastião do Cipoal (ARQSSC) association. Still, even if organized, some do not have an adequate physical space to hold meetings. As reported by participant Jaqueline da Silva Araújo, for example, the meetings in the Nossa Senhora do Carmo community are itinerant, which means that people do not participate, either due to space limitations or internal disagreements.
- Currently, the main place of sale of what is produced in the communities is Algar itself and the Portel Municipal Fair. In the case of the Municipal Fair, due to transportation difficulties and distance, only a few products are sold there.
- Technical improvement emerges as a possibility to reduce the impact that the oscillation in the harvest affects the communities (e.g., there are times when cocoa is discarded due to the exacerbated amount and others when there is no harvest of the fruit). In addition, it should not only involve the production process itself but the entire flow chain to the consumer market (e.g., product storage techniques aimed at increasing their shelf life).
- Technical improvement to expand the variety of products produced in the communities should not impact the cultural aspects involved in this production.

- The dissemination and continuity of technical improvement could be carried out by the people of the communities themselves. In this way, such people would act as multipliers and facilitators.

Thus, after implementing the workshop with community representatives and developing the missing steps by Ecológica's socio-environmental technical team, it was possible to develop the Theory of Change for the ABC Norte REDD Project presented below.

Table 13 - Project Activities and Theory of Change Table

Problem-question	Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
		Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
Production³⁶ stagnation	Promote the establishment of cooperatives or associations that encourage the diversification of production, enhancement on sales and organization to logistics.	Formation of cooperatives and/or associations.	- Quantitative increase per product already produced by the communities. - Expanded access to local markets and sales channels. - Improved logistics efficiency.	Diversity in production	The aim is not only to diversify production but also to increase the quantity per product already produced by the communities and expand access to local markets and sales channels. The formation of these collectives, in addition to enabling economic and collective strategies, strengthens social structures based on cooperation and diversification, generating a positive cycle that fosters social resilience, expands income-generating opportunities, and optimizes crucial logistical processes for long-term sustainability, consolidating a social ecosystem and community cohesion.
	Providing affordable home storage solutions.	Availability of storage solutions considering the reality of communities.	- Improvement in product quality. - Reduction of waste in the production chain.		These alternatives not only address the scenario of precarious infrastructure services and social vulnerability highlighted during the workshop but also enhance the quality of local products and reduce waste throughout the production and sales chain. Such an approach contributes significantly to process efficiency and the sustainability of productive practices in communities.

³⁶ It is emphasized that, following the review and analysis conducted by Ecológica Earth's technical team, modifications have been made to the "activity description" field in comparison to the blue cards raised by the community. These alterations will be communicated and validated by the community during the forthcoming visits conducted by Upbio.

	Diversifying cultivation and production techniques, considering the skills of community members, continuously.	Establishment of continuous training activities, covering topics related to the diversification of production based on the knowledge of the community.	• Diversification of products produced by communities. • Effective adoption of new cultivation techniques. • Improvement in production efficiency.		It emerges as a crucial step towards transforming agricultural practices. This process goes beyond the simple introduction of new crops; it constitutes a comprehensive orientation for implementing sustainable production processes that consider the reality of community vulnerability, as well as local knowledge. This orientation is based on providing adequate infrastructure, supplying appropriate equipment, and establishing market access. The approach includes the establishment of ongoing training activities designed not only to empower the community in the effective adoption of new cultivation techniques but also to cultivate a proactive mindset regarding resource management.
Lack of Community Governance Structuring	Defining a space for community use.	Renovation or construction of a functioning community area.	• Strengthening physical structures for community use.	Structured and effective governance in communities	For communities without available physical space, a collaborative approach is proposed, seeking to establish partnerships to gather resources and materials necessary for such definition and, if necessary, construction. For those with physical space but lacking engagement, a revitalization program will be implemented to make the existing environment dynamic and attractive, representing a central point for cohesion and active participation. This approach aims to strengthen not only physical structures but also the relationships and skills necessary to foster more active and participatory communities.

	Implementing initiatives for community engagement.	Development and implementation of activities for community engagement based on community demands.	• Effective participation of communities in collective activities. • Capacity building for community management. • Development of community-led community initiatives and projects.		The communities will be actively involved in decisions related to the programming and regulation of community space, aiming to cultivate a sense of ownership, where everyone becomes a co-author in its construction and maintenance. With this, an expansion of initiatives and projects developed for and with communities is expected, along with the development of capacities for the management of community space through workshops and training.
	Establish formal processes of consultation and deliberation.	Operationalization and adoption of specific and formal consultation and deliberation procedures.	• Implementation of deliberations in a representative manner. • Strengthening community trust.		The crucial initiative of establishing formal processes of consultation and deliberation will promote transparency, equity, and efficiency in community decisions. The primary objective is to achieve effectiveness in the implementation of deliberations, thus fostering the strengthening of community trust. The results go beyond the simple formalization of processes, aiming to create a solid foundation for more inclusive and transparent governance. Such procedures establish a favorable ground for community development, aligning local interests with the broader objectives of the project and other stakeholders.
Limitations related to income generation through alternative sources	Provide ongoing technical training activities for product processing.	Development and implementation of continuous training activities for product processing.	• Implementation of techniques that enable the processing of products.	Generate income through alternative sources	Aiming to effectively empower communities in adopting techniques that facilitate product processing, this initiative not only promotes the potential for economic diversification but also focuses on enhancing the quality of products, preferably based

					on the communities' own knowledge. In this context, the implementation of continuous training activities will address the specific demands of the communities and represent a valuable investment in the dissemination of local knowledge. Such an initiative not only diversifies income sources but also encourages a proactive mindset regarding responsible resource management.
	Establish a schedule of activities based on community availability aimed at developing alternative sources of income.	Construction of structured and implemented activity schedules with the participation of the communities.	• Greater participation of people from the communities in the proposed activities. • Increase in the diversity of skills acquired by people in communities.		The goal is not only to implement tangible actions but also to strengthen the social fabric of communities, reflecting a democratic vision of the process and ensuring that proposed activities align with local needs. Moreover, by prioritizing active community participation in defining these schedules, a conducive environment is created for the flourishing of a variety of skills beyond technical competencies, playing a crucial role in building community resilience. Empowering community members with a range of skills makes them better equipped to face multifaceted challenges. Therefore, it is crucial that actions are built considering the availability of these members, enhancing the potential for participation and, consequently, the acquisition of skills.

Loss of biodiversity	Carry out continuous monitoring of the fauna and flora within the project area.	Implementation of actions to identify and monitor local fauna and flora.	• Greater knowledge about the species existing in the region. • Implementation of activities that reinforce the conservation of local fauna and flora.	Conservation of local biodiversity	Continuous monitoring of local biodiversity allows for a better understanding of the species of fauna and flora that inhabit the region, enabling the project to carry out actions focused on conserving the biodiversity existing in that context. Furthermore, monitoring the project's impacts on the remaining flora allows a better understanding of how the project is positioning itself to have the lowest possible impact on the remaining flora and, consequently, contribute to the conservation of biodiversity and ecosystem balance throughout the project life cycle, positively impacting its integrity.
	Evaluate the company's actions to monitor the impact of the project on the remaining flora.	Actions to monitor the project's impact on the remaining flora, mainly related to project activities, such as: cutting trees, dragging, and building roads.	• Monitor the impact of the project on the remaining flora. • Implementation of actions with low impact on the remaining flora.		

Source: created by the authors

Finally, it is worth noting that, despite addressing the activities in isolation, it is crucial to recognize the intrinsic interconnectedness among them. The underlying concept of improving well-being in communities should be understood in a holistic and adaptive manner, allowing for continuous adjustments. This approach becomes essential for dealing with both anticipated and unanticipated risks and impacts, as well as changes in community demands.

These changes, sometimes inevitable, can indicate the effective realization of planned results within the scope of the REDD ABC Norte Project. Understanding the interrelation dynamics between the proposed activities and their impacts is crucial for the successful implementation and sustainability of initiatives. By adopting a holistic perspective, consideration is given not only to the execution of activities as planned but also to the ability to adapt to unforeseen scenarios. This ensures that the project's actions remain effective even in the face of changes in environmental, social, or economic conditions.

Furthermore, the adaptive approach is essential for incorporating continuous feedback from communities. The social dynamics and needs of populations can evolve over time, and it is vital that the project aligns with these changes to maximize its positive impact. Thus, by considering the interdependence of the proposed activities and maintaining a holistic and adaptive approach, the ABC Norte REDD Project can ensure an efficient and effective response to challenges and opportunities that may arise during its implementation, thereby promoting solid and lasting results for the well-being of communities.

SOCIALCARBON and Theory of Change

It is worth noting that the first two periods of monitoring the community benefits and biodiversity of the ABC Norte REDD Project were conducted and verified according to the methodology of the SOCIALCARBON Standard³⁷. However, in 2021, the Standard announced its transition from a standard exclusively focused on co-benefits to a full-fledged standard. As of 1-January-2024, projects that do not migrate to the SOCIALCARBON carbon accounting methodology will lose the certification label.

Thus, in order to highlight the actions already implemented by the ABC Norte REDD Project, the activities already developed in the communities were incorporated, when applicable, in the construction of the Theory of Change for each problem issue³⁸. These include:

Associations and cooperatives

In 2021, a lecture was given addressing the theme of associativism, offering valuable support for the internal organization of communities. Participants were instructed on the relevance of associations, their objectives,

³⁷ The Ecológica Earth team conducts an interview with ABC Norte staff and applies a questionnaire in order to indirectly obtain information about the SOCIALCARBON standard. In addition, the Ecológica Assessoria team collects the evidence provided by ABC Norte. Then, a cross-check is done to ensure that all documentation has been submitted and conforms to the information provided during the interview.

³⁸ The activities highlighted in this section and involving the SOCIALCARBON Standard include Point 1 of monitoring report (01-January-2021 to 31-March-2023).

benefits and legal aspects. The lecture was held in the communities of São Sebastião do Cipoal and Divino Espírito Santo, attracting the participation of 14 individuals.

Problem issues addressed: Production stagnation.

Conflict management

Since 2017, episodes of fires have occurred on the boundaries of the Pacajá Farm, being attributed to the planting of cassava (a common crop in the Amazon) and the theft of wood, perpetrated by a resident of the Monte Sião community.

To deal with this conflict, ABC Norte adopts as a guideline the Standard Operating Procedure 11 - Conflict Mediation³⁹. According to the document, the first step is to establish formal contact with the community leader. Through dialogue, ABC Norte representatives seek to make residents aware of the boundaries of the farm, forest management practices in the project area, and the prohibition of activities such as burning and wood appropriation.

After clarifying the facts with the community, the company takes the necessary measures, reporting the occurrences to the competent authorities by registering police reports and sending letters to regulatory agencies to request support in monitoring the area.

To maintain a closer dialogue and avoid future conflicts, ABC Norte is committed to enhancing its existing communication channels. Currently, these channels include messaging apps, social networks, direct contact with Upbio representatives during monthly technical visits, and direct communication with the manager of the Pacajá Farm. ABC Norte plans to install suggestion boxes in the communities, collected monthly by the Upbio team and delivered to ABC Norte.

Problem issue addressed: Lack of Community Governance Structuring.

Community Training

Agroforestry Systems: In May 2021, in collaboration with the Portel Technical Assistance and Rural Extension Company (Emater), people living in the Divino Espírito Santo Community received guidance on planting cocoa and açaí, as well as on the use of herbicides. In September 2021, a training on agroforestry system took place for 08 people from the community, covering topics such as preparation and reading of sketches, spacing, preparation of pits, organic fertilization, pruning and production of seedlings of forest and fruit species.

Handicrafts: Several workshops on fabric painting, natural fibre handicrafts and carpentry were held as part of the project (see Table 14).

³⁹ Any social conflict related to the project is assessed in accordance with the Code of Conduct of Algar and ABC, together with the Safety Procedures detailed in section 4.4 of the Monitoring Plan. ABC Norte strives to resolve conflicts through dialogue and the promotion of basic and environmental education. In this way, both the REDD project and the expansion of the PRS conducted by the company represent strategies to mitigate conflicts and maintain a positive relationship with communities.

Poultry farming: In September 2021, a training was conducted for 08 participants from the Monte Sião community, 20 from Nossa Senhora do Carmo and 10 from Cristo Salvador. The training covered the construction of suitable areas for broiler poultry breeding, alternative forms of feeding, and pest and disease control.

Sustainable Forest Management: A lecture was conducted in the communities of Nossa Senhora do Carmo and Divino Espírito Santo with the objective of explaining the processes and activities involved in sustainable forest management carried out at the Pacajá Farm. 08 people from Nossa Senhora do Carmo and 07 from the Divino Espírito Santo participated.

5 R's: In May 2022, a lecture on the 5 R's (refuse, reduce, reuse, reuse and recycle) was given to 12 people from the São Sebastião do Cipoal community. The objective was to promote awareness about the impacts of improper waste disposal on the environment and, especially, on rivers.

Problem issues addressed: Production stagnation and limitations related to income generation through alternative sources.

Alternative Sources of Income

Through the PRS, monthly visits are made to the communities to monitor and support activities related to the promotion of productive practices, such as fish farming, poultry farming, horticulture and agroforestry systems.

Initially aimed at their own consumption, production evolved as the project progressed, leading community members to start marketing their products. In June 2022, during the celebration of the “Festa Junina” at the Pacajá Farm, people living in the communities supported by the project were invited to sell their products during the event. The initiative resulted in the generation of R\$ 1,345.00 with the sale of products from the communities Nossa Senhora do Carmo and Divino Espírito Santo.

Problem issues addressed: Production stagnation and limitations related to income generation through alternative sources.

In addition, an additional consideration worthy of note is related to the ongoing activities of the ABC Norte Project, which were not addressed in any of the problem issues identified by the communities. This shows that some issues were not raised as demands during the workshop due to the fact that they were already being addressed through the activities developed by Upbio under the methodology of the SOCIALCARBON Standard. These activities, as well as their indicators, can be seen in Table 14.

Biodiversity monitoring and Impact on remaining flora

Although these were not topics raised by the communities present at the workshop, the project proponent understands that biodiversity conservation is extremely relevant not only for the integrity of the project but also to positively impacting the local ecosystem and the communities that live there. For this reason, since

2019, Algar Farming, in partnership with Upbio, has developed periodic fauna monitoring inventories in the project area and, in partnership with *Aflora Engenharia*, flora inventories are carried out, also due to the Forest Management Plan Sustainable that is implemented in the project area.

Between 13-September-2017 to 31-December-2020 (first monitoring period of SOCIALCARBON), the following monitoring were carried out regarding biodiversity monitoring and impact on remaining flora:

- Impact report on permanent plots: monitoring of flora to observe the conditions of previously explored areas.
- Semi-annual fauna reports, as well as recording of animals in the Forest: the campaign recorded 15 species of medium and large mammals, 48 species among amphibians, lizards, and snakes, in addition to pointing out the hypothesis that there are still species not sampled and yet to be discoveries in the Fazenda Pacajá's area of influence.
- The permanent installments impact report was being carried out. There was a partnership with the Federal Rural University of Amazônia, which carries out data processing for the elaboration of reports and studies. Planning and inventory of the species to be exploited has been carried out to avoid the unnecessary opening of roads and clearings.

In addition, during the second monitoring period of SOCIALCARBON (1-January-2021 to 31-March-2023), regarding biodiversity monitoring, the company ABC Norte has monitored the herpetofauna and medium and large mammals in the area of influence of Pacajá Farm. The monitoring is realized twice a year, once in summer and once in winter. During the last monitoring campaign, 23 mammals specimens were registered, distributed in 5 species; 4 species of bats; 8 specimens of insect vectors distributed in 4 genera; 108 reptiles and amphibians specimens and 7 bird species.

Furthermore, regarding the impact on remaining flora, ABC Norte company in partnership with the Federal Rural University of Amazônia has monitored the vegetation dynamics before and after the wood harvesting. Data were collected from sampling units (permanent installments) and served to validate the botanical identification of the species forestry, evaluate the spatial distribution of commercial species, initiate studies on clearings after harvesting trees, carry out studies on phytosociology and the relationship between forest height and diameter and soil conditions. Students participating in the project use the collected data to develop their monographs.

The project proponent will continue to develop fauna and flora inventories in order to enhance the local biodiversity conservation.

Table 14 - Activities developed in the REDD ABC Norte project not covered by the problem issues raised by the communities⁴⁰

Indicator	Activities
Women's inclusion	Natural fiber handicraft workshop: the objective of the initiative was to rescue the traditional knowledge of riverside communities to produce decorative and utilitarian objects, using natural raw materials available in the region and reused textile materials. Different fiber processing techniques, basketry, braiding, weaving, and macramé were taught. The workshop was held in September 2022 in 5 communities (Divino Espírito Santo, Cristo Salvador, São Sebastião do Cipoal, Nossa Senhora do Carmo and Monte Sião) and 32 women participated in the initiative. Fabric Painting Workshop: the goal of the workshop was to promote female empowerment and social interaction through art and creativity. The initiative was carried out for the first time in December 2022, during the 3rd Social Action carried out by the Pacajá Farm and Portel City Hall. Social Action aims to offer health, citizenship and cultural services to communities. It was held at the Walter Garcia School and reached residents of 11 communities around the Pacajá Farm. The workshop was attended by 90 women, including children, adults and the elderly. The second workshop was held in February 2023 in 3 communities (Divino Espírito Santo, São Sebastião do Cipoal and Nossa Senhora do Carmo). Of the 25 people who participated, 20 were women. Carpentry workshop: this workshop aimed to identify the interests and skills of the participants for carpentry, to promote the creation of a women's association in the future. The goal is to create sustainable furniture and decoration items, using waste from forest management in the area as raw material, in addition, generating income for the community. The first edition was held at Fazenda Pacajá in July 2022 and the target audience was wives of farm employees.
Public health	Health Center: there is a health center at the Pacajá Farm to assist employees and communities, as well as transportation to the nearest city center in case of emergency. The construction and maintenance of the building is the responsibility of the company ABC Norte and the health team is the responsibility of the Municipality of Portel. In addition, the nursing technician who works at the health center visits the communities to carry out health consultations and distribute medicines. Social Action: once a year the company holds the Social Action event, in partnership with the Portel City Hall. The initiative aims to offer health, citizenship and cultural services to the communities surrounding the Pacajá Farm. In 2021, 180 health consultations were carried out, 159 medicines and 200 face masks were distributed so that families can treat and prevent diseases. In addition, activities were carried out on sustainable attitudes and healthy eating for the children. In 2022, this number increased to 612 health consultations and more than 100 health items such as medicines, preservatives, and hypochlorite for water treatment were distributed. During the event, 50 oral hygiene kits with toothbrush and toothpaste were distributed to representatives of São Sebastião do Cipoal.

⁴⁰ The activities shown in Table 14 also include other indicators. For example, the workshops held with the women of the communities were also aimed at generating income. It was decided to insert them as activities not directly related to the problem issues based on their main objectives.

	Prevention of domestic accidents: in April 2022, a lecture on domestic accident prevention was held for 78 people from the Divino Espírito Santo community. The lecture addressed scalping on boats in a playful and interactive way for children, young people and adults in the school community, from early childhood education to Youth and Adult Education. Mental and emotional health: this initiative aimed to promote awareness of the emotions of the people participating and the ability to manage and express these feelings in an age-appropriate way. The lectures were held in February 2022 in 5 communities (Monte Sião, São Sebastião do Cipoal, Nossa Senhora do Carmo, Cristo Salvador and Divino Espírito Santo) and a total of 42 people participated. Healthy eating: delivery of 105 educational materials on healthy eating to children from the communities of Monte Sião, São Sebastião do Cipoal, Nossa Senhora do Carmo and Divino Espírito Santo.
Education	Educational infrastructure: the project supported the construction of a library in the Community of Divino Espírito Santo and the revitalization of the São Sebastião do Cipoal community school with painting material and termite insecticide. Donation of books: the project donated 1,000 textbooks and some children's books to the school and library of the community of the Divine Holy Spirit. 150 school kits were also donated to Divino Espírito Santo, São Sebastião do Cipoal and Nossa Senhora do Carmo. Literacy: there is a school at Pacajá Farm to encourage the education of young people and adults. The company ABC Norte also pays for the teacher's transportation. The classes are made up of employees and people from the communities. In addition, school reinforcement classes are held every Saturday.

Source: created by the authors using data from SOCIALCARBON Standard

Again, it is understood that the ideal is for the activities to be replanned during the deadline, allowing the execution and monitoring of the real impacts. Replanning will allow corrective measures to be applied in a timely manner in cases where there is a distortion between what was planned and what was executed for the maintenance of the project and the long-term success of the activities.

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

Starting date and end date of the historical reference period

The adopted historical reference period is September-2007 to September-2017.

Starting date of the project crediting period of the AUD project activity

The project has a crediting period of 30 years, from 13-September-2017 until 12-September-2047.

Following the CCB Program Rules⁴¹, as described in the section “3.3 Validation and Verification with a Recognized GHG Program”, page 12 item 3.3.1: “In order to use a recognized GHG program to substitute for Climate, Community & Biodiversity Standards Climate Section, the project must inter alia have the same name, the same project area, the same project proponent, the same project start date (i.e., the date on which activities that lead to the generation of GHG emission reductions or removals are implemented), the same activities and the same without-project scenario in both programs.”

The ABC Norte REDD Project is already registered by the ID 2558⁴², available on Verra webpage and predicts to reduce 30,138,794 tCO₂e over the 30 year project lifetime.

In this manner, the project fulfils the requirement outlined in the aforementioned document, and therefore, the project start date of the CCB is the same as shown in the VCS PD.

Starting date and end date of the first fixed baseline period

The first baseline period is from 13-September-2017 to 12-September-2027.

Monitoring period of the socioenvironmental benefits under the SOCIALCARBON Standard

3-September-2017 to 31-March-2023.

Monitoring of the socioenvironmental benefits under the CCB Standard

Starting from 01-April-2023.

2.1.10 Differences in Assessment Periods (G1.9)

Not applicable. There is no difference between GHG emission accounting period and the community and biodiversity benefits assessment periods of the ABC Norte REDD Project. However, there is a difference in the method of monitoring socioenvironmental benefits.

The first two monitoring periods for the community and biodiversity benefits of the ABC Norte REDD Project was developed and verified under the methodology of the SOCIALCARBON Standard. However, in 2021, the Standard announced that it would no longer be just a co-benefits standard and would become a full standard. Starting from 01-January-2024, projects that did not migrate to the SOCIALCARBON carbon accounting methodology would no longer have the certification label. In this way, considering that the SOCIALCARBON Standard underwent a methodological update and aiming to continue monitoring the actions that the ABC Norte REDD Project has already implemented, the third and subsequent verifications of the project's socioenvironmental benefits will be carried out through the CCB Standard.

⁴¹ Available at: <<https://verra.org/wp-content/uploads/CCB-Program-Rules-v3.1.pdf>>. Accessed on: 17 Oct. 2023.

⁴² Available at: <<https://registry.verra.org/app/projectDetail/VCS/2558>>.

2.1.11 Implementation Schedule (G1.9)

The table below shows a timeline of the main activities carried out since the project start date, both for the SFMP and REDD Project activities. This table shall suffer alteration along the project development.

Table 15 - SFMP and REDD Project activities

Year	SFMP	REDD Project
2017	23/01 - Feasibility Report conducted by a Carbon Project Developer; 07/03 - Board decision for the development of a Carbon Project together with the SFMP⁴³; 13/09 - New Tenant Contract (Madeira J&Y); 14/09 - Hiring of the new internal forest management team.	23/01 - Feasibility Report conducted by a Carbon Project Developer, which included an action plan for the development of the carbon project; 07/03 - Board decision for the development of a Carbon Project together with the SFMP; 24/08 - Community survey and first meetings with community leaders; 13/09 - New Tenant Contract (Madeira J&Y), which included environmental and social restrictions and obligations to the new tenant, which increased the control and surveillance against illegal deforestation. 13/09/2017 to 31/12/2020 - First monitoring period.
2018	01/03 - Hiring of a social environmental consultancy for conducting a better approach with the surrounding communities regarding the SFMP; May - The company starts to produce monthly environmental monitoring reports; 12/09 - Rural activity license on behalf of J&Y to conduct the new Sustainable Forest Management Plan, which includes several activities to mitigate impacts in the forest, besides the development of internal quality.	Year of 2018 - The company followed the guidelines of the feasibility study, starting the necessary regularizations and updates, in addition to social responsibility actions; Year of 2018 - ABC Norte start building monitoring bases to expand the area's surveillance and control, together with the monitoring of the property boundaries; May - The company starts to produce monthly environmental monitoring reports; 01/03 - Hiring of a social environmental consultancy (Upbio) to implement socioenvironmental activities for the surrounding communities, which maintained the services during the following years; 12/09 - Rural activity license on behalf of J&Y to conduct the new Sustainable Forest Management Plan, which includes several activities to mitigate impacts in the forest, besides the development of internal quality.

⁴³ In 2021, ABC Norte also elaborated an explanatory document to clarify about the decision made to initiate the carbon project in 2017, which also contains the preparatory measures that had to be carried out before the project start date and the confidentiality of the deliberations taken during the transition process in 2017.

2019	Year of 2019 - J&Y management activities begin at Fazenda Pacajá, under the new SFMP.	19/02 - Presentation of the PRS to the communities and state and municipal secretariats; 10/06 - 1st proposal for the elaboration of the carbon project from another project developer; 21/08 - Negotiation with the carbon project company and acceptance of the draft contract; 27/12 - Completion of the update of the registrations in the responsible notary's office and SIGEF.
2020	15/05 - CERFLOR certification for the SFMP.	January - Socioeconomic diagnosis of the communities; 26/03 - Acceptance of the project's economic model from the other project developer proposal; 02/06 - Contract renegotiation with the carbon project developer; 06/07 - First negotiations with Ecológica Assessoria for the development of the REDD Project; 24/07 - First fauna monitoring inventory in the Pacajá Farm region. 27/11 - Contract signature with Ecológica Assessoria.
2021	-	January - The company starts to produce monthly reports regarding the activities of the PRS in partnership with Upbio. This practice will be maintained in the following years of the project. 01/01/2021 to 31/03/2023 - Second monitoring period. 25/02 - Second fauna monitoring inventory in the Pacajá Farm region 25/06 - The consultation with the "ribeirinha" community São Sebastião do Cipoal and Nossa Senhora do Carmo. The meeting had a simplified presentation about the project, exposing the risks and benefits resulting from the project activities for the riverside population. 26/06 - The consultation with the "ribeirinha" community Divino Espírito Santo, Cristo Salvador and Vila ABC. The meeting had a simplified presentation about the project, exposing the risks and benefits resulting from the project activities for the riverside population. 27/06 - The consultation with the "ribeirinha" community Caminhoneiros do Bem. The meeting had a simplified presentation about the project, exposing the risks and benefits resulting from the

		project activities for the riverside population. June - The company developed, in partnership with Upbio, a Solid Waste Management Plan for Fazenda Pacajá and Vila ABC. 13/07 - Project is published in the VCS Pipeline.
2022	-	February - Mental and emotional health awareness in 5 communities (Monte Sião, São Sebastião do Cipoal, Nossa Senhora do Carmo, Cristo Salvador and Divino Espírito Santo) for 42 people. April - Lecture about domestic accident prevention held for 78 people from Divino Espírito Santo community May - lecture to 12 people from São Sebastião do Cipoal community about the 5 R's (refuse, reduce, reuse, repurpose, and recycle). 22/06 - Fazenda Pacajá was certified by the Onça Pintada Institute label. July - Carpentry workshop in Pacajá Farm, mainly for the employee's wives. 28/07 - Third fauna monitoring inventory in the Pacajá Farm region. September - Natural fiber craft workshop in 5 communities (Divino Espírito Santo, Cristo Salvador, São Sebastião do Cipoal, Nossa Senhora do Carmo and Monte Sião) for 32 women. November - "Internal Week f or the Prevention of Accidents at Rural Work": lectures regarding health and safety topics to ACB Norte employees. December - First fabric painting workshop during the 3rd Social Action conducted by Pacajá Farm and Portel City Hall.
2023	-	22/01 - Receipt of the final validation and first verification report by the audit. February - Second fabric painting workshop in 3 communities (Divino Espírito Santo, São Sebastião do Cipoal and Nossa Senhora do Carmo) for 25 people of which 20 were women. 01/06 - Second fauna monitoring inventory in the Pacajá Farm region. 11/07 - Renewal of the Onça Pintada Institute certificate. 07/12 - Meeting with communities to present the CCB certification, apply the SBIA workshop, and build the Theory of Change.

Source: created by the authors

In summary, activities implemented since the project start date are:

- Signing of a contract with a new tenant, with restrictive clauses and requiring environmental conservation and social responsibility;
- Structuring of a specialized internal team to monitor the conduct of the management plan and take over the activity, if necessary;
- Hiring a consultancy for the development of socioeconomic diagnosis and activities with the communities;
- Expansion of surveillance booths at strategic points on the Fazenda Pacajá;
- Certification of the Sustainable Forest Management Plan (CERFLOR).

2.1.12 Risks to the Project (G1.10)

The risk to the project analysis was carried out following the guidelines of the VCS AFOLU “Non-Permanence Risk Tool” version 4.0, issued on January 20th of 2023. The Table 16 below presents all identified risks, their potential impacts and the mitigation measures necessary to minimize risks related to the project's climate, community, and biodiversity.

Table 16 - Main project risks, their impacts and mitigation measures

Risk Category	Identify Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
Internal Risk	Financial Viability Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven.	The fact that the project currently does not have available callable financial resources to cover the total cash out before the project reaches breakeven, could impact in the maintenance of project activities, as well as the expected benefits for climate, community, and biodiversity.	The project proponent has sufficient private funds to conduct project activities, a practice that has occurred since the initial date of the REDD project, as the proponent carries out actions related to climate, community, and biodiversity despite the carbon project.
	Opportunity Cost NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence driven, net positive community impacts	As described on the VCS Joint PD MR, the most likely alternative scenario is considered to be livestock production, as it is the most profitable one. The livestock production scenario has a higher NPV 374 % higher than the REDD project scenario), as demonstrated in the cashflow spreadsheet.	Carbon credits will compose a significant income to the project activity to maintain its conservation operations and socio-economic benefits. The project is protected by legally binding commitment to continue management practices that protect carbon stocks, and they do cover the entire crediting period. ABC Norte has received permissions to manage forest resources based on a Sustainable Forest

	are not demonstrated.		Management Plan that was made available to IBAMA, the Environmental Agency responsible for licensing these activities in the Project region. At the beginning of the project, in 2017, the project area was already with a management plan implemented, which got renewed in 2019, extending the sustainable forest management for more 35 years, i.e. management practices should be maintained until 2054. However, the ABC Norte, will certainly renew the SFMP after the end of the 35-year cycle. It is important to note that ABC Norte is allowed (and has the intention) to request the renewal of the sustainable forest management plan for more 35 years once this first period is over.
Natural Risk	Fire (F) Increase of fire outbreaks	The increase in fire outbreaks can negatively impact the climate and biodiversity in the project area, as it can cause the loss of biodiversity (reducing species of fauna and flora, as well as their habitats) and also cause a loss of carbon stock in the region.	The management team performs monthly monitoring of the heat spots detected by INPE's program, allowing them to identify the spots that are most susceptible to fire outbreaks in order to send a team to assess their possible occurrence and take the appropriate measures to contain the possible fire outbreak, if necessary.
	Extreme Weather (W)	The extreme increase in weather is directly related to negative impacts on the climate and, consequently, on biodiversity and local communities, which can be negatively affected by an increase in the level of seas and oceans (consequently rivers), a decrease in animals used as a source of food (fish for example), loss of fauna and flora, etc.	No extreme weather events damaging the project area were reported by the management team since the project start date. No measures are taken for addressing this matter, since it is a risk that does not depend on continuous monitoring neither will be mitigated through some action.

Source: created by the authors based on Overall Non-Permanence Risk Rating and Buffer Determination for ABC Norte REDD Project

Table 17 - Overall Non-Permanence Risk Rating and Buffer Determination for ABC Norte REDD Project

Risk Category	Rating
Internal Risk	7.00
External Risk	0.00
Natural Risk	1.50
Overall Risk Rating (a+b+c)	10

Source: created by the authors based on Overall Non-Permanence Risk Rating and Buffer Determination for ABC Norte REDD Project

2.1.13 Benefit Permanence (G1.11)

Given its objectives, the ABC Norte REDD Project may also transform local economies in the project area throughout its lifespan. As fundamental components of a long-term low-carbon economy and in order to maintain and enhance climate, community, and biodiversity benefits beyond the project lifetime, the project will carry out a set of actions such as developing income-generating activities, promoting access to infrastructure, environmental education and sustainable practices, food security practices, health, nutrition and sanitation trainings, professionalizing courses, mitigation actions regarding local climate events, monitoring and studies about the local fauna.

Various actions were identified as a result of the workshop activities with the communities. These include promoting the establishment of cooperatives or associations to foster production diversification, enhance sales, and organize logistics. Additionally, providing cost-effective home storage solutions, diversifying cultivation and production techniques in a continuous manner while considering the skills of community members, and defining a dedicated space for community use were also determined. Other initiatives encompass implementing strategies for community engagement, establishing formal processes for consultation and deliberation, providing continuous technical training activities for product processing, and developing a schedule of activities based on community availability to explore alternative sources of income (see section “2.1.8 - Project Activities and Theory of Change”).

By collaborating with local communities, the project can ensure that its activities are tailored to the specific needs of the local population, leading to sustainable development and long-term economic growth. Regarding the financial support, the proponents had the necessary funds to maintain the project activities until the first verification, which occurred from 3-September-2017 to 31-December-2020. After this period, with the closing of sales of part of the carbon credits generated by the project, this income was reinvested in socio-environmental actions for the local communities and local biodiversity conservation.

Climate

The ABC Norte REDD Project aims to decrease and avoid deforestation and, therefore, promote the reduction of GHG emissions, which will benefit the climate. To generate more climate benefits, a constant and effective monitoring of the project area will be maintained during the project lifetime as well as other activities considering the local vulnerabilities and characteristics, to make improvements for the identified opportunities. Furthermore, the revenue from the Sustainable Forest Management implemented within the project area collaborates with the actions developed by the project proponent to monitor the project area to prevent illegal invasion, illegal deforestation, and other actions that could harm the forest conservation project.

Community

The community activities are designed to enhance the life quality and well-being of the people who live in the local communities in different aspects. Training, workshops, and environmental education regarding sustainable and food security practices can improve the community's relationship with the project and the environment, and, in addition, they can promote alternative income generation for these people.

Continuous communication and participatory consultation will be maintained with the local communities, throughout the project lifetime to ensure that the activities are reaching the goals, always considering their recommendations, feedback, and complaints. If necessary, the activities can be adapted, excluded, and reconstructed once they aim to create an environmental awareness that will benefit biodiversity, climate regulation, and their own community's well-being indirectly along generations.

Biodiversity

The project will realize a constant monitoring of biodiversity to observe the impacts and changes in the population, behavior, and the use of the area. This study is crucial to understand the local fauna and flora and, thus, enhance the conservation of priority species (endangered, threatened, endemic, and so on) and design effective activities to protect them. The engagement of the local communities in biodiversity conservation is essential, emphasizing the importance of the activities related to environmental conservation and education with these people.

2.1.14 Financial Sustainability (G1.12)

The financial sustainability of the ABC REDD Project was analyzed considering two scenarios: without the REDD project (considering only the Sustainable Forest Management Plan) and the SFMP with the REDD project. The results show that in the SFMP with the REDD project the Net Present Value (NPV) increases from R\$ 32.4 million to R\$ 53.2 million, which is an increment of 32%.

The financial analysis has been conservative. Considering only the income from the sale of wood from the Management Plan, the annual income is R\$ 8.5 million. The analysis assumes no income from carbon sales during the first 7 years of the project due to the expenses coming from the development of the carbon project (development consultancy, validation, and verification mainly). From the eighth year of the project to the tenth, the income coming from the revenues from the carbon credits is predicted to be around R\$ 708 thousand. From the eleventh year onwards, the project will generate an income of over R\$ 5 million per year from the sales of carbon credits.

It is also important to emphasize some details regarding the expenses that the project proponent has not only with the carbon project but also with the Sustainable Forest Management Plan (SFMP) and the socioenvironmental actions since the start date of the carbon project. The costs regarding the SFMP, considering operational and maintenance, are around R\$ 4 million per year, while investments related to the forest conservation measures, including socio-environmental activities (implementation/ maintenance of social activities in the PA and LMA) and the CERFLOR certification are around R\$ 2 million per year.

Table 18 - Financial sustainability analysis of ABC Norte REDD Project based on project's cashflow

Parameter	Scenario I – Sustainable Forest Management Plan (without the REDD project)	Scenario II – Sustainable Forest Management Plan + VCS AFOLU with the financial benefits from VCS
TOTAL REVENUES	R\$ 240.516.952,05	R\$ 519.026.531,26
Timber	R\$ 240.516.952,05	R\$ 240.516.952,05
Other (cattle ranching)	R\$ 0,00	R\$ 0,00
Carbon credits	R\$ 0,00	R\$ 278.509.579,21
TOTAL EXPENSES	- R\$ 123.944.247,66	- R\$ 193.089.281,44
SFMP costs	- R\$ 123.944.247,66	- R\$ 123.944.247,66
Forest conservation and socio environmental activities	R\$ 0,00	- R\$ 53.803.672,87
Carbon project development	R\$ 0,00	- R\$ 15.341.360,91
Other (cattle ranching)	R\$ 0,00	R\$ 0,00
Accumulated cashflow	R\$ 116.572.704,40	R\$ 325.937.249,82
Net Present Value (10%)	R\$ 32.435.252,98	R\$ 53.297.699,62

Source: created by authors

Taking all the information provided from the analysis of the cash flow, which will be available to the audit team during the validation process, the projection on the project's potential to generate emission reductions, and consequently, the results that will be achieved from the sale of the generated carbon credits demonstrate that the results are positive and will allow for the sustainability of the project and the maintenance of the Sustainable Forest Management Plan.

2.1.15 Eligibility Criteria for Grouped Projects (G1.14)

Not applicable. This is not a grouped project.

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

Not applicable. This is not a grouped project.

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

Not applicable. This is not a grouped project.

2.2 Without-project Land Use Scenario and Additionality

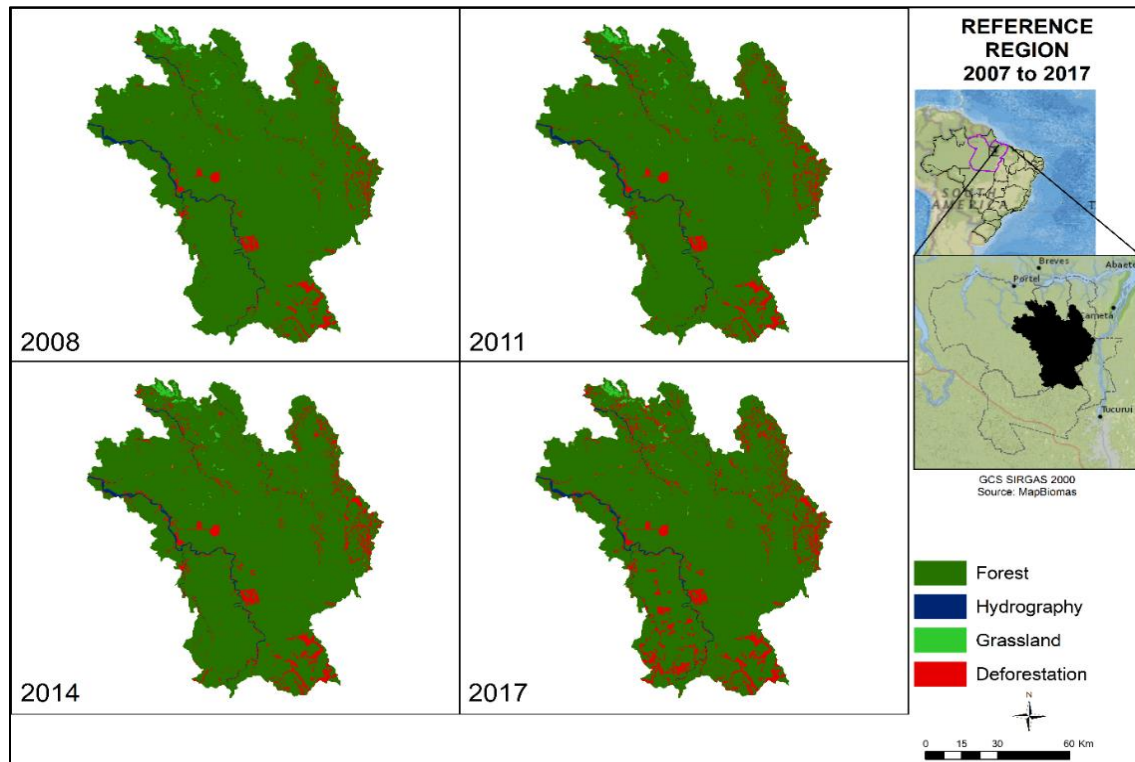
2.2.1 Land-Use Scenarios without the Project (G2.1)

The credible alternative land-use scenarios without the Project are:

I. The continuation of the current (pre-project) land use scenario: in this scenario, no REDD project is undertaken. The deforestation pattern identified in Figure 14, will most likely continue to cause deforestation in the future.

This scenario involves the implementation of a sustainable forest management plan within the project boundaries of the proposed VCS REDD project, however without carrying out additional social and environmental activities, as well as activities to reduce unplanned deforestation. Although this is a similar activity proposed by the present project, i.e. avoiding deforestation through conducting sustainable forest management activities, no other complementary activities to improve monitoring of deforestation would be carried out, such as: increased surveillance, monitoring and control by satellite images, REDD technical studies, social and environmental activities promoted by the CCB Standard, among others.

Figure 14 - Deforestation dynamics, between the years 2007 and 2017, in the reference region and project area



Source: VCS Standard ABC Norte REDD Project

Many scientific articles conclude that sustainable forest management plans (SFMP), namely those certified, can be considered a tool for forest conservation, maintenance of forest carbon stocks, and decrease of deforestation rates in the region where they are implemented. This mainly occurs due to the use of reduced impact logging techniques, reduced social and environmental operational impacts, greater surveillance in the area, and generation of economic value for forests. On the other hand, there is a belief that forest is a non-productive natural resource and needs replacing with productive activities, such as livestock farming and agriculture, primarily in areas that require social and economic development^{44,45,46,47,48}.

However, the complexity and costs of a sustainable timber operation, added to factors such as bureaucratic constraints and fluctuation of certified timber prices, make SFMP less competitive than illegal logging. Thus, investment in additional practices to what is required by law is risky and may affect the survival of the

⁴⁴ MMA - Ministério do Meio Ambiente. 2012. Plano de ação para prevenção e controle do desmatamento na Amazônia. Brazil. Available at: <<http://redd.mma.gov.br/pt/>>. Accessed on: 17 Nov. 2023.

⁴⁵ SCHULZE, M., GROGAN, J., & VIDAL, E. 2008. O manejo florestal como estratégia de conservação e desenvolvimento socioeconômico na Amazônia: quanto separa os sistemas de exploração madeireira atuais do conceito de manejo florestal sustentável? In N. Bensusan & G. Armstrong (Eds.), O Manejo da Paisagem e a Paisagem do Manejo (1ª ed., pp. 161-213). Brasil: IEB

⁴⁶ VIEIRA, I. C. G.; SILVA, J. M. C.; TOLEDO, P. M. Estratégias para evitar a perda de biodiversidade na Amazônia. Estud. av., São Paulo, v. 19, n. 54, Aug. 2005.

