Sustainable Development Verified Impact Standard

MANOA REDD+ PROJECT

Document Prepared by Biofílica Ambipar Environment Investments S.A.

Project Title	Manoa REDD+ Project
Version	Version 4
Date of Issue	10-December-2024
Project Location	Municipality of Cujubim, State of Rondônia, Brazil
Project Proponent(s)	Biofílica Ambipar Environmental Investments S/A: Plínio Ribeiro (plinio@biofilica.com.br); +55 11 3073-0430 Manoa Sustentável, Exploração e Serviços Florestais Ltda: Murilo Granemann de Souza (murilo@triangulo.com.br), +55 69 3582-2012
Assessor Contact	Not applied
Project Lifetime	08-August-2020 – 31-December-2042
History of SD VISta Status	November-2023: First validation and first verification
Other Certification Programs	Validated and verified: Verified Carbon Standard, Climate (ID 1571) Validated: Climate, Community and Biodiversity (CCB status revoked for not carrying out verification)
Expected Future Assessment Schedule	November-2023: First validation and verification

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1 SUMMARY OF SDG CONTRIBUTION

Table 1. Summary of Project SDG Contributions

Row number	Estimated Project Contribution by the End of Project Lifetime	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Section Reference	Claim, Asset or Label
1)	Carrying out **60 internal and external technical training on low-impact forest management** over the course of the project, aimed at employees, universities and interested institutions. With the estimated **participation of approximately 1,600 people** directly impacted by the content and sustainable practices covered, **involving 2 institutions per year**.	4.4	i. Number of internal and external technical training courses carried out on low impact forest management issues ii. Number of participants in forest management initiatives iii. Number of institutions involved	i. Increase ii. Increase iii. Increase	Section 3.2 Impact #1	Claim
2)	Carrying out **40 environmental education activities with schools** (institutions in Cujubim) over the course of the project. With the estimated **participation of approximately 1,200 participants from the 8 schools in Cujubim**.	4.7	i. Number of environmental education activities carried out ii. Number of participants involved in the activities iii. Number of Cujubim schools served	i. Increase ii. Increase iii. Increase	Section 3.2 Impact #2	Claim

Row number	Estimated Project Contribution by the End of Project Lifetime	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Section Reference	Claim, Asset or Label
3)	Protect about **4,492.545 ha of forest in areas of importance for the protection of aquatic ecosystems (**APP**),** through sustainable forest management, which does not allow APPs to be impacted by the activity, reducing the alteration and/or reduction in the extension of these areas.	6.6	Amount of forest area in areas of importance for the protection of aquatic ecosystems (APP)	Decrease	Section 4.2 Impact #9	Claim
4)	**Generate at least 35 annual jobs** related to the project's activities in the municipality of Cujubim	8.0	Number of jobs offered locally over time	Increase	Section 3.2 Impact #3	Claim
5)	**Bring the number of accidents at work to zero and carry out 30 training sessions** for employees on health and safety practices in the workplace.	8.8	i. Number of occupational accidents over time ii. Number of training courses on occupational health and safety and forest fire brigade	i. Implement activities to decrease ii. Increase	Section 3.2 Impact #4	Claim
6)	**Ensuring that 54 regular and temporary workers at Fazenda Manoa are registered** in accordance with Brazilian labour legislation.	8.8	Number of registered employees	Increase	Section 3.2 Impact #5	Claim

Row number	Estimated Project Contribution by the End of Project Lifetime	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Section Reference	Claim, Asset or Label
7)	**Support at least 20 local companies** with the use of sustainable raw materials certified by international standards.	12.2	Number of sawmills benefited over time	Implement activities to increase	Section 3.2 Impact #6	Claim
8)	**Support 15 research project** in the areas of forest conservation	12.8	Number of research projects by regional educational institutions used to disseminate information about managed forest areas and REDD+ projects	Implement activities to increase	Section 3.2 Impact #7	Claim
9)	Prevent the release of **7,070,723 tons of CO2** into the atmosphere over the course of the project	13.0	Tons of greenhouse gas emissions avoided or removed	Increase	PD_Manoa _v2.9 MR-2021-2022-Manoa VCS-v4.1_v2	Label
10)	**Conserve 18,150 hectares of forest** that would be deforested in a no-project scenario	15.1	Number of hectares of reduced forest loss in the project area measured against the without-project scenario	Increase	Section 4.2 Impact #11	Claim
11)	**Keep the annual volume exploited** by low-impact forestry management **below 25 m³/ha**.	15.2	Exploitation volume of sustainable forest management	Decrease	Section 4.2 Impact #12	Claim

Row number	Estimated Project Contribution by the End of Project Lifetime	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Section Reference	Claim, Asset or Label
12)	**Maintenance of at least 8 species of flora and 21 species of fauna** with some degree of threat through conservation of the project area	15.5	Number of endangered species of flora and fauna preserved	Implement activities to increase	Section 4.2 Impact #13	Claim
13)	**Promote 30 actions that encourage relationships with municipal**, state and federal institutions and universities in the state of Rondônia.	17.17	Number of promoted partnerships	Implement activities to increase	Section 3.2 Impact #8	Claim

2 PROJECT DESIGN

2.1 Project Objectives, Context and Long-term Viability

2.1.1 Summary of Project Sustainable Development Objective(s)

The REDD+ Manoa project is a partnership between Biofílica Ambipar Environment Investments S.A. and Manoa Sustentável, Exploração e Serviços Florestais Ltda, located at Fazenda Manoa, in the municipality of Cujubim, state of Rondônia, which covers an area of 74,038.748 hectares. Throughout its almost 30-year history, Manoa has improved its management techniques, becoming a world reference model for forestry exploration combined with nature conservation.

Manoa is a company that has always been a pioneer in low-impact forest management since 1997 and was recognized by the FAO (Food and Agriculture Organization of the United Nations) in 2010 as an "Exemplary Case of Forest Management in Latin America and the Caribbean"[1]. In 2005, the company obtained FSC forestry certification, which it still holds today. This certification ensures compliance with social and environmental requirements, as well as various other requirements that prove the legality of the area and compliance with applicable legislation, guaranteeing greater sustainability and reliability for the practice of timber extraction. It is currently one of the few private management companies in the region, and due to its location and forest cover it has significant environmental relevance, since it forms, together with the surrounding conservation units - the Jamari and Jacundá National Forests - an ecological corridor that is essential for maintaining vegetation and the mobility of fauna through the connectivity between these remnants, which total a block of 480,000 hectares.

The area, however, is at constant risk of deforestation since it is located in a region where invasions and timber theft are common activities. Furthermore, the dynamics of deforestation in the region follow the complex pattern typical of the "arc of deforestation" in the Brazilian Amazon. The numerous underlying causes that influence deforestation result in a complex chain of events, since local agents have different motivations and don't necessarily act in the same sequence of events, which makes it even more relevant for practices that make it possible to maintain forest areas in the region.

In climate terms, since the implementation of SD VISta monitoring, the aim of the project is to avoid the emission of 7,070,723 tons of CO2e over the project, which corresponds to 18,150 hectares of avoided deforestation. The calculation of the number of emissions that will be reduced throughout the project was carried out to comply with the VM0015 methodology, at the beginning of the project. In the corresponding VCS PD “PD_Manoa_v2.9_eng”, in sections 1.1, page 16 and 2.2, page 38, this same amount of reduction for the period is also reported. In social terms, there are no traditional communities that live on the property or depend on the project's forest resources directly, but the existence of Manoa, as well as the maintenance

[1] Food and Agriculture Organization (FAO). Standing Tall: In Latin America and the Caribbean Exemplary Cases of Sustainable Forest Management. Available at: https://www.fao.org/3/br099e/br099e.pdf. Accessed on: March 27, 2024.

of its activities in the region, generates a number of direct and indirect benefits at various scales of impact, especially at a regional level. Furthermore, as mentioned above, the maintenance of vegetation contributes to the conservation of biodiversity, which includes several threatened species, as well as High Conservation Value Attributes (HCVA). In addition, the importance of the project area at a landscape level also attributes the maintenance of forest cover to the maintenance of "ecological corridors" with Conservation Units in the state of Rondônia, mitigating the negative impacts of degradation in the region.

As a result, the project contributes to meeting seven sustainable development goals (SDGs) established by the UN, as shown below:

SDG 4 – Quality Education

- Training in Low Impact Forest Management techniques
- Promote socio-environmental education actions in the municipality of Cujubim
- Incentive and feasibility of research conducted on the farm for the improvement and expansion of knowledge related to local biodiversity and its dynamics

SDG 6 – Drinking Water and Sanitation

- Preservation of Permanent Preservation Areas

SDG 8 – Decent Work and Economic Growth

- Generation of direct and indirect job opportunities locally
- Generation of decent jobs that meet all requirements regarding labor rights

SDG 12 – Sustainable Consumption and Production

- Carrying out certified low-impact forest management
- Maintaining commercial relations with the municipality of Cujubim
- Integrating local sawmills into value and market chains
- Incentive and feasibility of research conducted on the farm to analyze the impacts of long-term forest management practices

SDG 13 – Action Against Global Climate Change

- Monitoring of deforestation using satellite images and generating annual reports (Biofílica and Manoa Monitoring)
- Property surveillance
- Forest fire prevention campaigns
- Implementation of certified low-impact forest management

SDG 15 – Terrestrial Life

- Monitoring of biodiversity (fauna and flora) combined with the encouragement and feasibility of scientific research by local institutions
- Preservation and monitoring of endangered species
- Preservation and monitoring of the High Conservation Value Area (HCVA) “Saleiro”
- Maintenance of ecological corridor with Conservation Units of the state of Rondônia
- Limitation of the volume of timber extracted annually, reducing the impacts of the activity

SDG 17 – Partnerships and Means of Implementation

- Institutional coordination with public bodies and private entities
- Implementation of partnerships with Cujubim institutions and local universities

2.1.2 Description of the Project Activity

The primary activity of the REDD+ Manoa project is to promote the reduction of deforestation, and consequently, the reduction of greenhouse gas emissions. For this purpose, some actions are carried out that contribute to the achievement of net benefits of sustainable development, which are:

1. Educational Activities:

- Training in Low Impact Forest Management techniques;
- Socio-environmental education actions;
- Ongoing training workshops for workers on REDD+ and health and safety;

Manoa has its own training center called CEFLOM, where **training** activities are carried out for workers in the forestry sector and external agents such as public bodies, researchers, universities and others. These trainings play a fundamental role in disseminating knowledge about sustainable forest management practices, and therefore emphasize the importance of environmental preservation and socio-environmental benefits.

CEFLOM also receives visits from local schools, during which **environmental education** activities are carried out. In this process, forestry engineers give lectures in which they describe the processes of sustainable forest management, while also addressing issues related to the conservation of local fauna and flora. These initiatives provide the community with a greater understanding of the activities carried out in the region, as well as highlighting the relevance of working in the forestry sector and the importance of research. In this way, quality information applicable to the local context is provided.

Through lectures and training, **preventive occupational action activities** related to the PCMSO and PPRA are carried out, such as, for example, the forest fire brigade, training with chainsaws, regulatory standard (personal protection equipment and safety in machinery and equipment), the importance of teamwork and forms of communication for interpersonal relationships, basic notions on how to recognize

the most common venomous animals in accidents, quality of life in the workplace emphasizing the site organization, conducts as to company's property, equipment, and accommodation, the vaccination calendar for adults and the importance of keeping it updated, basic notions of pre-hospital care, the most common worm infections in adults, basic hand washing and personal hygiene, and sexually transmitted infections (HIV, syphilis, and hepatitis B and C).

Manoa employees occasionally receive explanatory talks **about REDD+**, providing information about the activities carried out and the relevance of REDD+ for forest conservation and community benefits, in addition to distributing folders with information about the project.

These interventions with schools in the region to give lectures/seminars and workshops on environmental education and to support the training of skilled labor to work in the certified timber forest management chain meet the objectives of **SDG 4 - Quality Education and SDG 8 - Decent Work and Economic Growth**.

2. Environmental monitoring with incentive and support for local scientific research:

- Incentive and feasibility of research conducted on the farm for the improvement and expansion of knowledge regarding local biodiversity and its dynamics;
- Incentive and feasibility of research conducted on the farm to analyze the impacts of long-term forest management practices;
- Biodiversity monitoring (fauna and flora) combined with the encouragement and feasibility of scientific research by local institutions;
- Preservation and monitoring of endangered species;
- Preservation and monitoring of the High Conservation Value Area (HCVA) "Saleiro";

The project encourages the carrying out of **scientific research** within the property, preferably carried out through agreements with local educational institutions. With a focus on biodiversity conservation, **plans are drawn up for long-term monitoring of the impacts of the project and forest management** on regional biodiversity. In this way, the dissemination of this monitoring, among other studies fostered by the project, is not only allowed but also encouraged by the proponents.

Two research projects are currently in progress at UNIR, entitled "Characterization and Monitoring of the Use of a Ditch by Medium and Large Vertebrate Fauna in an Area of Low Impact Forest Management in the South-Western Amazon" and "Population Estimation of Medium and Large Mammals and Game Birds in Areas under Low Impact Forest Management at Manoa Farm, Cujubim, Rondônia". Some surveys and diagnoses carried out at Manoa made it possible to identify individuals present on the lists of **endangered species**, including mammals, birds and reptiles, as well as flora species.

Regarding the "Saleiro", which is **an HCV present in the project area**, access to the area is restricted to employees and researchers to promote maintenance of the area and avoid negative impacts to it and to the species that inhabit it. These research also have a technical nature, as they contribute to the **improvement of management practices** in order to guarantee that they do not, in fact, cause relevant impacts on the local flora and fauna.

These actions contribute to meeting **SDG 4 – Quality Education, SDG 12 – Sustainable Consumption and Production and SDG 15 – Terrestrial Life.**

3. Implementation of certified low-impact forest management:

- Preservation of Permanent Preservation Areas;
- Generation of direct and indirect employment opportunities locally;
- Maintenance of good practices in certified low-impact forest management;
- Limiting the volume of wood extracted each year, reducing the impacts of the activity;

One of Manoa's sources of funding is the implementation of low-impact forest management, which is an approach that uses **good practices in forest management**, seeking to balance the use of forest resources with the conservation of the ecosystem and the promotion of the well-being of the local population. The main objective of low-impact forest management is to allow the harvesting of timber products in such a way as to guarantee the continuity of these resources over time, without compromising the health of the forest and its ability to regenerate. This is done primarily by **limiting the volume of timber** extracted each year, among other procedures.

The company also has certifications (FSC and PEFC) for its forest products, which in turn include requirements for forest management that is considered to be environmentally appropriate, socially beneficial, and economically viable, which are verified through an independent auditing process aimed at checking compliance with the applicable standards.

This forest management activity promotes the **maintenance of Permanent Preservation Areas (APP in Portuguese)**, since there are various procedures to prevent trees from falling on the APP, logs from being dragged, and various other activities within these areas, contributing to their conservation.

Forest activity is a very important activity in the region, and certified forest management is able to provide quality **employment opportunities** for the local population, both directly, through people hired to work at Manoa, and indirectly, through the network of sawmills and services that arise to meet the demands of management.