⁴⁷ HOLMES, T.P. et al. Custos e benefícios financeiros da exploração de impacto reduzido em comparação à exploração florestal convencional na Amazônia Oriental. Belém: Fundação Floresta Tropical, 2002, 66p, 2nd edition.

⁴⁸ VERWEIJ, P. et al. Keeping the Amazon Forests standing: a matter of values. Zeist: WWF, 2009. 72p.

operation. This includes activities that are complementary to the operation, specifically avoidance or reduction of unplanned deforestation/degradation and increase of monitoring of forest management areas.

Therefore, despite the contribution to forest preservation and carbon stock maintenance, SFMP areas are subject to unplanned deforestation and loss of carbon stock due to external agents, however expected to be in a lower intensity than in other areas without forest management. In addition, there are incentives for the local population to perform activities that result in unplanned deforestation, such as the expansion of low productivity agricultural activities, resulting in an ongoing necessity of cutting down the forest to maintain production.

There are many challenges to guarantee the consolidation of these areas and their effective social and environmental protection. Many conservation areas located in the Amazon still don't have an approved management plan, and a large amount does not have a management team. Furthermore, the number of Government agents assigned to these areas is greatly lacking and insufficient to carry out effective surveillance. The result is intense deforestation and pressure on protected areas in the legal Amazon, primarily because of wood harvesting activities, agriculture, road construction and mining⁴⁹.

II. Implementation of a sustainable forest management plan, combined with the implementation of additional activities: in this scenario, the Project activity would be carried out on the land within the project boundary, nevertheless performed without being registered as the VCS REDD project. This scenario would include avoiding deforestation through conducting sustainable forest management activities, with the addition of certifications such as CERFLOR or FSC.

Additionally, complementary activities to improve the monitoring of deforestation would have to be carried out, such as: increased surveillance, monitoring and control by satellite images, social and environmental activities promoted by the CCB Standard, among others. These investments are usually not made by the Brazilian Government, nor are part of sustainable forest management plans, as they are financially unattractive and not necessary to legally perform the timber harvest. Therefore, the economic feasibility of this scenario would be reduced without additional revenues from the sale of VCUs.

III. Cattle ranching: in this scenario, ABC Norte would change its activity from forest management to cattle ranching. This is a plausible scenario since cattle is one of Brazil's main economic activities. Furthermore, it is one of the core activities of the holding. Therefore, the long-term experience of the Algar Group in this activity makes cattle ranching a very likely scenario to be developed in the property.

⁴⁹ VERÍSSIMO, A. et al (Org.). Áreas Protegidas na Amazônia brasileira: avanços e desafios. Belém: Imazon; São Paulo: Instituto Socioambiental, 2011. 90p.

According to the 2017's report⁵⁰, the State of Pará has the main cattle herd in Northern Region of Brazil, making Pará livestock an important segment for the state's economy. The relevance of livestock in the Pará economic matrix is expressed in its participation of 26% of the GDP of the primary sector. During the historic period (2007 to 2016), the state's herd grew above the national average, with a growth of 33.36%. This is also the most profitable and common practice in the region.

Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations

Scenario I and II: the application of a sustainable forest management plan is regulated in Brazil by the laws Nº 12,651, decree Nº 5,975, in addition to Pará legislation, with law Nº 6, 462 and normative instructions IN 05 and Nº 001/2014. Despite the requirement to mitigate social impacts, social and environmental activities for the communities surrounding the management plan area are not required by law. According to Ribeiro⁵¹, the main obstacles related to the approval of the sustainable forest management plan in the Amazon are: a) low investment capacity, financial and fiscal incentives, b) bureaucracy and lack of control in the SFMP approval procedure and c) lack of participation of traditional communities in the process of elaboration of the SFMP, when they are involved. Thus, it is common to see the exclusion of the surrounding community from management activities in private areas.

As it does not contain social and environmental activities to control deforestation coming from communities surrounding the property, scenario I may contain activities that are illegal or of uncertain legal status, not being enforced namely due to the lack of control and government capacity. This type of illegal deforestation, apart from planned deforestation, occurs mainly due to social pressure and low HDI in the Amazon regions. Although not being in compliance with applicable mandatory laws and regulations, this scenario results from systematic lack of enforcement of applicable laws and regulations. One of the goals of the present REDD project is to contribute to a solution to this problem by promoting the sustainable management of forest resources through increased monitoring and surveillance to avoid unplanned, illegal deforestation.

For instance, Government conservation units such as parks and sustainable use areas (APAs) are also affected by advancing deforestation and increased accessibility of the region to economic activities due to creation or improvement of infrastructure. Between 2000 and 2008, 2.25 million hectares were deforested in protected areas in Legal Amazon, and illegal exploitation of wood (degradation) has occurred in many of them.

⁵⁰ FAPESPA - Fundação Amazônia de Amparo a Estudos e Pesquisas. Boletim Agropecuário do Estado do Pará. Brazil. 2017. Available at: <<https://www.fapespa.pa.gov.br/boletins/>>. Accessed on: 19 Oct. 2021.

⁵¹ RIBEIRO, A.C.F. et al. O Plano de manejo florestal como instrumento de desenvolvimento da sustentável na Amazônia. Direito & Desenvolvimento, ISSN 2236-0859, 2020. Available at: <<https://periodicos.unipe.br/index.php/direitoedesenvolvimento/article/download/875/715/#:~:text=O%20Plano%20de%20Manejo%20Florestal%20Sustent%C3%A1vel%20%D%20PMFS%20est%C3%A1%20intimamente%20relacionado,forma%20alcan%C3%A7amos%20um%20desenvolvimento%20ambiental>>.

One way to avoid increased accessibility and illegal exploitation of protected areas would be to increase the effectiveness of sanctions in cases of environmental malpractice.

The creation of protected areas is proven to be one of the most effective tools in forest conservation and the fight against deforestation. However, without management and investment, these important reserves do not attain their sustainable development goals, leaving them vulnerable to criminal activity such as land squatting, illegal wood harvesting and deforestation. This underlines the importance of REDD projects for forest conservation, despite being located in protected areas, because they are capable of contributing to the improvement of deforestation monitoring and control, promoting social, economic and environmental benefits in the region.

As Scenario II is the implementation of the SFMP with the addition of social environmental activities, as presented above, it is also in compliance with all applicable legal and regulatory requirements. Thus, there are no restrictions for SFMP within the areas where the ABC Norte REDD project's property is located.

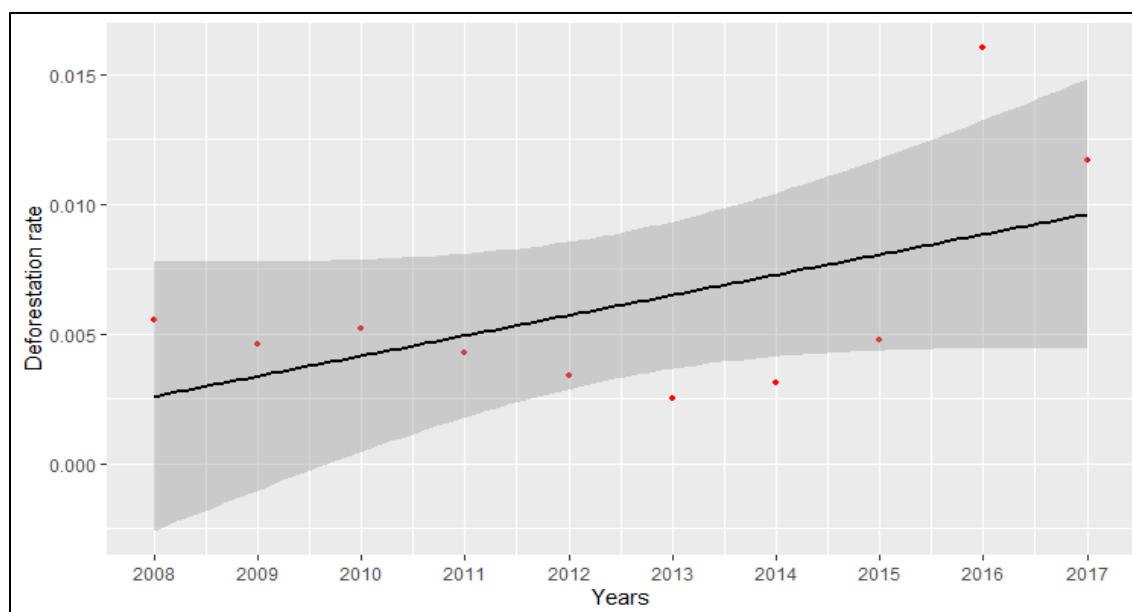
Scenario III: Cattle raising in the Amazon Forest is legal as long as the owner follows the 80% Legal Reserve and Permanent Preservation Areas restriction described in the Brazilian legislation. The landowner must also provide a deforestation authorization for clearing the area for pasture. This authorization is provided by the State's government, and in Pará, is regulated by Normative Instruction nº 2, from July 6th, 2015, in addition to the National Forest Code (Law 12,651) and Decree 5,975.

2.2.2 Most-Likely Scenario Justification (G2.1)

Based on the scenarios presented, the damage caused by the poor administration and execution of the previous management plan and the accumulated loss, it is possible to conclude that the baseline scenario is Scenario III. This is reinforced by the fact that it is already a company activity, and therefore it would be an acceptable change. These pieces of evidence allow recognizing that the future trend of deforestation within the reference region and the project area is also conclusive, especially when analyzing deforestation levels between 2007 and 2017 (Figure 8).

According to the GIS analysis, between 2007 and 2017, there was a deforestation of 55,117.62 hectares within the reference region, with an average annual oscillation of approximately 5,511.76 hectares. Although there was an increase in the deforestation rate during that period, when linear regression was applied, it was observed that this increase was not statistically significant ($R^2=0.21$, $p=0.10$), as shown in Figure 8. However, when this model was adjusted using a piecewise linear regression, it was found that the coefficient of determination increased to 0.62 and the comparison became significant ($p=0.027$), indicating that this model has a good fit. The main reason is that from 2014 (breakpoint) onwards, there was an increase in the deforestation rate in the reference region.

Figure 15 - Variation in the deforestation rate in the reference region between the years 2007 and 2017



Source: VCS Standard ABC Norte REDD Project

The annual deforestation values in the Reference Region during the historical reference period can be seen in the table below.

Table 19 - Annual deforestation in the Reference Region between 2007-2017 (September-2007 to September-2017)

Year	Accumulated deforestation (ha)	Deforestation per year (ha)
2008	38,706.75	5,126.13
2009	42,927.30	4,220.55
2010	47,697.93	4,770.63
2011	51,611.76	3,913.83
2012	54,702.36	3,090.60
2013	56,956.05	2,253.69
2014	59,755.32	2,799.27
2015	64,048.41	4,293.09
2016	78,415.74	14,367.33
2017	88,698.24	10,282.50

Source: created by the authors based on VCS Standard ABC Norte REDD Project

Table 20 - Annual deforestation in the Leakage Belt between 2007-2017 (September-2007 to September-2017)

Year	Accumulated deforestation (ha)	Deforestation per year (ha)
2008	373.65	373.65
2009	545.00	171.35
2010	790.06	245.06
2011	1,240.54	450.48
2012	1,421.51	180.98
2013	1,538.08	116.56
2014	1,637.47	99.39
2015	1,729.11	91.65
2016	2,383.60	654.48
2017	2,643.75	260.15

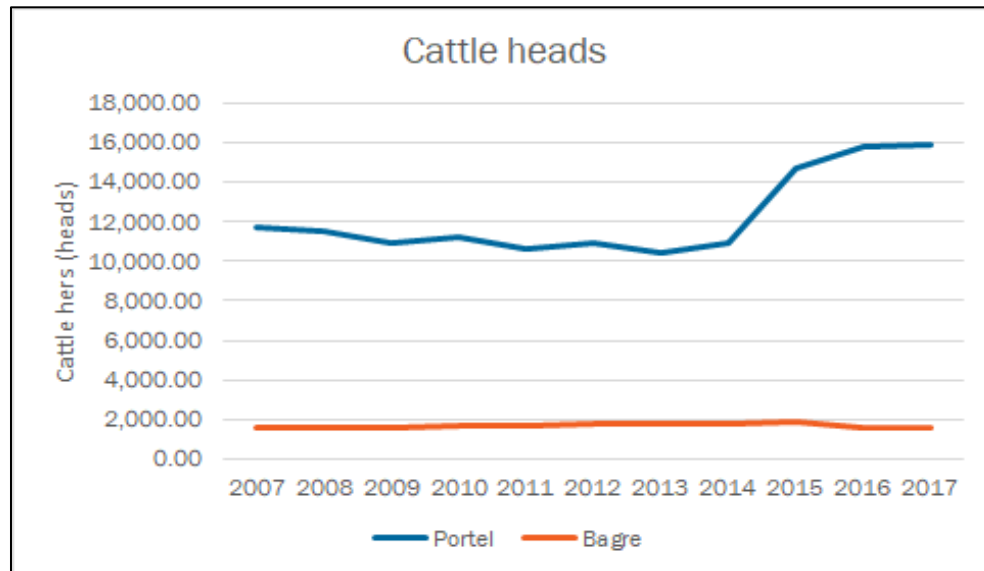
Source: created by the authors based on VCS Standard ABC Norte REDD Project

Some of the factors that characterize, and drive deforestation and subsequent cattle ranching are the low cost of the forested area; soil fertility and favorable weather; well-structured soil and mainly flat conditions of the area; tradition of farming existing in the municipalities and the meat market of the region⁵².

In addition, the price per unit (specifically, the “arroba”) of beef increased considerably in mid-2010 (Figure 16). This fact seems to stimulate rural producers to deforest new areas and expand their herds, attracting migration to forest borders distant from the municipality’s main city.

⁵² FAPESPA - Fundação Amazônia de Amparo a Estudos e Pesquisas. Boletim Agropecuário do Estado do Pará. Brazil. 2017. Available at: <<https://www.fapespa.pa.gov.br/boletins/>>. Accessed on: 06. Aug. 2021.

Figure 16 - Annual livestock in the two main municipalities of the reference region, in heads of cattle⁵³



Source: VCS Standard REDD ABC Norte Project

Figure above shows the increase of the cattle herd in the main municipality of the reference region across the period 2007-2017. It is possible to note that the total number increased around 30.88% over this period. Considering the stocking rate in the region (1.2 animals/ha), this would mean that cattle ranching alone was responsible for the deforestation of around 300 thousand hectares of Amazon rainforest in the analyzed municipalities.

Furthermore, forested property values are almost 6 times cheaper than established pasturelands. Thus, this disparity promotes the purchase of new forested areas, deforestation and further creation of new pasturelands. Thus, partly due to the expansion of globalization, deforestation rates in Amazonia appear to be linked to the growth of the international market, especially of beef⁵⁴.

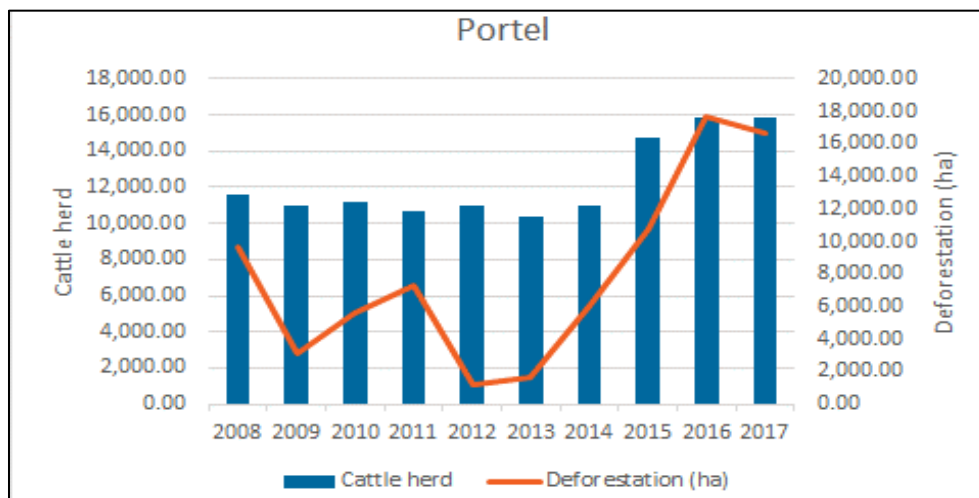
The Figures below also relate deforestation numbers with cattle herd in the region. According to PRODES satellite data⁵⁵, it can be noticed that in Portel and Bagre, where the largest portion of the Project Area and the Reference Region are located, the increase in deforestation follows the trend of an increase in the cattle herd.

⁵³ IBGE - Instituto Brasileiro de Geografia e Estatística. Brazil. 2021. Available at: <<https://cidades.ibge.gov.br/brasil/pa/portel/pesquisa/24/76693?localidade1=150110&localidade2=150520>>. Accessed on: 06 Aug. 2021.

⁵⁴ FEARNside, P. M. 2005. Deforestation in Brazilian Amazonia: history, rates and consequences. *Conservation Biology* 19(3):680-688p.

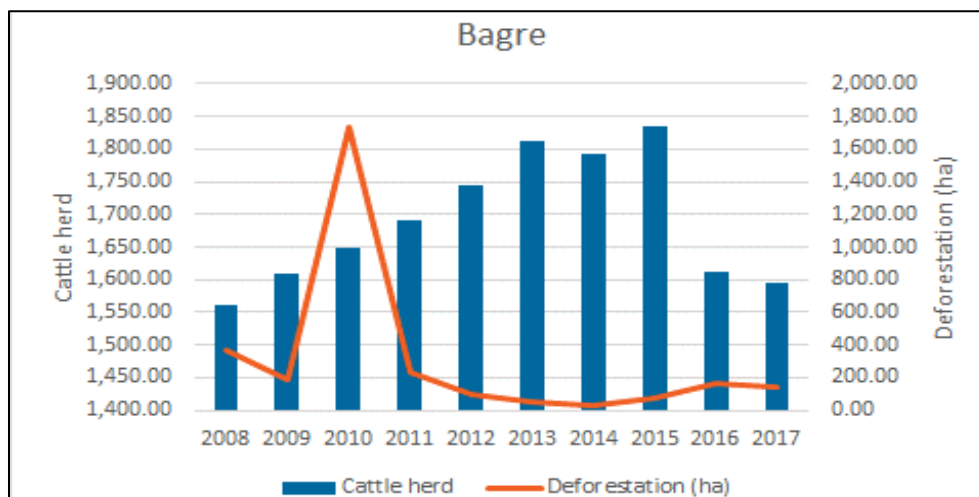
⁵⁵ Available in <http://terrabilis.dpi.inpe.br/app/dashboard/deforestation/biomes/legal_amazon/rates>. Accessed on: 06 Aug. 2021.

Figure 17 - Deforestation areas with cattle herd in Portel (PA), in hectares



Source: VCS Standard REDD ABC Norte Project

Figure 18 - Deforestation areas with cattle herd in Bagre (PA), in hectares



Source: VCS Standard REDD ABC Norte Project

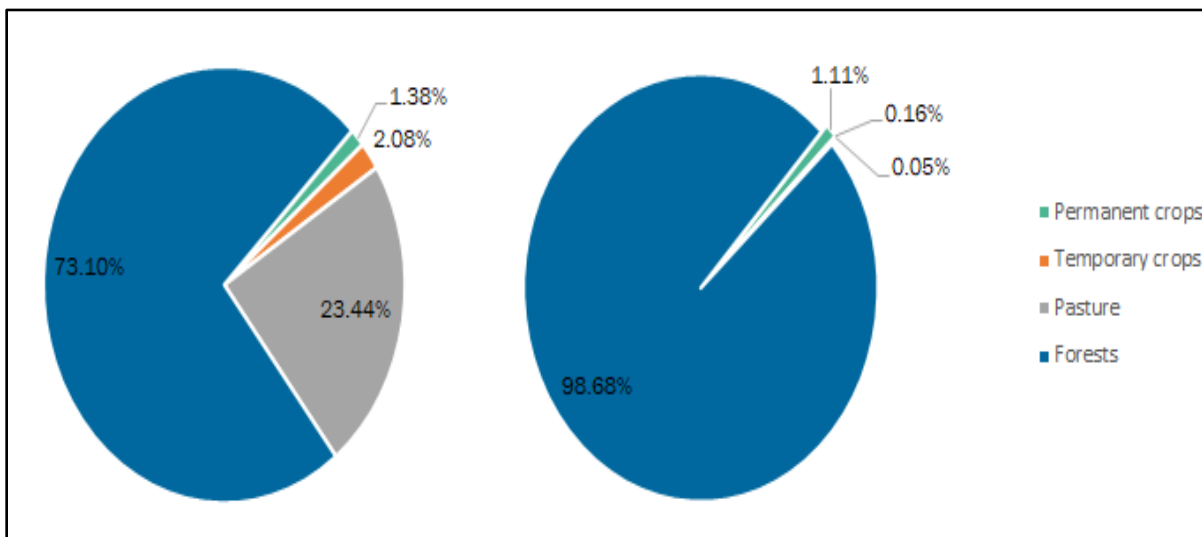
The increase in the cattle herd in Portel between 2012 and 2017 was accompanied by an increase in the number of hectares deforested in the same period. In Bagre, although the relation is not so direct, mainly because the municipality has a significantly smaller cattle herd, it is possible to notice that the two parameters are related, with a tendency to increase in close periods, as can be seen between 2009 and 2011. The peak of deforestation in 2011 was followed by a peak in the number of animals in the following years, for example. There is also a tendency to increase deforestation starting in 2016. In addition, according to Razera (2005)⁵⁶, given the large increase in pastureland property values, creation of new

⁵⁶ RAZERA, A. Dinâmica do desmatamento em uma nova fronteira do sul do Amazonas: uma análise da pecuária de corte no município do Apuí. Thesis (Master grade) - Curso de Biologia, Universidade Federal do Amazonas - UFAM, Amazônia: 2005, 109p. Available at: <https://repositorio.inpa.gov.br/bitstream/1/5091/1/Allan_Razera.pdf>. Accessed on: 06 Aug. 2021.

areas for livestock raising has been stimulated and intensified, raising cattle numbers and, consequently, increasing deforestation.

In addition, pastureland (either planted, natural or degraded) represents the main land use after forest (natural and protected areas) in the main municipalities of the reference region, which also shows that this is the main economic activity in the region.

Figure 19 - Land Use: Portel and Bagre, respectively (%)



Source: VCS Standard REDD ABC Norte Project

Based on the collected historical evidence, the relationships among the main agent groups, key drivers, and underlying causes of deforestation explain the sequence of events that typically lead and are likely to lead to deforestation within the reference region, linked to cattle raising practices.

2.2.3 Additionality (G2.2)

For the purpose of the present analysis, it is important to describe the context at the time of the project implementation. Before the project start date, the sustainable forest management plan was poorly conducted, and financial results were negative. For instance, in 2017, the accumulated loss was R\$17 million. Given the loss, the company analyzed other land use alternatives for the property, such as agriculture (soy planting), deforestation for cattle raising, development of a carbon project, donating the area for the implementation of a National Protected Area, and even the sale of the property. A final feasibility report was sent to ABC Norte in January-2017.

However, although not being a favorable economic scenario, the landowner decided to maintain the property as a personal purpose for the forest conservation and life improvement for the local communities. Thus, the alternative was to continue with the forest management plan, but this time carrying out

conservation activities and allocating part of the revenues to social and environmental actions. Considering the high accumulated negative balance at that time, this decision was based on the development of a carbon project in conjunction with the SFMP, thus generating carbon credits which would help paying the costs of the new SFMP operations and socioenvironmental activities.

In addition, the VCS Tool for the Demonstration and Assessment of Additionality in VCS Agricultural, Forestry and Other Land Use (AFOLU) Project Activities - VT0001 version 3.0⁵⁷ was applied. Following the STEP 1 described in section 3.4 of the VCS PD, this section describes STEPS 2 to 4.

STEP 2. Investment Analysis

Sub-step 2a. Determine appropriate analysis method

The ABC Norte REDD Project generates financial benefits other than the revenue from the sale of VCUs, primarily through the commercialization of timber, as a result of the sustainable forest management plan. Thus, two investment analysis comparison (Option II) will be carried out in order to determine the project's additionality, i.e, whether the proposed project activity, without the revenue from the sale of GHG credits, is economically or financially less attractive than the other land use scenarios.

Sub-step 2b. - Option II. Apply investment comparison analysis

An investment comparison analysis was performed to demonstrate which of the scenarios identified above is more financially attractive. For such analysis, the Net Present Value was considered the most appropriate financial indicator. Many articles on profitability of alternative land uses in areas under similar conditions to the project region applied the Net Present Value (NPV) for financial analysis^{58,59,60,61,62,63}.

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

The following scenarios were analyzed as part of the investment analysis:

1. The implementation of a sustainable forest management plan within the project boundaries of the proposed VCS REDD project, however without carrying out additional social and environmental activities, as well as activities to reduce unplanned deforestation.

⁵⁷ Available at: <<https://verra.org/wp-content/uploads/2017/11/VT0001v3.0.pdf>>. Accessed on: 06 Aug. 2021.

⁵⁸ AMARAL, P. et al. Floresta para Sempre: um Manual para Produção de Madeira na Amazônia. Belém: Imazon, 1998. 130p.

⁵⁹ BARRETO, P. et al. Custos e Benefícios do Manejo Florestal para Produção de Madeira na Amazônia Oriental. Série Amazônia N°10 - Belém: Imazon, 1998.

⁶⁰ SCHNEIDER, R. R. et al. Amazônia sustentável: limitantes e oportunidades para o desenvolvimento. Belém: Instituto do Homem e Meio Ambiente da Amazônia (IMAZON), 2000, 58p.

⁶¹ Available at: <<https://verra.org/wp-content/uploads/2017/11/VT0001v3.0.pdf>>. Accessed on: 06 Aug. 2021.

⁶² ARIMA, E.; BARRETO, P.; BRITO, M. Pecuária na Amazônia: tendências e implicações para a conservação ambiental. Belém: Instituto do Homem e Meio Ambiente da Amazônia (IMAZON), 2005, 76p.

⁶³ IDESAM - Instituto de Conservação e Desenvolvimento Sustentável do Amazonas. Viabilidade econômica da pecuária semi-intensiva no sul do Amazonas: uma oportunidade para reduzir o avanço do desmatamento. Manaus: IDESAM, 2014, 48p.

2. Implementation of a sustainable forest management plan, combined with the implementation of additional activities to reduce deforestation.
3. Land use change to cattle ranching.

Under Scenario I, expenses are mostly related to sustainable forest management plan, while revenues derive from the commercialization of timber. Under scenario II, the same revenues and expenses are expected. However, scenario II involves additional expenses to reduce deforestation, such as the cost of monitoring the Project Area and promoting social and environmental activities with local communities. In Scenario III, expenses are related to the implementation of the livestock infrastructure, including animal purchase and clearing of the forest area. Revenues include not only animal selling, but also the sale of commercial wood removed during the clearing of the area. The key parameters considered on each scenario are described on the Table below.

Table 21 - Main parameters used for the investment comparison analysis

Parameter	Scenario		
	Scenario I (in Brazilian Reais)	Scenario II (in Brazilian Reais)	Scenario III (in Brazilian Reais)
TOTAL REVENUES	R\$ 240,516,952.05	R\$ 240,516,952.05	R\$ 840,378,043.64
Timber	R\$ 240,516,952.05	R\$ 240,516,952.05	R\$ 251,856,329.51
Other (cattle ranching)	R\$ 0.00	R\$ 0.00	R\$ 588,521,714.14
TOTAL EXPENSES	-R\$ 123,944,247.66	-R\$ 177,747,920	-R\$ 236,988,138.12
SFMP costs	-R\$ 123,944,247.66	-R\$ 123,944,247.66	R\$ 0.00
Forest conservation and socio environmental activities	R\$ 0.00	-R\$ 53,803,672.87	R\$ 0.00
Other (cattle ranching)	R\$ 0.00	R\$ 0.00	-R\$ 236,988,138.12
TOTAL REVENUES	R\$ 240,516,952.05	R\$ 240,516,952.05	R\$ 840,378,043.64

Source: created by the authors based on VCS Standard ABC Norte REDD Project

The Table below provides the results of the investment comparison analysis.

Table 22 - Results from the investment analysis comparison between scenarios⁶⁴

⁶⁴ An electronic spreadsheet with a detailed calculation of financial indicators and the comparison of both scenarios was made available for the auditing team.

Investment Analysis Comparison - 30 years project lifetime (Brazilian Reais)			
Land use scenarios	I Sustainable Forest Management Plan (SFMP)	II SFMP combined with the implementation of additional activities to reduce deforestation	III Cattle Ranching
Variables			
Total costs	- R\$ 123,944,247.66	- R\$ 177,747,920.53	- R\$ 236,988,138.12
Total Revenues	R\$ 240,516,952.05	R\$ 240,516,952.05	R\$ 840,378,043.64
Accumulated cashflow	R\$ 116,572,704.40	R\$ 62,769,031.53	R\$ 599,364,382.40
NPV	R\$ 32,435,252.98	R\$ 17,928,606.53	R\$ 252,783,883.50

Source: created by the authors based on VCS Standard ABC Norte REDD Project

Through this analysis, it can be concluded that scenarios I and III would have a higher Net Present Value than what was calculated for scenario II. The implementation of the present VCS AFOLU project over the project lifetime (30 years) would represent a decrease on the expected NPV that would be generated by the sustainable forest management activity alone.

This represents a significant barrier for adopting additional deforestation reduction practices. Scenario I, where no REDD activities are undertaken together with the SFMP, is a more economically attractive scenario than the measures proposed by the project activity. Considering an activity change, Scenario III presents a much higher profit, although having higher costs.

Therefore, all the additional costs to monitor and reduce deforestation would not be needed if the REDD project did not occur, thus making the proposed VCS AFOLU project without the financial benefits from VCU's substantially less attractive when comparing to other land use scenarios.

Sub-step 2d. - Sensitivity analysis

The objective of this sub-step is to demonstrate that the conclusion regarding the financial attractiveness of the project is robust to reasonable variations in the critical assumptions. The investment analysis provides a valid argument in favor of additionality only if it consistently supports the conclusion that the proposed VCS AFOLU project without the financial benefits from carbon credits is unlikely to be financially attractive.

To carry out the sensitivity analysis, the following variables were subject to reasonable variation:

- Cost of SFM activities, including the SFM Plan, Yearly operational Plan and other documents (Brazilian Reais/year);

- Cost for forest conservation measures and social and environmental activities required by the REDD Project (Brazilian Reais/year);

And, for the Scenario III, two analysis were developed:

- Analysis 1 - Cattle Ranching
 - Arroba value (Brazilian Reais/year)
 - Production costs (Brazilian Reais/year)
- Analysis 2 - Timber harvesting
 - m³ value (Brazilian Reais/year)
 - Production costs (Brazilian Reais/year)

Revenues from SFMP will not be subjected to variations in this analysis, as the land owner has a leasing agreement with a Third Party. Such agreement establishes a fixed annual revenue from the leasing of harvesting activities on the Project Area.

The sensitivity analysis demonstrates that Scenario II would not be more feasible than Scenario I even if a variation of $\pm 10\%$ on the SFMP occurs. It is important to consider that any foreseeable change in these costs would likely occur in both scenarios, i.e., both scenarios would be impacted by changes in project operational costs. In addition, this indicates that forest conservation costs would need to be completely eliminated or be combined with a significant reduction in the cost of SFM activities to be comparable with the Scenario I's NPV.

In Scenario III case, the sensitivity analysis shows that even with a variation of 10% in the arroba value and production costs, cattle ranching would still be more economically feasible than the project activity. The same is observed with the timber harvesting analysis. Figures 34, 35 and 36 presented on the section “3.5. Additionality” of the VCS PD show the sensitivity analysis described above.

It is not expected that any large variation of project costs will occur, as the average inflation during 2007-2017 period was 6%/year⁶⁵. Preventing deforestation is a complex and resource demanding activity, which involves personnel, technology and the engagement with local communities in an area with more than 120,000 hectares. Therefore, the magnitude of these costs is a reflection of the complexity of developing an AFOLU REDD Project and maintaining measures to prevent deforestation and degradation. Such activities need to be performed either by for-profit organizations (such as consultancy companies) or by internal staff, that must be compensated for their services.

⁶⁵ IPC - Inflação Histórica Brasil. Annual inflation, cumulative value per year. Available at: <<https://www.inflation.eu/pt/taxas-de-inflacao/brasil/inflacao-historica/ipc-inflacao-brasil.aspx>>. Accessed on: 12 Sep. 2021.

The conditions to allow Scenario II to be more financially attractive than Scenario land III are considered unlikely by the Project Proponents. Hence, the land owner would hardly invest in activities to prevent deforestation beyond what is required by the applicable legislation in the absence of the REDD project.

Since the sensitivity analysis allows determining the VCS AFOLU project without the financial benefits from the VCS is unlikely to be financially attractive, a common practice analysis will be demonstrated next.

STEP 4. Common practice analysis

The previous steps shall be complemented with an analysis of the extent to which similar activities have already diffused in the geographical area of the ABC Norte REDD project activity. Similar activities to the proposed REDD project, i.e., that are of similar scale, take place in a comparable environment, inter alia, with respect to the regulatory framework and are undertaken in the relevant geographical area, shall be analyzed. Other registered VCS AFOLU Project activities shall not be included in this analysis.

As shown in the previous sections, logging is an important economic agent in the state of Pará, especially in the municipality of Portel and Bagre, municipalities in the project area.

In an analysis carried out with information from Secretaria do Meio Ambiente do Pará⁶⁶ (Pará Department of Environment), there are currently 1,241 establishments with a Sustainable Forest Management Plan registered in the State of Pará. Of these, 44 are located in the municipalities of Portel and Bagre. In addition to Fazenda Pacajá, 2 others have areas above 50 thousand hectares, which are owned by the same company. These areas don't have CERFLOR or FSC certifications. In Baião, municipality next to Portel, there is one area with over 100 thousand hectares, and it makes frontier with Fazenda Pacajá. This area is owned by other company, and it has FSC Certification since 2015.

CERFLOR/PEFC certification

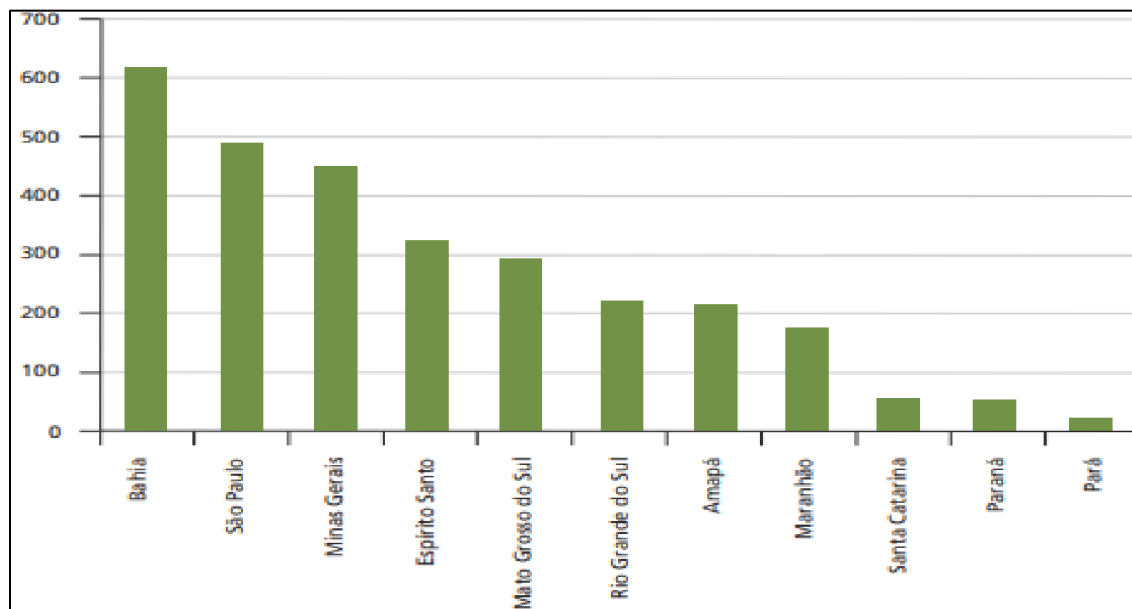
According to information of the National System of Forest Information⁶⁷, in 2017, there were 3,072,628ha of CERFLOR certified forest area. In 2016, 22 sustainable forest management plans were certified, totaling 2,905,578.69 ha⁶⁸. Figure below presents the number of certified hectares for each state:

⁶⁶ Available at <<https://www.semas.pa.gov.br/analise/ar/geoprocessamento.php>>. Accessed on: 12 Sep. 2021.

⁶⁷ Available at <<https://snif.florestal.gov.br/pt-br/certificacao-florestal/322-certificacao-cerflor>>. Accessed on: 21 Oct. 2021.

⁶⁸ Available at: <<http://repositorio.ipea.gov.br/bitstream/11058/9233/1/Contribui%C3%A7%C3%A3o%20da%20certifica%C3%A7%C3%A3o.pdf>>. Accessed on: 21 Oct. 2021.

Figure 20 - CERFLOR certified area, per state (data from 2016, in thousand ha)



Source: VCS Standard REDD ABC Norte Project

Thus, it can be stated that Pará state does not have a significant share in certificated areas in Brazil.

In 2021, 117 companies with CERFLOR/PEFC certification were identified throughout Brazil with valid and active certificates, 18 of which in the same category as Fazenda Pacajá⁶⁹. 3 of them, in addition to Fazenda Pacajá, are located in Pará. Of the 18, only 3 are categorized as Productive Forest (that is, management of native species and non-planted forest): Fazenda Pacajá, another area located in Pará, and one in Amapá. The other 15 are pine and eucalyptus plantation areas.

Of the two other areas with certificated native productive forest, it was noted that one of them develops a REDD Project, thus, it won't be included in this common practice analysis. Therefore, only one area has a similar project activity, located in Amapá State. After the assessment of the SFMP, however, it was possible to conclude that the management area is in a public forest under a Forest Concession Contract, where the government allows the use of the forest resources in state, municipal and union public forests. In addition, the proposed project area is 140,432.27 ha, while the Amapá area is 67.434,7874 ha, less than half of the proposed area.

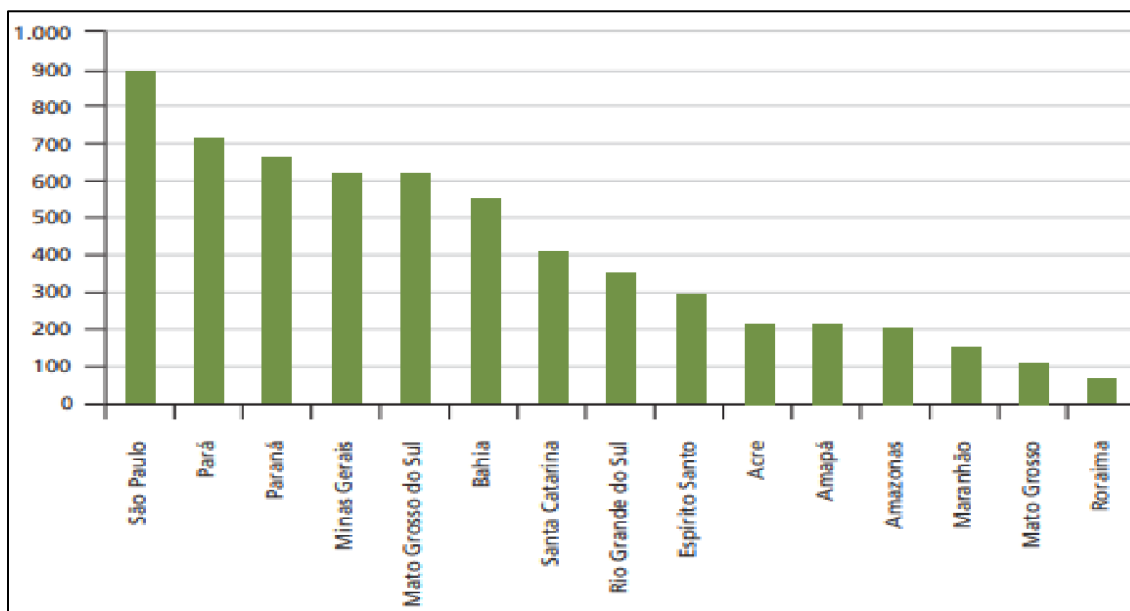
Therefore, it may be concluded that as Fazenda Pacajá is a private area, without any benefit from the public power, or concession area, the proposed project activity is not common practice in the region or in the country, being differentiated even from similar activities.

⁶⁹ This assessment included Forest Management certificate types for Wood manufacturers products in Brazil. Information available at: <https://www.pefc.org/find-certified>. 2021.

FSC

Data from 2016 shows that Brazil has 6.035.377,86 ha certified in the forest management category, in 106 management units. Of this, 1.244.497,18 ha are from native forest and 4.798.880,68 ha from planted forests. There are 37 certified entities in Pará State, 11 of them for their forest management⁷⁰. Figure below presents the certified hectares in each state:

Figure 21 - FSC certified area, per state (data from 2016, in thousand ha)



Source: VCS Standard REDD ABC Norte Project

It is possible to conclude that certified sustainable forest management plan is not a common practice in the Amazon Rainforest, and, according to the presented data, are concentrated in areas in the center-south and southeast of the country, generally associated with paper companies.

Therefore, the proposed project activity is not considered a common practice in the region. Thus, the proposed VCS AFOLU project is not the baseline scenario and, hence, it is additional.

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

Not applicable. No community and biodiversity benefits will be used as offsets.

⁷⁰ Available at: < <https://br.fsc.org/br-pt/newsfeed/fscr-brasil-no-o-liberal-do-para>>. Accessed on: 23 Oct. 2021.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

The complete ABC Norte REDD project will be available on the VERRA website, along with other mandatory documents and monitoring reports. Therefore, anyone interested in accessing it or obtaining more information can do so through the platform.

The project information itself will also be distributed orally and through folders to stakeholders during visits and local meetings that will occur before, during, and after its implementation, with the support of Upbio. The folders (printed material) containing such information, along with the results after project monitoring, will be distributed in Portuguese and according to the local language. This initiative will be undertaken to ensure that all stakeholders have access to all information and have the opportunity to address any questions that may arise.

It is important to emphasize that the activities to be developed will be previously validated by and with local communities, who will express their concerns and demands through social visits and inform the Project Proponents of activities they consider essential to be developed in the Project Area. The methodology used will be Social and Biodiversity Impact Assessment (SBIA). The technical team from Ecologica will conduct periodic meetings on-site with local communities and will also use the socioeconomic diagnosis produced by Upbio.

All documents and information about the results of project monitoring and verification will be published on VCS and CCB Standards platforms, as is normally done. Anyone interested in the ABC Norte REDD Project can contact Ecologica and the technical team via email: tecnica@ecologica.br. In case of doubts, the team will be available and happy to respond.

2.3.2 Dissemination of Summary Project Documents (G3.1)

Summary documents related to the Project will be made available and presented to local communities in the local language, ensuring a full understanding of its objectives and the activities to be developed in the Project Area, as well as the involved actors, their importance, and responsibilities. This documentation will be available in Portuguese for all stakeholders mapped in section “2.1.7 - Stakeholder Description”. It is also worth mentioning that any changes made to the CCB PD will be communicated to the local communities. It is also worth noting that, as indicated by the document “CCB Program Rules v. 3.1”⁷¹, the information included in the Portuguese summary covered sections G1.1-9 of the third edition of the Climate, Community & Biodiversity Standards, as well as sections “2.3.1 - Stakeholder Access to Project Documents”, “2.3.8 - Continued Consultation and Adaptive Management” and “2.5.3 - Free, Prior and

⁷¹ Page 17. Available at: <<https://verra.org/wp-content/uploads/2018/04/CCB-Program-Rules-v3.1.pdf>>. Accessed on: 18 Jan. 2024

Informed Consent”. Any changes related to the ABC Norte REDD Project will be communicated to the communities

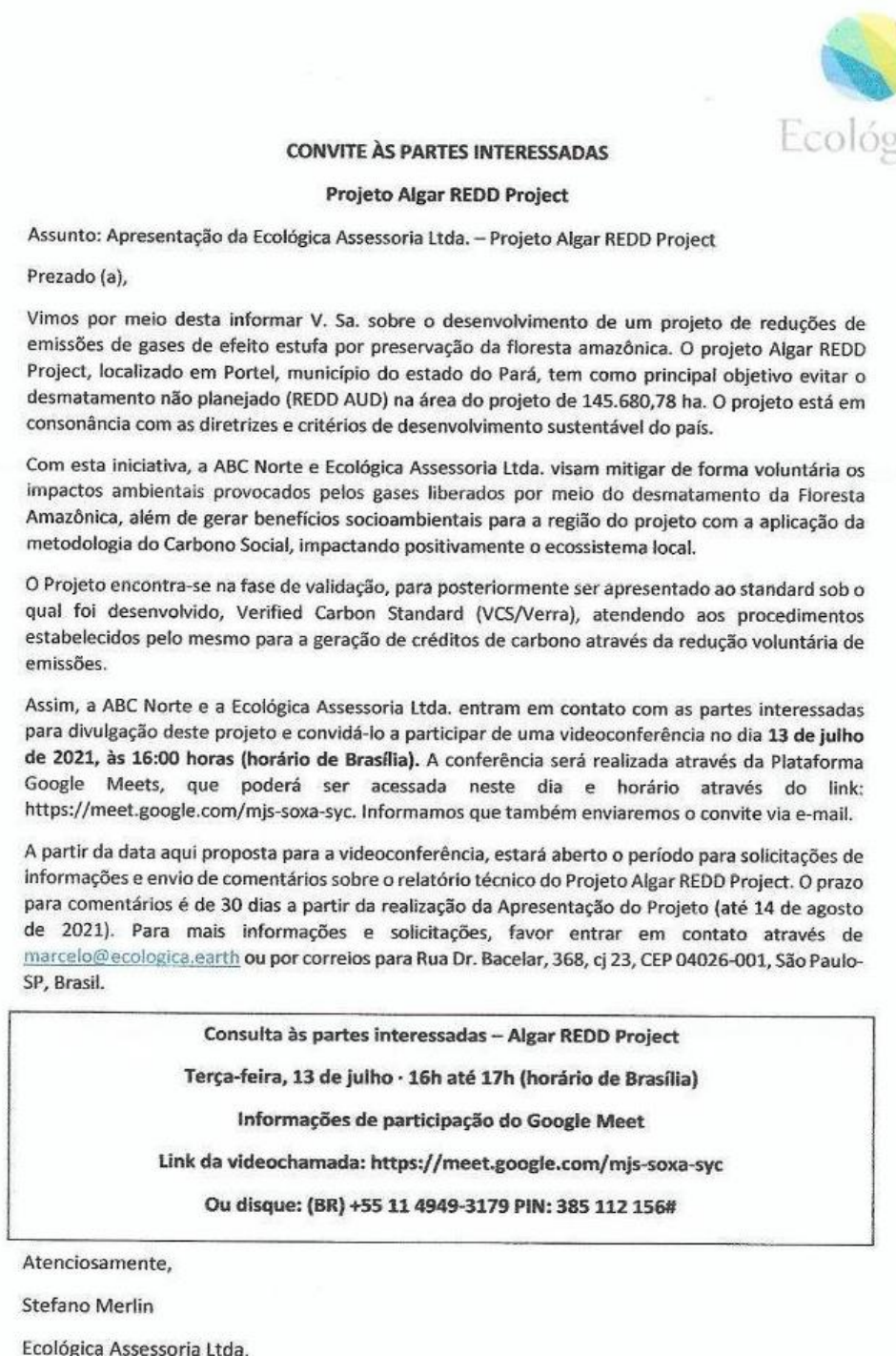
Furthermore, all documents and information regarding the results of the monitoring of the ABC Norte REDD Project development will be published in the VERRA Registry.

2.3.3 Informational Meetings with Stakeholders (G3.1)

Considering that the ABC Norte REDD Project passed through a validation process in 2020 and due to the worldwide Corona Virus pandemic that was established in the beginning of the same year, security and protection measures had to be taken to carry out the consultation with stakeholders. To contain new cases and avoid agglomerations, stakeholder consultation was carried out remotely during this validation. Thus, the Stakeholder consultation was divided in two steps: an online meeting and a local consultation with the community within and near the project instance area, where the leakage management area was defined.

To stakeholders located in urban areas, mostly government agencies, an explanatory letter was sent, briefly presenting the project. Moreover, they were also invited to attend a remote conference, with an email as a reminder for the meeting. The invitation letter and e-mail are shown below.

Figure 22 - Invitation letter to the remote consultation



Source: project proponent's collection

Figure 23 - Invitation e-mail to the remote consultation



Source: project proponent's collection

During the Local Stakeholder Consultations, no comments or suggestions regarding the project design were made, and thus, no modifications were made in the PD after the meetings.

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

Since its start date, the ABC Norte REDD Project has carried out participatory consultations with communities to understand real needs and possible activities to be developed by the demands of the communities involved in the PRS that the project proponent has in partnership with Upbio. Furthermore, the project was developed so that there are no costs for the communities, as all project activities will be funded by the project proponents. On the contrary, activities are planned to enhance the well-being of the people living in the project area.

During the visit to implement the workshop for the elaboration of the Theory of Change together with the community in December-2023, Ecológica Assessoria's socio-environmental technical team made a presentation reinforcing that the project will not negatively impact the community and that the activities that already have been developed in communities and will continue to occur has as unique objective to positively impact and offer improvements (according to the context and residents' demands) to local well-being.

During the December visit, it was possible to note that community members had a good perception of the project, as they saw improvements in their way of life (fish farming and poultry farming, for example) after the start of the visits and activities carried out by Upbio.

Thus, based on the Theory of Change outlined in section “2.1.8 - Project Activities and Theory of Change” and considering the concept of risk presented by SBIA⁷² as “pre-existing conditions” that is, as something that can impede the success of the project result, some risks were identified in the causal chain of the proposed activities for the communities. These elements, along with the risks and their mitigation strategies, are presented in detail in the following table.

Table 23 - Risks and Mitigation of Risks on Communities

Aspect of the Theory of Change	Aspect description	Risk	Description of the risk	Mitigation measure
Positive impact product “diversity in production”	Formation of cooperatives and/or associations	Internal conflicts	Possible internal conflicts within cooperatives/associations due to differences of opinion or interests	Build and implement mediation processes to resolve conflicts

⁷² Page 79. Available at: <<https://verra.org/wp-content/uploads/social-and-biodiversity-impact-assessment-sbia-manual-for-redd-projects-part-1.pdf>>. Accessed on: 23 Dec. 2023.

Positive impact result “diversity in production”	Expanded access to local markets and sales channels	Unfair competition	Possibility of unfair competition between community members, hindering cooperation and collaboration	Promote initiatives that encourage collaboration among community members rather than direct and unfair competition, such as the creation of support networks and strategic partnerships
Positive impact result “diversity in production”	Reduction of waste in the production chain	Weather fluctuations	Possibility of variations in crops due to weather fluctuations lead to unpredictable waste conditions	Develop adaptive strategies to cope with climate fluctuations (e.g. appropriate storage methods)
Positive impact product “diversity in production” and Positive impact product “limitations related to income generation through alternative sources”	Establishment of continuous training activities, covering topics related to the diversification of production based on the knowledge of the community and Development and implementation of continuous training activities for product processing	Low community participation	Lack of engagement and active participation of communities in training activities	Ongoing monitoring, regular feedback, and adjustments as needed to ensure community participation
Positive impact result “lack of community governance structuring” and Positive result product “limitations related to income generation through alternative sources”	Effective participation of communities in collective activities and Greater participation of people from the communities in the proposed activities	Barriers to access	Logistical, geographical, or socio-economic obstacles that hinder community participation	Identify and address practical barriers that hinder participation, such as transportation, location of activities, or impact on daily activities, among others
Positive impact result “lack of community	Development of community-led community	Misalignment of objectives	Divergence in the individual goals of community	Implement dialogue and negotiation sessions to align

governance structuring	initiatives and projects		members, resulting in challenges in defining collective initiatives and projects	objectives and ensure consensus in the definition of initiatives and projects aimed at the community
Positive impact product "lack of community governance structuring"	Operationalization and adoption of specific and formal consultation and deliberation procedures	Lack of adherence	Lack of buy-in by community members on the importance and purpose of the specific procedures established	Implement robust communication strategies to elucidate community members about the importance of procedures and their benefits

Source: created by the authors based on Theory of Change

The strategies for mitigating the identified risks are observed to be, to a certain extent, integrated with the causality developed in the aforementioned section. For example, the mitigation measure related to the implementation of robust communication strategies to elucidate community members about the importance of the procedures and their benefits is encompassed in the activity "establish formal processes of consultation and deliberation" This activity, among other expected results, seeks the implementation of deliberations in a representative manner.

It is also important to highlight that continuous communication between the project team and local communities will ensure the prompt identification and mitigation of any complaints related to risks in communities. Feedback from community members to the project team will ensure that activities have exclusively positive impacts, and any risk can be readily mitigated once identified. The project also adopts an adaptive management process to identify and mitigate possible risks in the community (see section "2.3.8 - Continued Consultation and Adaptive Management").

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

As the project is already validated and has gone through two VCS and SOCIALCARBON verification periods, communication with stakeholders regarding the audit process has been carried out since the beginning of the project. Regarding the validation of the CCB, as well as the next project steps, the project proponent will have the support of Upbio visits, which will be conducted in a detailed and explanatory manner regarding the CCB validation and verification process. Despite that, Upbio has a direct contact channel with the main leaders of the communities involved in the Fazenda Pacajá PRS via WhatsApp, wherewith it carries out most of the communications and contacts with the communities, as described in section "2.3.12 - Feedback and Grievance Redress Procedure".

About other stakeholders, a permanent communication channel with local stakeholders was created at the beginning of the project to receive any comments or suggestions regarding the present REDD project. This channel will be used for information about verification and validation visits by the project proponent and Ecológica Assessoria through the email tecnica@ecologica.earth.

During the visit to apply the workshop and construct the Theory of Change that took place in December 2023, the Ecológica technical team explained to the members of the communities present that the purpose of the Climate, Community, and Biodiversity (CCB) certification is to focus on the benefits socio-environmental benefits that the project offers to local communities and biodiversity. The Ecologica team distributed printed materials with explanations about the project as well as its certifications to the community members present at the workshop. In addition, they presented in a projector and banners additional information to clarify the process and what was being said and presented.

Furthermore, Ecologica's team explained that the participation of community members in this process is more than welcome so that the project's actions have the best possible adherence to the local context. On the other hand, it was also emphasized that community participation in the construction of the process, and in the activities to be implemented is completely voluntary.

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

For communities, information related to audit visits will be carried out in person, during Upbio's first annual visit to communities involved in the PRS at the beginning of February-2024. Furthermore, close to the visit date, the information will be reinforced through the Whatsapp group that the Upbio team has with community leaders.

Considering that Algar Farming already has an established communication channel with other stakeholder groups, the information about the audit visit will be done through formal communication via email, telephone, or informal meetings, with the support of Algar Farming professionals.

In addition, the communication between farmers, communities and other stakeholders with the audit representative(s) will be facilitated through representatives and the technical team of Ecológica Assessoria.

2.3.7 Stakeholder Consultations (G3.4)

Local Stakeholder Consultation - Online consultation

For the VCS validation of the ABC Norte REDD Project, the online local stakeholders' consultation was held on 13-July-2021, at 4pm (Brasília time zone) on a Virtual Conference Platform.

The presentation detailed a summary of the proposed activities of the project implementation and monitoring. The auditor from VVB, who will conduct the validation of this project, was also invited to this meeting.

The online meeting was attended by several actors, among them: Upbio Soluções Ambientais, Sustainable Carbon, Instituto Ecológica Palmas, Chico Mendes Institute for Biodiversity Conservation (ICMBio) and National Institute of Colonization and Agrarian Reform (INCRA). Stakeholders were very interested in the project, promoting a great discussion at the end of the presentation. No negative comments were made about the project.

The presentation described the main actions taken by ABC Norte to formulate the carbon project, such as certified forest management and social and environmental activities. In addition to the introduction of the company's activities, the carbon project development process, deforestation monitoring and projection methods, project area, reference region, leakage belt, etc. were also explained. The SOCIALCARBON Standard (methodology used until the second verification), its co-benefits, monitoring methods and methodology were also explained, as well as the relationship with the UN's Sustainable Development Goals. Comments received are summarized in table below:

Table 24 - Summary of comments made during the remote Stakeholder Consultation

Stakeholder	Comments
Environmental Analyst of DIMAN/ICMBio - Board of creation and management of protected areas	The environmental analyst explained his opinion on the importance of REDD projects and the voluntary carbon market. He pointed out that he only knew how the cutting cycle works, where an exploited area can be managed again only after the cycle is completed (in Fazenda Pacajá's case, 30 years). He asked about the calculation of the volume of avoided deforestation emissions and the sale of credits. It was explained that the Project is categorized as AUD (Avoided Unplanned deforestation), and that this category includes projects with or without sustainable forest management plan. The carbon calculation is performed from the deforestation reduction. The deforestation is projected for the entire duration of the project and compared with the actual deforestation during project monitoring. Emissions from the forest management are discounted from emission reductions and are called project emissions. Ecológica Assessoria also added that there are about 20 REDD projects in Brazil, and 4 of them with forest management. Due to the greater valuation of carbon credits, there is a tendency to value standing forests instead of areas with forest management, with the carbon credit starting to have a valuation close to certified legal wood. The presentation material, with information about the project, was sent to ICMBio.

Source: created by the authors

Contact information for Ecológica Assessoria and ABC Norte were made available at the end of the meeting. Communication can be carried out via letter, email or telephone.

Local Stakeholder Consultation - Communities consultation

Project stakeholders involve from government agencies to the resident community inside and outside the project area. Thus, by applying different forms of consultation, it is considered that the project covers the social, economic and cultural diversity of the different stakeholders.

For government agencies, private agencies and NGOs, communication was carried out in writing and orally, with the presentation of the project, its impacts and monitoring methodologies, accounting for credits and actions in the region via online. In a different way, for the communication of the project to the traditional communities located in the reference region and project area, a consultation was carried out considering their particularities for planning the future of the project.

The consultation with “ribeirinha” community took place from 25-June-2021 to 27-June-2021, visiting the 5 communities that are reached through the Socio environmental program. The meeting had a simplified presentation about the project, exposing the risks and benefits resulting from the project activities for the riverside population. The project’s location, context of climate change and the threat of deforestation were discussed with the communities in an informal conversation, with the “ribeirinhos” sharing their perceptions and experiences on the subject. The report with the summary of the meeting and comments from the stakeholders will be made available to the VVB.

Table 25 - Summary of meetings and inputs to the ABC Norte REDD Project

Date	Stakeholders	Comments
25-June-2021	São Sebastião do Cipoal Community	18 members of this community attended the meeting. They showed interest in knowing what was done in other projects, to have examples of actions that this type of project can carry out with the communities. The community already has a fish farming project, which is being very positive for the generation of income and training of the community. Their main demand is the renovation of the school and resumption of classes (ABC Norte has already committed to donating construction material). There were no comments against the project, they thought it was a good initiative by ABC Norte and they hope that the socio-environmental work with Upbio will grow even more.
25-June-2021	Nossa Senhora do Carmo Community	9 adults and 5 children attended the meeting. The community members demonstrated a lot of interest in the project and pointed out that the project's success will be positive to bring new activities to the community. They asked about what other projects can be developed to generate carbon credits, such as reforestation, agroforestry systems, etc.

26-June-2021	Divino Espírito Santo Community	After the project was presented, 8 meeting participants asked how the credit can help communities and how they can help secure this resource for them. It was answered that part of the sales of credits will be directed towards improvements in activities that are already developed with the communities, which can help with the work and maintenance of the forest, which will generate even more credits. The possibility of the community supplying seedlings for ABC Norte to carry out the reforestation of the areas, chocolate production, courses and training aimed at other productions, etc., was discussed. As the main demand, they commented on the lack of opportunities for young people and children, who have to leave the community to study and have better living conditions. They would like to be more organized as a community and expand the opportunities for these young people to come back and apply knowledge in the communities.
26-June-2021	Cristo Salvador Community	The participants mentioned having prior knowledge about the greenhouse effect and global warming. They observed changes in heat conditions and working hours due to solar intensity. They emphasized that deforestation in the communities is a practice for subsistence and survival, acknowledging, however, that this activity involves environmental aggressions and impacts. They expressed appreciation for the project's initiative and the opportunity to expand the company's actions within the communities. They expressed the desire for the resources to contribute to mitigating the impacts caused by the communities while providing employment opportunities and increased security.
26-June-2021	ABC Norte employees - Vila ABC	The employees asked about what benefits it could provide the village. They commented on the need for electricity and improvements in the health center, mainly. They were very interested in the project and looked for more folders to get in touch with the companies and find out more details.
27-June-2021	Monte Sião Community	The community confirmed that they feel a difference in the climate and the need to minimize impacts on nature. Currently, the community carries out aviculture activity. With the carbon resource, they hope to be able to start fish farming. As the main need, they asked for job creation in the ABC itself for the management.

Source: created by the authors based on Upbio's PRS

In addition, a permanent communication channel with local stakeholders was created in order to receive any comments or suggestions regarding the present REDD project. During the visit, an informative folder was distributed, containing address, e-mail and telephone number of Ecológica Assessoria and ABC Norte.

Thus, the channel is available for any comment, suggestion, or criticism. These will be registered and forwarded to the responsible part. In addition, the communities also have contact with the PRS team through message app, besides the monthly visits held by the program.

Furthermore, the stakeholder consultation for the CCB happened during the site visit of Ecologica's Socio-environmental technical team in December-2023. The application of the SBIA workshop, which supported the development of the Theory of Change, is detailed in the section "2.1.8 - Project Activities and Theory of Change". Despite that, Upbio has monthly meetings with the community to understand their perception of the project and its activities. During these meetings, the Upbio team collects perceptions and possible adjustments and demands to develop future actions within the communities.

Figure 24 - Folder distributed to community members (front side)

O que são os Projetos REDD+?

Os Projetos de REDD+ (**Redução de Emissões provenientes do Desmatamento e da Degradação Florestal**) visam evitar o desmatamento ilegal em determinada região por meio da conservação de uma área de floresta nativa, além de promover seu uso sustentável, proporciona a conservação da biodiversidade local.

O que são Créditos de Carbono?

A partir dessa conservação florestal são desenvolvidos os Créditos de Carbono, que são **moedas verdes**, geradas por diversos tipos de projetos, como o REDD+, que visam diminuir as emissões tão prejudiciais para a saúde do planeta e das populações.

1 tonelada de CO₂e = 1 Crédito de Carbono

Contatos

Algar: comunicacao@algarfarming.com.br
UpBio: comercial@upbiosolucoesambientais.com
Ecológica Earth: info@ecologica.earth

Projeto ABC Norte REDD+

Construindo um legado positivo para todas as pessoas!

Logos: Algar farming, ecológica EARTH, up bio

Source: project proponent's collection

Figure 25 - Folder distributed to community members (back side)

INÍCIO DO PROJETO
13 de Setembro de 2017

ÁREA TOTAL PROTEGIDA
140.432 hectares de floresta

VERIFICADOR
Verified Carbon Número de Registro: 2558
a VERES CONSULTING

CO-BENEFÍCIOS
SOCIAL CARBON® Climate, Community & Biodiversity Standards Em desenvolvimento

CERTIFICADORES FLORESTAIS
SysFlo® Cerflor



Socioambiental

O Projeto tem como pilar fundamental o seu programa de responsabilidade socioambiental, que impacta diretamente cinco comunidades nas proximidades da propriedade. Uma equipe dedicada visita cada uma dessas comunidades mensalmente, envolvendo-se em atividades culturais, educacionais e de geração de renda.

Sobre o Projeto

O Projeto de REDD+ ABC Norte, além da conservação florestal, visa promover o uso sustentável da floresta por meio do **Manejo Florestal Sustentável** uma área privada da Fazenda Pacajá, administrada pela empresa Algar Farming.

O Projeto se compromete com a conservação florestal e com a manutenção de um Plano de Manejo Florestal Sustentável (**PMFS**) ao utilizar técnicas de exploração de madeira de baixo impacto ambiental, seguindo o ciclo natural da floresta, o que permite a extração sustentável e certificada da madeira, **minimizando o impacto na floresta** e contribuindo para a geração de emprego e renda na região.





Source: project proponent's collection

2.3.8 Continued Consultation and Adaptive Management (G3.4)

The project will take all appropriate measures to communicate and consult with local stakeholders in an ongoing process for the life of the project. The project intends to carry out an average of at least one local stakeholder consultation per year, which will be monitored by CCB Standard. Every consultation shall communicate:

- The project implementation, including the project results and the importance of forest conservation activities.
- The risks, costs and benefits the project brings to local stakeholders.
- The benefit sharing mechanism.
- Procedures related to resolving eventual conflicts with stakeholders.
- The process of VCS Program validation and verification and the validation/verification body's site visit.
- Grievance redress and conflict management procedures, as well as benefit sharing mechanisms, will be discussed with communities through stakeholder consultations.

Furthermore, a permanent communication channel with local stakeholders was created in order to receive any comments or suggestions regarding the present REDD project. All communities have an online message group with the Upbios' team (91 98517-3832), responsible for the socioenvironmental activities. This channel is used to facilitate the communication and information management regarding the local activities and actions.

Moreover, Algar Farming has a document called "Communication Procedure and Record" that outlines the procedures related to the receipt of demands and complaints, especially from the communities, and defines the following communication channels:

- Ombudsman: 0800 034 2525;
- Direct service at the Pacajá Farm office;
- Meetings and/or field visits by Upbio;
- Implementation of suggestion and complaints box.

All comments received will be responded, and grievances will be resolved in a suitable time frame whenever possible, considering culturally appropriate conflict resolution methods, as detailed in section "2.3.12 - Feedback and Grievance Redress Procedure". This document will be submitted to the auditors if requested. All comments received will be responded, and grievances will be resolved in a suitable time frame whenever possible, taking into account culturally appropriate conflict resolution methods.

2.3.9 Stakeholder Consultation Channels (G3.5)

As described on sections "2.3.3 - Informational meetings with Stakeholders", "2.3.7 - Stakeholder Consultations" and "2.3.8 - Continued Consultation and Adaptive Management" meetings and participatory consultations with stakeholders have taken place monthly since the beginning of activities in partnership with Upbio at the beginning of 2019. Furthermore, the project already has an established communication channel with both communities and other stakeholders, as mentioned in the session above.

Monthly meetings with communities will continue to occur throughout the project's life cycle, as the proponent understands that it is a way of getting closer to communities and encouraging them to continue participating and getting involved in the activities promoted.

Furthermore, in addition to counting on the support of the Upbio team which, through monthly reports, passes on the necessary information, demands, complaints, and perceptions of the communities, the Ecológica technical team will carry out periodic visits to the site to talk to members of communities.

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

As described in previous sessions, in partnership with Upbio, the proponent makes frequent visits to communities to map the main topics of interest, local demands, and perceptions on the project, in addition to the implementation of training activities and technical teachings (such as psychology and poultry farming that had already been carried out in the communities).

Such visits and meetings allow communities to participate in the process of building project activities voluntarily. It is relevant to highlight that the meetings held by Upbio usually bring together men and women and, sometimes, Upbio developed specific workshops for women in the communities.

Furthermore, during the visit by Ecológica's socio-environmental technical team that took place in December to apply the SBIA methodology workshop, conversations also took place, in a participatory manner, regarding the communities' perception of the project and survey of demands. This activity served as input for the elaboration of the Theory of Change. Additional and detailed information regarding the workshop application process within communities can be found in the section "2.18 - Project Activities and Theory of Change".

Moreover, throughout the project's life cycle, the same processes mentioned above will be carried out with the new communities that are going to be included in Algar Farming's PRS in partnership with Upbio.

2.3.11 Anti-Discrimination Assurance (G3.7)

Ecológica upholds a strict Organizational Conduct that is founded on the principles of the Universal Declaration of Human Rights. The company condemns any form of abuse, harassment, discrimination, or exploitation, whether it be sexual, moral, or otherwise. Ecológica is committed to ensuring that all our business practices align with the following core values:

Principles:

- Transparency: act transparently and account for your actions to society;
- Communication: provide specific communication channels to receive denunciations, complaints, and suggestions regarding gender issues and diversity that may occur in projects and programs implemented by Ecológica Assessoria, as well as in its internal environment;
- Alignment with public policies: act in accordance with public policies national issues relating to gender and diversity;
- Incentive: encourage projects and programs that contribute to equality of gender and women's empowerment; and

- Competencies: promote the training and development of staff in gender and diversity issues and act in the generation and management of knowledge about the subject.

Organizational culture:

- Ethics: act professionally under the principles of morality and good conduct in all our activities and work.
- Respect: respect implies understanding, acceptance, and appreciation of the qualities of all people, with their individuality, rights, and duties.
- Responsibility: employees must use all their resources in their activities technical capacity, professionalism, prudence, and care for the performance of their functions.
- Reliability: the commitment of EA employees to pay attention to their activities reliably and efficiently.

The company believes that these values are critical to building a sustainable and responsible organization that contributes positively to society and the environment. We are constantly striving to improve our practices and hold ourselves accountable for upholding these standards.

2.3.12 Feedback and Grievance Redress Procedure (G3.8)

In 2021, the project proponent developed a standard operating procedure document for Conflict Management and Mitigating Measures, which aims to explain how communication between the company responsible for the PMFS of Fazenda Pacajá and the communities living around the management project will occur. The document establishes that the communication with community leaders will be carried out through the following mechanisms: Ombudsman (0800 034 2525), letter, suggestion box, and radio communication from the reception.

Letter: Formal document, in which the community will inform and/or request any demand from the PMFS coordination.

Radio communication: communication in which the community goes to the guardhouse Fazenda Pacajá, and informs what you intend to request. It is also necessary to inform formally (by letter) of the requested demand. Therefore, the radio aims to facilitate and speed up communication between the parties.

Box of Suggestions: Suggestion boxes will be implemented in communities and will be collected monthly. The objective is for community members to make suggestions for better communication and conflict resolution.

After the establishment of the means of communication, all demands will be responded to according to the level of urgency described below, and the appropriate measures will be taken.

- Level 1: simple demands, easily to be solved, which should be answered by the PMFS Coordination within 10 days, after the receipt of the request;
- Level 2: demands of medium complexity for resolution, which will be responded to within 15 days of receiving the request;
- Level 3: highly complex resolution demands, which will be responded within 30 days of receiving the request.

Aiming to resolve demands that may directly affect the community, the project proponent will send a specialized team for its proper solution. Furthermore, the demands will be recorded and monitored using the table of the figure 26 (see section “2.3.13 - Accessibility of the Feedback and Grievance Redress Procedure”).

In addition, the Upbio team also offers support in this regard through monthly face-to-face meetings with communities and through the WhatsApp group, which is in constant contact with leaders.

Furthermore, formal communication via email is prevalent among institutional stakeholders such as public bodies, research and teaching institutions, NGOs, and unions.

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

The Feedback and Grievance Redress Procedure (see section “2.3.12 - Dissemination of Summary Project Documents”) has been structured in the operating procedure Conflict Management and Mitigating Measures. All the feedbacks, grievances and demands will be recorded and monitored using the spreadsheet of the figure below.

Figure 26 - Recording and monitoring conflict resolution

Ordem	Data de recebimento	Descrição do ocorrido	Responsável por solucionar	Resolução da tratativa	Data de resposta	Status
1						
2						
N...						

Source: project proponent's collection

Furthermore, Upbio's monthly report also includes issues regarding feedback and grievance about the project. In addition, Ecológica Assessoria's socio-environmental technical team will develop monitoring and records of these feedbacks, grievance and demand as well.

In addition, as described in section “2.3.12 - Feedback and Grievance Redress Procedure”, after the establishment of the means of communication, all demands will be responded to according to the level of urgency described below, and the appropriate measures will be taken.

- Level 1: simple demands, easily to be solved, which should be answered by the PMFS Coordination within 10 days, after the receipt of the request;

- Level 2: demands of medium complexity for resolution, which will be responded to within 15 days of receiving the request;
- Level 3: highly complex resolution demands, which will be responded within 30 days of receiving the request.

All the records, indicators and relevant information can be made available and shared with relevant stakeholders, such as the Social and Environmental Committee, validation/verification bodies (VVB), clients and landowners.

2.3.14 Worker Training (G3.9)

Regarding the workers involved in forest management activities and other initiatives of the REDD ABC Norte Project, the priority is to conduct training and courses whenever necessary, aiming to continually improve safety and health conditions at work. The main goal is to empower employees to perform their tasks safely and efficiently.

In this context, the “Internal Week for Prevention of Rural Work Accidents”, held in November-2023, stands out. This event aimed to guide associates and service providers on the culture of safety in the workplace. Various topics were covered, including proper solid waste disposal, prevention of moral harassment, care for physical and mental health, as well as certifications and procedures.

Additionally, “Daily Safety Dialogues” were conducted in the farm lodgings, with a special focus on the importance of the proper use of Personal Protective Equipment (PPE), such as leg guards and helmet jugulars.

Below, we highlight some of the activities implemented throughout the year 2023, emphasizing the number of participants involved:

Table 26 - Activities conducted for workers involved in the REDD ABC Norte Project activities

Date	Activity	Number of participants
27-June	Lecture on the maintenance of the project's access road, loading and transportation of timber logs, and mechanical services	17 workers included
27-June	Lecture on road opening, yard and stockyard opening, skidding, unloading, and scaling of timber logs, and loading of timber logs onto rafts	17 workers included

27-June	Fire brigade and first aid course	20 workers included
28-June	Fire brigade and first aid course	23 workers included
22-November to 24-November	Internal Week for Prevention of Rural Work Accidents	71 workers included
24-November	Daily safety dialogue: use of leg guards	26 workers included
29-November	Daily safety dialogue: use of PPE, specifically leg guards, and excessive loading on transport trucks	14 workers included

Source: created by the authors using project proponent's collection

The figure below displays the attendance list for the fire brigade and first aid course held on 28-July-2023. The remaining attendance lists can be provided to the auditors upon request.

Figure 27 - Attendance list for the fire brigade and first aid course (28-July-2023)



Agropecuária Brasil Norte S. A. Produção e Exportação
Fazenda Pacajá – ABC Norte
CNPJ: 20.722.575/0004-78



LISTA DE FREQUÊNCIA – CURSO DE BRIGADA DE INCÊNDIO E PRIMEIROS SOCORROS			
DATA: 27/06/2023		LOCAL: ESCRITÓRIO ABC NORTE	HORÁRIO: 08:00 às 12:00 DE 14:00 às 18:00
SEQ	NOME	CARGO	ASSINATURA
1	BENEDITO DEME DE OLIVEIRA	ASSISTENTE DE CAMPO JR	Benedito Deme de Oliveira
2	DANIEL ALMEIDA DA SILVA	FISCAL DE AREA	Daniel Almeida da Silva
3	DOMINGOS DA SILVA CONCEICAO	AUXILIAR DE PRODUÇÃO	Domingos da Silva Conceição
4	EDIVAL DA SILVA CONCEICAO	VAQUEIRO	Edival da Silva Conceição
5	ELINHO PEREIRA DE SOUZA	AUXILIAR DE PRODUÇÃO	Elinho Pereira de Souza
6	FRANCIEL SOUZA DOS SANTOS	AUXILIAR DE PRODUÇÃO	Franciel Souza dos Santos
7	JACINTO DA SILVA	AUXILIAR DE PRODUÇÃO	Jacinto da Silva
8	JEFERSON LOBATO MAGNO	AUXILIAR DE PRODUÇÃO	Jefferson Lobato Magno
9	JEFFERSON RAIMUNDO GAMA FRANCA	ASSISTENTE DE MANUTENCAO	Jefferson
10	JOAO NASCIMENTO DOS SANTOS	AUXILIAR DE PRODUÇÃO	João dos Santos
11	LUCIVALDO ALVES DOS SANTOS	AUXILIAR DE PRODUÇÃO	Lucivaldo Alves dos Santos
12	MARCOS FURTADO DOS SANTOS	ASSISTENTE TECNICO FLORESTAL	Marcos Furtado dos Santos
13	MARIA VITÓRIA QUEIROS	ASSISTENTE TECNICO FLORESTAL	
14	NAZARENINIO SANTOS DA SILVA	INSPECTOR DE AREA	Nazareninio Santos da Silva
15	NIVALDO DA SILVA LOBATO	MARCENEIRO	Nivaldo da Silva Lobato
16	RAIMUNDO DO AMARAL	VIGIA	Raimundo do A. da Silva
17	RAIMUNDO GONCALVES	FISCAL DE AREA	Raimundo Gonçalves
18	RAY ZEBES VIEIRA	AUXILIAR DE PRODUÇÃO	Ray Zebes Vieira
19	REGINALDO MARTINS GONCALVES	AUXILIAR DE MANUTENÇÃO	Reginaldo Martins Gonçalves
20	SEBASTIAO FARIAS ROCHA	FISCAL DE AREA	

Source: project proponent's collection

As for the communities, the initiatives are developed by Upbio and focus primarily on the axes of promoting sustainable productive activities and educational and informative actions, as detailed in section “2.1.6 - Stakeholder Identification”. Below, some activities conducted in these axes in the year 2023 are highlighted, also emphasizing the number of participants involved:

Table 27 - Activities in the communities involving the axis of Promotion of sustainable productive activity and Educational and informative actions

Month	Activity	Number of participants
January	Monitoring the progress of poultry and fish farming activities	06 residents benefited (02 technical visits and 02 communities served)
February	Conducting a fabric painting workshop and donating feed for the maintenance of fish farming activity	32 residents benefited (03 technical visits and 05 communities served)
March	Donation of agricultural inputs	07 residents benefited (03 technical visits and 04 communities served)
April	Monitoring the development of a community garden and distributing educational pamphlets to understand the importance of wildlife preservation	13 families benefited (01 technical visit and 01 community served)
May	Execution of a bio-jewelry workshop, distribution of educational pamphlets to understand the importance of wildlife preservation, and promotion of sustainable productive activities through the donation of feed and water dispenser for poultry farming	81 residents benefited (06 technical visits and 04 communities served)
June	Execution of a floral arrangement workshop and promotion of sustainable productive activities through the donation of feed for poultry farming, as well as support and encouragement for vegetable and fish farming production	55 residents benefited (13 technical visits and 05 communities served)

July	Execution of a fabric painting workshop and promotion of sustainable productive activities through support and encouragement for vegetable production, in addition to the donation of feed for poultry farming	51 residents benefited (09 technical visits and 05 communities served)
August	Execution of a flower-making workshop and promotion of sustainable productive activities through support and encouragement for vegetable production, as well as the donation of feed for poultry farming	74 residents benefited (18 technical visits and 05 communities served)
September	Execution of a jelly production workshop and promotion of sustainable productive activities through support and encouragement for vegetable production, as well as the donation of feed for poultry farming	50 residents benefited (18 technical visits and 05 communities served)
October	Promotion of sustainable productive activities through the implementation/restructuring of the fish farming project and donation of feed for poultry farming	10 residents benefited (15 technical visits and 05 communities served)
November	Invitation to Social Action and Seminar on the Carbon Market (REDD Project) and promotion of sustainable productive activities through the donation of feed for poultry farming	33 residents benefited (09 technical visits and 05 communities served)
December	Occurrence of the Social Action and Seminar on the Carbon Market (REDD Project) and promotion of sustainable productive activities through the donation of feed for poultry farming	282 residents benefited (02 technical visits and 05 communities served)

Source: created by the authors through the monthly reports of the Upbio's PRS

Moreover, the Image 3 illustrates records of activities conducted in the communities, aligned with the thematic axes mentioned earlier⁷³.

⁷³ The mosaic encompasses records of various activities in the communities, highlighting the fabric painting workshop held in São Sebastião do Cipoal (24-February-2023), the distribution of educational pamphlets for understanding the importance of wildlife preservation in Monte Sião (27-April-2023), the bio-jewelry workshop in Divino Espírito Santo (26-May-2023), and the technical visit for the implementation of a fish farming system in São Sebastião do Cipoal (28-October-2023).

Image 3 - Record of activities developed in the communities by the PRS



Source: project proponent's collection (Upbio's PRS from 2023)

In summary, the activities developed for both the workers involved in forest management and the communities served by the PRS stand out for prioritizing safety, health, and the encouragement of sustainable practices. The approach aims not only to improve working conditions but also to promote a culture of safety and sustainability. By focusing on training and daily dialogues, the initiatives seek to strengthen the commitment to safe and healthy practices. Furthermore, the activities in the communities highlight the importance of environmental education and the encouragement of alternative and sustainable practices. The active engagement of workers and communities demonstrates the relevance of these actions for building safe work environments and promoting responsible practices for the environment and local development.

2.3.15 Community Employment Opportunities (G3.10)

During project activities related to the communities, described in section “2.1.11 - Project Activities and Theory of Change”, the community residents will also continue to be involved in capacity-building programs and training. The project will continue to promote training for producers to improve their agricultural practices, poultry, and fishing farming, as well as implementing actions related to alternative sources of income (such as handicrafts, jam workshops, and others that will be created according to the demands of the communities and local context).

Furthermore, residents of Vila ABC actively work on the project as forest technicians, in the guardhouses in the project area, in the cocoa plantation that is being carried out within Fazenda Pacajá (outside the project area), in the Pacajá Móveis factory, etc. All Vila ABC workers are registered by the laws described in section “2.3.16 - Relevant Laws and Regulations Related to Worker’s Rights” and undergo constant training, as described in section “2.3.17 - Occupational Safety Assessment”. It is also important to emphasize that the steps of the selection process and the hiring of workers are based on the criteria specified in the job description provided and require minimum qualifications. Despite that, project proponents already have community members on their work teams, including in management positions.

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

In Brazil, workers are protected by well-defined laws, such as the Consolidation of Labor Laws (CLT) Law No. 5.452/43, which was recently updated by Law No. 13.467/2017⁷⁴ (labor reform). Additionally, there is Law 5,889/73, which specifically regulates the rules applicable to rural employees. The CLT includes Brazilian Regulatory Norms (NR) that provide guidance on mandatory procedures related to occupational safety and health, and these are cited in Chapter V, Title II, and were approved by Ordinance no. 3214 in June 1978.

⁷⁴ Available at: <https://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/lei/l13467.htm>.

For the project, the following NR regulations are particularly relevant:

- NR 4 - Specialized Occupational Health and Safety Services.
- NR 5 - Internal Commission for Accident Prevention (last updated: SIT Ordinance N°. 247 of 12-July 12-2011).
- NR 6 - Personal Protective Equipment (PPE);
- NR 28 - Inspection and Penalties (deals with penalties that can be applied to companies that do not comply with the other rules established by the Federal Government);
- NR 31 - Safety and Health at Work in Agriculture, Livestock Forestry, Forestry, and Aquaculture;
- ILO Declaration on Fundamental Principles and Rights at Work;
- Conventions 87 and 98 - Dealing with union freedom and protection of the right to union and collective bargaining.

It is important to state that stakeholders associated with laws and regulations covering workers' rights are those employed by the Project's Instances. Therefore, all relevant laws and regulations covering workers' rights in Brazil are followed by the Project's instances and are communicated to each employee upon hiring⁵⁶. In the case of Instance 1, through Arca's Manual of Professional Conduct and Ethics ("Manual de Conduta e Ética Profissional").

2.3.17 Occupational Safety Assessment (G3.12)

A crucial element of the project lies in the diligent and effective dedication to the safety of employees, following the internal guidelines and official regulations of the federal and state governments. Due to the potential impact of work processes and the work environment on health, it is imperative to establish and apply a series of measures related to risk assessment. This includes promoting and preserving the physical and social well-being of employees, preventing occupational diseases, protecting against health risks, and ensuring a work environment appropriate to the physical and psychological aptitudes of those involved.

In this context, Algar Farming has a document entitled "SOP 10 - Standard Operating Procedure: Safety and Health at Work", which aims to describe the procedures necessary for the execution of Occupational Health and Safety measures, as well as Emergency Response actions that may occur during the activities.

The implementation of these procedures and the systematization of professional practice have the purpose of reducing possible errors and deviations in the exercise of professional activity, facilitating short, medium and long-term planning. The document serves as a guide, constituting essential tools to provide technical and practical information to the professionals involved, addressing aspects such as:

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Table 28 - SOP 10: Standard Operating Procedure

Safety	Health
Accident prevention	Specialized occupational health services
Personal protective equipment	Control of activities involving unhealthy operations
Risk Prevention Program	Ergonomics
Safety signage	Hygienic-sanitary procedures in food and beverage handling
Fire protection	Sanitary conditions and comfort in workplace and potability assessment of water

Source: created by the authors using project proponent's collection

The intention is to make these procedures available on each service front, using them in the daily work practice of all professionals, associates and employees. This document details each activity in detail, aiming to clarify any doubts and/or guide decision-making. In case of persistent doubts, the guidance of a senior technical manager is sought. ABC Norte, through its partners, is committed to providing resources, establishing safe procedures and work practices, aiming to prevent, eliminate and reduce failures.

This document will be submitted to the auditors.

2.4 Management Capacity

2.4.1 Project Governance Structures (G4.1)

Ecologica Assesoria Ltda. is responsible for managing all the necessary activities to develop a project description compatible with project standards and methodology. This includes calculating carbon credits generated, as well as providing assistance with project validation, verification under VCS/CCB and registration processes. The team responsible for these tasks is divided into five interconnected areas:

- **Technical monitoring team:** A technical team that specializes in developing REDD projects. They are responsible for project design, selecting activities, setting specific objectives, providing technical support to the owner, and monitoring that the activities are being carried out correctly.
- **Socioenvironmental Team:** This team is responsible for conducting socioeconomic analysis, engagement, and articulation with communities and other stakeholders.

They are also responsible for developing and implementing social activities and indicators and monitoring socioeconomic indicators.

- **Sales Team:** The sales team is responsible for the negotiation of the contract and closing the deal as well as for the sales of the carbon credits generated by the projects.
- **Legal Department:** A legal team that specializes in property, proponent, land tenure, and other legal matters. This analysis is conducted through certificates from the federal and state court of justice to identify potential land conflicts, overlaps with public areas, and possible risks of expropriation.

By working together, these teams ensure that Ecologica Assessoria's clients receive comprehensive support and expertise throughout the project development process. Additionally, after project validation/verification, Ecologica Assessoria coordinates Project Activities Governance in collaboration with the Algar Farming. Both parties are responsible for monitoring the project area to prevent invasions, changes to the biome, or any activity that could result in deforestation and loss of biodiversity. There is continuous communication between proponents throughout the project period.