The forest management carried out by Manoa, in turn, contributes to meeting **SDG 06 - Drinking Water and Sanitation, SDG 8 - Decent Work and Economic Growth, SDG 12 - Sustainable Consumption and Production, SDG 13 - Action Against Global Climate Change and SDG 15 - Terrestrial Life.**

4. Strengthening of local governance

- Generation of decent jobs that meet all requirements regarding labor rights;
- Maintenance of the commercial relationship with the municipality of Cujubim through the integration of local sawmills in value and market chains;
- Institutional articulation with public agencies and private entities;
- Execution of partnerships with institutions from Cujubim and local universities;

In order to make it feasible to carry out the project's activities, such as forest management, surveillance, among others, Manoa provides various **hiring options** (administrative functions, cleaning, food, operations, etc.). These jobs are preferably for local people, mainly from the **municipality of Cujubim**. The organization is not only concerned with hiring labor, but also with ensuring **adequate working conditions**, with all **labor rights** requirements being duly met. In addition, because some of the activities pose risks to workers, various training courses and activities related to occupational health and safety are carried out, providing instructions on the correct use of personal protective equipment (PPE) - which is provided free of charge by the company - and other procedures that should be applied in order to mitigate such occupational risks. The FSC and PEFC certifications also require the company to comply with a healthy working environment, thus functioning as another element of the project that reinforces the creation of decent jobs.

Manoa's activity also supplies various **sawmills in the region**, enabling them to enter a value chain driven by differentiated markets that are looking for products with greater added value, which strengthens their **commercial relationship** with the municipality of Cujubim.

As previously mentioned, based on partnerships with local universities, Manoa enables the execution of several research, providing benefits for both parties involved. Partnerships with institutions in Cujubim, public bodies and private entities, in turn, are represented by environmental education activities, the promotion of visits to Manoa, as well as donations made by the company. The company prioritizes actions that have a positive and significant impact on as many institutions and people in the community as possible.

The strengthening of local governance allows compliance with **SDG 8 – Decent Work and Economic Growth, SDG 12 – Sustainable Consumption and Production and SDG 17 – Partnerships and Means of Implementation.**

5. Forestry Monitoring Intelligence:

- Monitoring of deforestation through satellite images and generation of annual bulletins (Biofílica and Manoa);
- Property Surveillance;
- Forest fire prevention campaigns;
- Implementation of strategic certified low-impact forest management;
- Maintenance of ecological corridor with Conservation Units in the state of Rondônia;

One of the project's annual activities is the monitoring of deforestation via **satellite images** in order to identify the presence and location of increased pressure by deforestation, invasions and other illegal activities in the surrounding areas, it also serves as the basis for calculating the project's avoided emissions. This practice results in **bulletins** containing the coordinates of possible occurrences, which help the **property surveillance** team to carry out checks in the field. The surveillance activity aims to contain these possible invasions and illegal activities within the farm area, and Manoa employees are trained for this purpose. If any of these unwanted activities are detected, the team is trained to report the occurrence to the forestry manager, who in turn will contact the public bodies responsible for legal measures.

The plan to combine patrolling activities with remote monitoring using satellite images aims to develop unified strategies that will make surveillance more efficient and the strengthening of security on the borders

of the area. The **forest management** activity itself promotes the security of the site since the occurrence of possible invasions is discouraged by the physical presence of people on the farm and the use of the area.

Another existing risk is **fire** from anthropogenic causes. This risk is mitigated both by the surveillance of the property and by the sustainable forest management plan, where there is a description about forest protection against fires in the management plan area. This protection involves both internal educational and **informative campaigns**, in the management area and in the areas surrounding the Forest Management Area (AMF), as well as prevention to request immediate help, since all the campsites are equipped with a communication system (rural telephony, global cell phone, Internet, radio transmitters, etc.), which allows the transmission and receipt of information in case of fire.

All these measures together provide forest integrity within the farm, contributing to the maintenance of an **ecological corridor** that connects several Conservation Units, mitigating the negative impacts of degradation in the region.

This action is directly related to the containment of deforestation/invasions, maintenance of forest cover and, consequently, in line with **SDG 13 – Action Against Global Climate Change and SDG 15 – Terrestrial Life.**

2.1.3 Implementation Schedule

Date	Milestone(s) in the Project's Development and Implementation
January 01, 2013	Start planning, developing and monitoring the carbon project to VCS and CCB Standards
November 21, 2013	Signing of the Partnership Contract for the development of the REDD+ Project with Grupo Triângulo
Concluded in 2013	Construction of CEFLOM and CEVIFLOR
Started in 2014 and ongoing throughout the duration of the project	Prospecting for potential buyers of VCUs
Concluded in 2015	Carrying out the initial diagnoses of the project to characterize the area: Socio-economic and Environmental Diagnosis, assessment of biodiversity and physical aspects, carbon stock estimation and determination of the baseline
Concluded in 2016	Preparation of the project description document according to the VCS and CCB criteria

Date	Milestone(s) in the Project's Development and Implementation
Concluded on November 17, 2017	Completion of the audit process for CCB and VCS validation together with the first VCS verification
June/2018	First carbon credit sale
2019	With the objective of refining data collection methods, all activities started to be better recorded and to structure a communication channel.
August 08, 2020	From this date onwards, activities began to be monitored in accordance with the SD VISta framework, ensuring that quantitative information was clearly defined and properly evidenced.
August 28, 2020	Establishment of the partnership in Manoa and UNIR to carry out biodiversity monitoring
2021	Change of proponent: Triângulo Pisos e Painéis leaves and Manoa Sustentável Extração e Serviços Florestais joins (both are part of the Triângulo Group)
Julho/2021	New investor partner Grupo Ambipar joins Biofílica
November 10, 2021	Non-Permanence Risk Report Manoa REDD+ Project
July 12, 2022	Audit completion for performing the second VCS check
2022	Implementation of improvements to Fazenda Manoa's communication, farm monitoring and information management procedures
April 28, 2023	Non-Permanence Risk Report Manoa REDD+ Project updating
2023	Completion of audit to carry out third VCS check
August 2023	Review of SDGs to analyze all those affected by the activities carried out by the project. From this analysis, it was identified that the project had already been carrying out activities for all the SDGs to be claimed (SDG 04, SDG 06, SDG 08, SDG 12, SDG 13, SDG 15 and SDG 17) since 2020.
August – December 2023	Carrying out the second phase of socio-economic, environmental and carbon stock diagnosis (baseline reassessment)
2023 – 2024	Conducting the audit process to validate and verify SD VISta

2.1.4 Project Proponent

Organization Name	Biofílica Ambipar Environment Investments S.A.
Role in the Project	Proponent
Contact Person	Plínio Ribeiro
Position	Chief Executive Officer (CEO)
Address	420 Vieira de Morais Street, Unit 43/44, Campo Belo CEP 04617-000 São Paulo, SP Brazil
Telephone	+55 11 3073-0430
Email	plinio@biofilica.com.br

Organization Name	Manoa Sustentável, Exploração e Serviços Florestais Ltda
Role in the Project	Proponent
Contact Person	Murilo Granemann de Souza
Position	Chief Executive Officer (CEO)
Address	653 Cujubim Avenue, Sector 06 Cujubim, RO Brazil
Telephone	+55 69 3582-2012
Email	murilo@triangulo.com.br

Organizational structure, responsibilities and competencies

The monitoring plan for the Manoa REDD+ Project is a combination of three components: climate, socioeconomic and biodiversity. The results regarding the social and biodiversity scope can be located in sections 2.1, 2.3 and 3.1. The following sections demonstrate only the results regarding the climate component of the project. The competencies and responsibilities of the proponents are described below.

Biofílica Ambipar Environment: is a Brazilian company with 14-year experience in the voluntary carbon market, focused on forest management and conservation in the Amazon biome. In Manoa REDD+ Project,

Biofílica acts as co-manager, supporting in the coordination of the monitoring processes during the project's life cycle. In addition, it was also responsible for monitoring the climate aspects, with the support of Manoa, and is a party responsible for marketing the carbon credits.

Biofílica's work is guided by the Operating team (works in all stages of the project, from preparation, implementation, monitoring and management), Commercial team (works mainly in the raising of financial resources to the Project, from the sale of the carbon credits generated in the verifications), and Marketing team (that is present throughout the consumer journey of the carbon credits from REDD projects and provides technical support for creation of materials).

Manoa Sustentável, Exploração e Serviços Florestais: Is the owner of the property where the Manoa REDD+ Project is located, representing the Triângulo Group; it is responsible for carrying out the low impact forest management, for providing infrastructure and logistics support to Biofílica and other professionals involved in the project; and is responsible for the social monitoring and for the land security and property surveillance.

Among the activities performed by Manoa are the monitoring of socioeconomic attributes and indicators related to Sustainable Forest Management, monitoring of forest cover and high conservation value attributes. In addition, it encourages and provides support for the biodiversity monitoring that has been implemented in the area by UNIR, by the creation of a partnership with the Laboratory of Mastozoology and Terrestrial Vertebrates (LABMASTO).

2.1.5 Other Entities Involved in the Project

Organization Name	UNIR Fundação Universidade Federal de Rondônia
Role in the Project	Partnership to conduct scientific research focused on biodiversity
Contact Person	Mariluce Rezende Messias
Title	Coordinator of the Mastozoology and Terrestrial Vertebrates Laboratory
Address	2965 Presidente Dutra Avenue, Centro Porto Velho, RO Brazil
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2.1.6 Project Type

Sector Scope: 14 - Agriculture, Forestry and Other Land Uses (AFOLU)

Project Category: Reducing Emissions from Deforestation and Forest Degradation (REDD)

Type of Activity: Avoiding Unplaned Deforestation (AUD)

Grouped Project: No

2.1.7 Project Location

The Manoa REDD+ Project is located in Brazil, in the state of Rondônia, in the municipalities of Cujubim, Itapoã do Oeste and Porto Velho (Figure 1). Access to the area is via the BR-364 highway, Porto Velho-Ariquemes, which runs for around 140 km to the RO-205 highway, which connects to the municipality of Cujubim via a 50 km dirt road.

The surrounding area is characterized by the presence of several Conservation Units, as well as Agrarian Reform Settlements of the National Institute for Colonization and Agrarian Reform (INCRA). More recently, the region in which the project is located has undergone extensive change as a result of the advance of soybean cultivation.

The Project Area (72,843 hectares) is located within the Fazenda Manoa property, which totals 74,038.748 hectares (data from the most recent Rural Property Registration Certificate - CCIR). The vertices of the project area can be found in Table 2 and the location of the area in Figure 1.

Table 2 Geographical coordinates of the Manoa Farm vertices.

Vertice	Coordinate X	Coordinate Y
V 01	62°31'59,243"W	8°59'45,312"S
V 02	62°51'4,501"W	9°0'0,117"S
V 03	62°51'4,595"W	8°56'10,852"S
V 04	62°50'5,834"W	8°54'38,506"S
V 05	62°48'19,203"W	8°50'26,109"S
V 06	62°47'35,825"W	8°52'15,333"S
V 07	62°45'50,68"W	8°50'41,41"S
V 08	62°47'12,746"W	8°48'33,748"S
V 09	62°43'58,219"W	8°39'39,696"S
V 10	62°40'38,687"W	8°40'54,938"S

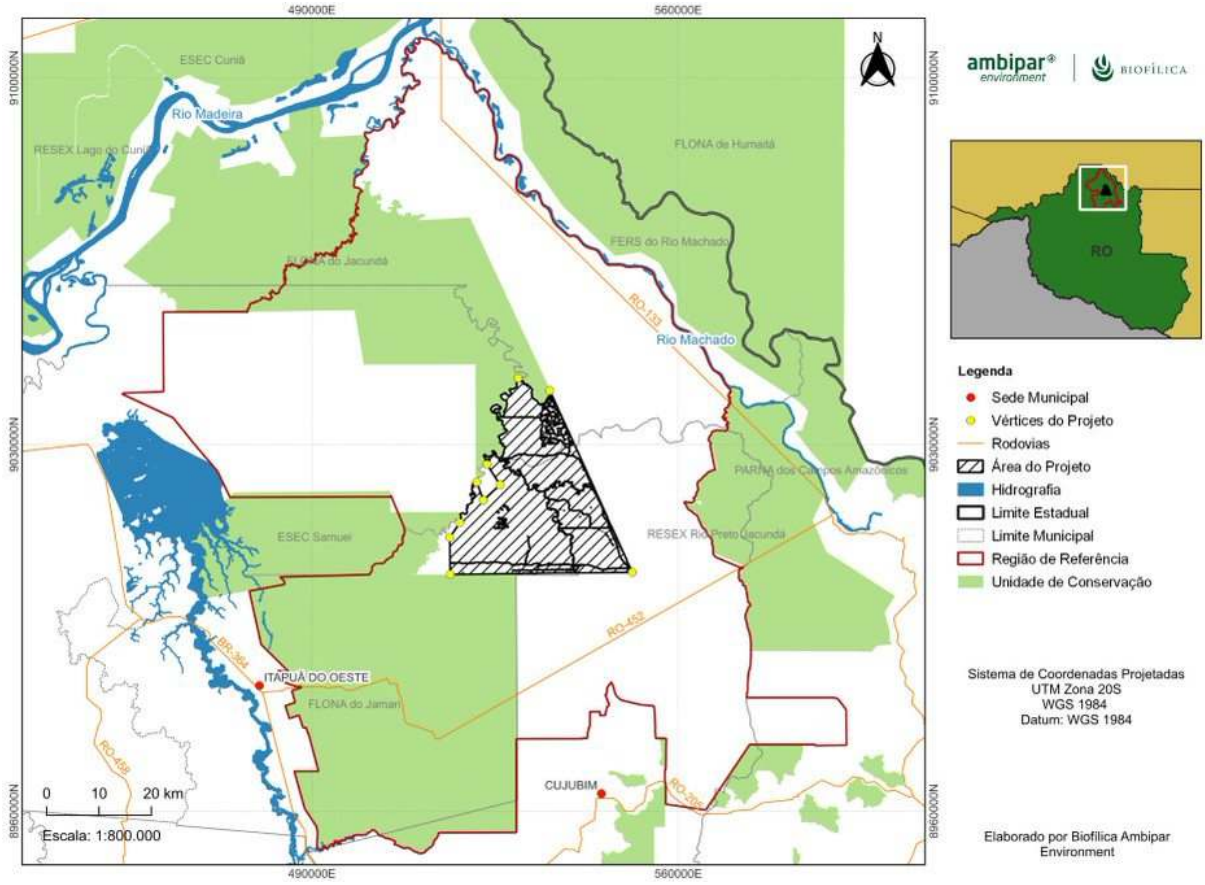


Figure 1. Location of the project boundaries

2.1.8 Baseline Scenario

Fazenda Manoa is a private property, mostly formed by native forest, located in the state of Rondônia (RO) and which has been carrying out Low Impact Forest Management activities since 1997. The forest management activity works strategically as a tool for maintaining forest cover, since it employs sustainable practices that limit the volume of wood to be sold, use procedures that avoid damaging the remaining species, only exploit selected individuals, guarantee the company's physical presence in the area, etc. In this way, forest management allows the impacts of timber production activities to be reduced, thus making it possible to maintain natural resources, which are managed using a Sustainable Forest Management Plan approved by the competent bodies.