The Algar Farming, a company belonging to the Algar Group, was founded in 2014 with the aim of standing out in the agriculture and livestock sectors. Currently, it is part of the agriculture, protein, and forestry sectors. Guided by the belief in the future of agribusiness, it adopts an approach that combines work, technology, and sustainable practices. Continuously seeking innovative initiatives, the company aims to ensure excellence in its results.

Recently, Algar Farming integrated ABC Norte, with which it manages a total area of 145,000 hectares, of which 110,286.67 hectares are allocated to sustainable forest management. In this management, 4,500 hectares are handled annually, ensuring the sustainable use of the forest. Its activities encompass Forest Management, Furniture Manufacturing, and the Carbon Market, with this axis directly related to the ABC Norte REDD Project. Details about the team involved in this axis, including a brief description of their experiences, can be found in the table below:

Table 29 - Resumes of Algar Farming collaborators

Name	Description
Cinthya Ramos	Postgraduate degree in Occupational Safety Engineering from Estácio de Sá (2019); Bachelor's degree in Forest Engineering from UEPA (2017); Works as a Forest Supervisor, previously worked as an Environmental Analyst at the consultancy level; was an intern at the Brazilian Agricultural Research Corporation - EMBRAPA; was a scholarship recipient from CNPq and FAPESPA.
Maicon Farias	Technologist in Environmental Management from Faculdade Ideal (2011), Master's degree holder from the Graduate Program in Natural Resource Management and Local Development in the Amazon - NUMA/UFPa (2014), and

	currently pursuing a degree in Agronomy at the Federal Rural University of the Amazon. Participated in the AguaSocial academic mobility project (a cooperation project between UFPA and the European Union). Interned at the Directorate of Protected Areas - DIAP/SEMA (2010-2011). A member of the Cartography team at Belem GPS. Worked as a consultant for cartographic services for Anthropological Reports on Quilombola Communities in Amapá and Maranhão. Was a scholarship recipient at the Institute of Economic, Social, and Environmental Development of Pará - IDESP, working on projects related to Environmental Quality Indicators of Pará Municipalities and the Belo Monte Observatory. Mainly focused on the following topics: Remote Sensing, Cartography, Geoprocessing, and Environmental Management.
Maria Almeida	Forest Engineer graduated from the Federal Rural University of the Amazon (UFRA), currently working as a forest assistant at Algar Farming - Pacajá Farm. In terms of academic experience, she participated in the Institutional Program for Scientific Initiation Scholarships (PIBIC) at the Evandro Chagas Institute (IEC) from 2019 to 2021, focusing on research related to the bioaccumulation of heavy metals in aquatic macrophytes and the water of lakes in the water supply system of the Metropolitan Region of Belém-PA. In 2021-2023, she was part of the Tutorial Education Program in Forest Engineering - PET Florestal, engaging in teaching, research, and extension activities.
Luciana Pereira	Master's in Natural Resource Management and Local Development in the Amazon (UFPA); Bachelor's degree in Forestry Engineering from the Federal Rural University of the Amazon (2007), and a degree in Geography with a teaching and bachelor's degree from the Federal University of Pará (2008). Currently, she works as Executive of Forests at Algar Farming group and serves as Executive Director (alternate) at the Association of Forestry Engineers of Pará. Prior to her current role, she held the position of Forest Management Manager at FRM Brasil, a subsidiary of FRM France. She previously worked as a Forestry Engineer (technician) at the State Secretary of the Environment of Pará. She has experience in the field of Geography as a teacher and researcher, focusing primarily on topics such as Forest Concession, Sustainable Forest Management, Space, gentrification, public policies, Sustainability, ESG, Carbon, and Continuing Education.
Pamela Bahia	Graduated in Forestry Engineering from the Federal Rural University of the Amazon (2018), currently holds the position of Forestry Supervisor at ABC Agropecuária Brasil Norte S.A. Produção e Exportação. Has experience in the field of Forest Resources and Forestry Engineering, with emphasis on Sustainable Forest Management and Forest Certification.

Source: created by the authors using project proponent's collection

2.4.2 Required Technical Skills (G4.2)

The knowledge and skills required to implement the project are related to the development of restoration and conservation projects in the Amazon; generation and analysis of satellite land use monitoring information; implementation, management, and provision of technical assistance for agroforestry production. As described in sections “2.4.1 - Project Governance Structures” and “2.4.3 - Management Team Experience”, Algar Farming as the project proponent (with Upbio as the main technical and

implementing partner), and Ecológica Assessoria are the institutions with staff directly involved in the implementation and development of the project - considering both the technical and management teams.

2.4.3 Management Team Experience (G4.2)

Ecológica Assessoria Ltda. has been operating in the forestry and carbon market since 1998 with REDD projects for forest carbon credit generation. Ecológica's DNA is its extensive experience as a developer of carbon emission reduction projects, with comprehensive socio-environmental co-benefits.

The technical and socio-environmental team has vast experience in a variety of disciplines critical to the planning and monitoring of projects. This includes forestry engineering, environmental management and engineering, geography, and geoprocessing analysis, among other related areas. The table below provides a brief description of the experiences of the Ecológica Assessoria team.

Table 30 - Resumes of Ecológica Assessoria Ltda

Name	Description
Aline Costa	Administration technician and Environmental Manager graduated from the University of São Paulo, Brazil. Currently a master's student in Applied Ecology at the University of Aveiro, Portugal. Working for more than two years as an Environmental Analyst and technician in the climate change sector with a focus on offsetting Greenhouse Gas emissions, building extensive experience in generating Emissions Reduction with the main international standards for Carbon Projects, since their conception to monitoring. Currently working as a technical coordinator of fossil fuel switch projects, and as an analyst in REDD projects.
Eliane Yamada	Eliane Yamada has more than 15 years' experience in socio-environmental projects, including experience with carbon projects, mainly REDD, sustainable rural development, agroecology, agroforestry systems, solid waste management plans and land structure. Developed and coordinated teams in settlement projects in Brazil through participatory rural diagnostics with the aim of implementing different types of agroecological projects. Coordinated a team to implement environmental projects, focusing on waste management and contaminated areas at a large Brazilian food retailer. Developed and coordinated innovation projects for sustainable development, with a focus on monitoring hydroelectric power plant and mapping the production chain of extractivists, and experience in biofuel projects in Africa and Latin American countries, with a focus on small farmers. Agronomist Engineer graduated from Escola Superior de Agricultura "Luiz de Queiroz"/USP. Master's degree in Science with an emphasis on Physics of the Agricultural Environment from the same institution and an MBA in Business Management from PECEGE/ESALQ/USP.
Júlia Batista	Bachelor's in international relations from Escola Superior de Propaganda e Marketing de São Paulo (ESPM) with a focus on Government Relations and technologist in Environmental Management from Centro Universitário SENAC de São Paulo. Has been working in the carbon market since 2021, accumulating knowledge from the commercial area to the technical area, specifically socio-

	environmental and, since April 2023, working specifically in the socio-environmental technical area, focusing on the development of socio-environmental impact monitoring reports (SOCIALCARBON and CCB) of forest conservation projects (REDD+). Currently integrates Ecológica Assessoria's socio-environmental technical team, participating in the development of socio-environmental impact monitoring reports (SOCIALCARBON and CCB), as well as in the design and implementation of external activities to improve the well-being of communities and conserve biodiversity in the region of REDD+ projects from the Ecológica portfolio.
Lara de Paula	Bachelor's degree in environmental management from 'Universidade de São Paulo', with five years of experience in the environmental sector. Experience includes work in the parks and public areas department of the City of São Paulo, focusing on environmental education and preservation issues. Additionally, acquired experience in the banking sector, working on fronts related to ESG themes and socio-environmental risk analysis in corporate compliance area. Currently, a member of the technical team at Ecológica Assessoria, dedicated to developing REDD projects, following internationally recognized methodologies for the verification and certification of projects to reduce greenhouse gas emissions, such as the VCS (Verified Carbon Standard).
Lucas Freitas	Bachelor's degree in Environmental Management from the School of Arts, Sciences, and Humanities at the University of São Paulo (EACH-USP) and is currently enrolled in an MBA program in Diversity and Inclusion Management in Organizations at PUC Minas. With over four years of experience in the socio-environmental field, there is expertise at the intersection of socio-environmental issues and emancipatory processes, particularly in contexts of vulnerability. Demonstrated experience in promoting popular educational initiatives with the active participation of communities directly affected by negative environmental impacts. Currently, part of the socio-environmental team at Ecológica Assessoria, contributing to the design and implementation of projects aimed at reducing and removing carbon emissions, improving community well-being, and conserving biodiversity, framed within the REDD category (Reducing Emissions from Deforestation and Forest Degradation).
Marcelle São Pedro	Bachelor's degree in Forest Engineering from the Federal Rural University of Rio de Janeiro and master's degree in Science of Tropical Forests from the National Institute of Amazonian Research. Currently, is a PhD candidate in Science of Tropical Forests at the same institute, having 8 years of experience in research in the Amazon Forest. Worked with the recovery of degraded areas and bioindicators of atmospheric pollution in the Atlantic Forest. In the Amazon, worked with the regeneration of secondary forests and carbon accumulation in their biomass after deforestation and degradation by cattle raising. As a PhD candidate, evaluates ecological relationships between forest structure and plant and animal species diversity and composition changes in a terra-firme tropical forest. Strong background in ecology of terrestrial communities and ecosystems, data analysis, and programming in the R software. Currently, integrates Ecológica Assessoria's technical team, being responsible for implementing and monitoring REDD+ projects, following internationally recognized methodologies in the voluntary carbon market, such as VCS (Verified Carbon Standard).
Maria Roquette	Graduated in Biological Sciences and Master in Geography from Federal University of Espírito Santo, Brazil, has been working on socio-environmental projects for ten years in technical and management areas with experience on

	environmental monitoring, methodological development, socio-environmental diagnoses and technical elaboration. Recently acted as coordinator of Espírito Santo state team for Social Dialogue and Information and Service Centers, in the context of an environmental disaster. In community-based work, has experience on planning, monitoring and evaluation of production chains and worked as analyst and head on a methodology development project for fishing economic activity compensation policy eligibility. When working with/on traditional communities, prioritizes the development and application of participatory approaches. Currently integrates Ecológica Assessoria's technical team, collaborating on the development of REDD+ projects, following internationally recognized methodologies for verification and certification of projects, especially those related to climate, community and biodiversity (CCB) standards.
Mariana Carriles	Master's degree in Environmental Science and Bachelor's degree in Environmental Management from the University of São Paulo, with 12 years of experience in the development of socio-environmental projects centered around critical themes such as water security, urban solid waste, and climate change. Since 2021, actively engaged in climate-related activities and has successfully conducted studies on climate vulnerability, developing reports on corporate performance using the CDP Climate Change questionnaire, and overseeing the monitoring of fossil fuel switch projects in accordance with international standards within the voluntary carbon market (VCS and SOCIALCARBON). Currently, working as part of the technical team at Ecológica Assessoria, contributing to the implementation and monitoring of REDD+ projects in the Amazon, aligned with the guidelines of the CCB Standard.
Stefano Merlin	Solid background and extensive experience in environmental science, sustainable development, and climate change. Co-founder and president of a Brazilian NGO focused on research and development initiatives related to sustainability and climate change, demonstrating profound expertise in project management. From project conception to development and commercialization of carbon credit projects, possesses vast knowledge and skills. Recognized for establishing five companies specializing in the carbon credit market: Instituto Ecológica, Ecológica Advisory, Sustainable Carbon, Future Carbon, and GreenAfrika. With a portfolio comprising over 50 distinct projects, stands out as a pioneer in the voluntary carbon market, providing consultancy services to renowned organizations such as the United Nations Development Programme (UNDP), International Education Institute (EEI), NASA, and leaders in various sectors, including JP Morgan, Santander, BP, VW, and Climate Partners, among others. Additionally, co-authored various publications on carbon sequestration and social carbon, and contributed to the development of the Social Carbon Standard.
Teresa Simões	More than 25 years of experience in the financial area, as an angel investor, partner in transformation and restructuring companies, general manager of a Corporate Venture fund, CFO in Multinationals and Private Groups in which her main challenges were to develop companies/businesses to create value for shareholders. Angel investor with participation in approximately 20 projects supporting entrepreneurs in the strategic and financial development of their businesses. Strong background in the development and scale-up of start-ups and extensive knowledge in M&A throughout Europe, Brazil, Latin America, and the United States. Served as a board member for companies in FMCG, Industry, IT IS, Fintech, and Agricultural Services, among others. Degree in Business Administration from "Universidade Católica Portuguesa" with a postgraduate degree from Harvard Business School.

Yara Fernandes	Graduated in Environmental Management from the University of São Paulo, and holding a degree in Social Impact from the Amani Institute, Yara brings extensive experience in emission reduction projects, particularly in energy efficiency and forest conservation. With five years of professional experience in the field of climate change, she has been actively involved in REDD+ projects in the Brazilian Amazon, strategically aligning these initiatives with the Sustainable Development Goals (SDGs) and ESG strategies. In addition to her involvement in carbon projects, Yara also excels in socio-environmental impact programs, leveraging methodologies such as Social Carbon and the CCB Standard. Currently serving as the Technical Coordinator at Ecológica Assessoria, she leads two teams - technical and socio-environmental. In previous roles, she served as the Coordinator of the SOCIALCARBON Standard and Socio-environmental Coordinator at Future Carbon Group, where she was instrumental in establishing and leading the socio-environmental sector.
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Source: created by the authors

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

Table 31 - Main information about AFLORA Engenharia

Organization name	AFLORA Engenharia
Role in the project	Technically responsible for the preparation and execution of the Sustainable Forest Management Plan and flora inventory
Contact person	Wiater Melo da Silva
Title	Technical responsible
Address	Ed., Mirai Oficccer, Rua Municipalidade, sala 1708, CEP 66053-180 - Umarizal - Belém - Pará - BRASIL
Telephone	+55 (91) 3241-3111
Email	-

Source: created by the authors

Table 32 - Main information about Uezu Planejamento Ambiental

Organization name	Uezu Planejamento Ambiental S/S LTDA
Role in the project	Geographic Information System - GIS
Contact person	Alexandre Uezu
Title	CEO
Address	Rodovia Dom Pedro I - KM 47, SN, Nazaré Paulista - SP
Telephone	-
Email	aleuezu@ipe.org.br

Source: created by the authors

Table 33 - Main information about Upbio Soluções Ambientais

Organization name	Upbio Soluções Ambientais
Role in the project	Fauna monitoring and socioeconomic diagnosis
Contact person	Hilário Vasconcelos Rocha
Title	General Coordinator
Address	Edifício Angra - Tv. São Pedro, 842 - 203 - Batista Campos, Belém - PA, 66030-465
Telephone	(91) 984119202
Email	Upbioconsultoria@gmail.com

Source: created by the authors

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

Ecologica Assessoria is a company that specializes in developing projects aimed at generating carbon credits. They assist companies in identifying their potential for credit generation by leveraging technology, innovation, and intensive capital to create pathways for exponential growth. Ecológica offers a broad spectrum of services: strategic environmental consulting, biomass, climate change, forest solutions, renewable energy, and other sustainability areas.

Ecologica's projects are outlined to reduce greenhouse gas emissions (GHGs) while generating socio-environmental impacts in specific locations. These carbon credits generated aim to impact positively in the local context, and objecting this, are certified by the highest international standards from the carbon market in order to offer reliability for the clients. A portion of the income from carbon credits is reinvested in social impact initiatives, always considering the local context.

While Ecologica is headquartered in Brazil, it operates globally. They currently have a portfolio of 10 projects located in 4 Brazilian states, and they are fully capable of developing projects anywhere in Brazil, as well as in other Latin American countries.

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

In Brazil, there are two main legal instruments aimed at preventing corrupt practices and unethical behavior: Law 12,846/2013⁷⁵ (Anti-Corruption Law) and Law 8,429/1992⁷⁶ (Administrative Misconduct Law). The Anti-Corruption Law, also known as Law no. 12,846/2013, establishes regulations regarding the civil and administrative liability of legal entities in cases of actions against national and/or foreign public

⁷⁵ LEI Nº 12.846, DE 1º DE AGOSTO DE 2013. Available at: <https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2013/lei/l12846.htm>.

⁷⁶ LEI Nº 8.429, DE 2 DE JUNHO DE 1992. Available at: <https://www.planalto.gov.br/ccivil_03/leis/l8429.htm>.

administrations. Meanwhile, under Law 8,429/1992, administrative misconduct is defined as immoral conduct that involves dishonesty and acts of bad faith by public officials.

In addition to complying with these laws, Ecologica has implemented an internal Ethical Code to ensure that the company avoids involvement in any corrupt practices or unethical behavior.

2.4.7 Commercially Sensitive Information (Rules 3.5.13 - 3.5.14)

No commercially sensitive information has been excluded from the public version of this CCB PD.

2.5 Legal Status and Property Rights

2.5.1 Statutory and Customary Property Rights (G5.1)

The project area of the ABC Norte REDD Project is owned by ABC Agropecuária Brasil Norte S.A. - Produção e Exportação. The legal documents proving the land title and ownership of the property will be made available to the auditors during the validation process.

In Brazil, the owner of the area is entitled to all the resources resulting from it. The owner has the right to use, enjoy and dispose of the property. The limitation on the right to property occurs in the case of underground research and mining (article 20, item IX and article 176 of the Federal Constitution⁷⁷ and article 1,230 of the Civil Code⁷⁸).

As far as carbon credits are concerned, they can be taken as the result of a property, so they belong to the owner. The legislation is expressed in this sense for the Permanent Preservation Areas and Legal Reserve, in art 41, § 4: "The maintenance activities of Permanent Preservation Areas, Legal Reserve and restricted use are eligible for any payments or incentives for services environmental issues, configuring additionality for the purposes of national and international markets for certified greenhouse gas emission reductions⁷⁹.

Therefore, as per section "2.1.1 - Project Proponent", project ownership is arising under law for ABC Agropecuária Brasil Norte S.A. - Produção e Exportação. Ecológica Assessoria is also Project Proponent as, per contractual right, where both companies have defined a percentage of ownership of the credits.

In addition, the VM0015 methodology implies that "The legal status of the land (private, forest concession, conservation concession, etc.) in the baseline case within the project area must exist elsewhere in the reference region. If the legal status of the project area is a unique case, demonstrate that legal status is not biasing the baseline of the project area." This is complied with the areas surrounding the Fazenda Pacajá

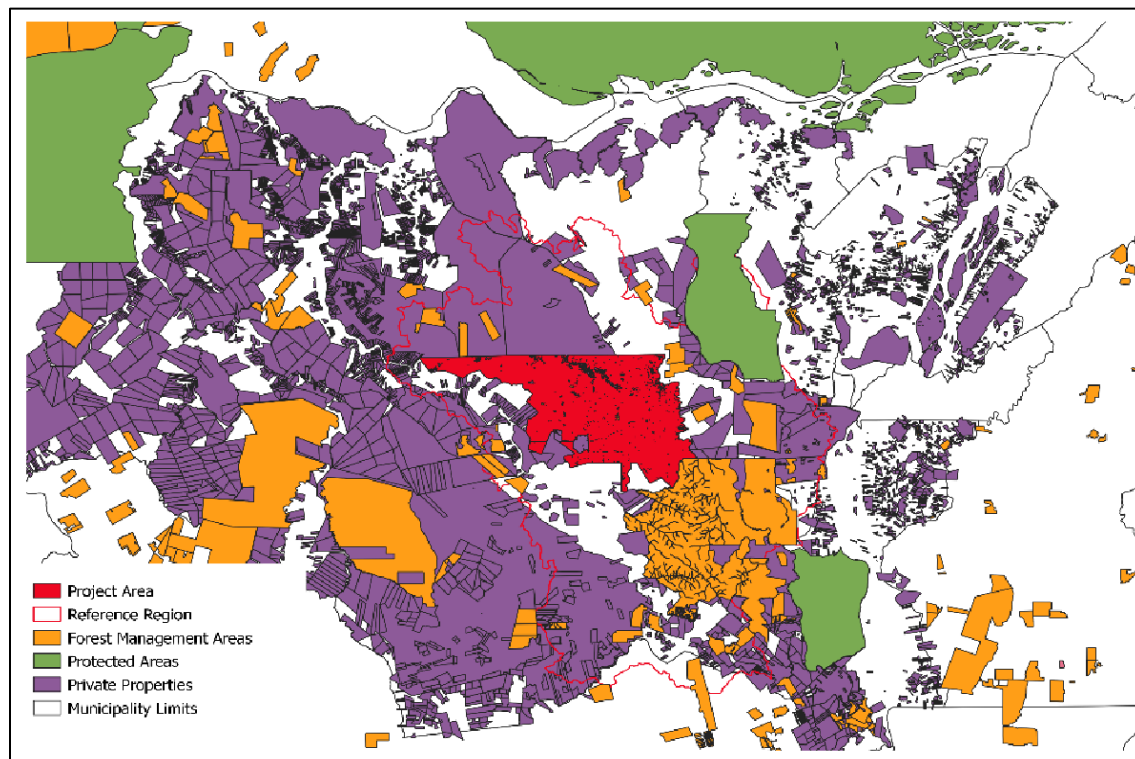
⁷⁷ Brazilian Constitution. Available at: <http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm>. Accessed on: 04 Sep. 2021.

⁷⁸ Brazilian Civil Code. Available at: <http://www.planalto.gov.br/ccivil_03/leis/2002/l10406compilada.htm>. Accessed on: 04 Sep. 2021.

⁷⁹ Brazilian Forest Code. Available at: <http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12651.htm>. Accessed on: 04 Sep. 2021.

that are not public or part of any protected area, such as project area. These conditions also comply with Land Use and Land Tenure items, once the conditions of the project area are found elsewhere in the reference region. The project area is governed by the same policies, legislation and regulations that apply elsewhere in the reference region. These policies are detailed in section “2.5.7 - Nacional and Local Laws”. Figure below shows the areas surrounding the Project Area, specially the municipalities of Portel, Bagre, Pacajá, Oeiras do Pará and Baião. Data presented is the private areas available at Brazil's Environmental Rural Registration⁸⁰, National Protected Areas⁸¹:

Figure 28 - Land tenure in the project zone



Source: VCS Standard REDD ABC Norte Project

2.5.2 Recognition of Property Rights (G5.1)

As described in section 2.5.1, all property rights are recognized, respected, and supported, and follow the land rights described in Section 2.5.7. The property of Fazenda Pacajá is privately owned, its title encompassing full control of the land in perpetuity. Moreover, the ownership and land tenure of these properties are recognized by the State of Pará, provided that the use of the areas attends to the requirements established by the Brazilian Environmental Agency (IBAMA) regarding the sustainable use of these areas and the continuation of management practices.

⁸⁰ Available at: <<https://www.car.gov.br/publico/imoveis/index>>. Accessed on: 04 Sep. 2021.

⁸¹ Available at: <<http://mapas.mma.gov.br/i3geo/datadownload.htm>>. Accessed on: 04 Sep. 2021.

In addition, information regarding the ownership and number of registration (real estate record file) of each real estate asset is listed in the table below.

Table 34 - The properties involved in the ABC Norte REDD Project, their respective area, ownership and registration number

Property	City	Total Area (ha)	Ownership	Rural property Registration Certificate (CCIR)
Fazenda Pacajá - Área 01 (Gleba Joana Peres I)	Portel - PA	7,820.6864	ABC Agropecuária Brasil Norte S.A.	951.072.824.232-0
Fazenda Pacajá - Área 02 (Gleba Joana Peres I)	Portel - PA	125,159.7337	ABC Agropecuária Brasil Norte S.A.	951.072.824.771-2
Fazenda Pacajá (Lote 08 Setor A Gleba Joana Peres - M D Rio Pacajá)	Portel - PA	2,621.5179	Luiz Alberto Garcia	999.920.599.450-5
Fazenda Pacajá Lote 25 Setor A (lote 25 Setor A Gleba Joana Perez I)	Portel - PA	2,435.0930	Ophelia Pereira Garcia	999.920.597.449-0
Fazenda Pacajá L-28 (Gleba Joana Peres, M/D Rio Pacajá)	Portel - PA	3,055.3948	Eleusa Garcia Melgaco	000.043.930.792-7

Source: created by the authors using project proponent's collection

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

The ABC Norte REDD Project is developed within a private property owned by Algar Farming. For this reason, the project will not trespass nor affect private property, community property, or government property. Once Free Prior and Informed Consent (FPIC) is the principle that a community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use, the FPIC does not need to be obtained since property rights are not affected by the project.

Since the project start date, during field visits, recurring conversations have taken place with the communities involved in Upbio's PRS regarding the limits of the project area, reinforcing that no community will be negatively affected or have its territory invaded by the project. Stakeholder consultations will continue to occur throughout the project's life cycle, reinforcing the project's objective and spatial limitation zone. This process aims to be conducted in a participatory manner with members of the communities located in the project zone.

2.5.4 Property Rights Protection (G5.3)

ABC Norte recognizes, respects and supports local stakeholders' customary tenure/access rights to territories and resources. The project will never encroach on private property or relocate people off their lands without consent. In the event there are any ongoing or unresolved conflicts over property rights, usage or resources, the project shall undertake no activity that could exacerbate the conflict or influence the outcome of an unresolved dispute.

ABC Norte has a stable relation with the communities, with activities in the region dating back to 1979. In 2017 the company took over the management of the area and the SMFP, also initiating social actions with the communities, with the PRS. Although there are 16 communities identified in the region, service is currently provided in only 5 of them, due to difficulties in transportation and communication with the other communities. With the carbon project revenue, the program is expected to reach all communities.

ABC Norte is the legal owner of the project area, however, has a verbal agreement with the communities to maintain the current use of land, as long as they commit to forest preservation and leave no environmental liabilities. There is no legal agreement since all contacts with the community are made prioritizing conversation and good relationship. In addition, the company prevents the community from being required to sign any documents, in order to avoid embarrassment and misunderstandings. The SMFP does not include the region occupied by the communities.

No community member has been or will be removed from their land, on the contrary, communities will be supported through programs and incentives the project proponent will instigate. In addition, the project did not introduce any invasive species or allow an invasive species to thrive through project implementation. If the project implements any reforestation project with non-native species over native species in the future, the possible risks and adverse effects of exotic species will be justified and explained to communities.

2.5.5 Illegal Activity Identification (G5.4)

Since 2017, incidents of fires have been documented along the boundaries of the Pacajá Farm, with the aim of cultivating cassava (a common crop in the Amazon) and engaging in timber theft. These episodes were carried out by a resident of the Monte Sião community. This document will be submitted to the auditors if requested.

To address the resulting conflict, ABC Norte follows Standard Operating Procedure 11 - Conflict Mediation as a guiding principle. As outlined in the document, the initial step involves establishing formal contact with the community leader. Through ongoing dialogue, representatives of ABC Norte consistently strive to educate residents about the farm's boundaries, the forest management practices in the project area, and the prohibition of activities such as burning and timber appropriation.

After clarifying the facts with the community, the company takes requisite measures by reporting incidents to the competent authorities through police reports and dispatching official letters to regulatory bodies, seeking support for monitoring the area.

To foster a more intimate dialogue with the communities, ABC Norte is dedicated to enhancing its existing communication channels. Presently, these channels include a messaging app number, social networks, direct contact with Upbio representatives during monthly technical visits to the communities, and direct communication with the manager of the Pacajá Farm. ABC Norte has plans to install suggestion boxes in the communities, which will be collected monthly by the Upbio team and delivered to ABC Norte.

Furthermore, the project undergoes periodic monitoring through technical field visits conducted by Upbio, serving as the primary tool for ABC Norte to combat deforestation and timber theft. The team is responsible for documenting any instances of illegal activities within the communities.

Finally, to minimize the occurrence of illicit activities, the project aims to implement the activities outlined in section “2.1.8 - Project Activities and Theory of Change” discouraging the engagement in such activities within the project area.

2.5.6 Ongoing Disputes (G5.5)

There are no records of conflicts or disputes in the area designated for the ABC Norte REDD Project concerning land rights, territories, and resources. Ongoing litigations with third parties or squatters are non-existent. The ownership and rights of access/use of resources in the region are upheld by “ABC Agropecuária Brasil Norte S.A. - Produção e Exportação”, acknowledged by both the State of Pará and environmental entities.

Any disputes occurring in the project area within the last 20 years, which are known to the project, will be treated as potential risks. In such instances, mitigating measures will be implemented as deemed necessary.

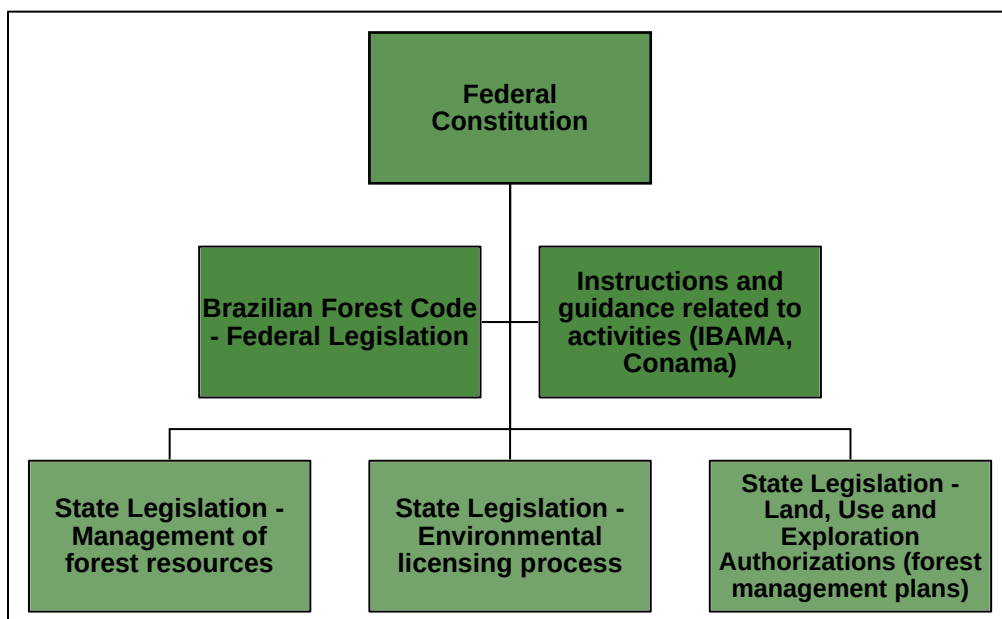
2.5.7 National and Local Laws (G5.6)

In a brief context of Brazilian legislation, the Federal Constitution determines that it is concurrent between the Union, Member States and the Federal District the competence to legislate on matters related to the protection of the environment, conservation of nature, defense of the soil, protection of landscape heritage and responsibility for damages to the environment. The same document establishes that municipalities are responsible for legislation at the local level⁸². However, in the absence of a qualified environmental agency or environmental council in the municipality, the state must carry out municipal administrative actions until its creation. In turn, in the absence of a qualified environmental agency or environmental council in the state

⁸² Available at: <http://www.mpsp.mp.br/portal/page/portal/documentacao_e_divulgacao/doc_biblioteca/bibli_servicos_produtos/bibli_boletim/bibli_bol_2006/RDC_07_23.pdf>. Accessed on: 04 Set. 2021.

and municipality, the Union will have to carry out administrative actions until its creation in one of those federative entities⁸³. It is also necessary to observe that a municipal law cannot contradict a state law, which in turn cannot contradict a federal law, under penalty of unconstitutionality.

Figure 29 - Structure of the Brazilian legislation



Source: created by authors

Thus, in the state of Pará, the Secretariat of the Environment and Sustainability (Semas/PA) is the body responsible for environmental licensing, including authorizations for forestry intervention.

According to the Brazilian Forest Code (Law N° 12.651, 25/05/2012)⁸⁴, all rural estates located in forest zones shall have:

- I. Permanent preservation area: protected areas covered or not by native vegetation, with the environmental function of preserving water resources, landscape, geological stability, biodiversity, gene flow of plants and animals, protecting the soil and ensuring the well-being of human populations.
- II. Legal Reserve: an area located within a rural property or possession which is required to be segregated, as well as the permanent preservation area, for the sustainable use of natural resources, conservation and rehabilitation of ecological processes, biodiversity conservation and shelter, and protection of native flora and fauna. In the Brazilian Legal Amazon, eighty percent (80%) of a rural property should be preserved.

⁸³ Available at: <http://pnla.mma.gov.br/competencias-para-o-licenciamento-ambiental>. Accessed on: 04 Set. 2021.

⁸⁴ LEI N° 12.651, DE 25 DE MAIO DE 2012. Available at: https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12651.htm.

However, there is a clear disregard for legal conservation requirements in the region. Much of the deforestation occurs in areas that should be preserved.

One of the main ways to combat deforestation in Brazil is command and control mechanisms, such as effective monitoring, requiring compliance with environmental legislation along with a greater State presence. However, this does not seem to be implemented in most regions of the country, because of the government's tendency to disregard these responsibilities in comparison with other social goals and economic interests, which has put Brazil among the world's largest deforesters. Given the approval of the new Forest Code in 2012, and its general pardoning of those who deforested, a significant increase in annual deforestation rates has been observed.

Despite the legal provisions intended to preserve at least 80% of the Amazon Forest coverage, lack of law enforcement by local authorities along with public policies seeking to increase commodity production and encourage land use for agricultural, bio energy and cattle breeding purposes have created a scenario of complete disregard for the mandatory provisions of the Forest Code. In addition, covering vast areas with low demographic density makes tracking of illegal activities and land surveillance very difficult for the authorities.

Moreover, according to PRODES, around 788,893 km² have been deforested until 2016, which is equivalent to 18.9% of the total Amazon biome area. Given the increasing deforestation trend observed in recent years, this data shows the non-compliance with the Legal Reserve requirement established by the Brazilian Forest Code.

Therefore, all calculations were made assuming that the reference region has a general non-compliance with the Brazilian Forest Code. Thus, the baseline scenario considers the potential of unplanned deforestation in the project area to surpass the limits stipulated by the Law.

As the project activity involves planned logging, it is important to describe compliance with applicable law.

Sustainable Forest Management is defined in Article 3, VII, of Law 12.651/2012 (National Forest Code), as the administration of natural vegetation to obtain economic, social and environmental benefits, respecting the support mechanisms of the ecosystem object of management and considering, cumulatively or alternatively, the use of multiple wood species or not, of multiple products and by-products of the flora, as well as the use of other goods and services.

The National Forest Code and Decree 5,975 also specifies the technical and scientific foundations of the PMFS (Article 31, 1st paragraph):

- I. Characterization of physical and biological environment;
- II. Determination of existent stock;
- III. Exploitation intensity compatible with the forest's environmental support capacity;

- IV. Cutting cycle compatible with the restoration time of the volume of product extracted from the forest;
- V. Promotion of the natural regeneration of the forest;
- VI. Adoption of adequate silvicultural system;
- VII. Adoption adequate operating system;
- VIII. Monitoring of the development of remaining forest;
- IX. Adoption of mitigation measures for the social and environmental impacts.

In addition, the law also demands the fulfillment of obligations related to control and monitoring of the sustainable management. The company must submit an annual report to the environmental agency with information on the entire Sustainable Management Area and the description of the applicable activities and must be submitted to technical inspections to approve the operations and activities carried out in the management area.

The technical procedures for the preparation, presentation, execution and technical evaluation of sustainable forest management plans are regulated by IBAMA's Normative Instructions: 1, of 24/04/2007, 5, of 11/12/2006 and 2 - 27/06/2007; in addition to CONAMA's Resolution 406, of 02/02/2009.

The approval of the SFMP and expedition of environmental licenses is responsibility of the State Government, with law Nº 6,462 and normative instructions IN 05, IN 08, IN 45 and IN 01. After the SFMP approval, the company proceeds to the applicable Forest Management Licenses (AUTEX, in national level, and AUTEF, in Pará).

In this sense the preparation for REDD activities, programs and projects become essential for the Project Region, not only to promote forest conservation, but also as a way to implement a new productive forest-based economy. This scenario needs to be reinforced because the areas in question hold incomparable biological and cultural diversity, with their traditional inhabitants marginalized from the process of economic development through capitalized livestock production.

Regarding other regulatory frameworks that exist in Brazil, on November 28th, 2019 occurred the approval of the Federal Decree 10,144/2019, which establishes the National Commission for Reducing Emissions of Greenhouse Gases from Deforestation and Forest Degradation, Conservation of Forest Carbon Stocks, Sustainable Management of Forests and Increase of Forest Carbon Stocks - REDD.

The development of this Project is not in conflict with such Decree. It is important to clarify the difference between Law and Decree in Brazil. The Brazilian Federal Constitution establishes the principle of legality for all the national territory, according to the text of article 5, item II "no one shall be obliged to do or not to do anything other than by virtue of law."

Law is an infra-constitutional (sub-constitutional) norm, it is a mandatory rule by the coercive force of the legislative power or of legitimate authority, which constitutes the rights and duties in a society. Law is different from Decree.

Decrees, on the other hand, are administrative acts, issued by the Chief Executive (president, governor or mayor), with the main objective of regulating and detailing a law, in order to grant it the necessary means for its faithful execution, without, however, being able to contradict any of its provisions or to innovate the Law.

Thus, in terms of the object, jurisdictionally and scope of the Decree 10,144/2019, it is understood that its application is merely administrative, that is, it merely organizes the functioning of the Federal Government about the REDD agenda. Its application is restricted to the federal entities of the Public Administration, and, because it is a decree, a normative type that only grants regulation to the matter of law, does not establish duties or obligations to the society.

Thus, Decree 10,144/2019 only limits the Federal Government's understanding of what shall be accounted for in order to comply with mitigation commitments of other countries to the United Nations Framework Convention on Climate Change. It does not impose a barrier or obstacles to the implementation of REDD projects and the commercialization of carbon assets generated from these projects. This consideration in the Decree does not affect or interfere with the voluntary or regulated carbon market, domestic or international.

There is no law in Brazil that does not allow or restrict the execution of REDD projects or that does not allow or restrict any commercial transaction of assets resulting from REDD projects. On the contrary, such transactions are valid and legally permitted. Thus, there is no contradiction or irregularity between the ABC Norte project and such Decree.

2.5.8 Approvals (G5.7)

There are no current approval processes in Brazil for REDD carbon credit projects. However, the project is 100% on private property, has no indigenous or traditional people overlapping the project area, thus as Brazil permits, Brazilians are allowed to do any project on their land.

2.5.9 Right to Claim Benefits (G5.8)

The project area of the ABC Norte REDD Project is owned by ABC Agropecuária Brasil Norte S.A. - Produção e Exportação. The legal documents proving the land title and ownership of the property will be made available to the auditors during the validation process.

2.5.10 Other Programs (G5.9)

The ABC Norte REDD Project is already validated, identified by the number 2558 under Verra Registry⁸⁵, and is currently in the process of verification of the 2nd monitoring period by the VCS Program. With a credit

⁸⁵ Available at: <<https://registry.verra.org/app/projectDetail/VCS/2558>>. Accessed on: 17 Jan. 2024.

period of 30 years, from 13-September-2017 to 12-September-2047, the project has the potential to reduce 30,138,794 tCO₂, as mentioned in section “1.2 - Standardized Benefit Metrics”.

The first two evaluations of the project's co-benefits were conducted in accordance with the SOCIALCARBON Standard, ensuring transparency and participation in monitoring through indicators linked to six resources: Social, Human, Financial, Natural, Biodiversity, or Technology and Carbon.

However, in 2021, the Standard announced its transition from a co-benefit standard to a full standard. As of 1-January-2024, projects that do not adhere to the SC accounting standard will no longer have the certification label.

In view of this, recognizing the methodological update of the SOCIALCARBON Standard and to continue monitoring the socio-environmental initiatives of the ABC Norte REDD Project, subsequent verifications of the socio-environmental benefits of the project will be conducted in alignment with the CCB Standard.

2.5.11 Double Counting (G5.9)

The project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program. The VCS Program has a central project database, which lists each approved project. The VCS Project Database is the central storehouse of information on all projects validated to VCS criteria and all Verified Carbon Units issued under the program. Every VCU can be tracked from issuance to retirement in the database, allowing buyers to ensure every credit is real, additional, permanent, independently verified, uniquely numbered and fully traceable online. This project has not been registered under any other credited activity, and no VCUs have been assigned to the project area so far. Thus, any possibility of double counting of credits is eliminated.

3 CLIMATE

3.1 Without-Project Climate Scenario

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

Following the Guidance for the Use of the CCB, as described in the section “7. Net Climate Benefits”, page 33 “[...] The Climate section is used to demonstrate net positive climate benefits. It is not to be used for claiming quantified GHG emissions reductions or removals to be used as offsets. Projects that meet the requirements of a Recognized GHG Program do not need to use the Climate section”.

The ABC Norte REDD Project is already registered by the ID 2558⁸⁶, available on Verra webpage and predicts to reduce 30,138,794 tCO₂e over the 30 year project lifetime.

⁸⁶ Available at: <<https://registry.verra.org/app/projectDetail/VCS/2558>>.

In this manner, the project fulfils the requirement outlined in the afore mentioned document, and therefore, this section is not applicable. For more information, access the project link.

3.2 Net Positive Climate Impacts

3.2.1 With-Project Estimated Greenhouse Gas Emissions (CL2.1)

Not applicable, as described in the section 3.1.1.

3.2.2 Net Impact (CL2.2)

Not applicable, as described in the section 3.1.1.

3.3 Offsite Climate Impacts (Leakage)

3.3.1 Types of Expected Leakage (CL3.1)

Not applicable, as described in the section 3.1.1.

3.3.2 Quantity of Expected Leakage (CL3.1, 3.3)

Not applicable, as described in the section 3.1.1.

3.3.3 Leakage Mitigation (CL3.2)

Not applicable, as described in the section 3.1.1.

3.4 Climate Impact Monitoring

3.4.1 Climate Monitoring Plan (CL4.1)

Not applicable, as described in the section 3.1.1.

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

Not applicable, as described in the section 3.1.1.

3.5 Optional Criterion: Climate Change Adaptation Benefits

Not applicable. During the next stages of project development, Ecológica Assessoria's technical team will study the best strategy to meet the requirements that will enable the project to reach the Gold Level for Climate, Community and Biodiversity.

3.5.1 Regional Climate Change Scenarios (GL1.1)

Not applicable, as described in section 3.5.

3.5.2 Climate Change Impacts (GL1.2)

Not applicable, as described in section 3.5.

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

Not applicable. At this point of the project development, the ABC Norte REDD Project is not seeking to achieve Gold Level for exceptional climate benefits. During the upcoming steps of the project development, the Ecológica Assessoria technical team will study how the project can achieve the Gold Level for Climate, Community and Biodiversity.

4 COMMUNITY

4.1 Without-Project Community Scenario

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

Data collection involved the five communities covered by the socioeconomic diagnosis prepared by Upbio (2023), a company engaged in the development of socio-environmental activities at Pacajá Farm through the PRS.

Social Organization

Regarding the area of influence of the Pacajá Farm, the population currently covered by Upbio's PRS is composed of 5 communities, as mentioned above. These communities have their residences predominantly located on the banks of the Pacajá and Jacundá rivers, mostly built with wooden structures. The variation in the size of these communities is noteworthy, ranging from 5 to 35 families, as highlighted in Table 35, totaling approximately 195 families and about 975 inhabitants. Of this population, 61% are adults, 31% are children and 8% are elderly, and it is important to note that 1% of the population has some special need.