The baseline context was built at the beginning of the project, focused on the analysis of the expansion of deforestation on the property, based on the specifications of the VCS VM0015 methodology, where it was concluded that the tendency in a common practice scenario would be to maintain the influence of the agents, causes and vectors of deforestation evidenced during the historical period analyzed.

The identification of deforestation agents was carried out to define the project's baseline through field interviews, consultations with Ecoporé researchers, and discussions with representatives of local institutions, the following groups of deforestation agents were identified: **Deforestation agents in the**

reference region: **Group 1** - illegal loggers and invasors; **Group 2** - Rural property holder with forest; **Group 3** - "landless"[2] groups, squatters and small ranchers; **Group 4** - farmers and rural producers of medium and large size. These deforestation groups mentioned above are responsible for 100% of the unplanned deforestation observed in the Reference Region.

Brief description of the agents:

Group 1 - Illegal loggers and invasors are motivated by the supply of wood in areas of easy access and low incidence of inspection. This group acts through the illegal extraction of wood that is "heated" in the sawmills present in the municipality of Cujubim and other itinerants in the region (moving according to the supply of wood). The deforestation caused by this group occurs in the form of opening of roads, branches, forest loaders and wood yards and forest degradation.

Group 2 is comprised of rural property owners who own native forest areas on their property, this group usually performs deforestation in search of an increase in the productive area and valorization of its properties, where the forest is not the main source of income for the owner.

The agents of **Group 3** ("landless", squatters and small ranchers) carry out illegal subdivision in areas not designated or irregularly owned, and in some cases legal when promoted by INCRA. It was possible to observe reports that such agents promote the invasion of private areas when fragility and low surveillance are identified. **Group 3** agents may act jointly or independently of **Group 1** agents, since **Group 3** agents aim to carry out deforestation to install plots and small areas with livestock pasture, in order to take possession of the area. There are numerous cases of invasion in private areas and Conservation Units, where "social groups" (locally called guerrillas) act together with illegal loggers to steal wood and take possession of these areas after deforestation. There are reports of situations where squatters and small farmers buy lots of land through "drawer contracts", without consulting the land tenure situation in the notaries, INCRA or SEDAM.

The agents of **Group 4** are composed of local farmers and rural producers of medium and large purchasing power. These agents cause deforestation by opening irregular access infrastructure (roads, airstrip), extensive grazing for livestock, legal and illegal logging, and annual crop cultivation. Over time, these agents perform land concentration in the region through the acquisition of properties of squatters and small farmers. The activities of the **Group 4** agents promote the incentive and the displacement of the agents of **Groups 1, 2 and 3** to new areas of expansion, boosting the chain of events that leads to deforestation. More detailed information on the context, references and statistical analysis of the baseline can be found in section 4.5 of VCS PD Manoa[3].

The result of the baseline projections indicated the occurrence of deforestation of approximately 18,150 hectares in the Project Area between 2021 and 2042. The objective of the project for the climate is to avoid this deforestation and, consequently, avoid the emission of 321,397 tons of CO2e per year (Average Annual Reduced Emissions), totaling 7,070,723 tons of CO2 over the 30 years of the project. Below is the table

[2] Migrants who often invade isolated forest areas, which are not identified with the National Movement of Landless Workers (MST).
[3] https://registry.verra.org/app/projectDetail/VCS/1571

containing the estimated values for the baseline, according to VM0015[4], and calculated at the beginning of the project (Table 3).

Table 3. Estimation of reduced emissions and GHG removals.

Year of the Project t	Annual area of baseline deforestation in the project area	Estimated removals and GHG emission reductions (tCO2e)
2021	715	248,388
2022	702	244,330
2023	806	301,007
2024	1,002	377,742
2025	826	309,770
2026	875	329,351
2027	861	324,113
2028	865	345,411
2029	890	355,865
2030	749	298,158
2031	847	338,505
2032	873	349,362
2033	919	368,358
2034	876	350,578
2035	763	304,156
2036	683	271,125
2037	782	311,645
2038	936	374,893
2039	938	375,768
2040	665	263,692
2041	817	326,007
2042	760	302,499
Total	**18,150**	**7,070,723**
Average Annual Reduced Emissions		**321,397**

For the first ten years of the project, the comparison between what was predicted in the baseline and what was actually avoided is presented in the following table.

Table 4. Baseline Carbon stock changes and Ex Post net GHG emission (2021 – 2022)

[4] It is important to highlight that in 2023 the process of reassessment the baseline began, therefore the predictions may undergo changes.

XZ

Year	Annual areas deforested within the project area monitored	Ex post net anthropogenic GHG emission reductions
2021	2.07	289,787
2022	0.02	282,366
Total	**2.09**	**572,154**

The conservation of the project area has an importance that goes beyond maintaining carbon stocks. The social relevance lies in the area's ability to supply the region with raw materials to run the sawmills, generating significant numbers of direct and indirect jobs. It also offers other benefits to the local community, such as training in Sustainable Forest Management, environmental awareness, knowledge about labor rights and decent employment, etc. In addition, it shows great environmental relevance, since at a landscape level the area is located close to conservation units in Rondônia, thus ensuring the permanence of an "ecological corridor", integrating regions, and minimizing the negative impacts of ecosystem fragmentation, allowing the movement of fauna and seed dispersal.

Socioeconomic context

The socio-economic context of the region at the start of the project was diagnosed through studies based on a survey of secondary data, by reviewing the literature and obtaining official social information, as well as obtaining primary data through interviews with residents of the urban and rural areas of the municipality of Cujubim, employees of the Manoa farm (outsourced and own staff), and visits to public and private institutions in Cujubim/RO.

The focus of the analysis in Cujubim is due to the fact that all of Fazenda Manoa's socio-economic relationships are connected to the municipality, where most of the mapped stakeholders are also located. The municipality's economy is based on agriculture, livestock and the timber industry, the latter of which has the Jamari National Forest and Fazenda MANOA as its main suppliers of raw materials.

In terms of population aspects, the Amazon region as a whole has experienced an increase in population due to government policies. Between the 1970s and 1990s, migration to Rondônia occurred due to agrarian reform policies, territorial reorganization and the PICs - Integrated Colonization Projects and PAs - Settlement Projects. These policies aimed to "occupy" a territory that was considered "empty" at the time. This occupation of the state, motivated by government programs, was linked to the exploitation of natural resources, and in most cases occurred in a random and disorderly manner.

The information obtained in the study indicates the low level of education of the population in the municipalities in the project region, which implies lower salaries and deficiencies in some sectors, such as the provision of specialized services. Another piece of information obtained from the municipal education department is that schools suffer from a lack of structure and school materials, a situation which hampers the teaching-learning process.

The area is not home to traditional communities such as extractivists, indigenous peoples, rubber tappers, riverine communities, fishermen and quilombolas. In addition, there are no dependent communities, or those with close relationships and direct links to the project area (forest area), whether for subsistence or any other activity.

The social diagnosis identified that in a non-project scenario (baseline) the trend would be towards a) a drop in timber extraction; b) the conversion of forests into pastures; c) an increase in agricultural mechanization. The decline in the timber sector, predicted as a result of the difficulty of maintaining the activity by companies that don't carry it out in a sustainable way, would inevitably lead to the conversion of forests into pastures, which would then be sold, as farmers often don't have enough funds to maintain the productivity of the area. As an alternative to the weakening of the soil, agricultural mechanization and monoculture would emerge, especially soya, which would find deforested areas with low mechanization costs, cheap and depleted land.

It should also be considered that the municipalities in the project area are part of the region known as the "Arc of Deforestation", due to actions related to illegal logging and the advance of agriculture and livestock farming. This context should lead to a rural exodus and the marginalization of this population in urban areas, in addition to the environmental impacts caused by deforestation.

The project scenario, in turn, allows for social, economic, environmental and governance conditions to be strengthened, especially in Cujubim, as it is believed that various actions can be triggered and thereby improve the population's self-confidence. Among the actions is a continuous process of capacity building and training for the residents, in the hope that they will acquire sufficient experience and technical knowledge to contribute to the development of the region. The section 2.1.2 brings more information about the relationship with and support for local institutions, and all the activities carried out by the project.

Environmental context

The Amazon stands out in the world scenario as the largest tropical forest, covering more than six million hectares with a distribution in nine South American countries (SILVA et al., 2005 apud Casa da Floresta, 2015[5]). To the execution of the biodiversity diagnosis a multidisciplinary team was assembled, made up of specialists in flora, herpetofauna, ichthyofauna, avifauna and terrestrial mastofauna. The results were based on scientific studies carried out in the project region, assessments carried out at Fazenda Manoa in previous years and during the field campaigns conducted in October and November 2014.

Based on this diagnosis, it was found that the project area is predominantly open ombrophilous forest with lowland formation with palm trees, followed by submontane open ombrophilous forest with lianas and patches of submontane open ombrophilous forest with palm trees (Casa da Floresta, 2015[6]). In addition, the survey at Fazenda Manoa identified 177 species of flora and more than 360 species of fauna, of which 12 mammals and 9 birds are under some degree of threat according to the IUCN.

[5] SILVA, J. M. C., RYLANDS, A. B.; FONSECA, G. A. B. The Fate of the Amazonian Areas of Endemism. Conservation Biology, v. 19, n. 3, p. 689–694, 2005
[6] CASA DA FLORESTA. Relatório de Caracterização do Meio físico, Projeto REED+ Manoa, Cujubim, RO Piracicaba, mar. 2015, 80 p. (Relatório Técnico)

The project area encompasses two "High Conservation Value Attributes" (HCVAs), a concept that designates elements with exceptional characteristics due to the presence of important environmental and/or social attributes.

One of the HCVAs identified is the salt pans/barrens or “Saleiro”, which are characterized by places in the middle of native vegetation, usually close to watercourses, with little vegetation and exposed soil, rich in macro and micronutrients (COELHO, 2006[7] apud Casa da Floresta 2015). These places are used by various animals, especially mammals, particularly herbivores, frugivores and omnivores (BLAKE et al., 2011[8], KLAUS et al., 1998[9], apud Casa da Floresta 2015), where they practice geophagy, i.e. ingesting the soil. Salt pans offer various functions in the diet of these animals, such as a source of nutrients, detoxification, minimization of intestinal reactions, a source of food in times of resource scarcity, etc. These characteristics define salt pans as habitats with a high concentration of endemic and threatened species and a rare ecosystem, which justifies the need to monitor their integrity, ensuring the maintenance and improvement of their attributes.

Another HCVA is found in the northern part of the farm, the Rio Preto Waterfall, which is characterized as an HCVA due to its scenic beauty, considered a landscape of special cultural significance within the Manoa Farm, as well as being a habitat for a diversity of bird species.

The maintenance of the forest cover in the project area together with the development of low-impact forest management activities will guarantee the protection of habitats in the Fazenda Manoa area, which has a great diversity of species, some of which are at some level of threat according to the IUCN (2014). More detailed information about the physical parameters of the area can be found in item 1.3 of the VCS PD Manoa, and the section 2.1.2 of this document brings more information about all the activities carried out by the project to improve forest maintenance. Detailed information on the social and environmental context are presented in sections 3.1 and 4.1 of this document.

2.1.9 Causal Chain(s)[10]

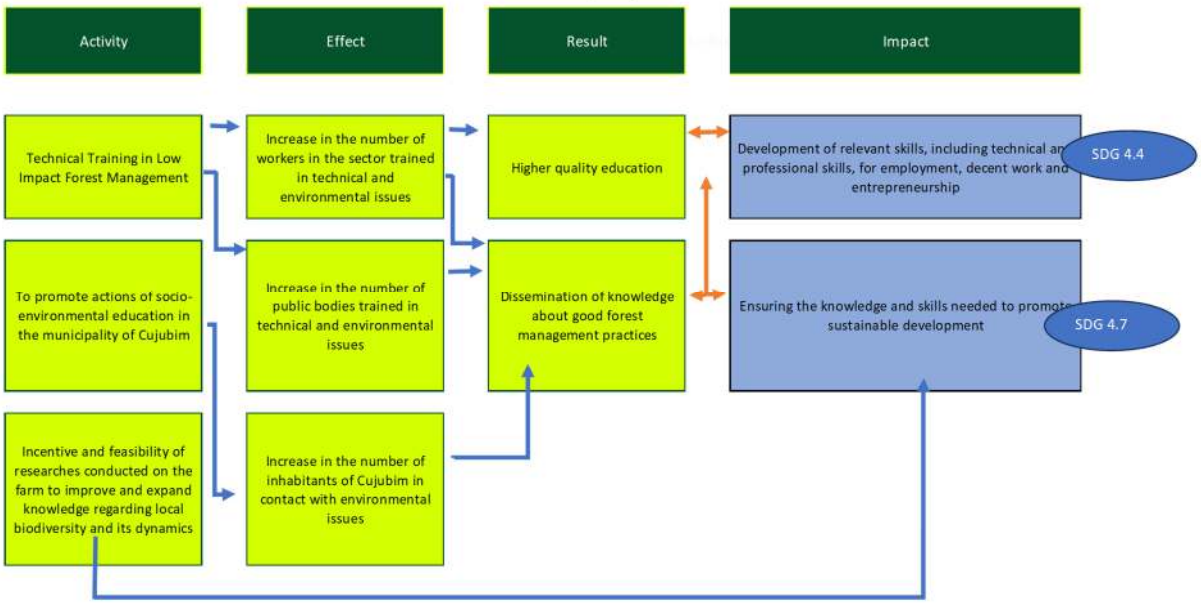
The causal chain was produced based on information from the local context presented by the socioeconomic and environmental diagnoses carried out at the beginning of the project. This information was primarily used to construct a “Theory of Change” for the CCB, but many of the actions and results identified were also adapted for the causal chain.

The initial basis for building the causal chain was the listing of activities currently been carried out by the project, and from this, identifying the SDGs that would be met by these activities. Having identified the SDGs, it was characterized whether they were more related to "People and Prosperity" or "Planet", as

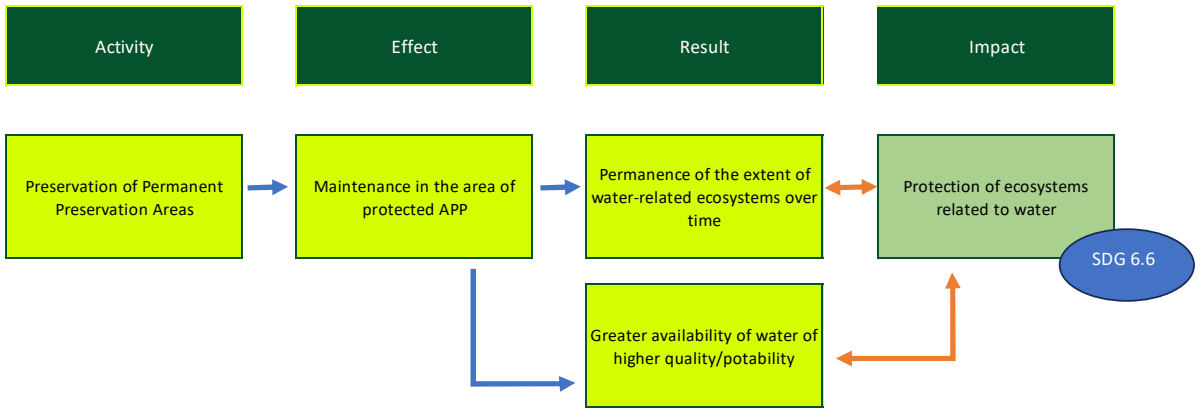
[7] COELHO, I.P. Relações entre barreiros e a fauna de vertebrados no nordeste do Pantanal, Brasil. Dissertação (Mestrado em ecologia), Universidade Federal do Rio Grande do Sul, 62p., 2006.
[8] BLAKE, J. G.; MOSQUERA, D.; GUERRA, J.; LOISELLE, B. A.; ROMO, D.; SWING, K. Mineral Licks as Diversity Hotspots in Lowland Forest of Eastern Ecuador. Diversity, v. 3, p. 217-234, 2011.
[9] KLAUS, G.; KLAUS-HUGI, C.; SCHMID, B. Geophagy by large mammals at natural licks in the rain forest of the Dzanga National Park, Central African Republic. Journal of Tropical Ecology, v. 14, p. 829–839, 1998.
[10] The text of the SDG were adapted to the Causal Chain

defined by the standard. All impacts identified by the activities are positive, and this was confirmed through the communication channels implemented by Manoa, from which no negative returns were identified.

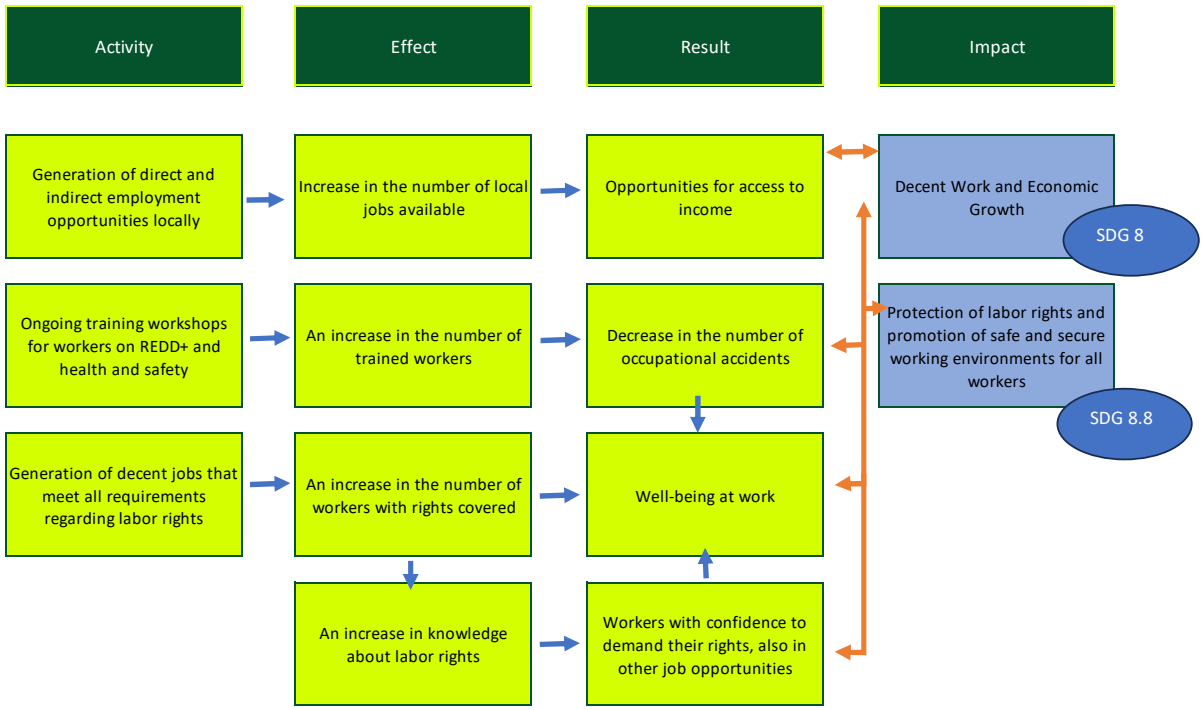
SDG 4 Quality education



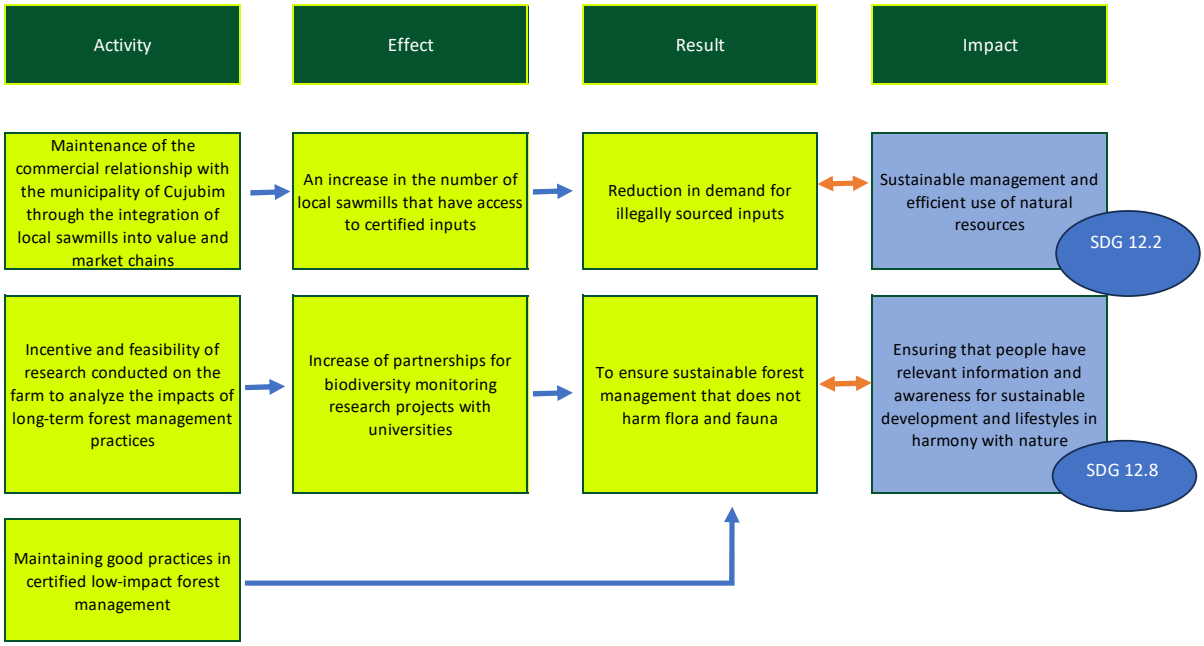
SDG 6 Drinking Water and Sanitation



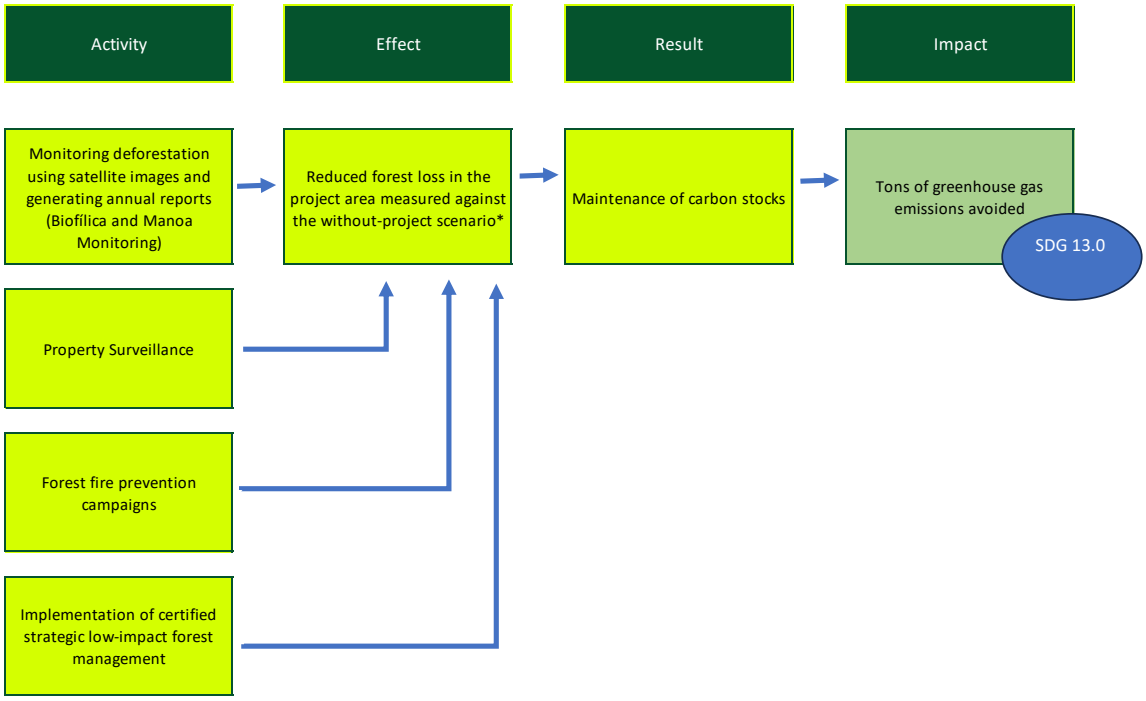
SDG 8 Decent Work and Economic Growth



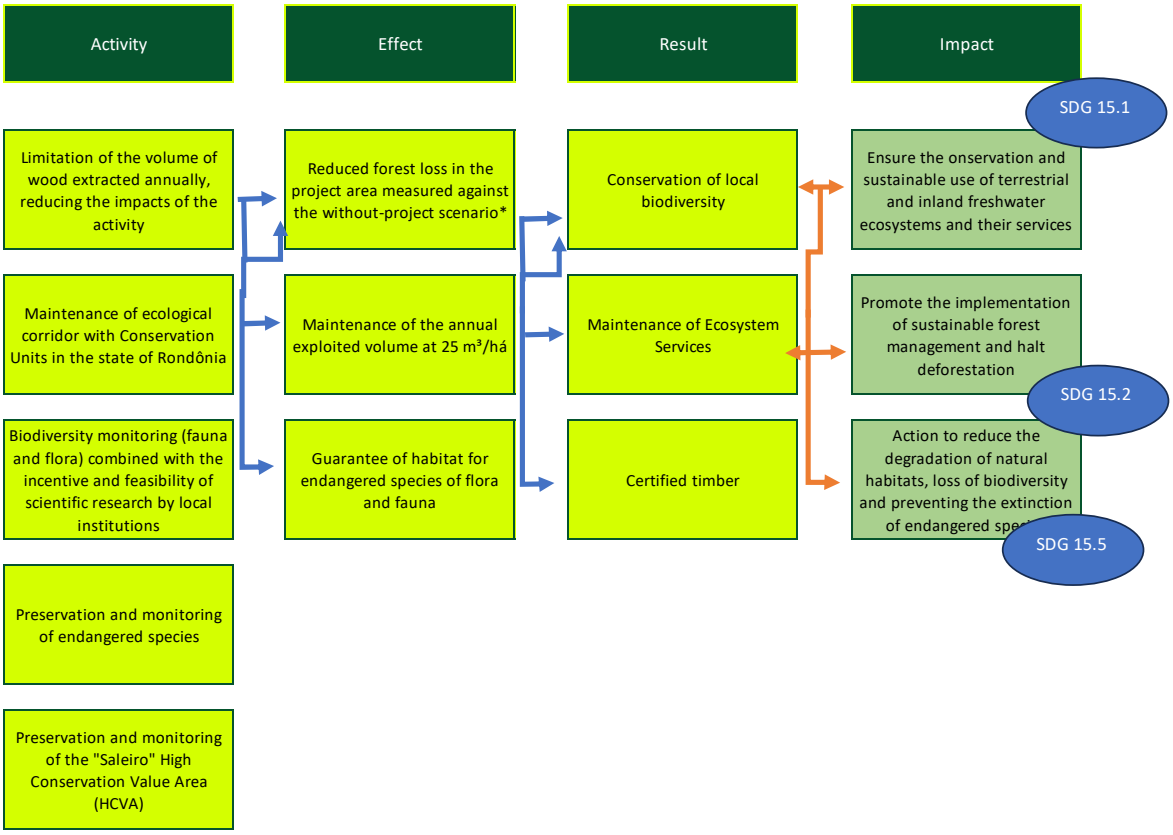
SDG 12 Sustainable Consumption and Production



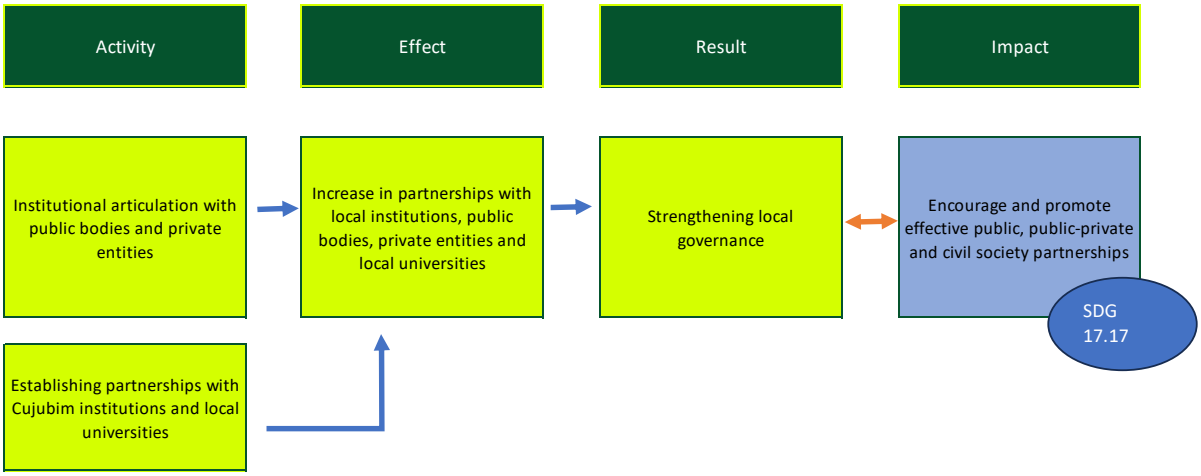
SDG 13 Action against Global Climate Change



SDG 15 Terrestrial life



SDG 17 Partnerships and Means of Implementation



Legend:

	Impact on People and Prosperity
	Impact on Planet
Effect: The direct and immediate response to a specific cause. **Result**: The widest consequence of the effects accumulated over time. **Impact:** The significant and lasting influence of actions on systems, communities or individuals.	

2.1.10 Threats to the Project

Regarding natural and human-induced threats to the expected sustainable development benefits during the project lifetime, it is understood that the risks to the expected benefits of sustainable development are directly associated with the risk of losing forest cover, since without the forest there are no credits to enable the project activities to be carried out. All the project activities related to curbing illegal deforestation in the project area are described in this document. The threats identified and the mitigations measures are listed below:

Natural Threat

Threat: Fire

Measures to mitigate these threats: No occurrence of natural fire (i.e., caused by lightning) was registered in the project area. Scientific research suggests that the occurrence of natural fires is rare in the Amazon, what happens is the predominance of anthropogenic fires, related to the human occupation of the area (SCHROEDER et al, 2009[11]). And even considering human caused fires, fire focuses hardly affect more than a couple hectares due to tropical forest humidity. Due to the natural characterizes of the Amazon

[11] SCHROEDER, W. et al. The Spatial Distribution and Interannual Variability of Fire in Amazonia. Amazonia and Global Change, v. 186, p. 43 60, 2013.