Table 35 - Number of families and estimated population by community

Community	Number of families	Estimated Population
Cristo Salvador	20	100
Divino do Espírito Santo	65	325
Nossa Senhora do Carmo	35	175
São Sebastião do Cipoal	61	305
Monte Sião	14	70
TOTAL	195	975

Source: created by the authors using data from Upbio

From a social point of view, the communities are predominantly made up of matriarchs and patriarchs, with most of the residents being relatives. This family dynamic and the strong bond between residents contribute to local social cohesion. The figure 9 in section “2.1.5 - Project Zone Map” illustrates the location of both the communities covered by Upbio's PRS (namely, the aforementioned five) and those that are not yet covered.

The communities are identified by the names of their patron saints, with 59% of the residents being Catholic. It is noteworthy that there are a considerable number of evangelicals in Mount Zion and Christ the Savior, the latter expressing the intention to change its name due to the religious beliefs of its residents. In addition, each community has a community leader, appointed by the official religious representative of the municipality of Portel, responsible for representing the community and conducting religious and local events. In each community, there is a church for religious celebrations and a community hall where meetings take place, as evidenced in Table 36.

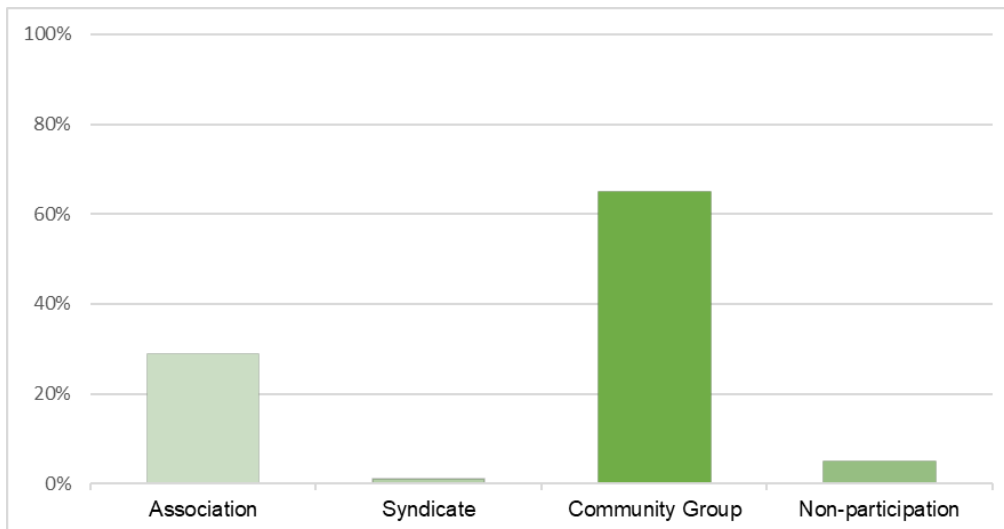
Table 36 - Community spaces in the communities

Community	Church	Community hall	Primary education	Library
Cristo Salvador	X	X	-	-
Divino do Espírito Santo	X	X	X	X
Nossa Senhora do Carmo	X	X	-	-
São Sebastião do Cipoal	X	X	X	-
Monte Sião	X	X	X	-

Source: created by the authors using data from Upbio

In addition to religious activities, residents actively participate in community groups with diverse interests, such as soccer teams, cleaning actions, flour production, dance groups, and unions, indicating greater participation in community meetings and events (Graph 3).

Graph 3 - Participation of communities in social organizations



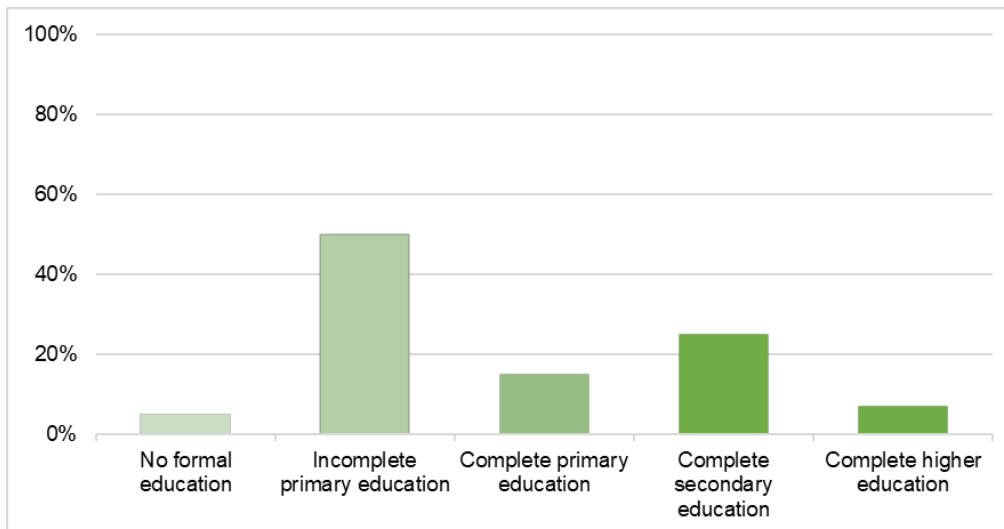
Source: created by the authors using data from Upbio

In general, the social structure of communities is based on the holding of religious events and agricultural production. Some communities have associations, such as the community of Divino Espírito Santo, which is part of the “Associação dos Agricultores Agroextrativistas do Médio Pacajá” and the “Associação de Produtores Rurais do Divino Espírito Santo”. In turn, the São Sebastião do Cipoal community, as the only remaining quilombola community, has the “Associação de Remanescentes Quilombolas de São Sebastião do Cipoal” (ARQSSC). Through these associations, residents develop cultural and sports projects, in addition to participating in initiatives to support family farming, such as the community of Divino do Espírito Santo with the Food Acquisition Program for school meals.

Education

Regarding the schooling of the population of the five communities, it is observed that 50% have incomplete primary education, while 5% have no schooling, totaling 55% with low schooling (Graph 4). It is important to highlight that in the communities of Nossa Senhora do Carmo, São Sebastião do Cipoal and Divino do Espírito Santo, there are municipal public schools that offer early childhood education, elementary education and education for youth and adults. These institutions have, on average, seven teachers per school, as well as kitchen staff and boatmen, some of whom are residents of the communities themselves. It is relevant to highlight that the implementation of education for youth and adults was made possible through the installation of solar panels in some communities, making it possible for educational activities to also take place at night.

Graph 4 - Level of education of the population in the communities⁸⁷

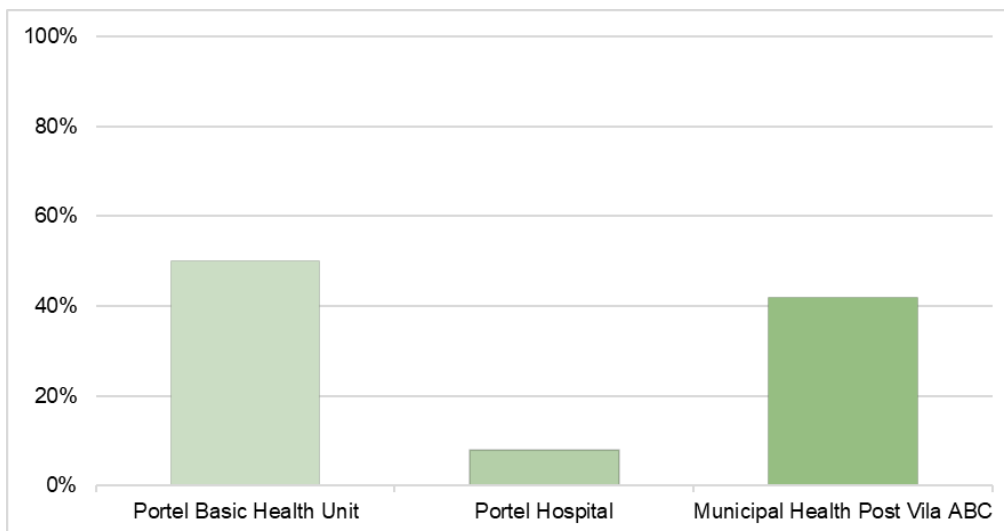


Source: created by the authors using data from Upbio

Health

With regard to health services in the communities, 42% of the residents seek the UBS of Portel, 8% seek the hospital in the same municipality, which is 12 hours away by boat. In addition, 50% seek care at the Vila ABC Municipal Health Center, where a permanent nursing assistant provides care to the families (Graph 5).

Graph 5 - Health services accessed by communities



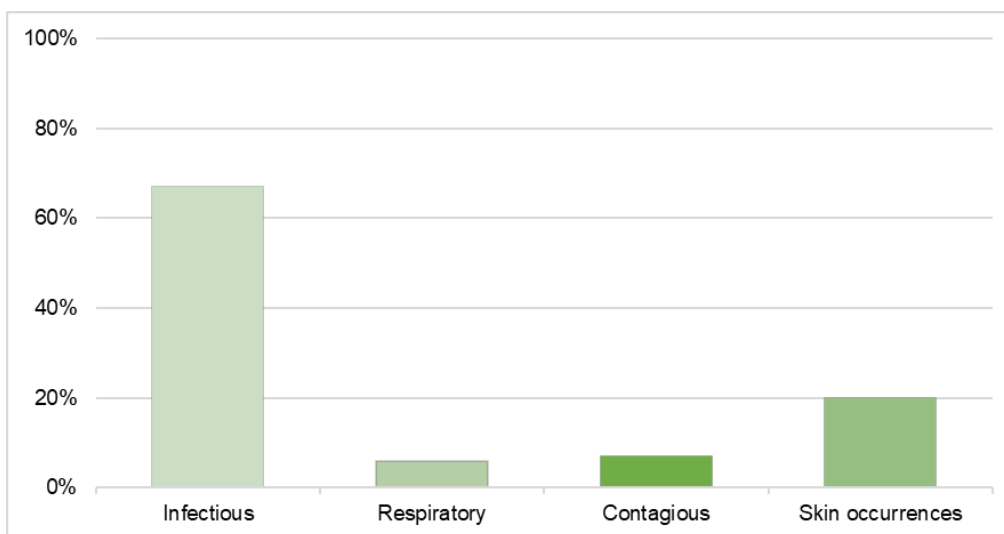
Source: created by the authors using data from Upbio

⁸⁷ According to Law 9394/1996, which establishes the guidelines and bases for national education, Brazilian basic education is divided into: I - Early Childhood Education (0 to 6 years old), II - Elementary School (7 to 14 years old) and III - High School (15 to 17 years old). BRAZIL. It establishes the guidelines and bases of national education. Available at: <https://www.planalto.gov.br/ccivil_03/leis/l9394.htm>. Accessed on: 22 Nov. 2023.

At the Vila ABC Health Center, frequent vaccination campaigns and other health services are carried out, making it the closest health unit to the residents of the community (approximately 1 to 2 hours by boat). Currently, the health unit has four health professionals in the region, and there is a service to access rescue services with a "boat ambulance" from the Municipality of Portel.

According to residents' reports, infectious diseases are the most prevalent in the communities, followed specifically by dermatoses, contagious and respiratory diseases, as illustrated in Graph 6.

Graph 6 - Most common diseases in communities



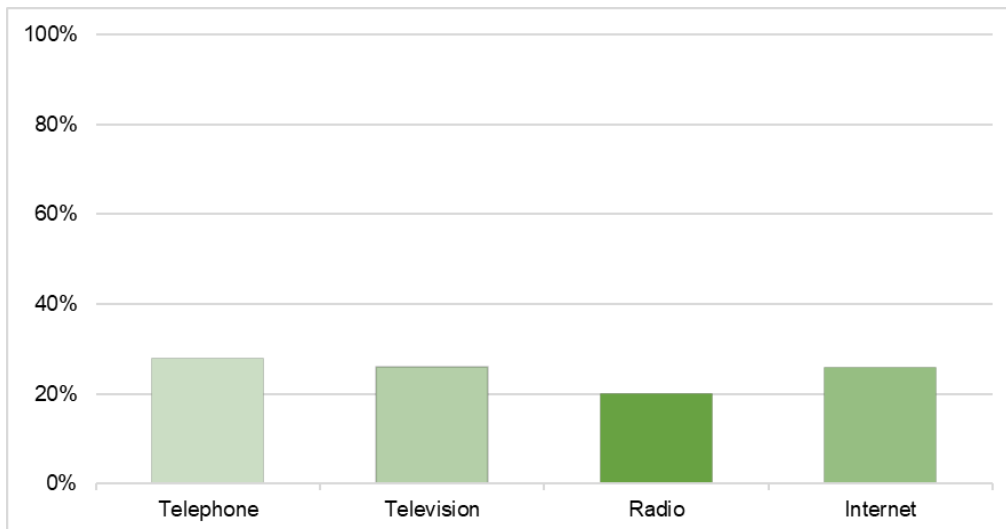
Source: created by the authors using data from Upbio

The Vila ABC Health Center plays a key role in providing health care to communities, conducting frequent vaccination campaigns and offering various medical services. As the nearest health facility, located approximately 1-2 hours by boat, it becomes a central point for residents to access medical care. Conducting vaccination campaigns highlights the health facility's commitment to preventing disease and promoting the health of the local population. In addition, the relative proximity of the health center is essential to ensure timely and effective access to health services, considering the geographical characteristics of the region.

Mobility and Communication

Regarding the means of communication in the communities, although there is no signal from mobile phone operators, a significant portion of the population has access to cell phones (28%) and 26% has access to the internet. This access is possible through Wi-Fi, facilitating communication between residents through chat app groups. It should be noted that there is no mail delivery service in any of the communities (Graph 7).

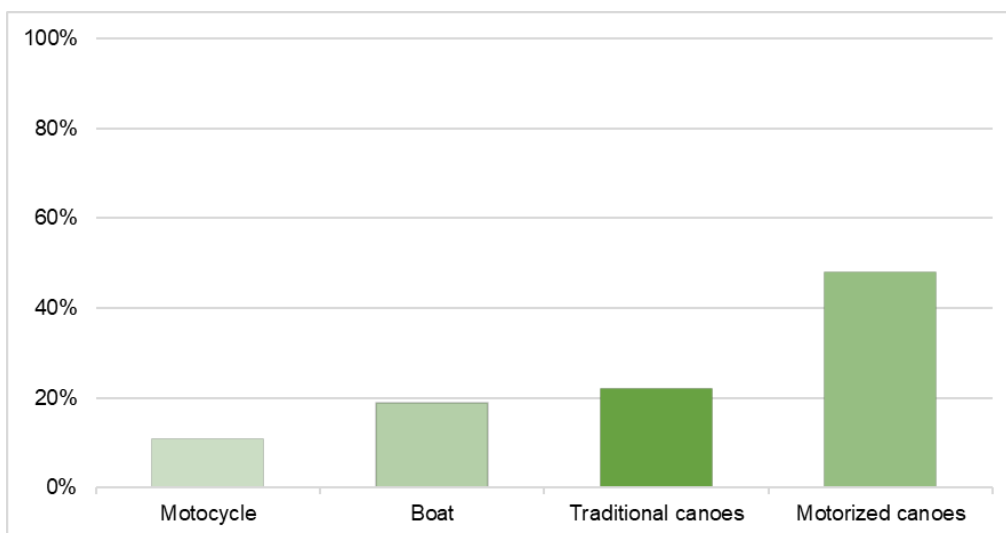
Graph 7 - Access to the media by communities



Source: created by the authors using data from Upbio

Regarding transportation and mobility, the communities surrounding the Pacajá Farm are predominantly riverside, reflecting that 89% of them are only accessible by waterways, either by boats (19%), motorized canoes (48%) or traditional canoes (22%), as evidenced by Upbio. Locomotion on land is done on foot or by motorcycle (Graph 8).

Graph 8 - Access to means of transport by communities



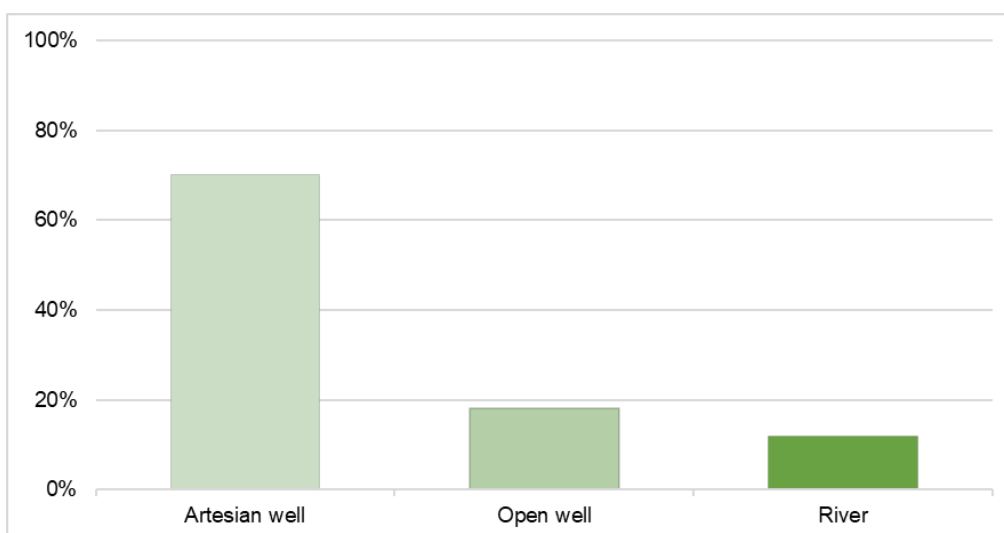
Source: created by the authors using data from Upbio (2023)

There are two boats that operate daily routes, allowing families to reach the city headquarters of Portel. The trip takes an average of 12 to 14 hours, and the fare is approximately R\$ 60.00.

Access to Water and Energy

Regarding the communities' access to water and energy, since 2022, solar panel systems have been installed in riverside homes and schools, in addition to electricity distribution poles for the Monte Sião and São Sebastião do Cipoal plants by the distributor Equatorial. This initiative minimized and/or replaced the use of diesel generators, which were commonly used until that year (for example, in 2019, 100% of communities still relied on diesel generators). Currently, 74% have access to solar energy, 16% to the power plant, and only 10% still use diesel engines. According to Graph 9, there is a significant number of households with artesian wells, reaching 70% of the sample surveyed; 18% have open wells, and the use of river water, although reduced, still accounts for 12% of the sample, according to Upbio (2023). The water from this source is mainly used for household chores and hygiene and no longer for consumption.

Graph 9 - Access to water by communities

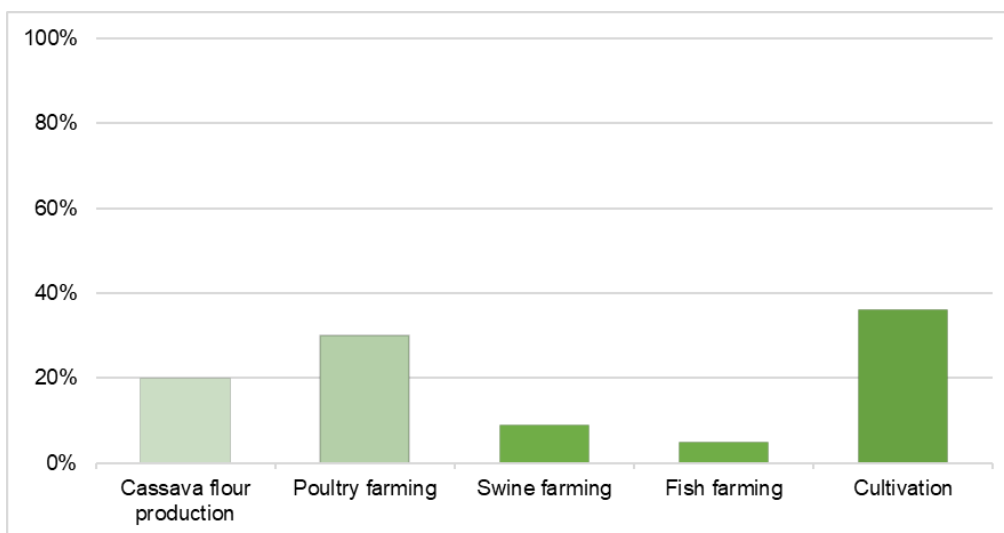


Source: created by the authors using data from Upbio

Economic Activities

In the communities of the Pacajá Farm, the economic activities of the riverside dwellers mainly involve the irregular extraction of timber (logs) and agriculture, with a focus on the production of flour (20%), planting of corn, cassava, fruits and vegetables (36%). The production of vegetables and the raising of small animals for meat (30% poultry and 5% fish farming) increased compared to 2019, possibly related to the incentive of the PRS in the promotion of sustainable productive activities.

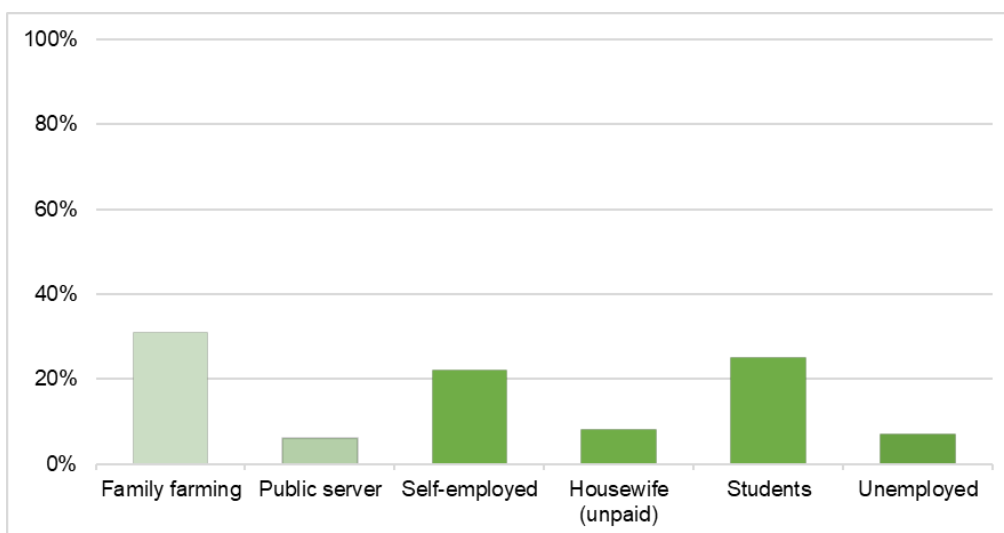
Graph 10 - Main legal productive activities in the communities



Source: created by the authors using data from Upbio

It is also noteworthy that the predominant occupation of the residents in the communities is family farming (31%), followed by the provision of services on their own account (22%). About 58% of the production of family farming is destined for the subsistence of local families, 22% is sold within the community itself and 17% is destined to the municipal headquarters of Portel. Graph 11 provides more details about the occupations, and it is relevant to mention that only 1% have a formal job.

Graph 11 - Occupation of community residents

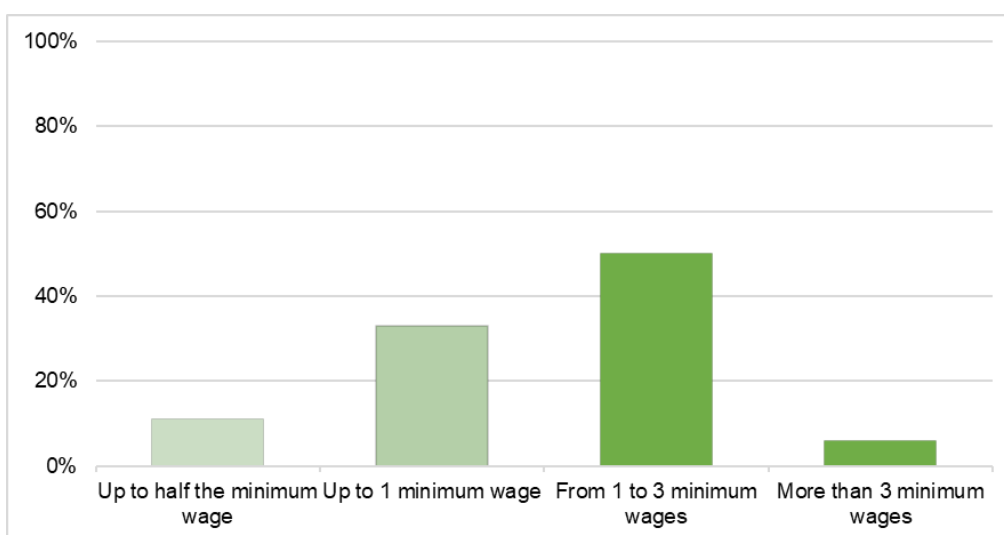


Source: created by the authors using data from Upbio

Harvest

Regarding family income in the communities, 11% reported having a family income of up to half a minimum wage per month, while 33% have up to one minimum wage, 50% from 1 to 3 minimum wages and 6% more than three minimum wages (Graph 12). According to Upbio (2023), there was an increase in the community's income, especially from the sale of poultry, fish, and vegetables made possible by the company's PRS. In addition, there was a 13% increase in beneficiaries of the Federal Government's "Bolsa Família Program" compared to 2019, when 70% of the population received the benefit, positively impacting the increase in family income.

Graph 12 - Family income in communities⁸⁸



Source: created by the authors using data from Upbio

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

Due to the substantial geographical distance between the communities, social interactions are primarily facilitated through community activities organized by Algar Farming and Upbio in Vila ABC. A notable example is the social action outlined in section "2.1.8 - Project Activities and Theory of Change", which not only provided financial support for the development of the theory of change applied in the ABC Norte REDD Project but also emerged as a pivotal point of convergence for residents.

Nevertheless, the social dynamics within the communities are predominantly shaped by religious events and agricultural practices. Associations play a central role, as detailed in section "4.1.1 - Descriptions of Communities at Project Start". Through these associations, residents engage in cultural and sports projects and collaborate on initiatives supporting family farming, exemplified by the Food Acquisition Program for school meals in the Divino Espírito Santo community. Additionally, community life extends beyond formal

⁸⁸ The minimum wage at the time the research was conducted was R\$ 1,212.00, according to Law 143.58/2022. BRASIL. Establishes the value of the minimum wage to take effect from January 1, 2022. Available at: <https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2022/lei/L14358.htm>. Accessed on: 23 Nov. 2023.

activities to include soccer tournaments and collective efforts such as cleaning, flour production, and planting.

In contexts like these, neighborly relations and kinship ties evolve into robust bonds of mutual respect, cooperation, and solidarity. However, it is acknowledged that the sturdy foundations of local social relations need fortification to propel collective actions capable of expanding communal goods.

Considering this scenario, the project, attuned to the context, aims to enrich interactions among community groups. This objective will be realized through capacity-building activities, technical assistance, and informational and engagement meetings, as delineated in the project scope. This approach seeks to strengthen community bonds, empower participants, and foster broader collaboration in the pursuit of collective benefits.

4.1.3 High Conservation Values (CM1.2)

The REDD ABC Norte project has adopted the guidelines outlined in the Resource Network's "Common Guidance for the Identification of HCV"⁸⁹ document for categorizing HCV at the community level. The classification is carried out under the following categories:

- HCV 5: Community Needs - encompassing crucial locations and resources that fulfill the basic requirements of local communities or indigenous peoples (including livelihoods, health, nutrition, water, etc.). These are identified through direct engagement with the respective communities or indigenous peoples.
- HCV 6: Cultural Values - covering sites, resources, habitats, and landscapes of global or national significance in terms of cultural, archaeological, or historical importance. Additionally, this category includes elements of critical cultural, ecological, economic, or religious/sacred significance to the traditional cultures of local communities or indigenous peoples. These are identified through active engagement with these local communities or indigenous peoples.

The ensuing section presents the HCV identified for the community component:

⁸⁹ Available at: <<https://www.hcvnetwork.org/library/common-guidance-for-the-identification-of-hcv-english-indonesian-french-portuguese>>. Accessed on: 08 Jan. 2024.

Table 37 - HCV: Pacajá river and other water bodies

High Conservation Value	Pacajá river and other water bodies (HCV 5 and 6)
Qualifying Attribute	The preservation and sustainability of water bodies, particularly rivers, play a crucial role in ensuring the survival and well-being of riverine communities. These communities depend directly on these resources to fulfill their basic needs, such as livelihoods, health, nutrition, and access to water. Additionally, rivers not only provide essential resources for daily life but also serve as means of transportation, facilitating trade and connection between these communities, Vila ABC, for example, and the headquarters of the Pacajá Farm. In addition to immediate needs, water bodies have profound cultural, historical, and ecological importance for riverine communities. Often, these sites are central to traditional practices, religious rituals, and the preservation of cultural identity. Considering this vital interdependence, the definition of water bodies as High Conservation Values (HCVs) is justified. HCVs, in this context, not only protect ecosystems that are crucial to local communities but also ensure the preservation of cultural and historical sites, contributing to the long-term sustainability of these areas. This approach aims not only to protect biodiversity but also to safeguard the traditional ways of life and cultural identity of riverine communities.
Focal Area	It encompasses a radius of 1km ⁹⁰ around all communities covered by Upbio's.

Source: created by the authors

In this way, in addition to enhancing the preservation of natural environments and associated biodiversity values, it will promote the maintenance of social values linked to the empowerment and improvement of the quality of life of local communities.

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

Initially, it is essential to highlight that the initiatives aimed at promoting the improvement of well-being in the communities identified in Section “2.1.6 - Stakeholder Identification” have been planned and developed since 2017, the start date of the project, by the PRS of Upbio. Thus, instead of using the expression “scenario without the project” with the communities, as recommended by the Social and Biodiversity Impact Assessment (SBIA)⁹¹, it was decided to use “scenario in case the actions currently carried out ceased to occur”. This choice was made with the deliberate purpose of preserving the recognition and continuity of

⁹⁰ To define the Leakage Management Area, a radius of 1 kilometer around the communities was used. See section “3.3 - Project Boundary” VCS Standard. Available at: <<https://registry.terra.org/app/projectDetail/VCS/2558>>. Accessed on: 08 Jan. 2024.

⁹¹ Available at: <<https://terra.org/wp-content/uploads/social-and-biodiversity-impact-assessment-sbia-manual-for-redd-projects-part-1.pdf>>. Accessed on: 31 Oct. 2023.

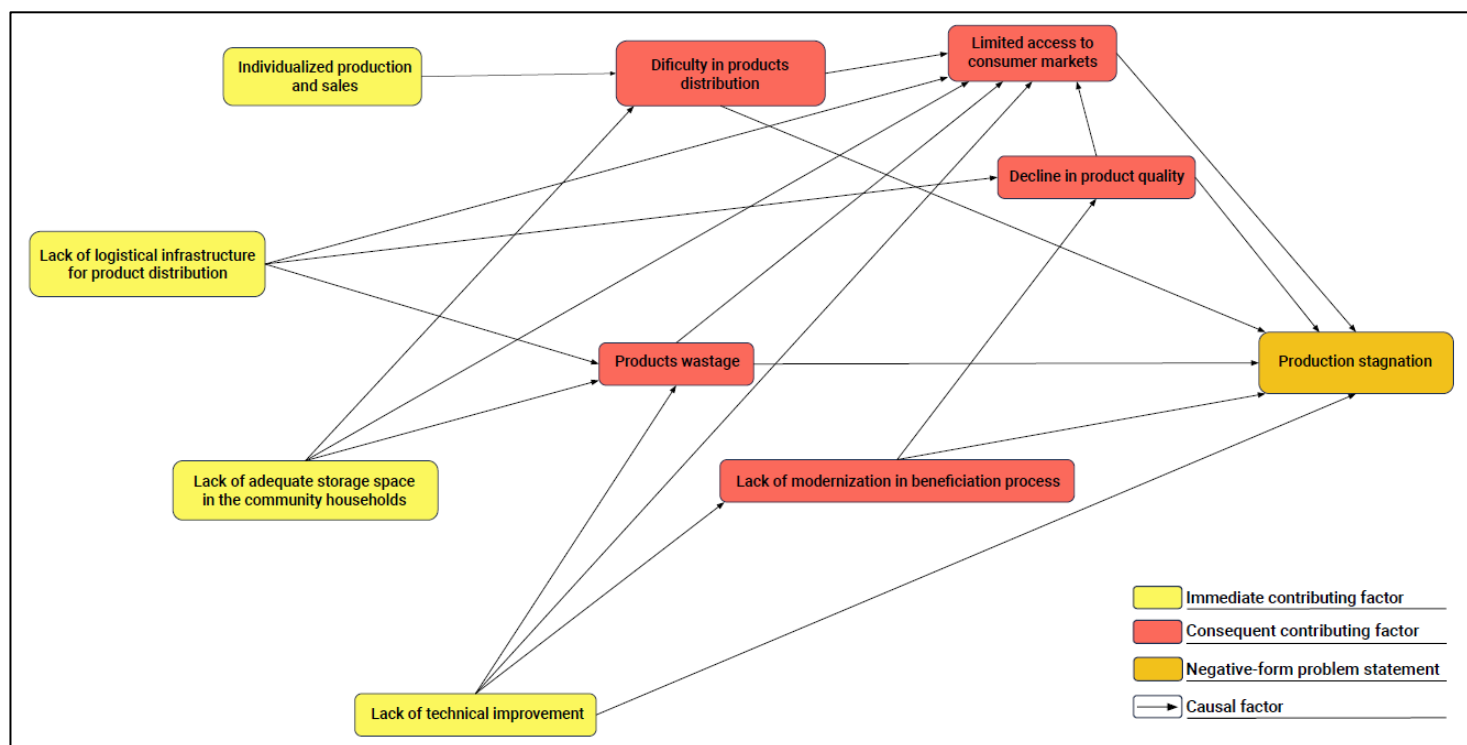
the positive impact that the project has had since its inception with Upbio, especially regarding the additional SOCIALCARBON Standard previously used.

In addition, as evidenced in “Section 2.1.8 - Project Activities and Theory of Change” the development of these scenarios involved the representation of leaders from four of the five communities included in the PRS of Upbio Soluções Ambientais, namely: Cristo Salvador, Divino Espírito Santo, Nossa Senhora do Carmo and São Sebastião do Cipoal. After the construction of the timeline and the presentation of the map of the project area, together with the survey of possible HCVs in the project zone, the participants were encouraged to reflect on the main problems identified in the territories of which a) the carbon project could address in the search for improvements; b) they were preferably common to all communities; and c) currently had a negative impact on the promotion of the quality of life and well-being of the residents. After the period of discussion and deliberation, the problem questions raised were:

1. Production stagnation;
2. Lack of community governance structuring;
3. Limitations involving income generation through alternative sources from forest products.

Once defined and validated, the participants were asked which of these issues negatively affected the largest number of communities present. This questioning was carried out so that the socio-environmental team of Ecológica Assessoria could collectively build the scenario, considering the limitation of time to address the three issues raised (the workshop covered only one of the activities proposed in the social action organized by Algar Farming mentioned in “Section 2.1.8 - Project Activities and Theory of Change”). Thus, “Production stagnation” was defined as the most prevalent problem issue in the communities. In this context and following the methodology described in the previously mentioned section, the “scenario in case the actions currently carried out ceased to occur” constructed by the leaders present at the workshop can be seen in Figure 30.

Figure 30 - Scenario in case the actions currently carried out ceased to occur related to the “production stagnation”



Source: created by the authors

In addition, a brief description of each aspect, considering the reality of the communities in the project area, can be viewed below. Each description highlights a critical aspect of the issue identified by the leaders, making it possible to identify possible strategies for solving/mitigating these problems to promote the well-being of the communities. It should also be noted that the causal relationship is identified by the direction of the arrows.

- **Production stagnation:** the projection defined by the participants involved the stagnation of product production in the communities. The lack of diversification and innovation would negatively impact the local economy and the promotion of improved well-being of the residents.
- **Individualized production and sales:** each producer acts in isolation, without collaboration, which results in limitations to reach local economies and efficiency in marketing and the livelihood of communities.
- **Lack of logistical infrastructure for product distribution:** the absence of an effective logistics infrastructure hinders the transportation and distribution of products from communities to local consumer markets, negatively impacting sales opportunities.
- **Lack of adequate storage space in community households:** housing in the communities faces the lack of adequate spaces for the safe storage of products, negatively

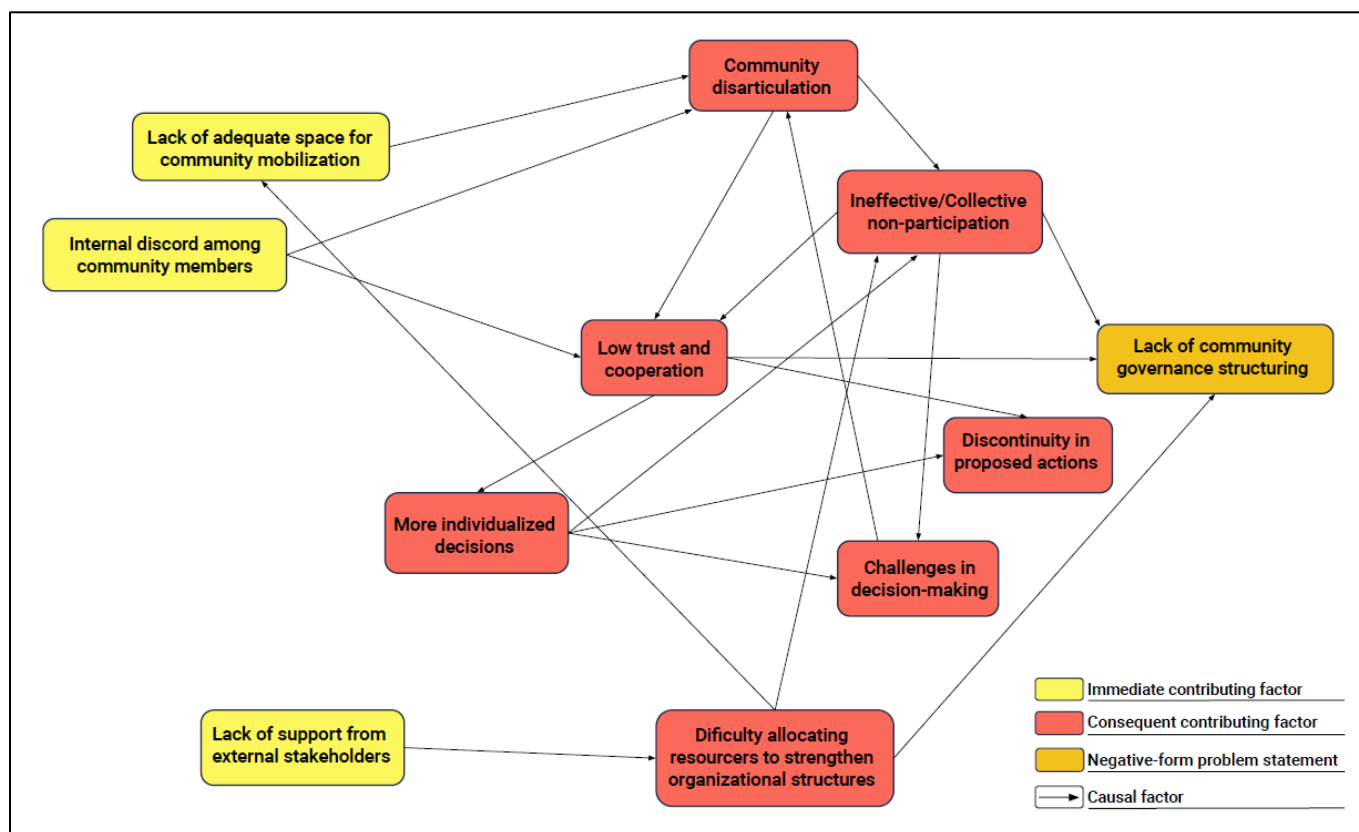
impacting the preservation of their quality. Here, we consider the situation of vulnerability present in these communities.

- **Lack of technical improvement:** the people who produce in the communities lack technical knowledge that culturally respects their production methods and that contributes to the efficiency in production and quality of the products.
- **Difficulty in products distribution:** the marketing of products faces significant challenges, including transportation difficulties that affect the ability of communities to get their products to local markets.
- **Products wastage:** products are lost due to the absence of adequate storage techniques both in housing and in transportation, directly impacting marketing, which results in waste.
- **Lack of modernization in beneficiation process:** the lack of adoption of modern practices for processing products that are efficient and culturally respectful of the communities' mode of production limits operational efficiency.
- **Limited access to consumer markets:** communities face difficulties in reaching consumer markets, including local ones, reducing opportunities for sales and income generation.
- **Decline in product quality:** the decline in product quality emerges from the intersection of the above challenges. The absence of adequate storage in homes compromises the preservation of products, while the lack of modernization in processes limits the efficiency of processes. These factors, combined, hinder access to consumer markets, preventing communities from reaching their full production and sales potential.

From the construction of the scenario, it is evident that the possibility of Production stagnation in communities emerges because of interconnected challenges that range from individualized production to the difficulty of access to consumer markets. Addressing these challenges requires a holistic approach that involves infrastructure solutions, technical capacity-building, efficient logistics, and market access strategies. The coordinated implementation of strategies would not only lead to the quality of the products but would also play a key role in breaking the possible cycle of stagnation, creating opportunities for local development and improving the well-being of the people living in the communities.

In relation to the “Lack of community governance structuring” and the “difficulty in generating income from alternative sources through the use of forest products”, the process of constructing the scenario was similar. It is worth noting, again, that there was no direct participation of the communities, considering that there were other activities taking place simultaneously. However, the entire development was based on the reports of the leaders present in the activity and evidenced in “Section 2.1.8 - Project Activities and Theory of Change”. From this perspective, the scenario related to the “Lack of Community Governance Structuring” can be seen in Figure 31.

Figure 31 - Scenario in case the actions currently carried out ceased to occur related to the “Lack of community governance structuring”



Source: created by the authors

Following the same logic of the scenario built with the communities, the following description is given:

- **Lack of Community Governance Structuring:** the lack of organization in the governance structure presents significant challenges for communities, impacting the effectiveness of decision-making, coordination, and local management of communities.
- **Lack of adequate space for community mobilization:** there is difficulty in collective structuring in some communities due to the lack of an appropriate place for meetings and mobilization of people. Even when there is adequate physical space, some communities do not have structured collectives. Such gaps hinder the effective implementation of community initiatives and limit the space for collective discussions and activities.
- **Internal discord among community members:** internal conflicts and disagreements undermine cohesion, affecting the smooth functioning of community activities, cooperation, and shared decision-making processes.
- **Lack of support from external stakeholders:** communities face a lack of support from external actors other than Algar Farming and Upbio Soluções Ambientais, making it difficult

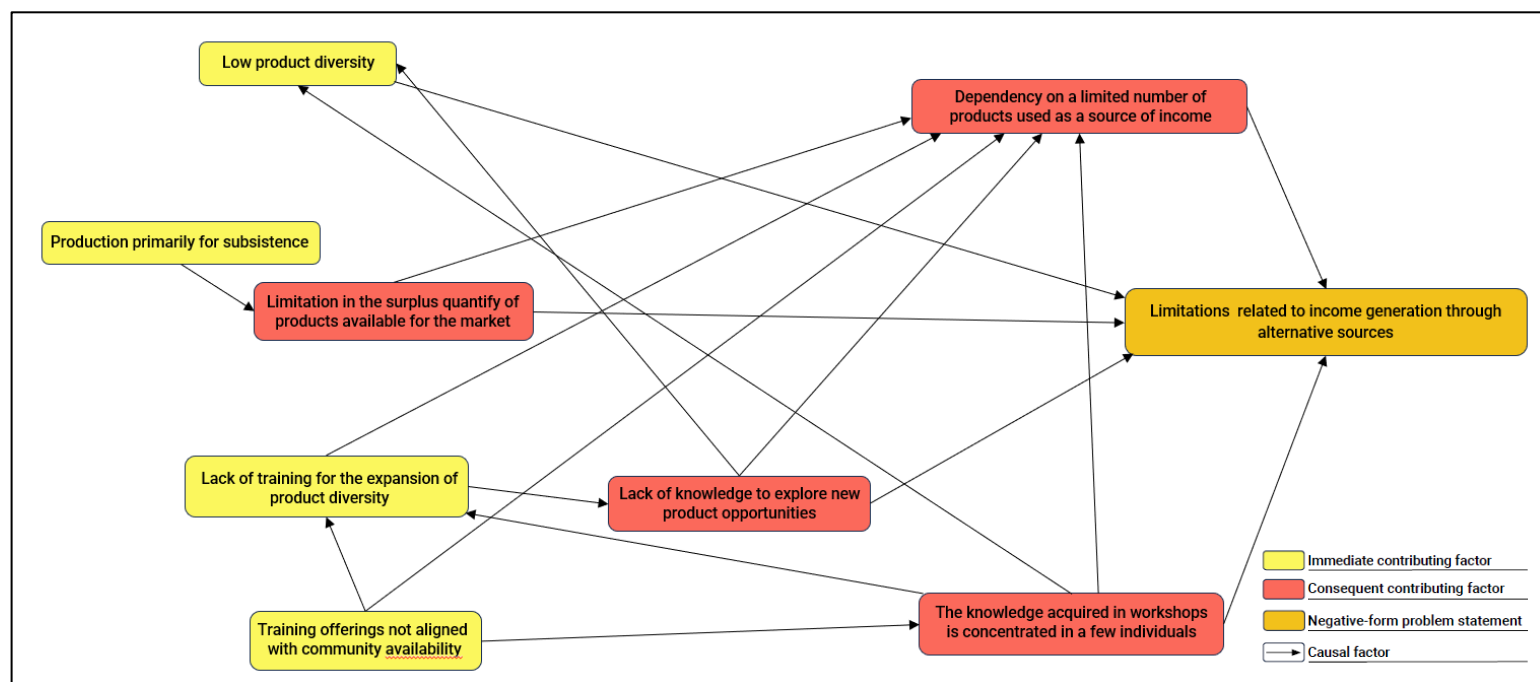
to access resources, guidance, and partnerships necessary for community development and effective governance.