Forest and the preventions and mitigation measures that are in place, this type of loss could damage less than 5% to less than 25% loss of the carbon stock.

Even considered as insignificant, this threat is mitigated both by the action of surveillance on the property. Also, there is a description of forest protection against fires in the forest management plan, which involves both educational and informative internal campaigns, in the management area and in the areas surrounding the AMF. All camps are equipped with a communication system, which allows the transmission and receipt of information in the event of a fire. In addition, the Fire Brigade training in compliance with NR-23 to comply with the planning of activities of the PCMSO and PPRA offered to all workers of the own and outsourced teams of Manoa.

Human-induced threats

Threat: Illegal activities such as trespassing and timber theft occurring rampantly around the project area causing degradation and loss of forest cover.

Measures to mitigate these threats : There is an effort by the project proponents to prevent trespassing and illegal activities in the project area (more information about the agents are described on the section 2.1.8 of this PD). In this regard, mainly satellite monitoring activities (annual deforestation bulletins and analyses of deforestation during the dry season) and patrimonial vigilance are carried out, in line with other educational activities, better detailed in section 2.1.2, 2.1.11 and 2.3.7 of this PD.

It is possible to perceive through the analyses of deforestation dynamics, mainly in the project's surroundings, as well as the alteration of these dynamics. As a strong activity present in the project area, the property surveillance of Manoa Farm is constantly carried out. Also, as a way of engaging the population in the theme regarding environmental education, courses, training and technical visits is provided[12].

Threat: Problems in marketing the carbon credits, due to variations in the price of credits and absence of a regulated market, and consequent lack of resources to finance the proposed activities.

Measures to mitigate these threats : Biofílica Ambipar has a revenue department, with commercial, marketing, communication, and market intelligence teams, responsible exclusively for developing materials to publicize the project, participate in national and international events related to REDD+ and carbon markets in order to publicize the project, establish and expand the network of business contacts with potential buyers of the carbon credits to be made at the best possible prices that ensure the financial sustainability of the Project and Biofílica Ambipar.

The commercial team relies on professionals who are split to serve national and international clients, who deliver the credits to companies and institutions committed to the effective conservation of their areas and the co-benefits to communities and biodiversity. In addition, Biofílica Ambipar is always looking for financing alternatives, such as donations and partnerships for direct implementation of project activities (not necessarily linked to credit sales).

[12] More information about the activities implemented to “Monitoring deforestation through satellite images and generation of annual bulletins”, “Patrimonial Surveillance” and “educational activities” can be accessed on the VCS MR reports.

Threat: Forest management activities may cause negative impacts on the project.

Measures to mitigate these threats: The Forest Management carried out at Manoa Farm follows the premises and guidelines of the FSC and PEFC certifications, which guarantees quality and mitigation of impacts. Moreover, Manoa has a procedure manual and a well-defined Forest Management Plan, documents that guide all the activities related to the management. Moreover, the management workers were offered training in this theme (described briefly in section 2.1.2 and detailed on the verification process).

Threat: Anthropogenic Fire

Measures to mitigate these threats: Anthropogenic fire is a recent threat since the fire is only beginning to approach the area due to the increase in deforestation on the surrounding. The actions to mitigate this threat are the same as those defined for the threat of fire due to natural causes, with the addition of practices that guarantee a good relationship with the surroundings (communication channels, for example).

2.1.11 Benefit Permanence

The REDD project is scheduled to last until 2042, after which, if it is convenient, it could extend its term and continue with income from the sale of VCUs, which would allow the benefits made possible by the credits to continue. However, another scenario is that of reaching a point where there is no need for this support, since the direction of the economy and society would have reached a "turning point" where the valuation of the standing forest would be attractive on its own, without depending on the implementation of projects.

All the activities carried out by the REDD+ Manoa project, especially those that address the root cause of various issues, are based on the broad objective of allowing sustainable activities to be common practice, promoting the permanence of the social, environmental and climate benefits of the activities. Tools have been selected to maintain and improve these benefits, some of which are already in use and others will be implemented. Below are descriptions of the activities that have the **potential to guarantee the permanence** of the project's benefits:

Constant improvement in the property's surveillance procedures:

By providing additional tools such as remote monitoring using high-resolution satellite images, offering training for the surveillance team and improving surveillance practices, the project aims to increase the efficiency and reduce the costs of property surveillance operations. In this way, surveillance operations will have a major boost in the intelligence process related to territorial monitoring and management, which should have a direct impact on maintaining climate benefits in the long term.

Educational Activities:

Environmental education and training activities act on the root cause of various issues that cause deforestation today and are characterized by having broad and lasting impacts. Therefore, strengthening

these actions, which promote environmental awareness and the dissemination of sustainable strategies, is the main tool for maintaining and increasing the benefits derived from the project.

Environmental education activities empower society on issues related to the environment, further disseminating knowledge about the subject. From the perspective regarding the importance of conservation and maintenance of forest cover, these activities help contain unplanned deforestation.

Environmental monitoring with incentive and support for scientific research focused on expanding local knowledge:

In addition to providing tools for sustainable socio-economic development, the axis of the project is to encourage scientific research. Manoa, through partnerships with researchers and universities, promotes long-term research to monitor biodiversity and HCVAs. The purpose of this monitoring is to assess impacts, implement mitigating actions and increase scientific understanding of biodiversity in the region. Scientific knowledge is also a tool that promotes consistent and long-lasting benefits, and the research carried out in the area has the possibility of continuing even after the end of the project. Furthermore, since the project promotes partnerships with local universities, there is the expansion of regional knowledge and the promotion of scientific benefits in line with the reality and context of the region.

Annual consultation of stakeholders:

To ensure that the impacts of the project's actions are in fact in line with the interests of the local population, periodic consultation with this public, mainly focused on the workers at Fazenda Manoa and in the municipality of Cujubim, is of great importance. The objective of the questionnaires, and other communication channels, is to allow local residents, Cujubim institutions and other interested parties to express their opinions and thus improve the project's activities, so that negative impacts are properly mitigated, and positive ones are improved.

2.2 Stakeholder Engagement

2.2.1 Stakeholder Identification

The first identification of stakeholders was carried out by Ecoporé - Ação Ecológica Guaporé, with a transdisciplinary team made up of biologists and sociologists, during the project's first socio-economic diagnosis.

The diagnosis did not identify any traditional communities living in the project area or dependent on the resources coming from it. Furthermore, according to the report carried out by Ecoporé[13]:

[13] ECOPORÉ. Diagnóstico Socioeconômico e Ambiental da região do Projeto REDD+ Fazenda Manoa – Cujubim. Porto Velho, Rondônia. 2015, 95p)

> *"No group that could be categorized as a traditional population was detected either in the secondary database or in the field research in the municipality of Cujubim. These populations are defined by their specific cultural manifestations and differentiated relationship with environmental resources. Groups such as extractivists, indigenous people, rubber tappers, riverine communities, fishermen and quilombolas are known as traditional populations".*

There are also no disputes over the rights to the land where Fazenda Manoa is located.

Below is a list of the stakeholders[14] identified by this diagnostic.

Stakeholders:

- Manoa's employees;
- Sawmills in Cujubim;
- Residents of Cujubim;
- Environmental agencies;
- Institutions in the municipality of Cujubim;
- Universities and researchers from the state of Rondônia.

2.2.2 Stakeholder Description

As mentioned above, there are no groups or individuals who live within the boundaries of the area or who have rights to the property where Fazenda Manoa is located, or rights to the resources coming from it.

Below is information about the identified stakeholders:

Stakeholders	Interest in the project	Influence	Importance
Manoa's Employees	Job opportunity	Mutual and beneficial influence for both parties. Employees make it possible to carry out the various activities proposed,	The vast majority are inhabitants of the municipality of Cujubim and this has a great impact on job creation and training, as well as

[14] According to Sustainable-Development-Verified-Impact-Standard-v1.0, Box 2: "A stakeholder is any person who can potentially be affected by the project. In identification of stakeholders, it is permitted to consider significance of user populations and how deeply affected they may be by the project such that distant or intermittent user groups who will be affected in very limited ways by the project need not be defined as stakeholders. **Note:** Interested stakeholders comprise any person, group of persons, or entity that has shown an interest, or is known to have an interest, in the activities of the project but that will not be materially affected by those activities. Throughout the SD VISta Program, unless otherwise specified, the term 'stakeholder' used on its own excludes interested stakeholders. Other potentially interested stakeholders — e.g., local or international NGOs — are identified as such.".

Stakeholders	Interest in the project	Influence	Importance
		while they benefit from the jobs and training generated.	ensuring the permanence of the population.
Sawmills in Cujubim	Maintenance of the supply of wood from the project area	Demand for local raw materials	As a source for generating jobs, if they close their activities, the workforce will move to illegal logging activities.
Residents of Cujubim	To maintain a good relationship with Fazenda Manoa, understanding the importance of the maintenance of the forest, affected by the direct and indirect generation of jobs.	They are part of the target audience for training and labor actions.	The participation of these figures is part of the scope of some of the project's activities. In addition to being affected by job creation and the training and capacity-building encouraged by the project.
Environmental agencies	It should serve as a model for other private properties in the state of Rondônia, including providing training on good forest use practices.	May require greater participation in directing environmental and social activities	They support the maintenance of forest management activities on the farm and forest protection actions
Institutions in the municipality of Cujubim	Tax collection, additional contributions to environmental education, and support for complementary demands	May require greater participation in directing social and educational activities	May facilitate public policies aimed at conservation and contribute to the implementation of activities

Stakeholders	Interest in the project	Influence	Importance
Universities and researchers from the state of Rondônia	Take advantage of the rich biodiversity that the project helps to preserve in order to carry out research, as well as contributing to the proposed courses and training courses.	They will monitor the project's interventions and show their effective results.	Their activities are part of the project scope

2.2.3 Stakeholder Consultation

The initial stakeholder consultation process was carried out by Ecoporé from October 8 to 14, 2014 and was focused on three fronts: the rural area, the urban area (Cujubim) and Manoa employees. The focus on the municipality of Cujubim, as the urban area, was because all of Fazenda Manoa's socio-economic relations in the region are directly linked to the municipality, whether in terms of supplying wood to sawmills in the region, generating jobs, taxes, etc.

Questionnaires covering open and closed questions were sent to all three of these fronts. These questions covered both general aspects, to draw up a diagnosis and a general understanding of these stakeholders, and targeted questions, with the function of questioning the influence and damage/benefits of the existence of Fazenda Manoa for the region. These interviews allowed the parties to express their opinions, complaints, etc. There were no stakeholders who required consultations in any dialect or language other than Portuguese.

Ecoporé's approach of conducting face-to-face interviews is a process that allows for adequate consultation with all affected parties, including vulnerable and marginalized populations, since the consultation covered the region's small producers (rural area), residents of Cujubim (urban area) and Manoa employees. Based on the information in the study, it is understood that these populations can be considered as vulnerable, mainly due to their low level of education, limited source of income, restricted access to health services and lack of infrastructure for sewage treatment, among other factors.

For the other interested parties - researchers, environmental agencies, municipal institutions - materials (leaflets, calendars, etc.) were passed on containing information about the project and the channels for accessing the ombudsman, such as telephone and e-mail. It is understood that this is a sufficient form of communication for these groups of stakeholders, due to their less constant physical presence at Manoa, physical distancing, and even because they have occasional participation in farm activities, which allows the use of simpler communication tools.

Since the start of the project, there have been no changes to the project design as a result of the consultations held. In addition, the project has procedures for communicating with stakeholders to make it possible to exchange criticisms and suggestions during the development of the project (see section 2.2.4).

Before the audit process, the project underwent a 30-day period of public consultation, during which only one comment was received, as follows: "The REDD+ Project Developed by Manoa is a source of pride for us, citizens of this region." Given that this is a complimentary comment, no specific action was identified as necessary in response to it. It was also understood that this comment does not necessitate any changes to the project's design.

2.2.4 Continued Consultation and Adaptive Management

The communication and consultation between the proponents and stakeholder groups about the project and its impacts, that enables the discussion about the progress of the project activities, both in the form of complaints and suggestions, occurs via three methods: application of a questionnaire to survey the positive and negative impacts (Figure 2), availability of the ombudsman channel (Figure 4) and development of the suggestion box (Figure 5). The methods used and the description of the analysis and forwarding of requests are detailed below.

1. *Application of a questionnaire to survey the positive and negative impacts:*

The application of a questionnaire to survey the positive and negative impacts is in line with the monitoring measures established for the social aspects that could be impacted by the forest management and the REDD+ Project activities and, when appropriate, Manoa performs the compensation of impacts.

There are two models of questionnaire (Figure 2), one for the farmers and one for the institutes, that are applied to neighbors present in a 15km line from Manoa entrance gate (Figure 3). Both include one question about the positive and negative impacts of Forest Management, besides that, the questionnaire for the institutions includes an additional question about the biggest challenges faced.


FICHA DE MAPEAMENTO SOCIAL – PRODUTORES RURAIS

FICHA DE MONITORAMENTO SOCIAL

Figure 2. Models of questionnaires applied for monitoring the impacts. Farmers on the left and institutions on the right.

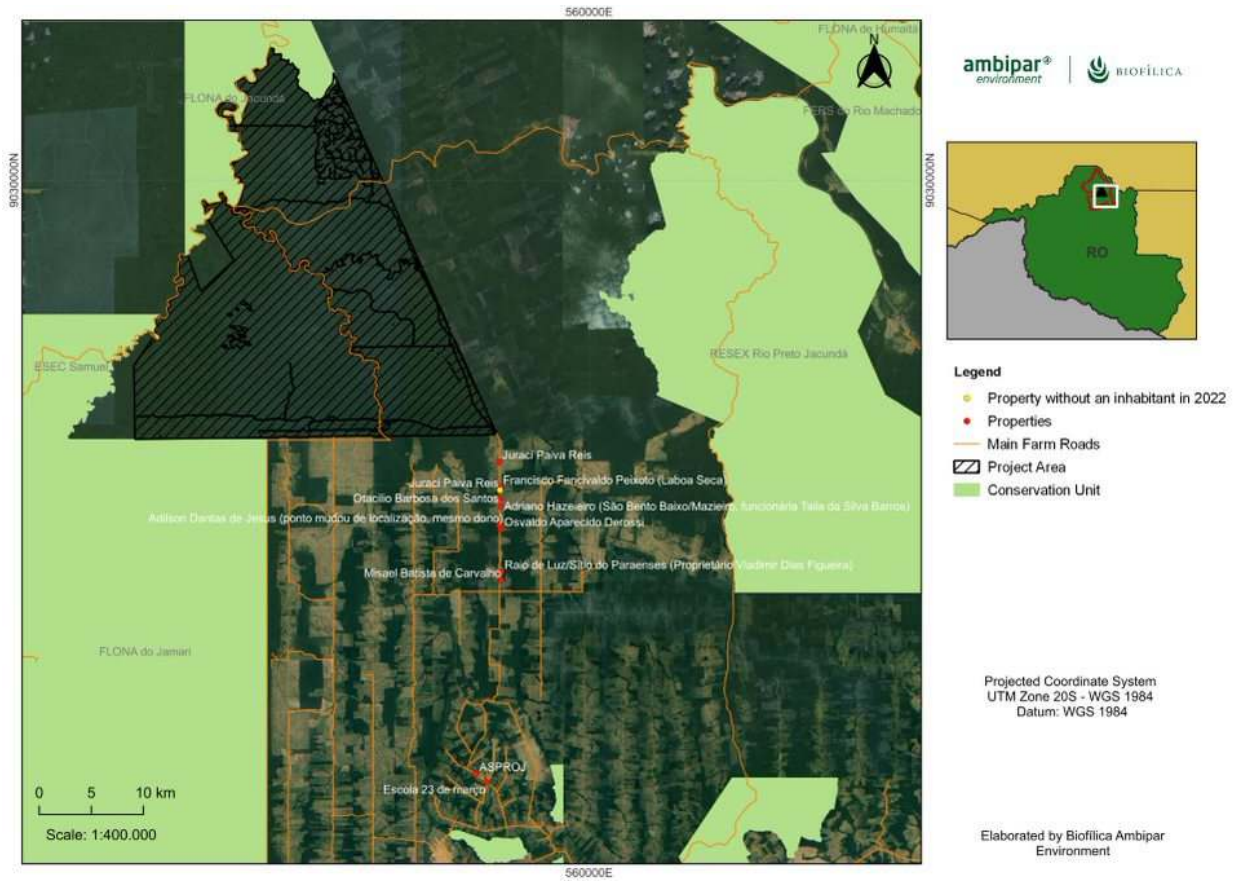


Figure 3. Map of the areas visited to carry out the social monitoring report surrounding the Forest Management Area (AMF).