- **Community disarticulation:** there is evidence of a noticeable disconnection and disorganization within the communities. This lack of cohesion makes the implementation of coordinated initiatives challenging, compromising the overall effectiveness of community efforts, resulting from multiple motivations.
- **Low trust and cooperation:** communities experience varying levels of trust and cooperation among members, affecting the collaborative spirit necessary for successful collective action and building a resilient community fabric.
- **More individualized decisions:** decision-making processes in communities tend to be more individualized, lacking the necessary collective participation. This tendency can result in decisions that do not fully represent the diverse perspectives and needs of the people living there.
- **Difficulty allocating resources to strengthen organizational structures:** allocating resources to improve organizational structures is a challenge for communities, especially considering their vulnerability. Limited financial means prevent investments in the infrastructure and capacities needed for effective community governance.
- **Ineffective/Collective non-participation:** there is a notable absence of effective and collective participation among community members. This can be attributed to a variety of factors, such as limited opportunities for participation or challenges in fostering a sense of shared responsibility.
- **Challenges in decision-making:** communities face difficulties in the decision-making process, attributed to various factors, such as individualized procedures, inadequate communication, among others.
- **Discontinuity in proposed actions:** communities experience interruptions and inconsistencies in the implementation of proposed actions. This discontinuity can result from a lack of sustained support, insufficient planning, or external factors that affect the continuity of initiatives.

The combination of these challenges reveals a complex and multifaceted landscape that communities face. Overcoming these obstacles requires an integrated approach, focused on promoting social cohesion, community strengthening, and actively seeking external partnerships. Only through coordinated efforts and comprehensive strategies will communities be able to transcend these barriers.

Regarding the question “limitations involving income generation through alternative sources from forest products”, the scenario outlined is presented in Figure 32.

Figure 32 - Scenario in case the actions currently carried out ceased to occur related to the “limitations involving income generation through alternative sources from forest resources”



Source: created by the authors

The following is a description of each aspect addressed:

- **Limitations involving income generation through alternative sources from forest resources:** communities face significant challenges in scaling up strategies to generate income from alternative sources using forest resources.
- **Low product diversity:** the individualized production of each producer limits commercialization, reducing opportunities for income generation.
- **Production primarily for subsistence:** production is primarily aimed at meeting the basic needs of communities. This scenario both results from and contributes to insufficient production for the local market.
- **Lack of knowledge to explore new product opportunities:** limiting specific information and skills prevents communities from identifying and taking advantage of new production and marketing opportunities, even with available resources.
- **Training offerings not aligned with community availability:** the calendar of workshops and training, in some cases, is not in accordance with the availability of the people living in the communities and may limit participation and acquisition of knowledge.
- **Dependency on a limited number of products used as a source of income:** communities rely heavily on a narrow set of resources to generate income, making them susceptible to fluctuations in the local market and the cycle of planting and harvesting.

- **Limitation in the surplus quantity of products available for the market:** production results in an insufficient quantity of products for sale that allows for continuous commercialization.
- **Lack of training for the expansion of product diversity:** the limited number of workshops and more targeted training, such as product processing, prevents communities from expanding their product range, limiting the ability to innovate.
- **The knowledge acquired in workshops is concentrated in a few individuals:** the knowledge obtained during the workshops is centralized in a small group of people who are precisely the ones who can participate in the activities according to the previously established schedule, hindering the wide dissemination of knowledge and its positive impact within the communities.

In view of the challenges presented, the complexity faced by the residents is evident, and it is imperative to develop strategies that promote innovation, diversification, and dissemination of the knowledge acquired, aiming at strengthening the communities. In this context, it is noted that some challenges are common among the issues raised, indicating a possible prioritization of strategies and interventions that should be validated by the communities.

4.2 Net Positive Community Impacts

4.2.1 Expected Community Impacts (CM2.1)

Based on the construction of the Theory of Change evidenced in the section "Section 2.1.8 - Project Activities and Theory of Change", the result of the reports collected in the workshop held with staff leaders of the five communities in the project zone contemplated by the Upbio's PRS (see same section), the expected impacts for the communities are presented below:

Table 38 - Positive impacts expected on communities from the problem issue “production stagnation”

Community Group	All communities covered by Upbio's PRS
Impact	Diversity in production
Type of Benefit/Cost/Risk	The promotion of diversity in production in communities through the formation of sustainable collectives and practices provides significant direct benefits. By strengthening social cooperation and community resilience, these initiatives open up new income opportunities and optimize logistics processes to ensure long-term sustainability. These benefits are tangible through the strengthening of social ties, the ability to face adversity, the diversification of income sources, operational efficiency, improved quality of local products, reduced waste, and a balance between economic and environmental benefits. This comprehensive approach not only boosts local economic development, but also strengthens social cohesion and promotes more responsible and efficient production in communities according to their specificities.
Change in well-being	• Strengthening social ties through the formation of collectives, promoting cooperation and mutual support. • Increased community resilience by providing more effective support in the face of societal challenges. • Expansion of income opportunities by expanding production, generating positive economic impacts. • Promotion of a more conscious and responsible approach to natural resources and ecosystem services.

Source: created by the authors

Table 39 - Positive impacts expected on communities from the problem issue “lack of community governance structuring”

Community Group	All communities covered by Upbio's PRS
Impact	Structured and effective governance in communities
Type of Benefit/Cost/Risk	The proposed mobilizations to strengthen governance in vulnerable communities have indirect benefits. By establishing partnerships and creating collaborative spaces, improved social cohesion is promoted. In addition to the revitalization of existing environments and involvement in decisions related to the management of these spaces, active participation and a sense of ownership are encouraged, expanding community initiatives. Not only that, the formalization of consultation and deliberation processes promotes transparency and efficiency in decisions, strengthening the trust of communities. This strengthened trust lays a strong foundation for more inclusive and transparent governance, aligned with project and stakeholder objectives. Therefore, these mobilizations boost social cohesion, active participation, the development of community initiatives and strengthen trust, consolidating a governance that promotes development in multiple aspects in communities.
Change in well-being	• Strengthening social cohesion through the consolidation of ties between community members. • Development of projects and actions that are more consistent with the needs and demands of the project community. • Strengthening the trust of communities, contributing to a stronger environment of cooperation and collaboration.

Source: created by the authors

Table 40 - Expected positive impacts on communities from the problem-question ‘limitations related to income generation through alternative sources’

Community Group	All communities covered by Upbio's PRS
Impact	Generate income through alternative sources
Type of Benefit/Cost/Risk	By diversifying sources of income, communities achieve economic autonomy, reducing financial vulnerability and fostering greater economic independence. Not only does this strategy bring direct benefits to individual community members, but it also boosts the local economy as a whole. Continuous training plays a crucial role in promoting a proactive mindset in the management of local resources, contributing to environmental and economic sustainability by establishing practices aimed at preserving natural resources. Additionally, the development of diverse skills strengthens the capacity of communities to face challenges, resulting in greater resilience in the face of change and adversity. The participatory approach creates a collaborative environment, in which diversity of skills is valued, promoting more cooperative and communal practices.
Change in well-being	• Expansion of income opportunities through diversification in production, generating positive economic impacts. • Reducing dependence on a limited amount of products, promoting greater economic stability. • Reducing dependence on middlemen through diversification of income opportunities. • Reducing financial vulnerability through the diversification of income sources and the strengthening of economic autonomy. • Strengthening community resilience in the face of challenges, positively impacting the mental and emotional health of individuals. • Strengthening social ties and community cohesion, promoting more united and collaborative communities.

Source: created by the authors

By highlighting the positive impacts and their effects on strengthening social ties, increasing community resilience, and expanding income opportunities through diversification in production, communities will be able to achieve not only the possibility of economic stability, but also a significant improvement in overall well-being. Reducing dependence on limited products, promoting a responsible approach to resources, and decreasing financial vulnerability are all consequences of this process. In addition, by fostering the active participation of community members, promoting projects aligned with their needs, and strengthening trust, the initiatives aim to create a more united and collaborative environment, culminating in a holistic and sustainable approach.

4.2.2 Negative Community Impact Mitigation (CM2.2)

Based on the Theory of Change outlined in section “2.1.8 - Project Activities and Theory of Change” and considering the concept of negative impact presented by the SBIA as an “outcome of an intervention”,⁹² i.e., as an unintended consequence of an outcome that compromises the success of the sequence of outcomes, some negative impacts were identified about the causal chain of the proposed activities for the communities. These elements, along with the negative impact and their mitigation strategies, are presented in detail in the following table.

Table 41 - Negative Impact and Mitigation of Negative Impact on Communities

Aspect of the Theory of Change	Appearance description	Impact	Description of the impact	Mitigation measure
Positive impact product “diversity in production”	Formation of cooperatives and/or associations	Social exclusion	Possibility of creating divisions or excluding members of the community who do not participate in cooperatives, making it unrepresentative	Promote the representative inclusion of community members in cooperatives/associations, as well as in their decisions and benefits
Positive impact result “diversity in production”	Expanded access to local markets and sales channels	Dependence on volatile markets	Over-reliance on volatile markets can result in financial insecurity	Encourage market diversification to reduce reliance on a single channel
Positive impact product “diversity in production”	Establishment of continuous training activities, covering topics related to the diversification of production based on the knowledge of the community	Information overload	The over-provision of information can overwhelm some members of the community, resulting in difficulties in absorbing and applying knowledge	Structure learning activities gradually and adapted to the pace of the community
Positive impact product: “structured and effective governance in communities”	Renovation or construction of a functioning community area	Difficulty in maintaining the use of community space	Community dissatisfaction with the functionality or management of the space can negatively impact its ownership and belonging	Develop a plan for the ongoing maintenance of the community space, identifying responsibilities of the people of the communities

⁹² Page 79. Available at: <<https://verra.org/wp-content/uploads/social-and-biodiversity-impact-assessment-sbia-manual-for-redd-projects-part-1.pdf>>. Accessed on: 23 Dec. 2023.

Positive impact product: “structured and effective governance in communities”	Operationalization and adoption of specific and formal consultation and deliberation procedures	Overload of processes and bureaucracies	Excessive procedures can overwhelm communities, which can discourage continued participation and adherence over time	Create moments of consultation and feedback from community members in order to improve the procedures adopted, ensuring that the process is adapted according to local needs and experiences
Positive impact “generate income through alternative sources”	Generate income through alternative sources	Social inequality	Certain alternative sources may benefit some groups more than others, generating the widening of social inequalities, instead of promoting economic inclusion	Implement actions to support vulnerable groups to ensure they benefit equitably from income-generating initiatives

Source: created by the authors based on Theory of Change

As with risks (see section “2.3.4 - Community Costs, Risks and Benefits”), it is observed that the strategies for mitigating the negative impacts identified are, to a certain extent, integrated into the causal chain of the theory of change mentioned above. For example, the mitigating measure related to the implementation of moments of consultation and feedback with community members, to improve the procedures adopted and ensure the adaptation of the process according to local needs and experiences, is included in the activity “implement community engagement initiatives”. This activity, among other expected results, seeks to develop capacities for community management. This highlights the presence of the precautionary principle, as conceived by the document “Definitions of the CCB Program⁹³”.

In addition, the adaptive management process also serves to identify and mitigate possible negative impacts on the community (see section “2.3.8 - Continued Consultation and Adaptive Management”). Ongoing communication between the project team and local communities will ensure prompt identification and mitigation of any risk-related complaints in communities.

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

The impacts of the strategies outlined for and with communities, as described in section “2.1.8 - Project Activities and Theory of Change” and exposed in section “4.2.2 - Negative Community Impact Mitigation”, were meticulously designed to generate significant positive impacts, aiming to considerably improve the

⁹³ Available at: <https://verra.org/wp-content/uploads/2017/06/CCB_Program_Definitions_v3.0.pdf>. Accessed on: 23 Dec.2023.

quality of life in the communities involved. When compared with a “Non-Project Scenario”, detailed in the sections “4.1.1 - Descriptions of Communities at Project Start” and “4.1.4 - Without-Project Scenario: Community”, it becomes evident that the project proposes activities capable of providing concrete benefits to these communities. Thus, the planned strategies will result in exclusively positive impacts, such as:

- Strengthening social ties: the formation of collectives fosters cooperation and mutual support, consolidating social ties between community members.
- Increasing community resilience: providing more effective support in the face of societal challenges, the strategies aim to strengthen community resilience.
- Expansion of income generation opportunities: diversification in production generates positive economic impacts, providing residents with additional income opportunities.
- Reduced dependence on a limited number of products: Product diversification reduces dependency, promoting greater economic stability.
- Conscious approach to resources: a more conscious and responsible approach to available resources is encouraged.
- Less dependence on middlemen: the diversification of income generation opportunities reduces dependence on middlemen, providing greater financial autonomy.
- Projects aligned with community needs: actions are consistent with the needs and demands of the community, strengthening trust and fostering a collaborative environment.

These net community impacts were identified as potential outcomes of the project's activities, designed based on the vulnerabilities and demands of the communities, both identified in workshops and by Upbio's PRS. See more details in the section “4.2.1 - Expected Community Impacts”.

In addition, it should be noted that at least one result of the project will benefit all people in the project area, even those who are not yet covered by Upbio's PRS. Forest conservation and the possible implementation of agroforestry systems represent crucial actions to ensure ecosystem services, benefiting the entire region. These actions promote climate benefits, such as improved soil quality, reduced GHG emissions, as well as diversification and food security, among others.

By relating the specific activities of the project to the expected benefits, the intention to not only address the vulnerabilities identified in the communities is evidenced, but also to promote a comprehensive transformation for the overall well-being by incorporating sustainable and adaptive practices. For more detailed information on the project activities and their relationship to the proposed impacts, it is recommended to revisit the section “2.1.8 - Project Activities and Theory of Change”.

4.2.4 High Conservation Values Protected (CM2.4)

About community-related HCV (see section “4.1.3 - High Conservation Values”), project activities are planned not to cause negative impacts. Instead, the focus is on protecting the ecosystem and sites of

importance to local communities. In the event of the identification of possible adverse impacts over the life of the project through the complaint mechanism, a mitigation plan will be implemented, seeking to reduce and, ideally, stop these impacts.

Thus, there is no forecast of negative environmental impacts, and no adverse effects on High Conservation Values (HCVs) are expected. The project is focused on promoting environmental, social, and cultural benefits while fully aligning with the principles of conservation and sustainability. This approach reflects the project's commitment to ensuring that its activities contribute positively to the preservation and enhancement of the areas involved.

4.3 Other Stakeholder Impacts

4.3.1 Impacts on Other Stakeholders (CM3.1)

The other stakeholders susceptible to the impacts outlined in section “4.2 - Net Positive Community Impacts” are the communities not yet covered by Upbio's PRS (see section “2.1.6 - Stakeholder Identification”). This definition was based on the fact that the identification of these impacts derived from the Theory of Change, relying on the reports of communities already benefiting from the PRS. The similarity of context and sharing of characteristics between these communities allows us to anticipate similar positive impacts among them.

The strategic decision not to incorporate such communities in this specific stage of the project resulted from meticulous analysis, highlighting logistical challenges and the need for careful management (see section “2.1.7 - Stakeholder Description”). However, it is imperative to stress that this decision does not constitute an unalterable commitment. Algar Farming and Upbio are proactively engaged in assessing and overcoming these challenges, with the ultimate goal of extending the benefits of the project to these communities.

The development of this inclusive approach reflects the commitment to ensuring that all impacted communities benefit fairly and sustainably from the project. As such issues are addressed, the PRS maintains the adaptability necessary to expand, fostering a wide-ranging positive impact.

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

With regard to the mitigation of negative impacts on other stakeholders, for the ABC Norte REDD Project, the forecast is that these will not occur or are unlikely, considering the implementation of strategies derived from the Theory of Change that substantially cover these impacts (see section “4.2.3 - Net Positive Community Well-Being”). As Algar Farming and Upbio expand their activities to include other communities, they will also benefit from these strategies in a fair and sustainable manner.

4.3.3 Net Impacts on Other Stakeholders (CM3.3)

Based on what was highlighted in sections “4.3.1 - Impacts on Other Stakeholders” and “4.3.2 - Mitigation of Negative Impacts on Other Stakeholders” and on the expansion of Algar and Upbio's activities to cover the other communities not covered by the PRS, the net impacts will be similar to those observed in the communities already benefited by the program.

4.4 Community Impact Monitoring

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

The conception of the indicators in this context is based on the Theory of Change, which was built from the reports of community leaders participating in the social action promoted by Algar Farming and Upbio. This approach is designed to encompass not only quantitative results but also qualitative aspects that truly reflect the impact on communities.

It is crucial to point out that the formulation of the procedures to be adopted will be guided by the traditional knowledge of the communities involved. Recognizing the relevance of this knowledge, the active participation of community members as leaders is essential. This approach aims to ensure the incorporation of local practices and perspectives, thereby strengthening the effectiveness of the proposed initiatives.

In addition, it is important to note that none of the proposed indicators is intended to have a negative impact on the identified High Conservation Value (HCV). Rather, the focus is on promoting environmental, social, and cultural benefits while strictly aligning with the principles of conservation and sustainability. The meticulous care in defining the indicators and conducting the procedures aims to ensure that the implementation of the project acts as a positive agent for the communities involved and for the environment to which they belong.

Table 42 - Indicator 1: activities carried out

Indicator 1	Activities carried out
Description	Measuring the number of activities conducted by the project during the current monitoring period, including: • Creation and maintenance of cooperatives and/or associations; • Diversification of cultivation and production techniques; • Community engagement; • Techniques for generating income through alternative sources; • Techniques for processing products produced by communities

Type of measurement and procedures adopted	Definition of the objective and scope of the activity: the purpose and format of the activity will be established - such as seminars, conversation circles, workshops, among others - aligning them with the items highlighted in the description of the indicator. Registration tool: the tool used to record the activities will be, in addition to the photographic record, an attendance list controlled by the group responsible for the activity (usually Upbio). It is worth mentioning that the list will not have the signature of the residents of the communities due to the issues highlighted in the section "2.1.8 - Project Activities and Theory of Change". Participants: for each activity, relevant details such as date, time, location, topic and duration will be recorded. Evaluation: information about the participants of each activity will be included, such as the number of participants, community of origin, feedback, and other pertinent details. Activities will also be evaluated, asking participants about the benefits and learnings gained. Follow-up reports: the recorded data will be used to generate reports that present the total number of activities carried out in a specific period, as well as other relevant information regarding each activity. Analysis and adjustment: an analysis of the data will be conducted to identify trends, such as most popular themes and most served communities. This information will be essential to adjust the strategy and improve future activities. Communication of results: the results of the count of actions will be shared with the community and other relevant stakeholders.
Monitoring Frequency	Annual
Forms of registration	Reports, emails, attendance lists, photographic records, recordings, meeting minutes and/or other documents will serve as evidence of the activities carried out.
Aspect of the Theory of Change (Section 2.1.8)	• Formation of cooperatives and/or associations; • Establishment of continuous training activities, covering topics related to the diversification of production based on the knowledge of the community; • Development and implementation of activities for community engagement based on community demands; • Development and implementation of continuous training activities for product processing.

Source: created by the authors

Table 43 - Indicator 2: people benefiting from the activities

Indicator 2	People benefiting from the activities
Description	Measuring the number of people participating in the project's proposed activities related to the social scope.
Type of measurement and procedures adopted	Definition of the participants: initially, the people benefited by the action will be identified, including the name of the community, workers in the Project Area, among others. Registration tool: the tool used to register the number of participants will be, in addition to the photographic record, an attendance list controlled by the group responsible for the activity (usually Upbio). It is worth mentioning that the list will not have the signature of the residents of the community due to the issues highlighted in the section "2.1.8 - Project Activities and Theory of Change". Documentation and identification: for each activity, relevant details such as date, time, location, topic covered and duration will be recorded. Classification of beneficiaries: participants will be categorized into groups through information such as age, gender identity, race/ethnicity, educational level, among others. This will allow for a more detailed analysis of the impacts on different segments of the community. Analysis and adjustment: the data will be analyzed to identify trends, such as the most popular themes and the most served communities. This information will be essential to adjust the strategy and engage more people to participate in future activities. Communication of results: the number of people participating will be shared with the community and other relevant stakeholders.
Monitoring Frequency	Annual
Forms of registration	Reports, emails, attendance lists, photographic records, recordings, meeting minutes and/or other documents will serve as evidence of the activities carried out.
Aspect of the Theory of Change (Section 2.1.8)	• Effective participation of communities in collective activities; • Greater participation of people from the communities in the proposed activities.

Source: created by the authors

Table 44 - Indicator 3: space for communal use

Indicator 3	Space for communal use
Description	Defining a physical location designed for community purposes or as a central point for information exchange and cooperation among community members.
Type of measurement and procedures adopted	Physical verification: if the community does not have a defined community space, a process of identifying and formalizing the site will be initiated. This will involve assigning a clear purpose to the space and promoting its recognition as a community area. This formalization may include the installation of signage, informational signs, or other visual means. If the community already has a designated space, actions will be implemented to improve its conditions, within the possibilities of the project, making it more welcoming and functional. Evaluation: to evaluate the effectiveness and usefulness of the space, conversations will be conducted with members of the community, in addition to formal evaluation mechanisms such as suggestion boxes or brief surveys during Upbio visits. These assessments will provide insights into the impact of the space on the community and identify areas for improvement. Communication of results: any change related to the community space will be communicated to the community and other relevant stakeholders.
Monitoring Frequency	Annual
Forms of registration	Formal document, validated by community members, that establishes a certain physical space as for community use, in addition to photographic records.
Aspect of the Theory of Change (Section 2.1.8)	Renovation or construction of a functioning community space.

Source: created by the authors

Table 45 - Indicator 4: community protocol

Indicator 4	Community Protocol
Description	Defining and implementing formal guidelines or agreements within the community or community group to guide behavior, interactions, and practices that impact the community.
Type of measurement and procedures adopted	Identification of needs: carry out a survey of the needs and challenges perceived by the community or community group that justify the creation of a protocol. Protocol development: facilitate activities to create, revise, and finalize the community protocol. This will include details on expected behaviors, norms of coexistence, conflict resolution, and other relevant topics. Community approval: present the protocol to the community or group for collective review and approval. Ensure that as many members as possible have the opportunity to contribute and express their opinions. Implementation and dissemination: putting the protocol into practice and ensuring that all members are aware of its provisions. Use different means of communication, such as community meetings and printed material, to disseminate the information, including the Upbio WhatsApp group. Evaluation: to assess the effectiveness and usefulness of the protocol, conversations will be conducted with community members, in addition to formal evaluation mechanisms such as suggestion boxes or brief surveys during Upbio visits. These evaluations will provide insights into the protocol's impact on the community, as well as points for improvement.
Monitoring Frequency	Annual
Forms of registration	Formal physical and digital document, available to all community members and other relevant stakeholders. Allow for the revision and adaptation of the protocol as circumstances or community needs evolve.
Aspect of the Theory of Change (Section 2.1.8)	Operationalization and adoption of specific and formal procedures for consultation and deliberation.

Source: created by the authors

Table 46 - Indicator 5: schedule with activities established through the participation of communities

Indicator 5	Schedule with activities established through the participation of communities.
Description	Creating a time plan that details the planned activities to be carried out in the community, considering the contributions and active participation of residents.
Type of measurement and procedures adopted	Identification of needs: conduct consultations and participatory meetings to identify the needs, aspirations, and priorities of communities in relation to planned activities. Collaborative planning: facilitating joint planning activities with the active participation of communities. Involve community members in setting specific goals, objectives, and activities to be included in the schedule. Drafting the schedule: develop a detailed timeline that includes all planned activities, their start and completion dates, and the resources needed. Ensure that the timeline reflects the aspirations and priorities of communities. Review and approval: present the timeline to communities for review and approval. Provide space for feedback and adjustments based on community input. Outreach: communicate the timeline in a clear and accessible manner to all members of the community. Use different means of communication, such as community meetings, bulletin boards, or printed material, to ensure that information is widely disseminated, including the Upbio WhatsApp group. Implementation: begin the implementation of activities according to the established schedule. Maintain open communication with communities throughout the process. Participatory evaluation: carry out periodic evaluations of activities in conjunction with communities. Incorporate ongoing feedback to make adjustments to the schedule if necessary. Continuous adaptation: allowing for revision and adaptation of the schedule as needs and circumstances evolve.
Monitoring Frequency	Annual
Forms of registration	Formal physical and digital document, available to all community members and other relevant stakeholders.
Aspect of the Theory of Change (Section 2.1.8)	Schedule with planned activities established through the participation of the communities.

Source: created by the authors

Table 47 - Indicator 6: income from alternative sources

Indicator 6	Income from alternative sources
Description	Qualitatively assessing household income from alternative sources.
Type of measurement and procedures adopted	Identification of alternative sources: identify the different alternative sources of income available to households. Explore communities' perceptions of the importance and feasibility of these sources. Data collection: conduct open conversations and application of a semi-structured questionnaire to collect information on the diversification of income sources. Characterization of contributions: to describe qualitatively how alternative sources contribute to the total income of families. Examine the narratives and stories to understand the perceived impact. Perceptions analysis: analyze households' perceptions of the effectiveness and sustainability of alternative sources compared to conventional sources. Communication of perceptions: disseminate the perceptions, as well as the results of the questionnaire, to community members, clarifying any doubts regarding the generation of income from alternative sources.
Monitoring Frequency	Annual
Forms of registration	Report, semi-structured questionnaire, interview, e-mail, photographic record, recording and other documents that corroborate as evidence of the activities carried out.
Aspect of the Theory of Change (Section 2.1.8)	• Generate income through alternative sources.

Source: created by the authors

Table 48 - Indicator 7: markets reached by cooperatives/associations

Indicator 7	Markets reached by cooperatives/associations.
Description	Measuring the capacity of cooperatives or associations to expand their presence and participation in different markets.
Type of measurement and procedures adopted	Formulation of the Indicator: Number of new markets reached = total new markets established in the current monitoring period - number of markets established in the previous monitoring period. Interpretation: A positive value indicates an increase in the number of markets served since the beginning of the period considered. A negative value suggests a reduction in the number of markets. Data collection: will be collected through direct interviews with members of cooperatives/associations. The count should consider the markets served at the beginning and end of the established period. Communication of results: data will be shared with cooperatives/associations at their meetings and with other relevant stakeholders.
Monitoring Frequency	Annual
Forms of registration	Report, interviews, e-mail, photographic record, recording and other documents that corroborate as evidence.
Aspect of the Theory of Change (Section 2.1.8)	Expanded access to local markets and sales channels.

Source: created by the authors

Stakeholders will be regularly invited to stay informed about the results achieved, propose actions, and articulate demands, with the goal of ensuring and enhancing benefits for the communities. These meetings will play a crucial role in evaluating the progress of proposed changes and actions, facilitating necessary adjustments. Furthermore, Upbio will continue to produce monthly reports for socio-environmental purposes, ensuring ongoing transparency regarding the actions and results attained throughout the project.

4.4.2 Monitoring Plan Dissemination (CM4.3)

Following the guidelines established in sections “2.3.1 - Stakeholder Access to Project Documents” and “2.3.2 - Dissemination of Project Document Summaries”, the monitoring plan will be disseminated to communities and other stakeholders through the following strategies:

- **VERRA platform:** the monitoring plan, as well as the results of the checks, will be shared on the VERRA platform, ensuring transparency and reaching a wider audience.

- **Upbio's field activities through PRS:** during the field visits carried out by Upbio in the communities, the monitoring plan and its results will be communicated orally and through printed material.
- **Communication channels:** the plan will be accessible to communities through Upbio's WhatsApp, which is already used as a communication vehicle.
- **Algar Farming headquarters:** the plan will be available at Algar Farming's headquarters and will be presented to stakeholders during periodic meetings about the project. Communities will also be able to access it, even those not covered by Upbio's PRS.

In addition, and the technical team of Ecológica Assessoria will be available for contact through the e-mail: tecnica@ecologica.br.

Finally, the brochures containing this information, along with the results after the project checks, will be distributed in Portuguese and in the local language. This initiative aims to ensure that all stakeholders have complete access to information and the opportunity to clarify any doubts that may arise.

4.5 Optional Criterion: Exceptional Community Benefits

Not applicable. During the next stages of project development, Ecológica Assessoria's technical team will study the best strategy to meet the requirements that will enable the project to reach the Gold Level for Climate, Community and Biodiversity.

4.5.1 Exceptional Community Criteria (GL2.1)

Not applicable, as described in section 4.5.

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

Not applicable, as described in section 4.5.

4.5.3 Community Participation Risks (GL2.3)

Not applicable, as described in section 4.5.

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

Not applicable, as described in section 4.5.

4.5.5 Net Impacts on Women (GL2.5)

Not applicable, as described in section 4.5.

4.5.6 Benefit Sharing Mechanisms (GL2.6)

Not applicable, as described in section 4.5.

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

Not applicable, as described in section 4.5.

4.5.8 Governance and Implementation Structures (GL2.8)

Not applicable, as described in section 4.5.

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

Not applicable, as described in section 4.5.

5 BIODIVERSITY

5.1 Without-Project Biodiversity Scenario

5.1.1 Existing Conditions (B1.1)

Brazil harbors the greatest concentration of biodiversity on the planet. It has a great abundance of life forms - which translates to over 20% of the total species on Earth - and raises the country to the main nation among the 17 countries with the highest biodiversity levels globally, containing over 70% of the planet's biodiversity⁹⁴.

Brazil has the greatest flora species richness in the world, with 46,392 species described. Furthermore, it contains over 8,700 known species of vertebrates consisting of 720 mammals, 986 amphibians, 759 reptiles, 1,924 birds and 4,388 fish species. It is estimated that around 93 thousand invertebrate species are known⁹⁵.

The number of known species in Brazil is estimated to range from 170 to 210 thousand, while the total number of species that the country harbors is approximately 1.8 million, putting the known proportion of biodiversity at a mere 11%. New species are described every day in Brazil⁹⁶. It is also estimated then that

⁹⁴ MMA - Ministério do Meio Ambiente. Brazilian Government Ministry for the Environment. The Brazilian Biodiversity. Available at: <<https://www.gov.br/mma/pt-br/assuntos/biodiversidade>>. Accessed on: 21 Oct. 2021.

⁹⁵ SiBBr - Sistema de Informação sobre a Biodiversidade Brasileira. Available at: <https://regions.sibbr.gov.br/regions/Biomass%20Brasileiros/Amaz%25C3%25B4nia#group=ALL_SPECIES&subgroup=&guid=&from=1850&to=2021&tab=speciesTab&fq=>>. Accessed on: 21 Oct. 2021.

⁹⁶ SiBBr - Sistema de Informação sobre a Biodiversidade Brasileira. Available at: <https://regions.sibbr.gov.br/regions/Biomass%20Brasileiros/Amaz%25C3%25B4nia#group=ALL_SPECIES&subgroup=&guid=&from=1850&to=2021&tab=speciesTab&fq=>>. Accessed on: 21 Oct. 2021.

approximately 10% of the entire planet's biodiversity is found in the project region, including many threatened species and those which exist only in Amazonia, or endemic species⁹⁷.

The ecosystem of Pará presents the biodiversity characteristic of the Amazon region, where more than two thousand species of fish have been catalogued, about 950 species of birds, 300 species of mammals and about 10% of all plant species on Earth. In the territory, this variety of animal and plant species is immense, mainly due to climatic conditions (location in the equatorial zone) and the size of the area covered by forests. Among the trees considered to be noble wood, which is why they are often cut down indiscriminately, are Angelim, Cedro and Mahogany. In the extractive sector, the most sought-after species are rubber and Castanheira-do Pará.

The flora also features exotic species, such as the water lily and dozens of species of bromeliads. In the last decades, the concern with the future of the Amazonian ecosystem has been manifested inside and outside Brazil, by governmental and non-governmental institutions.

Several factors contribute to the destruction of flora and the accelerated process of extinction of animals in Pará territory. Among these factors, we highlight the selective exploitation of wood (which ends with natural reserves of hardwoods), extensive agriculture (responsible for cutting down the forest for transformation into pasture), the construction of hydroelectric plants (which alters the ecosystem of rivers and nearby areas), indiscriminate hunting aiming at the removal of leather for commercialization, overfishing and extraction of plants destined for the pharmaceutical industry.

In some areas, animals, such as the white-lipped peccary, the manatee, the pirarucu, the turtles and the curassows have already been greatly reduced.

The "Red book of Endangered Brazilian Fauna" was developed in 2008⁹⁸ and updated in 2018⁹⁹. In 2008, the document reported that the Amazon biome presented 24 threatened species. On the 2018 update, of the total endangered species in Brazil, 15.3% are found in the Amazon, representing 180. Of this total, 124 species are endemic to this biome.

The project area boasts an incredibly rich biodiversity of fauna, according to the fauna monitoring report developed by ABC Norte. Faunal surveys conducted have indicated the presence of 15 species of medium and large mammals. Among these 15 species, the tamarin (*S. sciureus*) is endemic to the Amazon Rainforest. None of the species are listed on official endangered species lists, but the fox (*Cerdocyon thous*)

⁹⁷ ARPA - Protected Areas Program of the Amazon (Org.). Arpa Biodiversidade. Amazonas: WWF - Brasil, 2010. 34p.

⁹⁸ Available at: <<https://biodiversitas.org.br/wp-content/uploads/2021/06/Livro-Vermelho-BR-Vol-I.pdf>>. Accessed on: 13 Oct. 2021.

⁹⁹ Available at: <https://www.icmbio.gov.br/portal/images/stories/comunicacao/publicacoes/publicacoes-diversas/livro_vermelho_2018_vol1.pdf>. Accessed on: 31 Oct. 2021.

and the scent tamarin (*Saimiri sciureus*) are included in Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)¹⁰⁰.

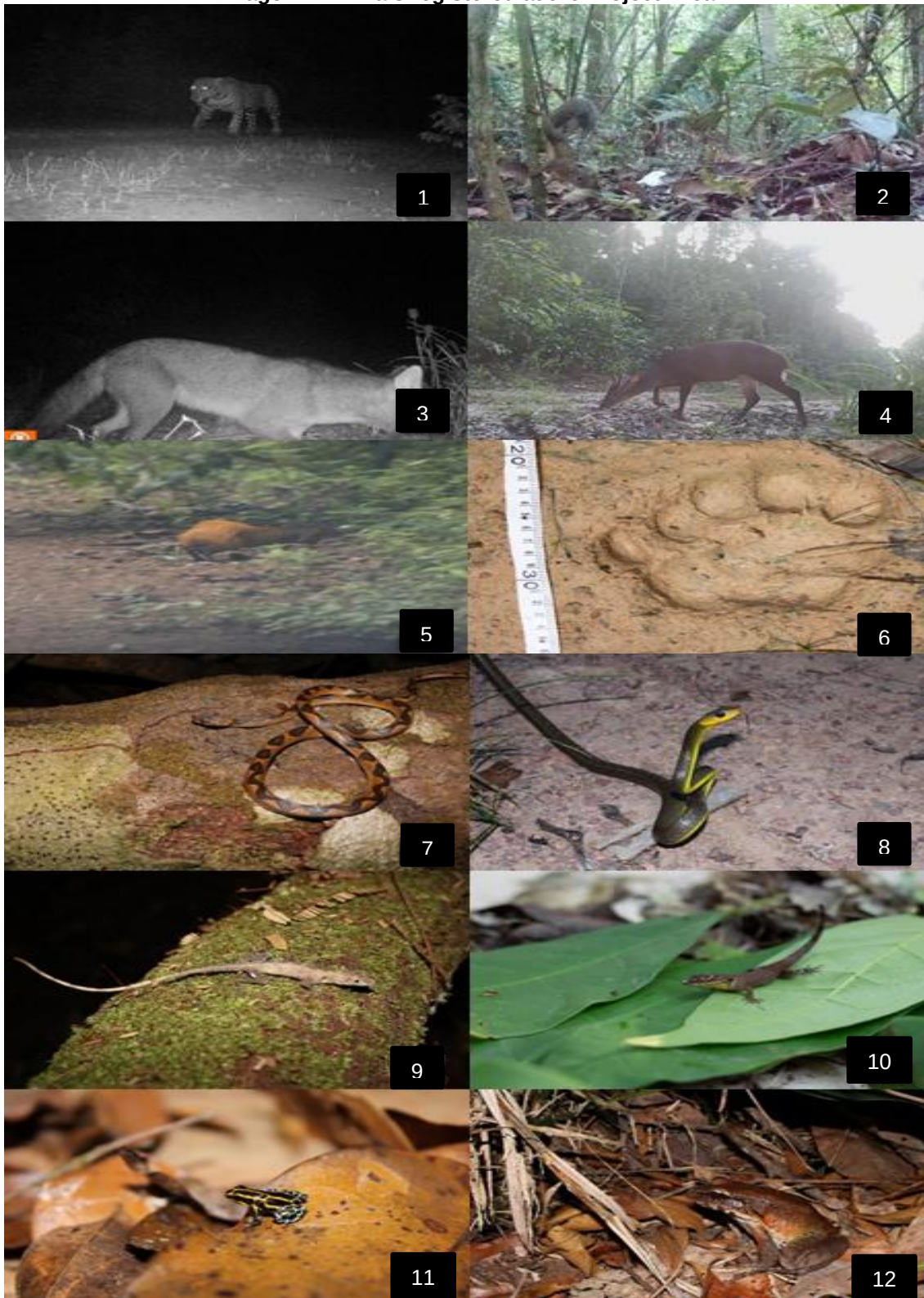
Also, 48 species were sampled, including amphibians, lizards and snakes. None of the registered are on official lists of extinction threats. Some species such as *Rhinella marina* and *Rhinella major* can adapt more easily to modified environments, are more tolerant to environmental changes and are commonly found in modified environments, such as urbanized areas.

On the other hand, species that use litter like *Adenomera andreae*, *Rhinella margaritifera*, *Rhinella proboscídea*, *Ranitomeya ventrimaculata* and *Allobates femoralis* were recorded during the sampling, corroborating the significant non-alteration of the environment, especially *R. ventrimaculata* and *A. femoralis* which are individuals who need microhabitats with specific characteristics of environmental quality to survive. The presence of *Anolis fuscoauratus* and *Plica umbra* demonstrates that the area provides the necessary support for species maintenance, since they are arboreal lizards and do not support drastic changes in the environment.

Seasonality proved to be very significant in the composition of herpetofaunistic communities, mainly due to the formation of new niches, and conditions that allow the occupation and reproduction of some species, such as the case of *Pithecopus hypochondrialis* and *Callimedusa tomopterna*. However, the methodology restrictions on time-limited demand justify the collection efficiency values below the expected for the area, thus not meeting its maximum potential.

¹⁰⁰ CITES - Convention on International Trade in Species of Wild Flora and Fauna in Endangered. Appendices. Available at: <<https://cites.org/eng/app/appendices.php>>. Accessed on: 31 Oct. 2021.

Image 4 - Animals registered at the Project Area



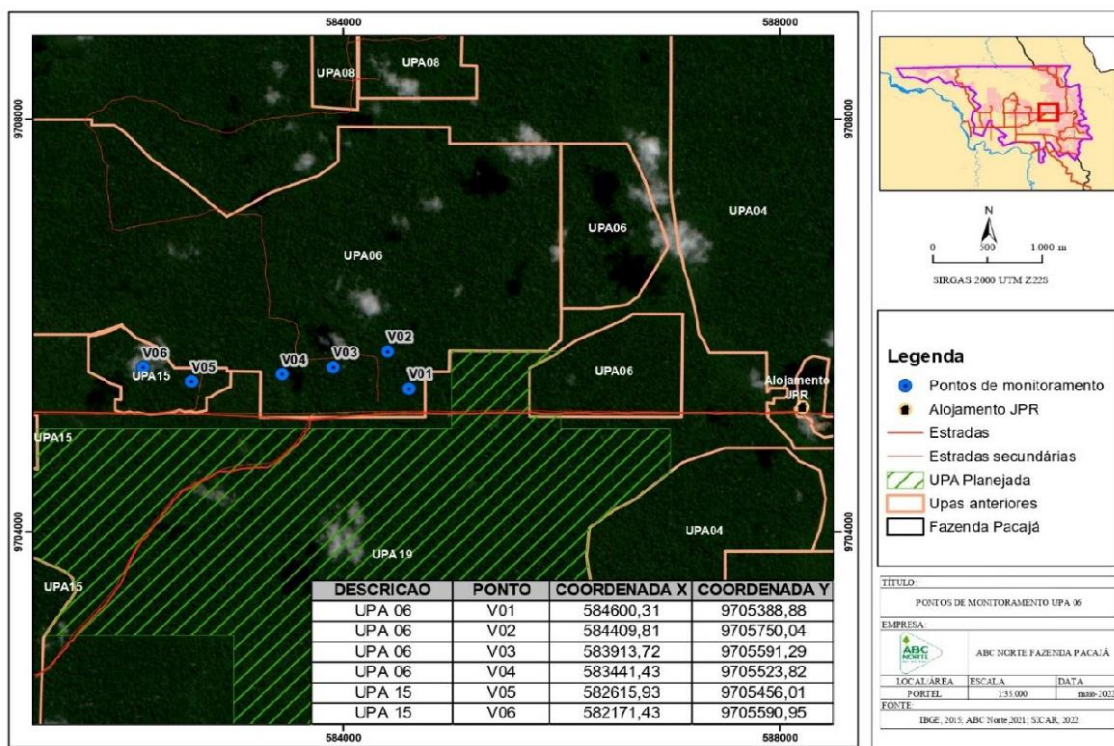
Source: project proponent's collection (Fauna Inventory Report from 2022)

Fauna

To monitor the fauna existent within the Pacajá Farm area, Grupo Algar, in partnership with Upbio (a specialized consultancy company legally qualified to develop environmental studies), periodically carries out an inventory of fauna on site.