The questionnaire is applied in one day between the months of July and October, to the neighbors present at the moment of Manoa visit. The number of questionnaires answered varies between the years, because not always the owners or employees are present at the time, and because the property can be bought or sold from one year to the other.

Along with the questionnaire, Manoa also provides a copy of the public summary of the management plan, that includes information about the REDD+ Project, about the fauna protected in Manoa Farm and about the social impact of Manoa's activities, as well as a contact phone number and digital address of the company's ombudsman channel. In the future the project intends to improve the questionnaire to better understand if the stakeholders know how to contact the farm if needed and to better communicate the REDD+ Project results in the documents distributed during said questionnaires.

2. *Availability of the ombudsman channel*

To promote effective communication with the stakeholders in the surrounding area, in cases of repair of possible damage or negative impacts resulting from the activities, the company makes a public ombudsman channel available. Through the ombudsman's office it is possible to report any origin such as complaints,

dissatisfactions or even suggestions. The ombudsman channel is available at the entrance of the farm, for the neighbors' easy access, and at Triângulo website[15] (Figure 4).

Figure 4. Triângulo website on the left with the ombudsman channel at the bottom of the page and the sign at Manoa's entrance with phone number and email address to contact Triângulo, if necessary, on the right.

The Financial manager is responsible for registering, analyzing and forwarding the significant requests to the appropriate sector.

3. *Development of the suggestion box*

The third consultation and communication front consist of the suggestion box (Figure 5), with the aim of dealing with possible suggestions, demands or complaints from Manoa Farm's employees.

The box must be opened by the technicians responsible (either the Forestry Engineer or the Field Coordinator) in front of all the farm's employees, and the records assessed one by one to take the necessary actions considering each demand.

[15] Triangulo website. Available at: https://www.triangulo.com.br/sustentabilidade/. Access on: July 11, 2023.

Figure 5. Suggestion box located in the cafeteria of Manoa Farm.

4. Other communication channels

Besides the three main consultation and communication fronts set up by Manoa, dialog is also established by other means, such as e-mail exchanges, meetings, and informal chats. During the harvest period the activities are initiated by speeches and training about low impact forest management and the correct procedures and, then according to the team availability, meetings led by the forestry engineer occur, to reinforce the safety procedures, to hear employees' doubts, suggestions and requests. From 2022 onwards those meetings started being documented in reports.

At Manoa's office, the communication with external stakeholder, such as schools and environmental institutions is ministered as follows: Manoa receives the institution request for environmental education, technical training or other by email or phone, evaluates which request will be attended and then proceeds with the activity (see flowchart in Figure 6). The criteria used to define which request will be attended varies with the priority established by Manoa, activities with potential to involve a large sector of the low impact forest management, for example, takes high priority. Activities that result in significant benefit for the community are also prioritized). After the activity, when Manoa receives the thanking notes and or feedback concerning the activity the process is considered concluded. The criteria used to define if the request will be attended will be better described below.

5. Analysis and forwarding of requests

The process of how the requests received by each channel are analyzed and dealt with are presented in a flowchart in Figure 5. The significance of each request is evaluated according with the following criteria:

a) According to the type of request, which can be complaint, doubt, suggestion, compliment, etc.

b) Regardless of the type of demand, those that (1) are related to the company's activities, (2) involve impacts caused by the company, (3) that have the potential to cause environmental, social or economic impact are considered significant.

c) Donation-type requests that do not have the potential to bring community return are automatically considered non-significant, as this type of activity is not part of the company's policy. Manoa prioritizes actions that positively and significantly impact as many people as possible in the community.

Manoa tries to answer the request as soon as possible and the way the result of the analysis of the request is reported to the stakeholders varies according with the communication channel used and with the stakeholder characteristics, for example, internal requests made by employees through the suggestion box can be answered through the notice board, e-mail and/or WhatsApp. However, requests made by the neighbors are usually answered personally. Other requests' answers will vary according to the most appropriate method (by email, phone, in person, letter etc.). The feedback to the stakeholders is always the responsibility of the Forestry Manager and/or Forestry Engineer.

Additionally, whenever a Manoa employee identifies an emergency situation (e.g. forest fire, actions that go against the company policy) in Manoa Farm, regardless of the type of situation, the field coordinator must be informed immediately.

Manoa’s Human Resources and the Financial Manager are the ones responsible for accompanying and negotiating with unions, the Ministry of Labor and other institutions related to workers' rights/duties. Contact with the environmental bodies, whether for interpellations, assessments, requests for information or any matter related to the environment, is carried out by the Forestry Management and the Forestry Engineer. Cases involving legal matters are forwarded to the company's legal department.

Demands related to land issues, with the potential for conciliation, are handled by the Forestry Manager. Claims that need to be discussed in court are forwarded to the legal area. Requests or contacts involving the press are made by the Marketing department, which uses its own tools or the specialized work of a press relations agency.

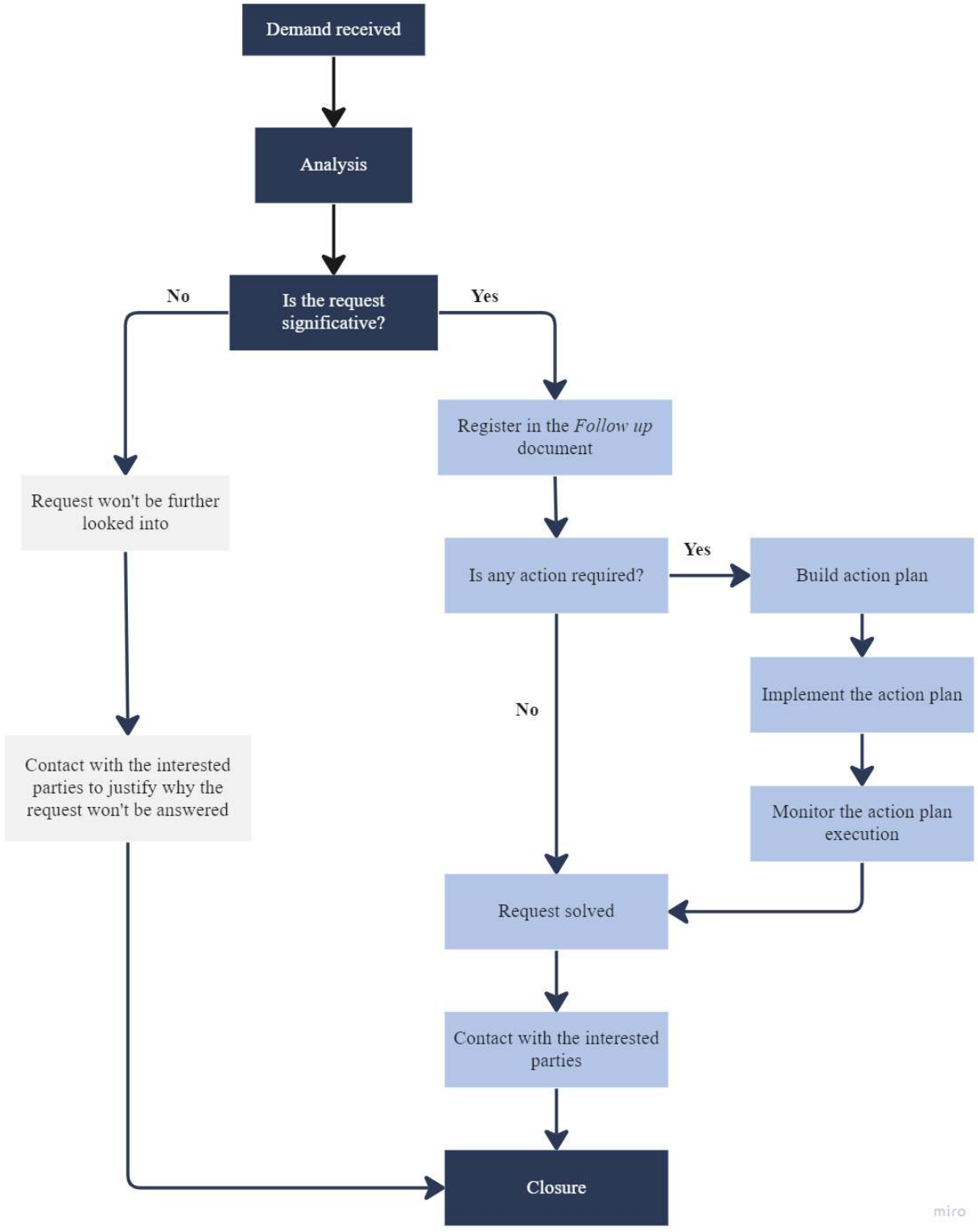


Figure 6. Flowchart of how each request received by the project communication channels is handled.

2.2.5 Anti-Discrimination

The Project follows the measures aligned with its proponents regarding guaranteeing anti-discriminatory measures, described for each part below.

Biofílica Ambipar Environment follows the principles of the Ambipar Group's "Code of Conduct and compliance"[16], with the basic premise of respect for people, regardless of their hierarchical position, origin, color, ethnicity, culture, age, social level, physical ability, religion and sexual orientation, and does not accept any practice of discrimination. Among its commitments are encouraging an attitude of respect for people, their traditions and values, as well as guiding relationships by respect for the laws and conventions that deal with fundamental human rights.

Manoa has an internal policy that prohibits any form of discrimination based on gender, race, religion, sexual orientation or any other characteristic, and defines that any form of discrimination, harassment or unfair treatment is strictly forbidden. The document also states that "All employment decisions, promotion, salary, training and other opportunities will be based exclusively on the merit and skills of the employees".

The policy is displayed on company walls in common areas, accessible to all employees and visitors. In addition, during training and activities carried out with employees, whenever appropriate, information about this document is passed on to employees. Furthermore, any Manoa employee who feels discriminated against or is a victim of harassment is encouraged to report it or use anonymous channels, such as the suggestion box set up by Manoa. Many employees confirm that they feel safe raising these issues directly with those responsible, should the need arise.

In addition to these strategies, the REDD+ project relies on communication channels (see section 2.2.4) to mitigate possible negative impacts related to this issue. Testimonies and/or complaints are dealt with in accordance with the procedures and the people responsible for them, described in section 2.2.4 and in the flowchart shown in Figure 6.

2.2.6 Worker Training

The continuity and viability of the REDD+ Manoa project depends on the execution of several activities, including property surveillance, which will ensure the integrity of the area against deforestation by external agents, forest management, which promotes the use of forest resources while protecting it, and several others, often adjacent to these. These activities, however, require training, both to improve technical skills and to ensure safety, since they also pose risks.

All activities carried out by Manoa's own, or outsourced employees are included in a training program that takes place annually before the start of the harvest. The training includes safety training and guidelines (prevention and mitigation), and are aimed at all employees, without distinction, including those characterized as marginalized and/or vulnerable, where applicable. The training applied minimally follows all the relevant labor legislation, such as ordinances and regulatory standards, and are supported by specific internal procedures that describe the processes for the correct execution of the assigned functions.

[16] Codigo-de-Conduta-e-Compliance-2023-Ingles.pdf (ambipar.com)

The field study carried out for the purposes of social diagnosis mentions that another important aspect of the trainings is that after the time spent working at Fazenda Manoa, if the worker goes on to work at another forest management company, they have already experienced working within the standards required by labor laws and certified management, which strengthens their ability to claim previously unknown rights. It is worth noting that more than 80% of the employees come from the municipality of Cujubim, so these actions also promote the development of local skills and participation by the population.

In addition to internal training, Manoa also promotes training in low-impact forest management for external parties, focusing mainly on stakeholders in the region, such as environmental agencies, schools, institutions, etc. Additional information is presented in section 2.1.2 of the document and detailed on the verification process.

2.2.7 Equal Work Opportunities

In accordance with the proponents' policies indicated in section 2.2.5, it is understood that the project has as a premise that all stakeholders directly involved in the project activities will have equal opportunities for hiring and promotion within the existing functions, provided that the job specifications are met.

Reinforcing this point, more than 80% of employees come from the municipality of Cujubim, demonstrating the applicability of measures to include the local population, who are often part of marginalized and/or vulnerable groups. In addition, the number of positions occupied by women is more representative in administrative positions at the Cujubim office and in areas such as food, cleaning, etc.

The REDD+ project reinforces the procedure of including and promoting local participation, thus generating direct jobs and providing the opportunity to include local stakeholders in the project's actions and, consequently, in understanding the benefits of conserving forest areas. Local jobs are also generated indirectly, through the supply of raw materials for the operation of various sawmills, as well as prioritizing the hiring of local companies for activities that rely on outsourced employees. According to the survey carried out in 2023, two outsourced companies operating in Manoa come from the region.

2.2.8 Workers' Rights

The relevant laws and regulations that protect workers' rights in Brazil, as well as the international agreements ratified by Brazil on labor issues, are listed below.

Federal legislation and regulations

Decree-Law No. 5,452, of May 1, 1943: Approves the Consolidation of Labor Laws.

Law 6.514, of December 22, 1977: Amends Chapter V of Title II of the Consolidation of Labor Laws, relating to occupational safety and medicine, and makes other provisions.

With regard to labor rights, the organization complies with the following international agreements:

International Labor Organization Convention No. 29 of 1930, ratified by Brazil on April 25, 1957: Provides for the abolition of forced labor.

International Labor Organization Convention No. 87 of 1940: Provides for freedom of association.

International Labor Organization Convention No. 97 of 1949, ratified by Brazil on June 18, 1965: Provides for migrant workers.

International Labor Organization Convention No. 98 of 1949, ratified by Brazil on 18/11/1952: provides for the right to unionization and collective negotiation.

International Labor Organization Convention No. 100 of 1951, ratified by Brazil on April 25, 1957: Provides for equal pay for men and women.

International Labor Organization Convention No. 105, ratified by Brazil on June 18, 1965: Provides for the abolition of forced labor.

International Labor Organization Convention No. 111 of 1958, ratified by Brazil on March 1, 1965: Provides for discrimination in respect of employment and occupation.

International Labor Organization Convention No. 131 of 1970, ratified by Brazil on May 4, 1983: Provides for the fixation of minimum wages, especially in developing countries.

International Labor Organization Convention No. 138 of 1973, ratified by Brazil on 28/06/2001: Provides for the minimum age for admission.

International Labor Organization Convention No. 142 of 1975, ratified by Brazil on 24/11/1981: Provides for the development of human resources.

International Labor Organization Convention No. 143 of 1975: Provides for immigration under abusive conditions and the promotion of equal opportunities for migrant workers.

International Labor Organization Convention No. 155 of 1981, ratified by Brazil on May 18, 1992: Provides for the safety and health of workers.

International Labor Organization Convention No. 169 of 1989, ratified by Brazil on July 25, 2002: Provides for indigenous and tribal rights.

International Labor Organization Convention No. 182, ratified by Brazil on 02/02/2000: Provides for the prohibition of the worst forms of child labor and immediate action for their elimination.

In addition, all national labor legislation is duly complied with. Manoa also has FSC and PEFC forestry certifications, which undergo annual third-party audits to ensure compliance with all legal requirements relating to labor aspects.

In the area where the project is located, an internal procedure (General Procedures Manual) is applied, which, among other things, deals with labor procedures and the hiring of third parties.

As far as labor procedures are concerned, this document establishes that the company must keep digital and analog files in its office containing proof of the legality of its own and outsourced workers. These files must include the registration book, payslips, occupational health certificates (ASO), proof of payment of

fees, taxes and charges, as well as records of labor agreements between own and/or outsourced employees, and proof of delivery of Personal Protective Equipment (PPE) and periodic examinations, among others.

As far as the procedure for hiring third parties is concerned, at the time of hiring, at least one certified copy of the articles of incorporation and any amendments thereto is required, proof of employee registration, proof of tax compliance (CNPJ, federal tax clearance certificate, federal and municipal tax clearance certificate, etc.) and mandatory medical examinations, as well as other information with the same requirements as for own employees.

During the training sessions held every year, before the harvest period, the company disseminates knowledge about labor rules and rights to its own employees and third parties, making workers aware of their rights.

2.2.9 Occupational Safety Assessment

Health and safety at work is an aspect considered to be of great importance by Manoa and is part of the project's day-to-day activities. For this reason, the company complies with the Occupational Health Medical Control Program (PCMSO), carrying out medical evaluations on each employee on admission, annually, on the employee's return to work, on leave of more than 30 days, and on dismissal. It also complies with the Environmental Risk Prevention Program - PPRA, which monitors and proposes measures to reduce the risks arising from each work activity.

In addition to the above-mentioned documents, which are drawn up by occupational physicians and occupational safety technicians in accordance with the general procedures manual, the risks of the activity and the actions needed to avoid them are also addressed.

The document describes the safety equipment that must be used for each job (PPE), procedures for carrying out each activity properly and safely, instructions on the proper disposal of waste, hygiene measures and more.

Despite the use of PPE and various techniques that improve worker safety, forest management is an activity that poses risks to health and safety, especially in the cutting area, loading yard, concentration yard and supply area. Therefore, the annual training sessions are of great importance for employees to absorb the necessary precautions. In addition, checks are made on the implementation of these practices in the field through internal audits carried out every six months, which ensure that the actions are carried out within the established deadlines. It is worth noting that all these training and internal auditing activities include both the company's own and outsourced employees.

2.2.10 Feedback and Grievance Redress Procedure

Manoa has a communication procedure that it uses daily to guide the way in which it establishes relationships with the players around the farm and its employees. The project uses this procedure and intends to improve it over the course of its existence. Up to now, there have been no conflicts or disputes

related to the project's activities. However, consultation and communication with these players makes it possible to discuss the progress of the activities carried out, whether in the form of complaints or suggestions.

As indicated in section 2.3.4, there are no traditional peoples and communities in the project area, and there have been no conflicts related to project activities to date. However, if there are any problems along these lines, the traditional conflict resolution methods used by local stakeholders will be respected and, where applicable, integrated into the process. This approach includes informal conversations and in-person meetings to directly address grievances, honoring cultural and local preferences for handling issues or disagreements. The Manoa REDD+ Project ensures that communities may choose these methods, offering informal and locally adapted alternatives before resorting to formal mediation and arbitration stages, if necessary.

The contact with the actors takes place on three fronts: application of a questionnaire to survey the positive and negative impacts, provision of the ombudsman channel and development of the suggestion box (all described in section 2.2.4). These channels are monitored by the Finance Manager and, as of 2023, have been recorded in a spreadsheet for follow-up.

Through these mechanisms, it is possible for stakeholders to influence in the implementation of the project's activities, adopting, where appropriate, any suggestions for improvement or innovation, and taking corrective or compensatory measures in cases of complaints and damages.

Regarding courses, training or actions carried out with schools and associations in the region, criticism and suggestions are collected through e-mails and/or suggestions made in person after the action has taken place.

Although the official communication channel is the ombudsman, verbal complaints or those made by other means are also considered and duly addressed according to their significance, as described in section 2.2.4 and Figure 6. The procedure also describes how Manoa employees return the result of the complaint and/or request to the stakeholder concerned according to the particularities of each case, always seeking the most appropriate form of communication for the interested parties (be it email, telephone, meeting in person or other).

2.2.11 Feedback and Grievance Redress Procedure Accessibility

Some of the ways in which stakeholders can make complaints are via email and telephone. These contacts are made available on signs at the farm's entrance, in calendars distributed annually, on the company's website, among other places.

In addition, questionnaires are administered annually to some of the stakeholders so that they can express their opinions and concerns, and there is a suggestions and complaints box located near the cafeteria, providing an easily accessible place for Manoa's employees to send feedback (see section 2.2.4). Manoa's constant presence in the region also allows for more informal contact, such as face-to-face conversations.

In this way, all stakeholders can communicate with the company, guaranteeing an efficient channel for dialog and the resolution of relevant issues. The way in which criticism and suggestions are responded to

varies according to the channel used for communication and the characteristics of the stakeholder in question (section 2.2.4), and can be via email, a face-to-face meeting, a wall in a common area, among others. In addition, the project relies on the dissemination of information via social networks, detailed in section 2.2.12.

2.2.12 Stakeholder Access to Project Documentation

The documents related to the validation and verification of the Manoa REDD+ Project are available by virtual means on the Verra[17] registration platform for stakeholder consultation. The link to Manoa REDD+ Project in the Verra Registry is available at Biofilica Ambipar website[18], where details of the project results are also described.

Furthermore, news and updates about the project are published in the Biofilica Newsletter via blog[19] and social media (Instagram[20] and LinkedIn[21]). The results obtained and audit results are also disseminated on these platforms to stakeholders. In addition, Manoa has a profile on Instagram[22] (Figure 7), managed by Grupo Triângulo, which focuses mainly on reaching the public in the project region, to disseminate information about the REDD+ project, sustainable management, biodiversity, and carbon credits.

Figure 7. Manoa's Instagram focused on sustainable management, biodiversity and carbon credits, with emphasis on the direct posting about the Manoa REDD+ Project.

[17] Manoa REDD+ Project at Verra registry. Available at: https://registry.verra.org/app/projectDetail/VCS/1571. Access on: July 11, 2023.
[18] Biofilica Ambipar website. Available at: https://www.biofilica.com.br/projeto-redd-manoa/. Access on: July 12, 2023.
[19] Biofilica Ambipar blog. Available at: https://www.biofilica.com.br/blog/. Access on: July 12, 2023.
[20] Biofilica Ambipar Instagram. Available at: https://www.instagram.com/biofilica_br/. Access on: July 12, 2023.
[21] Biofilica Ambipar Linkedin. Available at: https://www.linkedin.com/company/biofilicabr. Access on: July 12, 2023.
[22] Manoa Instagram. Available at: https://www.instagram.com/manoaeco/?igshid=MTI1ZDU5ODQ3Yw%3D%3D. Access on: July 12, 2023.

Another example of dissemination related to the Manoa REDD+ Project is the distribution of a catalog with information about the project (Figure 8) to participants who visit the Manoa Farm for training sessions and to neighbors that answer the questionnaires detailed in section 2.2.4.

Figure 8. Cover of catalog containing information about the Manoa REDD+ Project.

2.2.13 Information to Stakeholders on Assessment Process

The measures and methods of communication to inform stakeholders about the processes of the SD VISta project, including audit visits, is partially described in item 2.2.12. In addition to what was previously described, in the period prior to the field audit, public institutions and social organizations mapped are visited and a summary of the project, communication channels and other relevant information is delivered. For Manoa's employees, a presentation is made about the project in which information regarding the audit visit is also given.

On August 7, 2023, for example, a meeting was held with Manoa employees in which they explained the importance of the project forest, what a REDD+ project is, which SDGs the Manoa REDD+ Project contributes to, the impacts of the project, who is benefitted by the project, the month in which the SDVISta standard audit will take place and what the standard is (Figure 9). They also explained how the validation and verification processes work.

Figure 9. Presentation of the Manoa REDD+ Project to farm employees on August 7, 2023.

The communication process to interested parties about the SD VISta audit took place on October 3, 2023 at CEFLOMFigure 10). The presentation was led by Manoa employees and covered explanations about the SD VISta standard, the UN agenda, and its Sustainable Development Goals (SDGs), the steps to be followed to obtain the seal, the validation and verification process, as well as its operation, the expected date for carrying out the audit (November/2023), among other information. This process was extremely important to ensure that everyone involved is fully informed about the presence of the auditors and the activities that will be carried out during the audit.

Figure 10 Presentation about the SD VISta audit to farm employees on October 3, 2023.

2.3 Project Management

2.3.1 Avoidance of Corruption

Biofílica Ambipar Environment has a legal team responsible for implementing and monitoring the good practices set out in the "Ambipar Group Code of Conduct and Compliance", especially the "Anti-Money Laundering Policy", which is perfectly in line with the Brazilian Anti-Corruption Law (Law no. 12. 846/13), Law no. 9613/98 (Money Laundering Act) and the International Anti-Corruption Conventions (UN, OECD, Transnational Anti-money Laundering Act). 846/13), with Law No. 9613/98 (Money Laundering Law) as well as with the International Anti-Corruption Conventions (UN, OECD, Transnational Convention to Combat Money Laundering in the International Public Service, Merida Convention, Palermo Convention, Convention against Organized Crime); as well as observing the precepts contained in the FCPA (Foreign Corrupt Practices Act) and the UK Bribery Act.

As such, Biofíica Ambipar clearly expresses its position against the practice of acts of corruption and/or conduct aimed at personal gain to the detriment of the company, society or the government, strictly complying with national and international anti-corruption precepts, as well as the Ambipar Group's main guidelines and positions on combating money laundering, terrorist financing and all forms of corrupt conduct, such as bribery (Active and Passive Corruption), embezzlement and granting undue advantages (administrative improbity), and curbing acts of its employees that impede investigation and inspection activities. It should also be noted that Biofílica Ambipar Environment undergoes annual financial audits to ensure that its funds are used responsibly and free from corruption.

Manoa Sustentável, Exploração e Serviços Florestais Ltda, has an internal policy to ensure that all its activities and business are carried out ethically, transparently and in compliance with applicable laws and regulations, establishing guidelines to prevent corruption and combat unethical behavior. Details of this policy are available on Manoa's bulletin boards at the Cujubim office and at the farm.

Manoa's internal policy covers actions related to corruption and bribery, relationships with customers, suppliers and partners, conflicts of interest, whistleblowing and whistleblower protection and the consequences if the policy is not respected.

2.3.2 Statutory and Customary Rights

Manoa owns all the legal rights to the property in which the project area is located, and all the corresponding documentation can be shared with VVB. Furthermore, there are no disputed titles or rights within the project area.

2.3.3 Recognition of Property Rights

The project area is within private property belonging to Manoa Sustentável, Exploração e Serviços Florestais Ltda. All documentation proving the legal right to the property can be shared with VVB. There are no disputed titles or rights in the project area.

2.3.4 Free, Prior and Informed Consent

There are no traditional peoples and communities, as defined by Decree No. 6.040 of February 7, 2007, which instituted the National Policy for the Sustainable Development of Traditional Peoples and Communities, in the project area. Nearby there are only rubber tapper remnants located around the Jamari FLONA, in Itapuã do Oeste, as well as large river communities along the Madeira and Machado rivers. These communities, although located in the reference region, have no link to the project area, and therefore there are no measures or programs that can be indicated to these populations (Ecoporé, 2015).

The project area belongs to one of the proponents, Manoa Sustentável, Exploração e Serviços Florestais Ltda, and all the corresponding documentation can be shared with the VVB. The project has not affected and will not affect the property rights of any of those involved or interested, so this section does not apply.

2.3.5 Restitution and/or Compensation for Affected Resources

There is no community or person who resides within the project area or who depends on resources from the project area directly, therefore the project has not and will not negatively affect any party and no allocation or restitution is required, which makes this section not applicable.

2.3.6 Property Rights Removal/Relocation of Property Rights Holders

Manoa holds the right to use the farm, since it is private property, which has all the documentation proving its ownership. As identified in the socio-economic diagnosis, there is no population that inhabits or depends on the Manoa REDD+ project area for their subsistence, culture, or livelihoods. There has been no removal or relocation of property rights holders, making this section inapplicable.

2.3.7 Identification of Illegal Activities

The only illegal activity that could affect the project's impact is deforestation. In order to curb illegal deforestation in the project area, surveillance patrols are carried out, satellite images are analyzed to monitor deforestation around the project area (one analysis is carried out annually and another monthly during the dry season), there is constant monitoring of hotspots that may indicate forest fires around and inside the project area, and a good relationship is maintained with the surrounding residents.

Property surveillance is directly linked to the monitoring of unplanned deforestation. It aims to maintain the integrity of the Project Area, keeping potential deforestation agents away, avoiding the entry of encroachers and adding to the monitoring of unplanned deforestation when it is not possible to prevent these illegal activities. The activity is carried out by the Manoa Farm’s employees adopting a strategy to have the "surprise effect", that is, there is not a defined frequency and time of patrols so that the encroachers do not identify a pattern in the inspection action. In case wood theft or invasion is detected, the employees are

trained to immediately report the occurrence to the forest manager, who will call the responsible public agencies so that legal measures can be taken.

As a process of improvement and control arising from REDD+ activities in the project, as of July 2020 the patrols started to be recorded by means of standardized forms. Thus, surveillance patrols take place with a team of 2 to 3 people (ideally 3) and priority is given to areas with the highest deforestation pressure. At the field, the team registers the activity with photos, GPS points (tracking) and all possible information about any illegal activities, always adopting the "good neighbor policy".