The last fauna inventory carried out at Fazenda Pacajá took place between June 1-June-2023 and 8-June-2023, with this inventory campaign being carried out in the intermediate season (between dry and rainy) in the region. The execution of the activities was based on the Fauna Monitoring Plan, in addition to the recommendations and conditions contained in the Authorization for Capture, Collection, Management, and Transport of Wild Fauna (AU) under no. (5141/2023), issued by the State Secretariat for the Environment Environment and Sustainability of Pará (SEMAS/PA). The sampling standards and analysis criteria followed legal requirements as recommended by Normative Instruction 52/2010 SEMAS/PA, in addition to Resolution 301/2012 of the Federal Council of Biology. The inventory included the Pacajá Farm area shown in Figure 33.

Figure 33 - Map of the location of the area of influence of Fazenda Pacajá, in Portel-PA



Source: project proponent's collection (Fauna monitoring)

The inventory was divided into groups of animal species: terrestrial mammals, chiropterans, insect vectors, herpetofauna, and avifauna.

Terrestrial mammals

Small mammals are key elements in natural communities, acting at different trophic levels and in the predation process and seed dispersal. In this context, inventories focusing on assemblages of these organisms are the basis for understanding ecological processes such as population dynamics and community structures and for developing management plans in natural environments.¹⁰¹

To sample small mammals, a total of 20 live traps were used at each sampling site, 10 Shermans and 10 Tomahawks of varying sizes, as shown in Image 5. Arranged on the ground or in trees, lianas, etc., up to a maximum height of two meters. The traps were installed at a minimum distance of 20 meters, remaining open for 48 hours at each point, totaling 960 hours/sampling point. Concomitant to sampling with live traps, the technical team used lines of pitfall traps installed for herpetofauna. Each line consisted of five buckets, 10 meters equidistant, totaling 15 units of plastic buckets with a capacity of 60 liters.

Image 5 - Installation of Sherman and Tomahawk traps



Source: project proponent's collection (Fauna Inventory Report from 2022)

For medium and large mammals, two visual censuses were carried out in each Sampling Unit, in the morning and night shifts, covered by a 1km transect, to visually record species (Direct Records), in addition to feces, footprints, hair, or tracks (Indirect Records). In addition to the census, four traps of the “Camera Trap” type were installed by UA, which were activated 24 hours a day for two days in each unit, strategically inserted in possible locomotion trails, close to dens, in resting places, reproduction, and feeding of mammals.

¹⁰¹ MOURA, M.C et. al. How does sampling protocol affect the richness and abundance of small mammals recorded in tropical forest? An example from the Atlantic Forest, Brazil. Neotrop. Biol. Conserv. 3(2):51-58. 2008.

Image 6 - Installation of lives traps



Source: project proponent's collection (Fauna Inventory Report from 2022)

During the terrestrial mammal fauna monitoring campaign, 24 specimens distributed across 12 species were registered, as shown in the table below:

Table 49 - List of Species recorded from terrestrial mammal fauna during fauna monitoring

Family	Species	Common name	UA1	UA2
Atelidae	<i>Alouatta</i> sp.	Guariba	0	-
Cebidae	<i>Saguinus niger</i> (É. Geoffroy St.-Hilaire, 1803)	Sagui-Preto	0	6
Cervidae	<i>Mazama nemorivaga</i> (Cuvier, 1817)	Veado-Roxo	0	-
Cricetidae	<i>Oecomys</i> sp.	Rato	2	0
Cuniculidae	<i>Cuniculus paca</i> (Linnaeus, 1766)	Paca	0	2
Dasypodidae	<i>Dasypus novemcinctus</i> Linnaeus, 1758	Tatu-galinha	1	0
Dasyproctidae	<i>Dasyprocta leporina</i> (Linnaeus, 1758)	Cutia	9	1
	<i>Dasyprocta</i> spp.	Cutia	0	1
Didelphidae	<i>Philander opossum</i> (Linnaeus, 1758)	Cuíca-quatro-olhos	2	0
Felidae	<i>Leopardus pardalis</i> (Linnaeus, 1758)	Jaguaririca	0	1
	<i>Panthera onca</i> (Linnaeus, 1758)	Onça	0	-
Procyonidae	<i>Nasua nasua</i> (Linnaeus, 1766)	Quati	12	0

Source: created by the authors using project proponent's collection

Among the records, the presence of Agouti (*Dasyprocta* spp) stands out, which are species affected by habitat fragmentation and by man, suffering considerable pressure due to predatory hunting for consumption. Another species that deserves special attention is the black marmoset *Saguinus niger*, classified as vulnerable according to the Red List of Endangered Species of the International Union for the Conservation of Species (Red List - IUCN) and an endemic specie to the Amazon¹⁰².

Records of individuals from the felid family were carried out through tracks (footprints), including one record of *Panthera onca* and one of *Leopardus pardalis* (classified as of little concern), both on the access road very close to the entrance to point UA2, indicating that this entire area is used by these felines.

Image 7 - *Saguinus niger*

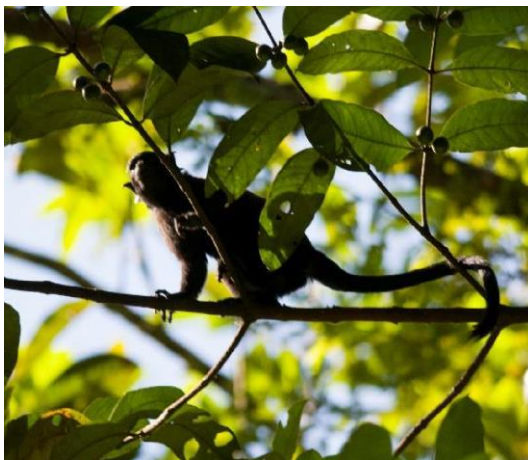


Image 8 - *Oecomys* sp.



Source: project proponent's collection (Fauna Inventory Report from 2022)

Images 9 - Footprint of *Panthera onca*



Image 10 - *Leopardus tigrinus*



Source: project proponent's collection (Fauna Inventory Report from 2022)

¹⁰² Available at: <<https://www.iucnredlist.org/species/160901052/192553958>>. Accessed on: 31 Oct. 2021.

Chiropterans

Bats belong to the Order Chiroptera, a word derived from the Greek “cheir” for hand and “pteron” for wing. They are cosmopolitan animals, not only occurring in polar regions. It is the second order with the greatest species richness, with 1300 currently known, surpassed only by Rodentia. In the Amazon region, which encompasses the greatest diversity of bats, around 200 species are known, distributed in nine families, namely: Phyllostomidae, Thyropteridae, Furipteridae, Noctilionidae, Mormoopidae, Emballonoridae, Vespertilionidae, Molossidae and Natalidae^{103,104,105}.

The bats were captured in natural populations with the aid of seven ground-level mist nets, measuring 12 x 3 m with 25 mm mesh, set up along trails and possible bat flight routes. Captures started at 18:00h and ended at 00:00h, and inspections were carried out at intervals of 20 to 30 minutes, each point was sampled for two consecutive nights. The captured specimens were removed from the nets manually using gloves and placed in cloth bags. In the intervals between inspections, specimens were analyzed and identified according to the identification key for Amazonian¹⁰⁵.

During the sampling period, 3 species of bats were recorded during fauna monitoring at Fazenda Pacajá, as shown in the following table:

Table 50 - List of species recorded for Chiroptero fauna

Species	UA1	UA2
<i>Artibeus obscurus</i>	1	1
<i>Carollia perspicillata</i>	2	1
<i>Phyllostomus elongatus</i>	1	0

Source: created by the authors using project proponent's collection

¹⁰³ REIS N.L. et al. Mamíferos do Brasil. Londrina: SEMA p.153-23. 2006.

¹⁰⁴ REIS N.L. et al. Morcegos do Brasil. Londrina. 1A edição, 253 p., 2007

¹⁰⁵ LÓPEZ-BAUCELLS, A. et al. Field guide to Amazonian bats. National Institute of Amazonian Research. Manaus, Amazonas. 2016.

Image 11 - *Carolia perspicillata* in the mist net and *Artibeus obscurus*



Source: project proponent's collection (Fauna Inventory Report from 2022)

Insect vectors

Mosquitoes from the Culicidae family are dipterans popularly known as mosquitoes, *muriçocas* or *carapanãs*. The Culicidae family currently contains more than 3,300 species worldwide, with 994 species and subspecies known from Brazil¹⁰⁶, 218 species are recorded in the Brazilian Amazon and 152 in Pará¹⁰⁷.

Mosquitoes were collected through two types of capture, they are: (i) The CDC (Centers for Disease Control) trap consists of a transparent film cylinder approximately 20 cm long and 10 cm in diameter. At the top, there is a small lamp and, just below, a fan that produces an air current with a gravitational direction and works with a current of 6 or 12 v. An aluminum tray covers the trap, protecting it from the rain. The Culicidae collected by this method are trapped and remain alive in the receiving compartment. (ii) Shanon Trap. During the sampling period, 34 specimens of insect vectors distributed in 4 genera and 6 species were obtained during fauna monitoring at Fazenda Pacajá, as shown in the table below:

¹⁰⁶ GAFFIGAN, T. V. et al. Systematic catalog of Culicidae. Washington, DC: Walter Reed Biosystematics Unit, 2015. Available at: <www.mosquitocatalog.org>.

¹⁰⁷ CERQUEIRA, N. L. Distribuição geográfica dos mosquitos da Amazônia (Diptera, Culicidae, Culicinae). Revista Brasileira de Entomologia, São Paulo, v. 10, p. 111- 168, 1961.

Table 51 - List of species recorded for Entomofauna

Species	UA1	UA2
<i>Anopheles triannulatus</i>	0	2
<i>Coquillettidia venezuelensis</i>	3	0
<i>Culex quiquefasciatus</i>	10	0
<i>Culex sp.1</i>	3	9
<i>Culex sp.2</i>	4	2
<i>Psorophora ferox</i>	1	0

Source: created by the authors using project proponent's collection

Image 12 - Low CDC trap (~1.5m) and species collection in Shannon trap



Source: project proponent's collection (Fauna Inventory Report from 2022)

Herpetofauna

In the Brazilian Amazon, there are around 505 species distributed as follows: 232 species of amphibians, 221 of which are anurans, 9 of gymnophinas, and 2 of salamanders; 273 species of reptiles, 16 of which are chelonians, 4 of crocodiles, 94 of lizards, 10 of amphisbaenians and 149 of snakes.¹⁰⁸

The reptiles represent a relevant tool for understanding the state of conservation of natural environments. As, in general, they occupy higher positions in food chains (sometimes as top predators of the trophic chain), they function as excellent indicators of the degree of conservation of ecosystems and, consequently, the levels of environmental change¹⁰⁹. Furthermore, it is known that the number of reptile species has been

¹⁰⁸ AVILA-PIRES, Et al. Herpetofauna da Amazônia. In: Nascimento, L. B. & Oliveira, M. E. (eds.). Herpetofauna no Brasil II, Sociedade Brasileira de Herpetologia, Belo Horizonte, pp. 13-43. 2007.

¹⁰⁹ MOURA-LEITE, J. C.; et al. 1993. Método para a caracterização da herpetofauna em estudos ambientais. P. 1-5. In: Surehna/GTZ. (Org.). MAIA - Manual de Avaliação de Impactos Ambientais. 2 ed. Curitiba: Superintendência de Recursos Hídricos e Meio Ambiente do Paraná.

declining on a global scale, mainly due to habitat loss and degradation, introduction of invasive species, environmental pollution, and global climate change¹¹⁰.

Amphibians are considered one of the groups of vertebrates most sensitive to microclimatic changes, mainly due to their physiological restrictions^{111,112} making them more demanding when it comes to choosing their habitat.

For sampling herpetofauna, two sampling methods were considered: active search limited by time (day and night transects) and pitfall traps. Three lines of pitfall traps were installed, each containing five buckets equidistant 10 meters apart.

During the fauna monitoring, were recorded 248 specimens distributed across 36 species, 31 genera, and 2 orders of local herpetofauna at Fazenda Pacajá, as shown in the Table 52 below:

Table 52 - List of species recorded for Herpetofauna

Family	Species	UA1	UA2
Aromobatidae	<i>Allobates femoralis</i> (Boulenger, 1884)	0	1
	<i>Allobates marchesianus</i> (Melin, 1941)	5	0
Bufonidae	<i>Rhinella margaritifera</i> (Laurenti, 1768)	5	1
	<i>Rhinella marina</i> (Linnaeus, 1758)	4	1
Colubridae	<i>Leptophis ahaetulla</i> (Linnaeus, 1758)	1	0
	<i>Chironius fuscus</i> (Linnaeus, 1758)	0	1
Craugastoridae	<i>Pristimantis fenestratus</i> (Steindachner, 1864)	3	0
Dactyloidae	<i>Anolis fuscoauratus</i> D'Orbigny, 1837	2	4
Dendrobatidae	<i>Ranitomeya amazonica</i> (Schulte, 1999)	1	0
Dipsadidae	<i>Helicops angulatus</i> (Linnaeus, 1758)	2	0
	<i>Hydrops triangularis</i> (Wagler, 1824)	1	0
	<i>Leptodeira annulata</i> (Linnaeus, 1758)	1	0
Elapidae	<i>Micrurus surinamensis</i> (Cuvier, 1817)	1	0
Gymnophthalmidae	<i>Arthrosaura reticulata</i> (O'Shaughnessy, 1881)	1	0

¹¹⁰ GIBBONS, J. W. et al. Bioscience. American Institute of Biological Sciences. The Global Decline of Reptiles, Deja Vu Amphibians, Vol. 50 nº 8. August 2000. Available at: <https://www.biologicaldiversity.org/campaigns/southern_and_midwestern_freshwater_turtles/pdfs/Gibbons-et-al-2000.pdf>. Accessed on: 13 Dec. 2023.

¹¹¹ BLAUSTEIN, A. R. et al. Amphibian declines: Judging stability, persistence, and susceptibility of populations to local and global extinctions. Conservation Biology, 8: 60-71. 1994.

¹¹² HOOGLMOED, M. S. et al. Mapeamento e diagnóstico da biodiversidade do Parque Nacional da Amazônia e das Florestas Nacionais de Itaituba I e II: subsídios para a elaboração dos Planos de Manejo - Herpetofauna. Relatório Técnico, 2007, 43p.

Hylidae	<i>Boana cinerascens</i> (Spix, 1824)	8	8
	<i>Boana fasciata</i> (Günther, 1858)	4	4
	<i>Boana geographica</i> (Spix, 1824)	14	14
	<i>Osteocephalus taurinus</i> Steindachner, 1862	1	4
	<i>Phyllomedusa vaillantii</i> Boulenger, 1882	3	0
	<i>Scinax nebulosus</i> (Spix, 1824)	11	6
	<i>Scinax ruber</i> (Laurenti, 1768)	10	7
	<i>Trachycephalus typhonius</i> (Linnaeus, 1758)	2	1
Leptodactylidae	<i>Adenomera hylaedactyla</i> (Cope, 1868)	2	0
	<i>Leptodactylus paraensis</i> Heyer, 2005	0	1
	<i>Leptodactylus pentadactylus</i> (Laurenti, 1768)	2	3
	<i>Leptodactylus rhodomystax</i> Boulenger, 1884	0	2
	<i>Physalaemus ephippifer</i> (Steindachner, 1864)	1	6
Phyllodactylidae	<i>Thecadactylus rapicauda</i> (Houttuyn, 1782)	3	0
Scincidae	<i>Copeoglossum nigropunctatum</i> (Spix, 1825)	2	3
Sphaerodactylidae	<i>Chatogekko amazonicus</i> (Andersson, 1918)	25	20
	<i>Gonatodes humeralis</i> (Guichenot, 1855)	3	4
Teiidae	<i>Ameiva ameiva</i> (Linnaeus, 1758)	1	4
	<i>Cnemidophorus cryptus</i> Cole & Dessauer, 1993	7	10
	<i>Kentropyx calcarata</i> Spix, 1825	7	8
	<i>Tupinambis teguixin</i> (Linnaeus, 1758)	1	0
Viperidae	<i>Bothrops atrox</i> (Linnaeus, 1758)	1	0

Source: created by the authors using project proponent's collection

Image 13 - *Adenomera hylaedactyla*



Source: project proponent's collection (Fauna Inventory Report from 2022)

Image 14 - *Anolis fuscoauratus*



Images 15 - *Arthosaura reticulata*



Source: project proponent's collection (Fauna Inventory Report from 2022)

Image 16 - *Boana cinerascens*



Images 17 - *Bothrops atrox*

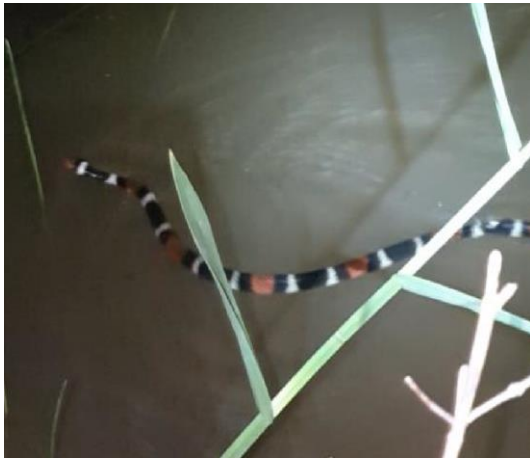


Source: project proponent's collection (Fauna Inventory Report from 2022)

Image 18 - *Leptodeira annulate*



Images 19 - *Micrurus surinamensis*



Source: project proponent's collection (Fauna Inventory Report from 2022)

Image 20 - *Chironius fuscus*



Images 21 - *Boana geographica*



Source: project proponent's collection (Fauna Inventory Report from 2022)

Image 22 - *Hydrops triangularis*



Images 23 - *Kentropyx calcarata*



Image 24 - *Scinax ruber*



Source: project proponent's collection (Fauna Inventory Report from 2022)

Avifauna

Birds make the most diverse group of vertebrates in the world and are excellent indicators of the environmental quality of the habitat due to their intrinsic relationship with vegetation and because they are sensitive to its modification. Some species have vast adaptive power to changes in their habitat, which makes them animals that become familiar with anthropic environments. On the other hand, a hefty part of the species that compose this group needs forest environments to live, feed, and/or reproduce¹¹³.

Specifically in the Amazon, which represents around 40% of all remaining tropical forests in the world, 1,294 species of birds are recorded¹¹⁴. Since the first scientific expeditions to this region, it has become clear that species of birds and other groups of organisms are not homogeneously distributed in the Neotropical region. The Belém endemism center (CE Belém) records a great richness of species, around 441 species have already been recorded. Including the municipality of Ananindeua, the list of birds that occur in this region is 482 species, many of which are included in the official lists of threatened fauna¹¹⁴.

The avifauna monitoring was carried out using two sampling methods: point census with visual and auditory recording and bird capture using mist nets. The fixed point census consisted of the researcher moving along the transects, stopping every 50 meters, where a recording point was established.

In addition, the team of avifauna researchers installed six mist nets measuring 12 x 3 meters. The nets were inspected every 20 minutes to avoid the death or stress of the captured animals. After being captured, the birds were carefully removed from the mist net, and biometric measurements were taken (length of the beak, tarsus, wing, tail, total length, and weight), in addition to examination to identify the presence of seedlings (remiges, rectrices, and metrics) and the incubation plate, to provide information on reproductive cycles.

During the sampling days, the following records were possible during the fauna monitoring at Fazenda Pacajá:

Table 53 - List of species recorded for Avifauna

Species	Common name	UA1	UA2
<i>Accipter bicolor</i>	Gavião-pombachinha-grande	1	1
<i>Ara ararauna</i>	Arara-canindé	4	4
<i>Ara macao</i>	Araracanga	6	6

¹¹³ SICK, H. (1997) Ornitologia Brasileira. Nova Fronteira, Rio de Janeiro.

¹¹⁴ MITTERMEIER, R. A. et al. Tropical Rainforests - Amazonia. In: Wilderness - Earth's Last Wild Places. Russel A. Mittermeier, Cristina G. Mittermeier, Patricio G. Gil and John Pilgrim, (Eds.). Cemex, Conservation International and Agrupación Sierra Madre. Cidade do México. Pp.: 56-107. 2002.

<i>Aramides cajaneus</i>	Saracura	1	1
<i>Arremom taciturnus</i>	Tico-tico-de-bico-preto	1	3
<i>Caracara plancus</i>	Caracará	2	2
<i>Chloroceryle amazona</i>	Marim-pescador-verde	2	2
<i>Elanoides forficatus</i>	Gavião tesoura	2	2
<i>Glyphorhynchus spirurus</i>	Arapaçu-bico-de-cunha	3	0
<i>Herpetotheres cachinnans</i>	Acauã	1	1
<i>Heterospizias meridionalis</i>	Gavião-caboclo	2	2
<i>Ibycter americanus</i>	Cancão	1	1
<i>Leucopternis albigollis</i>	Gavião-branco	1	1
<i>Mionectes macconnelli</i>	Abre-asa-da-mata	1	0
<i>Myrmotherula brachyura</i>	Choquinha-miúda	2	2
<i>Nyctibius griseus</i>	Urutau/ mãe-da-lua	1	1
<i>Nyctidromus albigollis</i>	Bacurau	6	6
<i>Pauxi tuberosa</i>	Mutum-cavalo	1	1
<i>Phaethornis ruber</i>	Besourinho-da-mata	1	1
<i>Psophia viridis</i>	Jacamim	1	1
<i>Pyriglena leuconota</i>	Papa-touca-de-belém	4	4
<i>Saltator Maximus</i>	Trinca-ferro	1	0
<i>Thamnomanes caesius</i>	Ipecuá	2	0
<i>Trogon viridis</i>	Surucuá	3	3
<i>Willisornis vidua</i>	Rendadinho	0	1

Source: created by the authors using project proponent's collection

Images 25 - *Glyphorhynchus spirurus*



Source: project proponent's collection (Fauna Inventory Report from 2022)

Image 26 - *Mionectes macconnelli*



Images 27 - *Saltator maximus*



Source: project proponent's collection (Fauna Inventory Report from 2022)

Image 28 - *Arremon taciturnus*

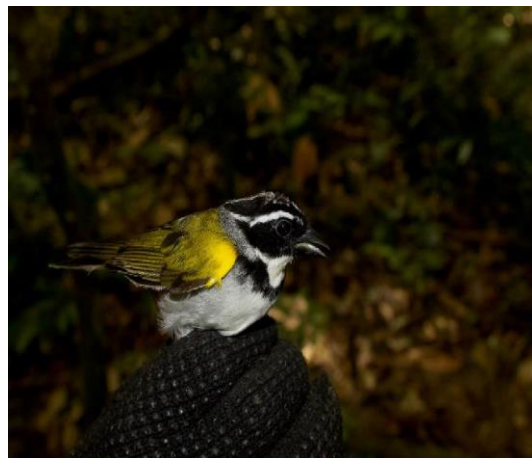


Image 29 - *Thamnomanes caesius* (female) Image 30 - *Thamnomanes caesius* (male)



Source: project proponent's collection (Fauna Inventory Report from 2022)

Finally, since June of 2022 the Pacajá Farm is certified by the Onça Pintada Institute, which aims to certify that the fauna in the farm region is intact. In other words, despite the Sustainable Forest Management implemented in the area, the impact of this activity is not harmful to the local fauna. The certificate is valid for one year and can be renewed each time it expires. To carry out this certification, third-party audit professionals carry out an on-site audit to collect field analyses and information, as well as farm documents.

Figure 34 - Onça Pintada Institute certificate (June-2022 to June-2023)



Source: project proponent's collection

Figure 35 - Onça Pintada Institute certificate (June-2022 to June-2023)



ATESTADO DE CERTIFICAÇÃO
CERTIFICADO ONÇA-PINTADA

A Fazenda Pacajá, inscrita sob o CNPJ 20722575/0004-78, com uma área de 145.680,8 hectares e sede na Gleba Joana Peres I, margem direita do Rio Pacajá, s/n Município de Portel, Pará, recebeu o seu primeiro Certificado Onça-Pintada em 22 de junho de 2022 com validade até 22 de junho de 2023. Atualmente, a propriedade se encontra em processo de renovação do mesmo junto ao Instituto Onça-Pintada.

A Certificadora Oreades- Núcleo de Geoprocessamento já realizou a auditoria in loco e as análises, tanto da documentação enviada pela propriedade, quanto de imagens obtidas para verificação de irregularidades ambientais; e o relatório de auditoria encontra-se em fase de elaboração.

Por meio da análise prévia dos documentos, atesta-se que a renovação do COP será concedida, por período de um ano, fato esse justificado pela ausência de irregularidades que acarretariam a suspensão da Certificação já concedida.



Leandro Silveira
Presidente do Instituto Onça-Pintada

Mineiros, 11 de julho de 2023

Instituto Onça-Pintada (IOP)
CNPJ: 05.092.106/0001-86
Rodovia Go 341, km 81. Zona Rural. Mineiros – GO. 75.838-899

Source: project proponent's collection

Flora

In terms of flora biodiversity, the vegetation within the project area itself was assessed by the Madeireira J&Y in a forest inventory¹¹⁵. To develop the evaluation of the potential of the area, data was sought through the Systematic Sample Inventory, a methodology that aims to collect information on species of interest, as well as biogeographic characteristics of interest in the field, where the execution was based on the points of paths to be traversed by opening between points, considering species with DBH greater than 30cm, in a range of 50m wide, being 25m to the right and 25m to the left.

Figure 36 presents the list of the 20 main forest species found in the forest inventory, containing the common, scientific, and family name.

Figure 36 - Main forest species found in the forest inventory

Nome Vulgar	Nome Científico	Família
Acapú	<i>Vouacapoua americana</i> Aubl.	Fabaceae
Andiroba	<i>Carapa guianensis</i> Aubl.	Meliaceae
Angelim-Amargoso	<i>Vatairea fusca</i> (Ducke) Ducke.	Fabaceae
Angelim-Pedra	<i>Hymenolobium petraeum</i> Ducke.	Leguminosae
Angelim-Vermelho	<i>Dinizia excelsa</i> Ducke.	Leguminosae
Breu-Sucuruba	<i>Trattinickia burserifolia</i> (Mart.) Willd.	Burseraceae
Copaíba	<i>Copaifera langsdorfii</i>	Fabaceae
Cumarú	<i>Dipteryx odorata</i>	Fabaceae
Cupiúba	<i>Goupia glabra</i> Aubl.	Goupiaceae
Fava-bolota	<i>Parkia pendula</i> Benth. ex Walp	Leguminosae
Faveira	<i>Parkia decussata</i> Ducke.	Fabaceae
Guajará-bolacha	<i>Zygiopsis oppositifolia</i> Ducke.	Sapotaceae
Jatobá	<i>Hymenaea courbaril</i> L.	Fabaceae
Jutaí	<i>Hymenaea coubaril</i> L. (Hayne) Lee	Caesalpinaceae
Louro-Vermelho	<i>Nectandra rubra</i> (Mez) C. K. Allen	Lauraceae
Maçaranduba	<i>Manilkara huberi</i> (Ducke) Chevalier.	Sapotaceae
Mandioqueira-preta	<i>Ruizterania albiflora</i> , Marcano Bert.	Vochysiaceae
Maparajuba	<i>Manilkara bidentata</i>	Sapotaceae
Marupá	<i>Simarouba amara</i> Aubl.	Simaroubaceae
Matamatá-branco	<i>Eschweilera coriacea</i> (DC.) S.A.Mori	Lecythidaceae

Source: project proponent's collection (Fauna monitoring)

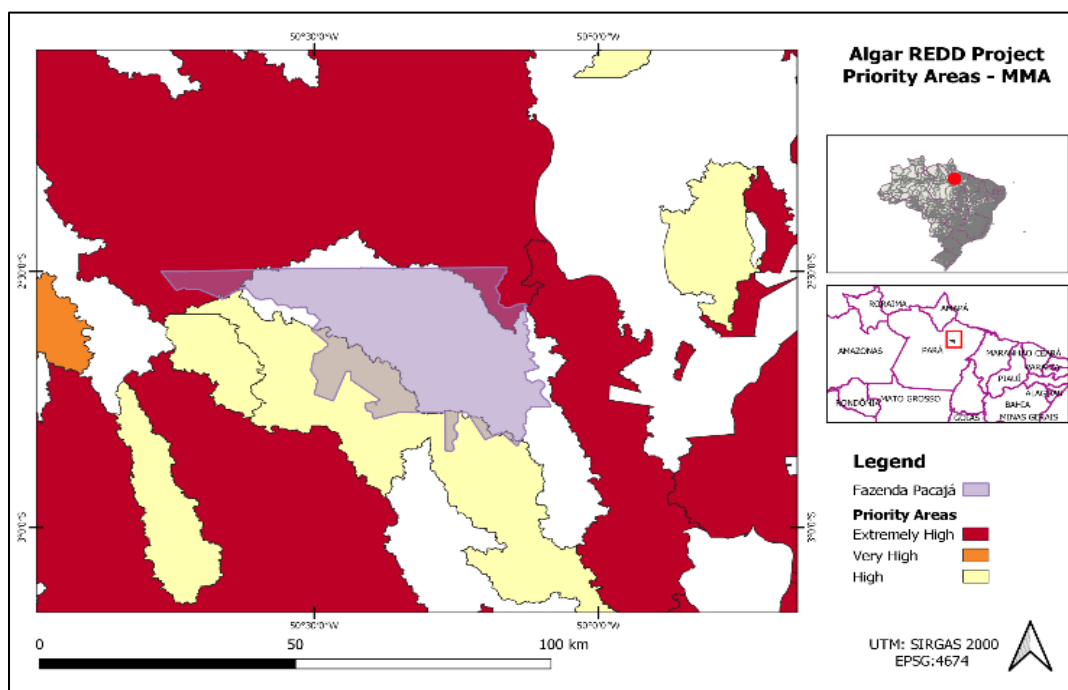
¹¹⁵ SILVA, W. M. M. Plano de Manejo Florestal Sustentável: Fazenda Pacajá. Belém: Aflora Engenharia, 2019. 106p. Available in the personal collection of ABC Agropecuária Brasil Norte S.A.

The composition of the population, formed by important species for the timber sector, is also considered a good indication for this activity, where the frequency of species such as Maçaranduba (*Manilkara huberi* (Ducke) Chevalier), Cupiúba (*Goupia glabra* Aubl.) was recorded. Cracker Guajará (*Zygiopsis oppositifolia* Ducke.) Sapucaia (*Lecythis pisonis* Cambess) and Muiracatiara (*Astronium gracilis* Engl.) with good distribution, being present in practically all diameter classes, which favors management¹¹⁶.

Therefore, the Northeast Amazon region has a great biological diversity and several environment types, in addition to the presence of endemic species of extreme importance to the conservation of Amazon biodiversity¹¹⁷.

The Brazilian Government Ministry for the Environment classified the ABC Norte REDD project region in its 2018 survey of Brazil's priority areas for conservation¹¹⁸. The surroundings of the project area are mainly classified within the "very high" priority category, as detailed in figure below. This shows the importance of the present REDD project for the conservation of Brazilian biodiversity, creating an ecological corridor for preservation of the fauna and flora species. Thus, the conservation of these private lands contributes to the Brazilian Government's conservation proposal.

Figure 37 - Brazil's priority areas for conservation and the Project area



Source: VCS Standard REDD ABC Norte Project

¹¹⁶ Considering the current legislation for logging (IN 05 MMA, dated 11 Dec. 2006), which allows logging of up to 30m³/ha, in a cutting cycle of 35 years and minimum cutting diameter (DMC) of 50cm.

¹¹⁷ NELSON, B. W.; A. A. OLIVEIRA. Avaliação e Ações prioritárias para a Conservação do bioma Floresta Amazônia: Ações Prioritárias para a Conservação da Biodiversidade da Amazônia. Programa Nacional da Diversidade Biológica- PROBIO, 1992, MMA.

¹¹⁸ MMA - Ministério do Meio Ambiente Government Ministry for the Environment. Brazilian priority areas for biodiversity conservation and sustainable use - 2nd update. Available at: <<http://areasprioritarias.mma.gov.br/2-atualizacao-das-areas-prioritarias>>. Accessed on: 08 Oct. 2021.

The ABC Norte REDD project therefore creates an important Northeast Amazon biodiversity corridor in a threatened and still unknown region. Preserving continuous forest environments is one way of ensuring continued gene flow of regional species and limiting the entrance of invasive species from other habitats.

5.1.2 High Conservation Values (B1.2)

To identify the High Conservation Values related to biodiversity within the ABC Norte REDD project area, two categories were considered according to the HCV Network Approach¹¹⁹: HCV 1 - Species Diversity and HCV 3 - Ecosystem & Habitats. In addition, the identification was performed following the recommendations stated in the “Common Guidance on the Identification of High Conservation Values”¹²⁰.

Three potential High Conservation Values related to biodiversity for the ABC Norte REDD Project were identified and are presented below.

Table 54 - HCV: *Saguinus niger*

High Conservation Value	<i>Saguinus niger</i>
Qualifying Attribute	Classified as vulnerable according to the Red List of Endangered Species of the International Union for the Conservation of Species (Red List - IUCN) and an endemic specie to the Amazon ¹²¹ . Black-handed Tamarin <i>Saguinus niger</i> has most recently been assessed for The IUCN Red List of Threatened Species in 2020 and is listed as Vulnerable under criteria A2cd ¹²² .
Focal Area	It is necessary to conserve and protect in totality the current vegetation in the project area (140,432.27 ha) and maintaining biodiversity monitoring and impact on remaining flora within the project area activity.

Source: created by the authors using project proponent's collection

Table 55 - HCV: *Panthera onca*

High Conservation Value	<i>Panthera onca</i>
Qualifying Attribute	Jaguar <i>Panthera onca</i> has most recently been assessed for The IUCN Red List of Threatened Species in 2016 and is listed as Near Threatened under criteria A2cd ¹²³ .
Focal Area	It is necessary to conserve and protect in totality the current vegetation in the project area (140,432.27 ha) and maintaining biodiversity monitoring and impact on remaining flora within the project area activity.

Source: created by the authors using project proponent's collection

¹¹⁹ Available at: <<https://www.hcvnetwork.org/hcv-approach>>. Accessed on: 14 Nov. 2023.

¹²⁰ BROWN, E. et al. Common guidance for the identification of High Conservation Values. HCV Resource Network, 2013.

¹²¹ Available at: <https://www.gov.br/icmbio/pt-br/assuntos/centros-de-pesquisa/cpb/arquivos/fichas_primatas/CALLITRICHIDAE/ficha_saguinus_niger.pdf>. Accessed on: 14 Nov. 2023.

¹²² Available at: <<https://www.iucnredlist.org/es/species/160901052/192553958>>. Accessed on: 14 Nov. 2023.

¹²³ Available at: <<https://www.iucnredlist.org/es/species/15953/123791436>>. Accessed on: 14 Nov. 2023.

Table 56 - HCV: *Guaruba guarouba*

High Conservation Value	<i>Guaruba guarouba</i>
Qualifying Attribute	Golden Parakeet <i>Guaruba guarouba</i> has most recently been assessed for The IUCN Red List of Threatened Species in 2018. <i>Guaruba guarouba</i> is listed as Vulnerable under criteria A2cd+3cd+4cd; C2a(ii) ¹²⁴ .
Focal Area	It is necessary to conserve and protect in totality the current vegetation in the project area (140,432.27 ha) and maintaining biodiversity monitoring and impact on remaining flora within the project area activity.

Source: created by the authors using project proponent's collection

Furthermore, aiming to have a better understanding and identification regarding the HCVs present within the project area, both for local communities and about biodiversity, in February a company specialized in identifying high conservation values will be hired to carry out this survey in-depth in the project area.

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

In without-project scenario, the native forest areas of the participating properties would be deforested almost entirely to establish pastures for livestock and timber logging, as described in section “2.2.1 Land-use scenarios without the project”. Timber logging (both legal and illegal) is an important economic activity within the reference region. Economic data sources between 2007 and 2017 show that timber stands out as having the highest values of annual production in the project area municipalities of Bagre and Portel.

The impacts on biodiversity without the project would be the loss of habitat and species populations in these areas, as well as the environmental services that the forest provides. The loss of habitat contributes to the local extinction of fauna specimens while reducing the population size of biological communities in the reference region and the project area. In addition, deforestation could also contribute to the loss of some native flora species that are conserved and protected with the implementation of the project.

5.2 Net Positive Biodiversity Impacts

5.2.1 Expected Biodiversity Changes (B2.1)

Table 57 - Biodiversity element: 191 species with commercial potential identified

Biodiversity Element	191 species with commercial potential identified
Estimated Change	Sustainable forest management with FSC certification and Chain of Custody (CoC) certification.

¹²⁴ Available at: <<https://www.iucnredlist.org/species/22724703/132029835>>. Accessed on: 14 Nov. 2023.

Justification of Change	The project is based on selective and low-impact logging management according to a previous Sustainable Forest Management developed, by dividing the area under sustainable forest management into a total of 35 cutting plots, which will be harvested annually (one part each year) and at a certain intensity of harvesting (the design considers a cutting cycle every 35 years, allowing natural regeneration and the growth and reproduction of unharvested individuals. A great diversity of species (191) with timber potential has been inventoried. The Forest Management Unit will be divided into annual production units, considering a 35-year cycle. The methodology of the Sustainable Forest Management Plan (SFMP) includes the license of a General Forest Management Plan and the preparation of the Annual Operating Plan, which begins with a forest inventory, in which the variety and quantity of potential species to be harvested are documented. This process makes it possible to know the number of individuals of each species that are suitable for harvesting, and the approximate volume of wood that they will generate, which makes it possible to calculate and control, among other things, the total volume of wood to be harvested. After this step, it is possible to identify the seed trees that are kept in the forest, guaranteeing the production of seeds, ensuring the survivability of the species, and favouring their natural regeneration. Felling is done by directing the fall and minimizing damage to the surrounding vegetation so that the clearings left in the forest are of similar dimensions to those created by the natural fall of the trees. This favours regeneration since the entry of light into the clearings triggers the growth of seedlings that remain in a dormant state under the shade of the parent tree. This allows the conservation of the forest cover, almost untouched, guaranteeing successively the conservation of innumerable species of associated flora and fauna. To this end, the project has trained personnel, created infrastructure, and adapted the processes necessary to obtain the Sustainable Forest Management Certification - FSC 100% - guaranteeing an environmentally sustainable, socially inclusive, and economically viable model. The SFMP has a certification of its Chain of Custody (CoC), which certifies that the product reaches the customers in agreement with the traceability processes and the three pillars of sustainability (environmental, social, and economic). In this way, the forest maintains its rhythms and cycles similarly to the natural way, maintaining its processes, and where the species that indicate the health of the ecosystems register healthy and growing populations.
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Source: created by the authors using project proponent's collection

Table 58 - Biodiversity element: rivers and *igarapés*

Biodiversity Element	Rivers and <i>igarapés</i>
Estimated Change	Protection and conservation of water bodies inside the project area
Justification of Change	Inside the AMF, there are the following main rivers: Pacajá, Candirú, Raquerá, Camaraipi, Jacundá, Repartimento, Arraia, and Castanha, as well as many other small streams such as the Conderu, Taquera and Ipitinga streams, and caves that will be delimited in the surveys field and subject to a protection regime as Permanent Preservation Areas (APP) as established by the forestry code.

Source: created by the authors using project proponent's collection

Table 59 - Biodiversity element: threatened fauna species

Biodiversity Element	Threatened fauna species
Estimated Change	Identification, monitoring, protection, and conservation of threatened species
Justification of Change	Small mammals are key elements in natural communities, acting at different trophic levels and in the processes of predation and seed dispersal. In this context, inventories focusing on assemblages of these organisms are the basis for understanding ecological processes such as population dynamics and community structures and for developing management plans in natural environments¹²⁵. Habitat loss and fragmentation, resulting from human activities, constitute the greatest threats to terrestrial mammals in Brazil and are related to economic development through the growth of cultivated and urban areas, increased population density, atmospheric and aquatic pollution, and increased road network¹²⁶. Although research into the factors that determine the richness and abundance of mammals has increased in recent years, understanding the structure and ecological processes of mammal communities is still poor. Several studies in the Amazon have demonstrated the effects of the main forms of anthropogenic pressure, such as fragmentation, logging, and hunting, on the abundance and population density of mammal fauna, mainly in primates and medium and large terrestrial mammals¹²⁷. Therefore, monitoring studies have the main objective of knowing the influence of the main impacts (positive and negative) generated by the implementation of a project on local fauna. In addition to trying to unravel these impacts, monitoring studies recommend mitigating or compensatory measures,

¹²⁵ MOURA, M. C. et al. How does sampling protocol affect the richness and abundance of small mammals recorded in tropical forest? An example from the Atlantic Forest, Brazil. *Neotrop. Biol. Conserv.* 3(2):51-58. 2008.

¹²⁶ COSTA, L.P. et al. Conservação de mamíferos no Brasil. *Megadiversidade*, vol. 1, nº 1, 2005.

¹²⁷ FERRARI, S. F. et al. Dynamics of primate communities along the Santarém-Cuiabá highway in south-central Brazilian Amazonia. In: Laura K. Marsh (Org.). *Primates in Fragments: Ecology and Conservation*. Kluwer Academic/Plenum Publishers, 2003, 123-144p.

	supported by a consistent database, generated from sampling carried out over a time gradient. Due to the high morphological and behavioral diversity of mammals, the methods used for diagnosis are specific, as each one is suitable for capturing or observing a fraction of the fauna of this group. In this context, the groups selected for the diagnosis were: small mammals, chiropterans, and medium and large mammals.
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Source: created by the authors using project proponent's collection

5.2.2 Mitigation Measures (B2.3)

The actions that cause direct and indirect impacts on the environment must be monitored and innovated as appropriate mitigating measures. Likewise, the management and field teams must be well trained to employ natural resource management methodologies to minimize impacts and costs, in addition to supporting the implementation of techniques to reduce the damages caused to the remaining species, soil, hydrography, air, and fauna. In this aspect, activities with the highest impact were identified through the Forest Inventory and will be monitored. The activities and their mitigation measures are described in Table 60.

Table 60 - Description of environmental impacts and mitigating measures of project activities: construction and maintenance of forestry infrastructure

Preventive and/or mitigant actions	Indicator	Means of verification	Responsible
Construction and maintenance of forestry infrastructure			
Soil erosion			
a) In sloped areas, make a speed bump at the beginning of the slope, especially during the rainy season, to avoid water running down the middle of the road and thus prevent erosion;	Analysis regarding soil exposure.	Field verification during forestry activities.	Monitoring team
b) Build ditches, wet passages and culverts to direct rainwater to areas alongside roads;	Mapping the microzoning of areas.		
c) Operational training of employees involved in operations;			
Soil compaction			
a) Use of equipment developed for forestry operations, characterized by a rolling system equipped with low-pressure tires or tracks;	Soil exposure	Field verification during forestry activities.	Monitoring Team
Obstruction of streams and streams			

a) When building bridges, special care must be taken to avoid water damming, erosion and damage to the APP;	Existence of watercourses and observe whether there is a need to build bridges or culverts.	In road planning	Monitoring Team
b) Do not push soil into the watercourse, clean the watercourse beds, removing antlers that could impede the passage of water;		Field verification during infrastructure construction.	
c) Make whiskers to direct rainwater;			
d) If necessary, build earthen retaining walls to prevent clogging of water courses;			
e) Identify microzoning in the 100% inventory;			
f) Plot of microzoning on base maps;			
g) Use of the base map (UT) in planning, facilitating better visualization of APPs, hilly areas and trying to avoid transposition;		During the execution of the inventory and analysis of microzoning in the preparation of base maps.	
h) Training of teams involved in the activities;			
i) Meetings with teams if there is evidence of impact to implement preventive and/or mitigating measures;			
Possible environmental impacts in the port area.			
a) Training for employees involved in port operations.	a) Communication with the community; b) Assessments of port conditions; c) Soil erosion.	Periodic internal audits	Forestry and operational management.
b) Lecture on environmental education for employees and providers involved in yard operations.			
c) Repair of possible damage caused to the ground.			
d) Prevention of river pollution.			
e) Planning of port operations.			
Damage to remnants and species protected by law			
a) Road planning with the help of the base map (UT), visualizing the location of the species.	a) Damage to remaining forest; b) Opening of clearings during forestry exploitation; c) Decrease in biodiversity.	In road planning and construction.	Monitoring Team
Impacts on the ground resulting from fuel and lubricant spills			

a) Periodic inspection and maintenance of machines and chainsaws;	a) Hose burst b) daily inspection of equipment.	In the field during operations.	Road Construction Team
b) Do not wash equipment in the field;			
c) Detect and remedy the cause of the leak;			
d) Training of people who handle fuel and employees involved in the operation;			
e) Use of appropriate equipment to supply machines and chainsaws;			
f) If there is a leak, absorb the spilled fuel with earth.			

Source: created by the authors using project proponent's collection

Table 61 - Description of environmental impacts and mitigating measures of project activities: tree harvest

Preventive and/or mitigant actions	Indicator	Means of verification	Responsible
Tree Harvest			
Damage to remnants and species protected by law			
a) Identify the remnants and species protected by law, rare species on the cut and drag map;	a) Damage to remaining forest; b) Opening of clearings during forestry exploitation; c) Decrease in biodiversity.	Field verification during monitoring	Monitoring Team
b) Use of cutting techniques;			
c) Protection of nest trees;			
d) Cutting vines in 100% inventory;			
e) Training and recycling for employees involved in the operation.			
Damage to permanent preservation areas (APPs)			
a) Identify microzoning in the 100% inventory;	100% inventory	Field verification during tree felling and monitoring.	Monitoring Team
b) Plot of microzoning on cut and drag maps;	Cut and drag maps	When planning drag lines, possible impacts are checked.	
c) Use of cutting techniques;		Field verification during tree felling.	
Impacts caused to fauna and flora			
a) Use of cutting techniques to minimize the impact on the flora.	100% inventory	Field verification when monitoring operations.	Monitoring Team
b) Preserve nest trees, or trees that serve as reproduction for fauna.	Cut and drag map.	In the results of fauna monitoring.	
c) Maintenance of dead trees standing.	Tree harvesting	In the analysis of flora monitoring	

		results (permanent plots).	
d) Training for employees involved in the operation.	Deficiency in operational execution	During the execution of forestry operations.	
Impacts on the ground resulting from fuel and lubricant spills			
a) Periodic inspection and maintenance of chainsaws.	Daily inspection of equipment.	In the field during operations.	Tree felling team
b) Do not wash equipment in the field.			
c) Training of people who handle fuel and employees involved in the operation.			
d) Use of appropriate equipment to supply chainsaws (canisters with spikes).			
e) If there is a leak, absorb the fuel with earth.			

Source: created by the authors using project proponent's collection

Table 62 - Description of environmental impacts and mitigating measures of project activities: tree dragging

Preventive and/or mitigant actions	Indicator	Means of verification	Responsible
Tree dragging			
Damage to remnants and species protected by law			
a) Use of dragging branch planning techniques.	Damage to remaining forest;	In monitoring assessments.	Monitoring Team
b) Identify the remnants and species protected by law on the cut and drag map.			
c) Protection of nest trees.			
d) Training for employees involved in the activity.			
Damage to the soil resulting from dragging			
a) Avoid removing the soil.	a) exposing the soil with the removal of the litter during the dragging of the logs.	In monitoring assessments.	Monitoring Team
b) Avoid soil compaction using suitable machines (Skidder), blades raised when dragging the logs.	b) soil compaction.		
c) Adoption of skid trail widths of up to 4 meters.			
d) Limit the number of trees dragged by branches, minimizing soil compaction.			
e) Training for employees involved in the operation.			
Impacts on the ground resulting from fuel and lubricant spills			

a) Periodic inspection and maintenance of machines and chainsaws;	Daily inspection of equipment.	In the field during operations.	Log hauling felling team
b) Do not wash equipment in the field;			
c) Detect and remedy the cause of the leak;			
d) Training of people who handle fuel and employees involved in the operation;			
e) If there is a leak, absorb the spilled fuel with earth.			

Source: created by the authors using project proponent's collection

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

The forest management produces impacts that can cause changes in the richness of forest ecosystems. These impacts are more significant in the tropics, where forest ecosystems are more complex and diverse. However, the negative impacts can be reduced to a minimum with an effective forest management planning and careful implementation. It is known that the management of the natural forests does not preserve the original biodiversity of a given area in its primitive stage. On the other hand, management is a relevant tool to increase preservation practices in strictly protected areas.

The appropriate selection of species for forest management is also one of the determining factors for the maintenance of ecological (biodiversity, carbon sequence, forest hydrology, etc.), social and economic functions. The greater the number of species identified as having commercial value, the greater the number of species favored by management practices, and the less likely the managed forest will be to differ from the original; furthermore, the greater the number of species exploited, the lower the intensity and exploitation of each of them, reducing selective pressures on some species.

Dickinson (1996)¹²⁸ considers the management of natural forests to be ideal when a small, selective volume of wood is extracted, promoting the natural regeneration of selected species, and enabling the recovery of the ecosystem, so that the process can be repeated on a sustainable basis. According to Whitmore (1990)¹²⁹ and Sayer & Wegge (1991)¹³⁰, forest management carried out in this way, which causes this type of anthropogenic disturbance, imitates the natural processes that create and conserve biodiversity in tropical forests.

¹²⁸ DICKINSON, M.B. et al. Natural Forest management as a conservation tool: divergent opinions on constraints, possibilities, and alternatives. *Commonwealth Forestry Review* 75 (4), 2006, 309-315p.

¹²⁹ OKALI, D. T. C. An introduction to tropical rainforests. Clarendon Press, Oxford, xii 226 pages. Hardback: ISBN 0-19-854274-7. Price: £35.00. Paperback: ISBN 0-19-854276-3. Price: £16.95. *Journal of Tropical Ecology* (2), 1991, 285-285p.

¹³⁰ BOYLE, T.J.B.; SAYES, J.A. Measuring, monitoring and conserving biodiversity in managed tropical forests. 1991. Available at: <<https://www.jstor.org/stable/42607085>>. Accessed on: 22 Dec. 2023.

In addition, because the project carries out a Sustainable Forest Management Plan, a periodic fauna and flora inventory are held in the project area. These inventories can support the maintenance of the fauna and flora species by monitoring their existence, population growth, and population reduction. Through this monitoring, actions to support the local fauna and flora can be implemented, such as education actions within the local communities, the planting of species that may be threatened as well as the action to protect species that may be threatened.

Furthermore, habitat loss and fragmentation, resulting from human activities, constitute the greatest threats to different types of fauna in Brazil and are related to economic development through the growth of cultivated and urban areas, increased population density, atmospheric pollution, and water and increase in the road network¹³¹.

Several studies in the Amazon have demonstrated the effects of the diverse forms of anthropogenic pressure, such as fragmentation, logging, and hunting, on the abundance and population density of terrestrial fauna¹³².

Therefore, biodiversity monitoring studies, such as those developed within Fazenda Pacajá, have as their primary objective the understanding of the influence of the main impacts (positive and negative) generated by the implementation of a project on the local fauna. In addition to trying to illustrate these impacts, monitoring studies recommend mitigating or compensatory measures, supported by a consistent database, generated from sampling carried out over a time gradient.

Ultimately, the main objective of the project, as described in the section “2.1.2 - Project Objectives”, is to conserve 140,432.27 hectares of the Amazon rainforest, avoiding unplanned deforestation (AUD) and the emission of 30,138,794 tCO₂e over the 30-year project credit period and to preserve the existing biodiversity within the project area through monitoring of fauna and flora, with a focus on threatened species in the region.

5.2.4 High Conservation Values Protected (B2.4)

Targeted and low-impact logging does not adversely affect any HCV, but sustainable harvesting favors the conservation of almost intact forest cover, while ensuring the conservation of countless species of associated flora and fauna, including endangered species.

¹³¹ COSTA, M.V.; CHAVES, P.S.V; OLIVEIRA, F.C. Uso das Técnicas de Avaliação de Impacto Ambiental em Estudos Realizados no Ceará. In: XXVIII Congresso Brasileiro de Ciências da Comunicação, Anais. Rio de Janeiro, 2005. Available at: <<http://www.intercom.org.br/papers/nacionais/2005/resumos/r0005-1.pdf>>.

¹³² PRES, C.A.et al. 2003. Extent of nontimber resource extraction in tropical forests: accessibility to game vertebrates by hunters in the Amazon basin. Conservation Biology 17, 521-535.

The areas considered environmental protection and permanent preservation (rivers, streams, streams, and other areas identified in the micro-zoning) will be subject to continuous monitoring due to their importance in maintaining the balance of the ecosystem in these locations.

The project will preserve slope areas, hills within the hydrographic network, and places with rugged topography. In addition, warning signs will be provided and placed in these locations to indicate that these areas are protected by law.

The project also carried out annually a fauna inventory to monitor the species existing inside the project area and develop monitoring plans to ensure their livelihood and to minimize possible impacts on animals' well-being.

5.2.5 Species Used (B2.5)

The project has a Sustainable Forest Management Plan being carried out in the project area. According to the Forest Inventory carried out in 2019, there are approximately 191 species, including commercial, non-commercial, and potential. Figure 38 shows the list of the species that can be managed in the next UPAs within the Pacajá Farm.

Figure 38 - Managed species and possible managed species inside the Sustainable Forest Management of Pacajá Farm

Nome Comercial	Nome Científico	Nº de árvores	Área Basal (m²)	Volume (m³)	Nº de árvore/ha	Área basal/ha (m²/ha)	Volume/ha (m³/ha)
Abiu	<i>Pouteria caimito</i> (Ruiz & Pav.) Radlk.	8	2	17	0.00229	0.00055	0.0049
Abiu Branco	<i>Pouteria oppositifolia</i> (Ducke) Baehni	212	68	620	0.06059	0.01931	0.1773
Abiu Cutiti	<i>Pouteria ramiflora</i> (Mart.) Radlk.	10	4	27	0.00286	0.00101	0.0077
Abiu De Casca Grossa	<i>Pouteria lasiocarpa</i> (Mart.) Radlk.	1372	317	2.933	0.39213	0.0906	0.8384
Abiu Vermelho	<i>Poteria sp. Aubl.</i>	1	0.134484	1	0.00029	3.8E-05	0.0003
Abiurana	<i>Pouteria guianensis</i> Aubl	14	4	30	0.004	0.00108	0.0085
Abiurana Rosadinha	<i>Pouteria anomala</i> (Pires) T.D.Penn,	1641	362	3.130	0.46901	0.10356	0.8946
Acapu	<i>Vouacapoua americana</i> Aubl,	9451	2.578	22.356	3	0.73685	6

Acapui	<i>Desconhecido</i>	2	0.4901 46	5	0.00057	0.00014	0.0013
Acapurana	<i>Campsiandra comosa</i> Benth,	112	25	178	0.03201	0.00728	0.0509
Açoita Cavalo	<i>Luehea paniculata</i> Mart,	435	122	1.159	0.12433	0.03487	0.3312
Amapa	<i>Brosimum</i> <i>parinarioides</i> Ducke	4	1	11	0.00114	0.00035	0.0032
Amapa Amargoso	<i>Brosimum rubescens</i> Taub,	264	87	792	0.07545	0.02475	0.2262
Amapa Doce	<i>Brosimum</i> <i>parinarioides</i> Ducke	305	108	984	0.08717	0.03097	0.2812
Amesclao	<i>Trattinnickia</i> <i>burseraefolia</i> (Mart.) Willd,	1	0.2299 56	3	0.00029	6.6E-05	0.0007
Anani	<i>Symphonia</i> <i>globulifera</i> L.f,	296	67	675	0.0846	0.01909	0.1928
Anani Terra Firme	<i>Moronobea pulchra</i> Ducke	5	1	9	0.00143	0.00032	0.0026
Andiroba	<i>Carapa guianensis</i> Aubl,	1007	240	2.155	0.28781	0.0687	0.616
Andirobarana	<i>Guarea kunthiana</i> A.Juss,	3	0.7456 94	5	0.00086	0.00021	0.0015
Andirobarana	<i>Guarea kunthiana</i> A.Juss,	3	0.7456 94	5	0.00086	0.00021	0.0015
Angelim Amargoso	<i>Vatairea paraensis</i> Ducke	538	191	1.840	0.15376	0.05469	0.5259
Angelim Coco	<i>Andira stipulacea</i> Benth,	24	8	74	0.00686	0.00223	0.0213
Angelim Pedra	<i>Hymenolobium</i> <i>excelsum</i> Ducke	517	222	2.045	0.14776	0.06337	0.5844
Angelim Rajado	<i>Pithecellobium</i> <i>incuriale</i> (Vell.) Benth,	146	31	271	0.04173	0.0088	0.0773
Angelim Vermelho	<i>Dinizia excelsa</i> Ducke	1370	1.525	13.698	0.39156	0.43594	4
Anoerá	<i>Licania macrophylla</i> Benth,	4	0.7606 69	6	0.00114	0.00022	0.0017
Aquariquara	<i>Minquartia</i> <i>guianensis</i> Aubl,	46	14	131	0.01315	0.00401	0.0374
Araracanga	<i>Aspidosperma</i> <i>megalocarpon</i> Müll.Arg,	92	23	242	0.02629	0.00662	0.0691
Aroeira	<i>Lithraea brasiliensis</i> March.	12	5	43	0.00343	0.00153	0.0124
Arura	<i>Otoba parvifolia</i> (Mgf.) M.Gently	29	5	43	0.00829	0.00144	0.0123
Ata Branca	<i>Annona</i> sp. L.	20	4	34	0.00572	0.0011	0.0097
Ata Meju	<i>Bocageopsis</i> <i>multiflora</i> (Mart.) R.E.Fr.	3	0.6258 03	6	0.00086	0.00018	0.0017
Ata Preta	<i>Desconhecido</i>	6	1	9	0.00171	0.0003	0.0026
Bacuri	<i>Attalea phalerata</i> Mart ex Spreng,	91	49	453	0.02601	0.01393	0.1293

Barbatimao	<i>Byrsonima sericea</i> DC,	5	1	11	0.00143	0.00031	0.0031
Barrote	<i>Tetragastris panamensis</i> (Engl.) Kuntze	907	241	1.518	0.25923	0.06877	0.4339
Breu	<i>Protium heptaphyllum</i> var, <i>brasiliense</i> Engl,	7	2	15	0.002	0.0006	0.0042
Breu Branco	<i>Protium sagotianum</i> March,	29	8	64	0.00829	0.00215	0.0182
Breu Manga	<i>Protium spruceanum</i> Engl,	12	2	19	0.00343	0.00063	0.0056
Breu Sucuruba	<i>Trattinnickia demerarae</i> Sandwith	380	144	1.336	0.10861	0.04115	0.3818
Breu Vermelho	<i>Protium subserratum</i> Engl,	405	106	983	0.11575	0.0304	0.2809
Bucuubarana	<i>Desconhecido</i>	2	0.8947 91	9	0.00057	0.00026	0.0026
Buranji	<i>Moronobea coccinea</i> Aublet	231	87	801	0.06602	0.02474	0.2289
Buranji Branco	<i>Moronobea</i> sp.	97	24	220	0.02772	0.00677	0.0628
Buranji Vermelho	<i>Moronobea</i> sp.	117	27	239	0.03344	0.00767	0.0683
Caju	<i>Anacardium spruceanum</i> Benth, ex Engl,	203	77	709	0.05802	0.02195	0.2027
Caju Açú	<i>Anacardium microcarpum</i> Ducke	483	184	1.688	0.13804	0.05251	0.4824
Cajui	<i>Anacardium microsepalum</i> Loes	2	1	12	0.00057	0.00038	0.0033
Caqui	<i>Diospyros praetermissa</i> Sandwith	2	0.3965 57	4	0.00057	0.00011	0.001
Caqui Preto	<i>Diospyros praetermissa</i> Sandw	9	2	21	0.00257	0.00067	0.0059
Carapanauba	<i>Aspidosperma rigidum</i> Rusby	3	0.5995 69	6	0.00086	0.00017	0.0018
Caripe	<i>Couepia paraensis</i> (Mart. & Zucc.) Benth.	2	0.8550 26	8	0.00057	0.00024	0.0022
Casca Doce	<i>Pradosia cochlearia</i> subsp, <i>praealta</i> (Ducke) T.D.Penn,	105	29	268	0.03001	0.00835	0.0765
Casca Fina	<i>Patagonula bahiensis</i> Moric,	83	19	164	0.02372	0.00556	0.0469
Casca Seca	<i>Psidium dentale</i>	7026	1.709	15552.3	2	0.48851	4
Castanheira	<i>Bertholletia excelsa</i> Humb. & Bonpl,	1	0.3509 88	3	0.00029	0.0001	0.001
Catingueira	<i>Aspidosperma</i> sp,	4	1	11	0.00114	0.00035	0.0031
Cedro	<i>Cedrela odorata</i> L,	4	3	31	0.00114	0.00096	0.009

Cedroarana	<i>Cedrelinga catenaeformis</i> Ducke	16	18	172	0.00457	0.00513	0.049
Coco Pau	<i>Couepia bracteosa</i> Benth	766	267	2.496	0.21893	0.0762	0.7134
Conduru	<i>Brosimum lanciferum</i> Ducke	1	0.1979 23	1	0.00029	5.7E-05	0.0004
Conduru De Sangue	<i>Brosimum rubescens</i> Taub.	216	48	404	0.06173	0.01368	0.1156
Conduru Preto	<i>Duguetia</i> A.ST.-Hil.	10	2	15	0.00286	0.00051	0.0043
Copaiba	<i>Copaifera duckei</i> Dwyer	770	227	2.059	0.22007	0.06484	0.5885
Cumarú	<i>Dipteryx odorata</i> (Aubl.) Willd.	1003	343	3.049	0.28666	0.09816	0.8715
Cumarurana	<i>Dipteryx trifoliata</i> Ducke	186	59	477	0.05316	0.01692	0.1364
Cupiuba	<i>Goupia glabra</i> Aubl.	1397	676	5.828	0.39927	0.19312	2
Curupixa	<i>Micropholis acutangula</i> (Ducke) Eyma	210	93	872	0.06002	0.02669	0.2491
Embauba	<i>Cecropia sciadophylla</i> Mart.	19	4	31	0.00543	0.00115	0.009
Embauba Branca	<i>Mezilaurus lindaviana</i> Schwacke & Mez	26	5	45	0.00743	0.00148	0.0129
Embaubaran a	<i>Pourouma velutina</i> Mart. ex Miq.	1101	234	1.978	0.31467	0.06674	0.5652
Embira	<i>Guatteria olivacea</i> R,E,Fr,	1	0.1344 84	1	0.00029	3.8E-05	0.0003
Embira Branca	<i>Guatteria amazonica</i> R,E,Fr,	1	0.2037 22	1	0.00029	5.8E-05	0.0004
Embira Cana	<i>Guatteria ovalifolia</i> R,E,Fr,	183	38	376	0.0523	0.01073	0.1075
Embira Preta	<i>Onychopetalum amazonicum</i> R,E,Fr,	49	10	82	0.014	0.00281	0.0235
Embira Quiabo	<i>Sterculia speciosa</i> K,Schum,	1264	299	2.715	0.36126	0.08558	0.7759
Escorrega Macaco	<i>Capirona huberiana</i> Ducke	444	151	1.340	0.1269	0.04327	0.3831
Faveira	<i>Pithecellobium scandens</i> Ducke	124	41	363	0.03544	0.01177	0.1036
Faveira Amargosa	<i>Vataireopsis araroba</i> (Aguilar) Ducke	1	0.1344 84	1	0.00029	3.8E-05	0.0003
Faveira Atana	<i>Parkia oppositifolia</i> Spruce ex Benth,	276	108	1.024	0.07888	0.03099	0.2927
Faveira Bolota	<i>Parkia pendula</i> (Willd.) Benth, ex Walp.	321	183	1.573	0.09174	0.05225	0.4496
Faveira Branca	<i>Stryphnodendron pulcherrimum</i> (Willd.) Hochr,	1283	494	4.490	0.36669	0.14123	1
Faveira Carocinho	Desconhecido	7	3	28	0.002	0.00094	0.008

Faveira De Paca	<i>Stryphnodendron guianense</i> (Aubl.) Benth,	525	113	854	0.15005	0.03236	0.2441
Faveira Folha Fina	<i>Piptadenia suaveolens</i> Miq,	135	42	386	0.03858	0.01213	0.1102
Faveira Pinho	Desconhecido	3	0.7042 34	5	0.00086	0.0002	0.0015
Faveira Tamboril	<i>Enterolobium maximum</i> Ducke	65	23	200	0.01858	0.00661	0.0571
Faveira Vick	Desconhecido	230	65	528	0.06574	0.01858	0.1508
Freijó	<i>Cordia goeldiana</i> Huber	128	32	328	0.03658	0.00909	0.0936
Gema De Ovo	<i>Apuleia leiocarpa</i> (Vogel) J.F, Macbr,	23	5	40	0.00657	0.00146	0.0114
Goiabao	<i>Pouteria pachycarpa</i> Pires	319	75	709	0.09117	0.02136	0.2026
Goiabinha	<i>Eugenia lambertiana</i> DC,	3	0.7682	5	0.00086	0.00022	0.0015
Guajara	<i>Chrysophyllum venezuelanense</i> (Pierre) T.D, Penn,	8938	2.440	22.159	3	0.6975	6
Guajara Bolacha	<i>Pouteria pentasperma</i> (Standl,) Baehni	2860	1.082	10.344	0.81741	0.30917	3
Guajara Cinza	<i>Pouteria petenensis</i> Lundell	438	148	1.406	0.12518	0.04233	0.4019
Guajara Ferro	<i>Micropholis venulosa</i> (Mart. & Eichler) Pierre	37	10	81	0.01057	0.00291	0.0233
Guajara Vermelho	<i>Pouteria venosa</i> subsp. Amazonica T. D. Penn.	1508	444	4.008	0.431	0.12704	1
Inga	<i>Inga quadrangularis</i> Ducke	1169	269	2.113	0.33411	0.0769	0.6038
Inga Vermelho	<i>Inga paraensis</i> Ducke	515	101	805	0.14719	0.02891	0.2302
Inhare	<i>Helicostylis pedunculata</i> R, Benoist	759	175	1.589	0.21693	0.05003	0.4541
Inhare Branco	<i>Brosimum</i> sp. SW.	45	11	99	0.01286	0.00321	0.0284
Ipê	<i>Handroanthus impetiginosus</i> (Mart. ex DC.) Mattos	105	39	392	0.03001	0.01105	0.1122
Ipeuba	<i>Macrolobium latifolium</i> Vogel	5290	2.394	20.263	2	0.68413	6
Itauba	<i>Mezilaurus itauba</i> (Meisn.) Taub, ex Mez	354	95	807	0.10118	0.02702	0.2308
Itaubarana	<i>Sweetia nitens</i> (Vogel) Benth	1	0.1979 23	1	0.00029	5.7E-05	0.0004
Jacareuba	<i>Calophyllum brasiliense</i> Cambess	2	0.4527 74	4	0.00057	0.00013	0.0012

Jarana	<i>Lecythis chartacea</i> O,Berg	54	24	223	0.01543	0.00678	0.0637
Jatobá	<i>Hymenaea</i> <i>stigonocarpa</i> Mart. ex Hayne var. <i>stigonocarpa</i>	889	297	2.914	0.25408	0.08487	0.8327
Joao Mole	<i>Pouteria elegans</i> (A.D.C.) Baehni	4	1	11	0.00114	0.00034	0.0031
Lacrao	<i>Chaunochiton</i> <i>kappleri</i> (Sagot ex Engl.) Ducke	12	2	20	0.00343	0.00069	0.0057
Louro Canela	<i>Aiouea saligna</i> Meissner	495	177	1.557	0.14147	0.05046	0.4451
Louro Cravo	<i>Dicypellium</i> <i>caryophyllatum</i> (Mart.) Nees	102	25	214	0.02915	0.00706	0.0611
Louro Faia	<i>Euplassa pinnata</i> (Lam.) I,M, Johnst	529	138	1.282	0.15119	0.03956	0.3665
Louro Papo De Mutum	<i>Lacunaria jenmani</i> (Oliv.) Ducke	98	22	208	0.02801	0.0064	0.0594
Louro Pimenta	<i>Licaria reitzkleiniana</i> Vattimo	637	184	1.638	0.18206	0.05269	0.4681
Louro Precioso	<i>Aniba canelilla</i> (Kunth) Mez	59	13	116	0.01686	0.00363	0.0331
Louro Preto	<i>Ocotea neesiana</i> (Miq.) Kosterm,	434	106	916	0.12404	0.03017	0.2618
Louro Rajado	<i>Ocotea cymbarum</i> H,B,K	23	5	48	0.00657	0.00154	0.0138
Louro Rosa	<i>Aniba terminalis</i> Ducke	9	2	17	0.00257	0.00058	0.0048
Louro Tamaquare	<i>Caraipa grandiflora</i> Mart,	5	2	21	0.00143	0.00069	0.006
Louro Vermelho	<i>Ocotea rubra</i> Mez	410	162	1.485	0.11718	0.04626	0.4243
Macacauba	<i>Platymiscium duckei</i> Huber	33	10	100	0.00943	0.00294	0.0286
Maçaranduba	<i>Manilkara excelsa</i> (Ducke) Standl,	2605	765	7.182	0.74453	0.21852	2
Macucu	<i>Hirtella eriandra</i> Benth,	1	0.3851 75	4	0.00029	0.00011	0.001
Mandioqueira	<i>Qualea lancifolia</i> Ducke	139	62	572	0.03973	0.01761	0.1634
Maparajuba	<i>Manilkara paraensis</i> (Huber) Standl,	4479	1.152	10.503	1	0.32938	3
Mari	<i>Poraqueiba</i> <i>paraensis</i> Ducke	1	0.2299 56	2	0.00029	6.6E-05	0.0007
Maria Preta	<i>Vitex orinocensis</i> H,B,K,	33	9	86	0.00943	0.00262	0.0245
Marupa	<i>Simarouba amara</i> Aubl,	338	106	973	0.0966	0.03032	0.2781
Matamata	<i>Eschweilera</i> <i>parviflora</i> (Aubl.) Miers	33	9	70	0.00943	0.00246	0.02

Matamata Branco	<i>Eschweilera coriacea</i> (DC.) S.A. Mori	6796	1.693	14.722	2	0.48387	4
Matamata Ci	<i>Eschweilera amazonica</i> R. Knuth	769	149	1.327	0.21979	0.04257	0.3792
Matamata Jiboia	<i>Eschweilera apiculata</i> (Miers) A. C. Sm.	464	127	1.203	0.13261	0.03638	0.3438
Matamata Preto	<i>Lecythis idatimon</i> Aubl.	2339	608	5.478	0.6685	0.17378	2
Matamata Vermelho	<i>Cariniana micrantha</i> Ducke	3192	637	5.536	0.9123	0.18204	2
Melancieiro	<i>Alexa grandiflora</i> Ducke	290	126	1.159	0.08288	0.036	0.3314
Mirauba	<i>Mouriri callocarpa</i> Ducke	116	50	464	0.03315	0.01424	0.1326
Mirim	<i>Bowdichia virgilioides</i> Kunth	60	19	137	0.01715	0.00533	0.0391
Morototo	<i>Schefflera morototoni</i> (Aubl.) Decne. & Planch.	93	23	216	0.02658	0.00658	0.0618
Mucuuba	<i>Eriotheca</i> sp. Schott & Endl.	1	0.4973 91	5	0.00029	0.00014	0.0013
Mucuubarana	Desconhecido	550	266	2.440	0.15719	0.07598	0.6975
Muiracatiara	<i>Astronium lecontei</i> Ducke	776	254	3.082	0.22179	0.07254	0.8809
Muiratinga	<i>Perebea guianensis</i> Aubl.	11	4	28	0.00314	0.00103	0.0079
Muruci	<i>Byrsonima crista</i> A. Juss.	102	24	207	0.02915	0.00698	0.0591
Murure	<i>Brosimum acutifolium</i> subsp. <i>interjectum</i> C. C. Berg	276	101	960	0.07888	0.02883	0.2742
Mutamba Preta	<i>Luehea grandiflora</i> Mart. & Zucc.	9	2	18	0.00257	0.00053	0.0052

Mututi	<i>Pterocarpus amazonicus</i> Huber	183	58	488	0.0523	0.01646	0.1396
Oiticica	<i>Licania rigida</i>	63	18	175	0.01801	0.00526	0.0501
Orelha De Macaco	<i>Enterolobium schomburgkii</i> (Benth.) Benth,	360	140	1.243	0.10289	0.04009	0.3553
Parapara	<i>Jacaranda copaia</i> (Aubl.) D,Don	171	40	377	0.04887	0.01147	0.1078
Paruru	<i>Vantanea parviflora</i> Lam,	4	0.913088	8	0.00114	0.00026	0.0023
Pau Amarelo	<i>Euxylophora paraensis</i> Huber	45	18	148	0.01286	0.00501	0.0422
Pau Jacare	<i>Laetia procera</i> (Poepp.) Eichler	320	75	688	0.09146	0.02132	0.1968
Pau Marfim	<i>Calycophyllum acreanum</i> Ducke	28	6	52	0.008	0.00186	0.015
Pau Roxo	<i>Peltogyne paradoxa</i> Ducke	4	1	10	0.00114	0.00031	0.0028

Pau Santo	<i>Zollernia paraensis</i> Huber	144	41	360	0.04116	0.0118	0.1029
Piquia	<i>Caryocar villosum</i> (Aubl.) Pers.	132	95	782	0.03773	0.02723	0.2236
Piquiarana	<i>Caryocar microcarpum</i> Ducke	341	155	1.315	0.09746	0.04422	0.3759
Pitomba De Leite	Desconhecido	64	12	108	0.01829	0.00339	0.0308
Quaruba	<i>Erisma lanceolatum</i> Stafleu	103	30	277	0.02944	0.00848	0.0792
Quarubarana	<i>Erisma uncinatum</i> Warm.	63	34	297	0.01801	0.00962	0.0849
Quarubatinga	<i>Qualea brevipedicellata</i> Stafleu	135	62	582	0.03858	0.01776	0.1664
Sapucaia	<i>Lecythis pisonis</i> Cambess.	744	452	3.790	0.21264	0.12924	1
Seringa	<i>Hevea brasiliensis</i> Müll, Arg.	84	19	187	0.02401	0.00547	0.0533
Seringa Branca	<i>Hevea guianensis</i> Aubl.	116	30	289	0.03315	0.00844	0.0826
Seringa Terra Firme	<i>Hevea guianensis</i> Aubl.	6	1	9.00003	0.00171	0.00036	0.0026
Seringarana	<i>Dodecastigma</i> sp. Ducke	1	0.1979 23	2	0.00029	5.7E-05	0.0006
Seringueira	<i>Hevea brasiliensis</i> Müll, Arg.	115	27	277	0.03287	0.00759	0.0793
Sucupira	<i>Bowdichia nitida</i> Spruce	1468	412	3.657	0.41957	0.11779	1
Sucupira Preta	<i>Diplotropis martiusii</i> Benth.	227	65	614	0.06488	0.01847	0.1755
Sucupira Tinto	<i>Clathrotropis nitida</i> (Benth.) Harms	278	73	607	0.07945	0.02089	0.1734
Sucuuba	<i>Himatanthus sucuuba</i> (Spruce ex Müll, Arg.) Woodson	4	0.6657 68	6	0.00114	0.00019	0.0017
Sumauma	<i>Eriotheca longipedicellata</i> (Ducke) A. Robyns	4	0.9135 63	8	0.00114	0.00026	0.0024
Sumauma Amarela	Desconhecido	30	11	108	0.00857	0.00328	0.0308
Sumauma Rosa	Desconhecido	183	55	504	0.0523	0.01584	0.1441
Tamanqueira	<i>Zanthoxylum hermaphroditum</i> Willd.	58	12	96	0.01658	0.00333	0.0273
Tanibuca	<i>Terminalia amazonica</i> (J.F. Gmel) Exell.	1205	468	4.184	0.3444	0.13372	1
Taperebarana	<i>Touroulia guianensis</i> Aubl.	6	1	12	0.00171	0.00037	0.0034
Tatajuba	<i>Bagassa guianensis</i> Aubl.	64	21	198	0.01829	0.00596	0.0566

Tatapirica	<i>Tapirira guianensis</i> Aubl,	1	0.1559 48	1	0.00029	4.5E-05	0.0003
Tauari	<i>Couratari martiana</i> (O,Berg) Miers	1953	745	7.060	0.55818	0.21289	2
Taxi	<i>Tachigali paniculata</i> Aubl	28	8	70	0.008	0.00235	0.02
Taxi Branco	<i>Sclerolobium guianense</i> Benth,	2261	681	6.040	0.64621	0.19451	2
Taxi Preto	<i>Tachigali myrmecophila</i> Ducke	2444	810	7.170	0.69851	0.23138	2
Taxirana	<i>Sclerolobium paraense</i> Huber	715	195	1.761	0.20435	0.05567	0.5034
Timborana	<i>Enterolobium schomburgkii</i> (Benth,) Benth	3528	1.224	10.791	1	0.34975	3
Tuturuba	<i>Pouteria macrophylla</i> (Lam,) Eyma	58	12	103	0.01658	0.00345	0.0294
Ucuuba	<i>Iryanthera paraensis</i> Huber	236	50	473	0.06745	0.01423	0.1353
Ucuubarana	<i>Iryanthera grandis</i> Ducke	22	8	73	0.00629	0.00217	0.0207
Urucurana	<i>Sloanea froesii</i> C,E,Sm	153	43	377	0.04373	0.01216	0.1078
Uxi	<i>Endopleura uchi</i> (Huber) Cuatrec,	190	61	563	0.0543	0.01737	0.1609
Uxirana	<i>Vantanea cupularis</i> Huber	1416	352	3.036	0.4047	0.10067	0.8676
TOTAL		108.311	33586. 3	300.345	30.9561	9.59921	85.841

Source: project proponent's collection (Fauna monitoring)

In addition to the species indicated above, the management plan forecasts the implementation of a technique frequently used to fill spaces with gaps in natural regeneration, which is called enrichment planting. The enrichment planting will be done with native species such as paricá, faveiras, mahogany, ipê, tatajuba, etc.

5.2.6 Invasive Species (B2.5)

Not applicable. Considering that the main objective of the project is forest conservation, the project activities do not foresee the use or introduction of native or invasive species, whether fauna or flora.

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

Not applicable, as described in section 5.2.6

5.2.8 GMO Exclusion (B2.7)

No GMO will be used in the project activities.

5.2.9 Inputs Justification (B2.8)

Not applicable.

5.2.10 Waste Products (B2.9)

Related to environmental management, the development of new technologies and sustainable alternatives emerge as a relevant instrument that, if used correctly and consciously within sustainable forest management in the Amazon, aims to improve, make practicable, and take advantage of forest residues, valuing the by-products.

It is expected that the investments made will directly contribute to the use and handling of waste from forest harvesting activities and the entire timber production process, contributing in a sustainable way to the conservation of the ecosystem.

In addition to the search for greater efficiency in the wood extraction and processing process, forest residues can no longer be considered a problem or something harmful resulting from the industrial process, but rather as an alternative and creative source of raw material for new products¹³³.

Therefore, for the management plan of the ABC REDD project, the use of forestry residues within the SFMP of Fazenda Pacajá after forestry exploitation will be used as raw material for various purposes, such as handicrafts, and energy generation, among others, and will be used as a basis for current legal precepts, in particular Normative Instruction No. 05, of November 10, 2015, of the Secretariat of Environment and Sustainability, contained in Art. 2º where "residues from forestry exploitation: branches, sapopema, remains of tree trunks from exploited trees (felled trees), which can be used as secondary products of forestry management for the production of wood and energy".

Furthermore, Fazenda Pacajá has, within its territory, a furniture factory called "Pacajá Móveis" which uses wood remains from management activities that would otherwise be discarded to produce its commodities. With this initiative, in addition to reusing all raw materials from the Sustainable Forest Management activity carried out within the Farm area, Algar Farming also trains residents of Vila ABC to work in the furniture factory, impacting the generation of employment and income for the residents.

Furthermore, within Vila ABC there is a group of women known as "Mulheres da Vila ABC" who also use wood scraps from management and Pacajá Móveis to develop craft items and sell them to people from the local communities.

¹³³ Coronel, Sheila, Yvonne T. Chua, Luz Rimban and Booma B. Cruz (2007) The Rulemakers: How the Wealthy and the well-born dominate Congress, Philippine Center for Investigative Journalism, Quezon City.

5.3 Offsite Biodiversity Impacts

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

The project's activities are not anticipated to have any adverse impacts on biodiversity beyond - or within - the project zone. Moreover, the proposed actions were designed to minimize and mitigate any possible leakage effects or other unfavorable outcomes. The actions aim to foster sustainable practices and encourage the involvement of the local population in environmental and biodiversity initiatives, including future generations. Accordingly, the mitigation measures include environmental education programs and training on soil enhancement, among other things, aimed at curbing degradation, deforestation, hunting, and other threats to biodiversity and its habitat. If any negative impacts on biodiversity are detected, both within and beyond the project zone, prompt measures will be proposed and implemented to prevent and mitigate them.

Table 63 - Negative offsite impact and mitigation measures

Negative Offsite Impact	Mitigation Measure(s)
Fires and burns	• Partnership with a local fire brigade, with training, supply of materials and fuel; • Actions to raise awareness about the use of fire in the region, open to both participants and non-participants in the project; • Monitoring of fires outside the project area.
Deforestation and forest degradation	• Monitoring of deforestation outside the project zone, including leakage belt; • Partnership with local bodies to promote trainings for the local communities regarding the climate change and the importance to adopt sustainable practices; • Training in sustainable rural production activities for the local communities which lives from the agriculture and livestock.
Illegal hunting or fishing activities	• Installation of information signs about places of high conservation value and prohibition of hunting or fishing in the project area that will be able to inform the community outside the project area.
Sustainable forest management - Frighten animals	• Restrict the circulation of personnel and equipment on the Project Area to avoid frightening or modifying the behaviour of animals; • Regular meetings with communities living within the leakage management area explaining about the difference between the customary and the predatory hunting and fishing; • Timber harvesting should be performed on annual plots and not at several locations simultaneously; • Establish procedures to monitor fauna on traditional hunting spots inside each APU.

Sustainable forest management - Vehicle transport	• Monitor vehicles for their compliance on driving speed; • Establish speed bumps and spray roads with water near populated areas; • Establish and monitor time limits for harvest transportation to avoid disturbing locals during rest periods.
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Source: created by the authors using project proponent's collection

5.3.2 Net Offsite Biodiversity Benefits (B3.3)

It is anticipated that the Project will have a positive impact on biodiversity by avoiding ecosystem fragmentation through voluntary engagement of neighboring communities in the Project's activities. The focus of the project is solely on conservation measures within the project boundaries and its buffer zone, which greatly reduces the likelihood of negative offsite effects. Additionally, any minimal negative effects outside the project boundaries are immediately addressed through flora and fauna monitoring. As stated in G3.2, the Project does not involve the introduction of non-native species. Consequently, the Project's activities and "with project" scenario are expected to have a positive impact on biodiversity.

In the unlikely event that any negative impact on biodiversity is observed inside or outside the project zone, the proponents are well-equipped to mitigate and address the situation. Employees who work directly or indirectly in field activities are constantly receiving training about manners to reduce impact exploration, which includes instructions on equipment operation, safety, ergonomics, and forest fire prevention. In addition, during the past years community members had contact with training and lectures in different areas related to the biodiversity, such as: 5Rs (rethink, refuse, recycle, reduce and reuse), poultry farming, fish farming, agroforestry systems and sustainable forest management.

5.4 Biodiversity Impact Monitoring

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

The Monitoring Plan for biodiversity of the ABC Norte REDD Project was created based on the activities presented in section "2.1.8 - Project Activities and Theory of Change", on the species presented in section "5.1.2 - High Conservation Values" and the activities related to monitoring fauna and flora and protection of the project area. In addition, according to the Sustainable Forest Management Plan of Pacajá Farm, project proponent already has a plan for monitoring and mitigating impacts related to the management activity carried out in the area, which collaborates and encompasses the monitoring of local biodiversity as described on section "5.2.2 - Mitigation Measures".

Table 64 - Biodiversity Monitoring Plan

Activity	Biodiversity variable	Source	Indicator	Area	Frequency
Protection of the project's native vegetation area	Forest cover	Technical report, local patrols	Project area (ha) undisturbed	Entire project area	Monthly
Fauna monitoring	Terrestrial mammal fauna, herpetofauna, and avifauna, includes HCV wildlife	Camera traps, technical report, fauna inventory	Biodiversity monitoring - Quantity, family name, species name, location	Strategic points of the UPAs that were explored within Pacajá Farm	2 annual monitoring: 1 in the dry season and 1 in the rainy season
Flora monitoring	Tree species diversity, includes HCV trees	Sample plots, technical report, flora inventory, forest inventory	Biodiversity monitoring - Quantity, tree species name, location	Strategic points of the UPAs that were explored within Pacajá Farm	Annually
Monitoring of the dynamics of vegetation before and after the wood harvesting	Botanical identification of the species forestry, spatial distribution of commercial species	Sample plots, reports, documents, and registries from project proponent	Impact on remaining flora	UPAs that were explored	Annually

Source: created by the authors using project proponent's collection

Furthermore, the Farm has guardhouses around the project area to carry out its complete monitoring and security through protection patrols aiming to avoid illegal events and invasions. The guardhouses are carried out by employees who take turns staying on-site to ensure the area's security.

Furthermore, for monitoring fauna and flora and analyzing the impact on the remaining flora, the project proponent has the support of specialized consultancies, such as Upbio and Aflora Engenharia.

5.4.2 Biodiversity Monitoring Plan Dissemination (B4.3)

The Biodiversity Monitoring Plan of project activities presented in section “5.4.1. Biodiversity Monitoring Plan” will be available to the communities involved and project stakeholders through the communication channels described in section “2.3.2. Dissemination of Summary Project Documents”. In order to facilitate the access of the local communities to the material, the monitoring plan of all project activities will be available to the Upbio team and will be presented by their technicians during periodic meetings about the project and consultation with the local communities involved.

5.5 Optional Criterion: Exceptional Biodiversity Benefits

Not applicable. During the next stages of project development, Ecológica Assessoria's technical team will study the best strategy to meet the requirements that will enable the project to reach the Gold Level for Climate, Community and Biodiversity.

5.5.1 High Biodiversity Conservation Priority Status (GL3.1)

Not applicable, as described in section 5.5.

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

Not applicable, as described in section 5.5.