Manoa's good relationship with the surroundings and the constant presence of the surveillance team in the areas of greatest pressure helps contain the entry of encroachers in the area. In some cases, the intruders themselves act in the “maintenance” of the property, when they identify and stop, among themselves, the action of other potential agents of deforestation, in such a way to maintain the good relationship with Manoa Farm. Once the field activity is concluded, the forest manager writes the form with the description of what was done and, afterwards, the form is signed by the team who performed the activity, confirming the information, finally, the data is sent to Biofílica (in São Paulo) to to consolidate and organize in the project database.

2.3.8 Ongoing Conflicts or Disputes

The company has not been involved in any disputes over land rights or the use of its resources in the last 20 years.

2.3.9 National and Local Laws and Regulations

The objective of the REDD+ Manoa Project is in line with the Federal Constitution, as well as current legislation protecting the native forest and the climate change regime established in international regulations (UNFCCC) and in the National Policy on Climate Change (Law 12.187). In addition, it recently (August 9, 2023) adopted the Belém Declaration, drawn up by the Amazon Cooperation Treaty Organization (ACTO), which has as its main objective sustainable development, conservation and sustainable use of biodiversity, forests and water, to avoid the point of no return in the Amazon, the fight against deforestation and illegal activities in the region, economic development with social inclusion and the generation of income and employment, based on mechanisms for social participation, especially of indigenous peoples and local and traditional communities, and the strengthening of ACTO.

The project complies with all current national, state and international legislation. As the project takes place in a private area and involves forest management, it responds mainly to legislation related to land issues and the Brazilian Forest Code. The main laws and decrees that regulate the project's activities are listed and detailed below.

Legislation: Brazilian Federal Constitution of 1988: Defines and regulates how laws should be created in the country, how the 3 powers (Executive, Legislative and Judiciary) should work and the bodies that act in conjunction with them. The Constitution's fundamental principles are:

I - the sovereignty;

II - the citizenship;

III - the dignity of the human person;

IV - the social values of work and free enterprise;

V - the political pluralism;

Applicability to the project: Regulates and directs all national legislation that influences the project.

Theme: Land regulation

Related legislation:

Law 601/1850 – Lands Tenure Law: Provides for vacant lands in the Empire, and about those that are owned by title of allotment without fulfilling the legal conditions, as well as by simple title of quiet and peaceful possession; and determines that, having measured and demarcated the former, they should be ceded for a valuable consideration, both to private companies and for the establishment of colonies of nationals and foreigners, the government being authorized to promote foreign colonization in the manner stated.

Law 4.504/1964 - Land Statute: Provides for the land statute and other measures. This law regulates the rights and obligations concerning rural real estate, for the purposes of implementing Agrarian Reform and promoting Agricultural Policy.

Law 9.393/1996 - ITR Law - Tax on Rural Territorial Property: Provides for the ITR Tax, payment of the debt represented by Agrarian Debt Bonds and other provisions.

Law 10.406/2002 - Brazilian Civil Code - About rights and duties in private life, people, property and legal facts. Divided into two parts, (1) General Part, referring to people, property and legal facts and (2) Special Part, referring to the law of obligations, companies, things, family and successions.

Applicability to the project: The project complies with the laws listed, which guarantees the right to the property that includes the Project Area and regularity with taxes related to rural properties.

Theme: Environment

Related legislation:

Law 12.651/2012 - Brazilian Forest Code: Establishes general rules on the protection of vegetation, Permanent Preservation Areas and Legal Reserve areas; forest exploitation, the supply of forest raw materials, the control of the origin of forest products and the control and prevention of forest fires, and provides for economic and financial instruments to achieve its objectives.

Law 9.605/1998 - Federal Law on Environmental Crimes: Provides for criminal and administrative sanctions arising from conduct and activities harmful to the environment, and makes other provisions.

MMA Ordinance No. 148, of June 7, 2022 - Recognizes the following official lists: "Official National List of Endangered Flora Species", "Official List of Endangered Brazilian Fauna Species" and "Official List of Extinct Brazilian Fauna Species".

Law 7.347/1985 - Law on Public Civil Action: Regulates public civil action for liability for damage caused to the environment, the consumer, goods and rights of artistic, aesthetic, historical, touristic value and makes other provisions.

Applicability to the project: The project area includes Permanent Preservation Areas, Legal Reserve areas, and endangered species of Brazilian fauna and flora, which leaves the owners of the area susceptible to the consequences of the law if they fail to fulfill their responsibilities. Throughout its duration, the project has always complied with the law, without receiving any penalties or fines.

Theme: Forest Management

Related legislation:

Conama Resolution 406/2009 - Establishes technical parameters to be adopted in the preparation, presentation, technical evaluation and execution of a Sustainable Forest Management Plan - PMFS for timber purposes, for native forests and their succession forms in the Amazon biome.

Federal Decree 5.975 and related laws - Regulates articles 12, final part, 15, 16, 19, 20 and 21 of Law 4.771, of September 15, 1965, article 4, item III, of Law 6.938, of August 31, 1981, article 2 of Law 10.650, of April 16, 2003, amends and adds provisions to Decrees 6.514/08 and 3.420/00, and makes other provisions. It regulates issues related to the Sustainable Forest Management Plan, suppression and clear-cutting of forests and successor formations, use of forest raw materials, licenses for transporting native forest products and subproducts, among others.

Ordinance GAB/SEDAM No. 039/2010 - Establishes the procedures and criteria, within the scope of the Secretary of Environmental Development - SEDAM, necessary for the technical analysis of requests for services available in the DOF System, carried out at the Environmental Protection Coordination Office - COPAM, to regulate the procedure that guarantees the order of control over operations of products and subproducts originating from forest management within and outside the State, as well as to curb the commercialization of products and subproducts of illegal origin, which shall come into force with the following wording.

Applicability to the project: As it includes sustainable forest management activities, the project must comply with the laws relating to this practice (in addition to those already listed under "environment"). The management carried out at Manoa has always complied with the legislation and is FSC and PEFC certified.

2.3.10 Project Ownership

The project area is characterized as **private property belonging to Manoa Sustentável Extração e Serviços Florestais Ltda**. The ownership and use rights are demonstrated through the following documents:

- Final title of lands, about 74,038.74 hectares in the municipality of Cujubim, State of Rondônia;
- Certificate of Rural Property Registration - CCIR;
- Certificate of Full Content;
- 20-Year History Certificate;
- Domain Recognition Title;
- Rural Environmental Register (CAR);
- Clearance certificate of embargo from IBAMA;

Additional documentary research concludes that the property is in order and there are no encumbrances, onus, or limitations on the full use of the property, nor are there any obstacles to the realization of the Manoa REDD+ Project, such as blockades, liens, mortgages, seizures or land disputes. Proof of this legitimacy can also be seen by obtaining the FSC and PEFC certification stamps, which attest to the legality of the project, as explained above.

As mentioned in section 2.3.8, there are no records of disputes with third parties over ownership of the property or disputes over access to natural resources or use of the property, and Fazenda Manoa has a good relationship with the surrounding populations.

2.3.11 Grouped Projects

The Manoa REDD+ Project is not a grouped project and therefore this section does not apply.

3 BENEFITS FOR PEOPLE AND PROSPERITY

3.1 Condition of Stakeholders at Project Start

The first socio-economic and environmental diagnosis was carried out by the Environmental Association, Ação Ecológica Guaporé-Ecoporé in 2014. This assessment was conducted in alignment with the VCS and CCB premises during the project's development and has served as a foundation since then. It is important to highlight that, at the start of project monitoring under the SD VISta guidelines, no new studies were conducted, as these are scheduled to take place once the Carbon Project reaches 10 years, in 2023. Considering that no significant changes have occurred in the social contexts or vulnerabilities of the region, this content remains an accurate reflection of the reality in which the project is embedded.

As mentioned earlier, the methodology chosen to analyze the socio-economic situation considered a combination of data obtained from municipal administrations, government departments and field research in Cujubim, as well as secondary data. Questionnaires were also applied, targeting three groups: rural residents, urban residents and farm workers, creating the basis for the analyses carried out.

The questions in the questionnaires were both closed and open to capture subjective nuances. The number of questionnaires applied refers to the sampling effort obtained in the time allocated to the field survey, during which the following activities were carried out: Interviews with residents of the urban perimeter of Cujubim and the rural area and with workers at the Manoa farm; in addition, during this period the researchers' perceptions of the situation in the municipality were obtained and it was also possible to contact the municipal administration departments, with which open-ended interviews were carried out and recorded on audio recordings with the authorization of the interviewees.

According to the information contained in Ecoporé's diagnosis, secondary data was obtained from public information on official websites, as well as by requesting it through official letters from state public bodies in the various socio-economic areas.

It is also worth noting that the project area is bordered by an adjoining private property, with controlled access. The diagnosis confirms that it is not home to traditional communities such as extractivist populations, indigenous peoples, rubber tappers, riverine communities, fishermen and quilombolas. In addition, there are no dependent communities, or those with close relationships and direct links to the project area, whether for subsistence or any other activity.

Historical and socio-economic context:

Until the middle of the 20th century, the Cujubim municipality was populated by various indigenous ethnic groups who disputed the territory, mainly through hunting and fishing. However, it is not certain how many ethnic groups inhabited the area of the current municipality, although the presence of the Arikem, Boca-Negras, among others, has been pointed out.

Historiography and other studies show that at the end of the 19th century and the beginning of the 20th century, the indigenous people went through a process of drastic changes in their way of life, resulting in ethnocide. The extraction of rubber (*Hevea brasiliensis*) to meet the needs of the wars led to the insertion of capitalism and provided rubber tappers and traders in general with great wealth.

Therefore, in the region, the presence of the northeastern worker in the rubber plantations and the explorers of unknown territories and rivers inevitably led to the "meeting of societies" with different values and a series of clashes resulted in the loss of indigenous territories.

In this tragic scenario, indigenous people and rubber tappers were victims of the process of occupation in the Amazon. The indigenous were forced out of their territories and suffered ethnocide, while the rubber tappers faced poverty, slavery, loneliness and death.

The 1950s were a new milestone for the region, in terms of population growth, as the entry of mining, with the extraction of cassiterite in Ariquemes and the Machadinho River Valley, attracted new social actors.

From the 1970s onwards, with the improvement of access to the region, especially via the BR-364 highway, the official colonization of the state began, first in the Ariquemes region with the installation of two INCRA Directed Settlement Projects (PADs) "Marechal Dutra" and "Burareiro", and then in the following decade the Cujubim Settlement Project (PA) was set up, which gave rise to the municipality. In the 1980s, with the creation of the Machadinho, Cujubim and Buritis Settlement Projects, all the municipalities in this Territory derived from these INCRA colonization and settlement projects, with the exception of Campo Novo de Rondônia, which originated from the exploitation of cassiterite, starting in the 1950s (TEIXEIRA & OLIVEIRA, 2001 apud SANTOS, 2014[23]).

The PADs and PAs clearly reflect the policy of occupying the Amazon, as a geopolitical strategy adopted by the Brazilian state, which in this case provided the region with some of the infrastructure that led to the creation of these municipalities. At the same time as the state's actions, the logging industry contributed significantly and was directly responsible for the expansion of deforestation, while at the same time offering "jobs" to a section of the population that was unemployed and lacked skilled labor.

Cujubim has a territorial area of 3,864.07 km² (IBGE/2010), bordered to the north by the municipality of Porto Velho, to the south by Rio Crespo, to the east by Machadinho d'Oeste and to the west by Itapuã do Oeste. It originated as the Urban Nucleus of Rural Support (NUAR) of the Cujubim Settlement Project and adopted the same name as the project. It has a density of 4.10 inhabitants/km² (IBGE/2010), and was created by State Law 568 of 22.06.1994, signed by Governor Oswaldo Piana Filho, with the areas of Rio Crespo and Itapuã do Oeste.

Cujubim is economically sustained by agriculture, livestock farming and the timber industry. Currently, the main providers of raw materials for the timber industry are the Jamari National Forest and the MANOA Farm, which covers the municipality's land area and is certified as having forest origin due to sustainable forest management plans.

[23] DOS SANTOS, Vanubia Sampaio. O PROCESSO DE OCUPAÇÃO DE RONDÔNIA E O IMPACTO SOBRE AS CULTURAS INDÍGENAS. **Revista Fórum Identidades**, 2015.

In recent years, the timber sector has been going through a major crisis as a result of the reduction in stocks of wood available in private forests, as well as the enforcement action of public bodies that restrict illegal predatory activity in the industries and consequently the closure of companies and the laying off of workers.

In addition, there was an advance of commodities in northern Rondônia, validated by the substitution of pastures, land leasing, and the high price of the hectare of agricultural land (SILVA and MICHALSKI, 2020[24]). This point has been reflected since 2016, when Embrapa recorded a 70%[25] increase in soybean planting in the nine municipalities that make up the Jamari Valley. According to data collected by the National Supply Company (Conab[26]) soybeans are the main agricultural product of the state of Rondônia, and the Jamari Valley region, in particular, attracts many producers by the favorable prices of their land in the market, in addition to the proximity to the capital's port. More recent data, by IBGE, shows a 50%[27] increase of soybean planting from 2019 to 2020 just in Cujubim. Furthermore, the soybean production value in Cujubim had around 149%[28] increase from 2019 to 2021, exhibiting a high financial encouragement to produce this grain.

Characteristics of stakeholders

For the socio-economic study of the project region, the reference region was taken as a sample (the limit defined by the VCS-VM0015 methodology, in which the project was validated in terms of climate), which includes the municipality of Cujubim and partially the territories of the municipalities of Itapuã do Oeste, Candeias do Jamari and Porto Velho. However, only in the municipality of Cujubim was primary data obtained, while in the other three municipalities the data obtained was secondary.

In addition to the relations mentioned above, it should be noted that:

a) access to the area occurs from Cujubim;

b) the area is adjacent to Conservation Units in several parts of its boundaries;

c) the land reform settlements (considered vectors of deforestation) are located on the area between Cujubim and Fazenda Manoa;

d) the remaining areas are forested from the period, privately owned and used for management plans;

[24] Caminho do Norte: cartography of the territorial impacts of agribusiness in Rondônia (western Amazonia). DOI: https://doi.org/10.4000/confins.28017.

[25] G1. Globo. 2017. Available at < http://g1.globo.com/ro/ariquemes-e-vale-do-jamari/noticia/2017/02/plantio-da-soja-aumentou-mais-de-70-no-vale-do-jamari-em-ro.html > Access on: September 30, 2021.

[26] G1. Globo. 2017. Available at < http://g1.globo.com/ro/ariquemes-e-vale-do-jamari/noticia/2017/02/plantio-da-soja-aumentou-mais-de-70-no-vale-do-jamari-em-ro.html > Access on: September 30, 2021.

[27] IBGE tables downloaded from https://www.ibge.gov.br/estatisticas/economicas/agricultura-e-pecuaria/9117-producao-agricola-municipal-culturas-temporarias-e-permanentes.html?=&t=resultados and https://www.ibge.gov.br/estatisticas/economicas/agricultura-e-pecuaria/9107-producao-da-pecuaria-municipal.html?edicao=29151&t=resultados> accessed 03/06/2023. See folder “tables-activities-agro-ibge” for original data and file “tabelas-atividades-agro-ibge.xlsx” for values cited here.

[28] Same as note 4.

e) areas known as "old rubber soldiers' titles" are located in the municipality of Cujubim and are used for forest management;

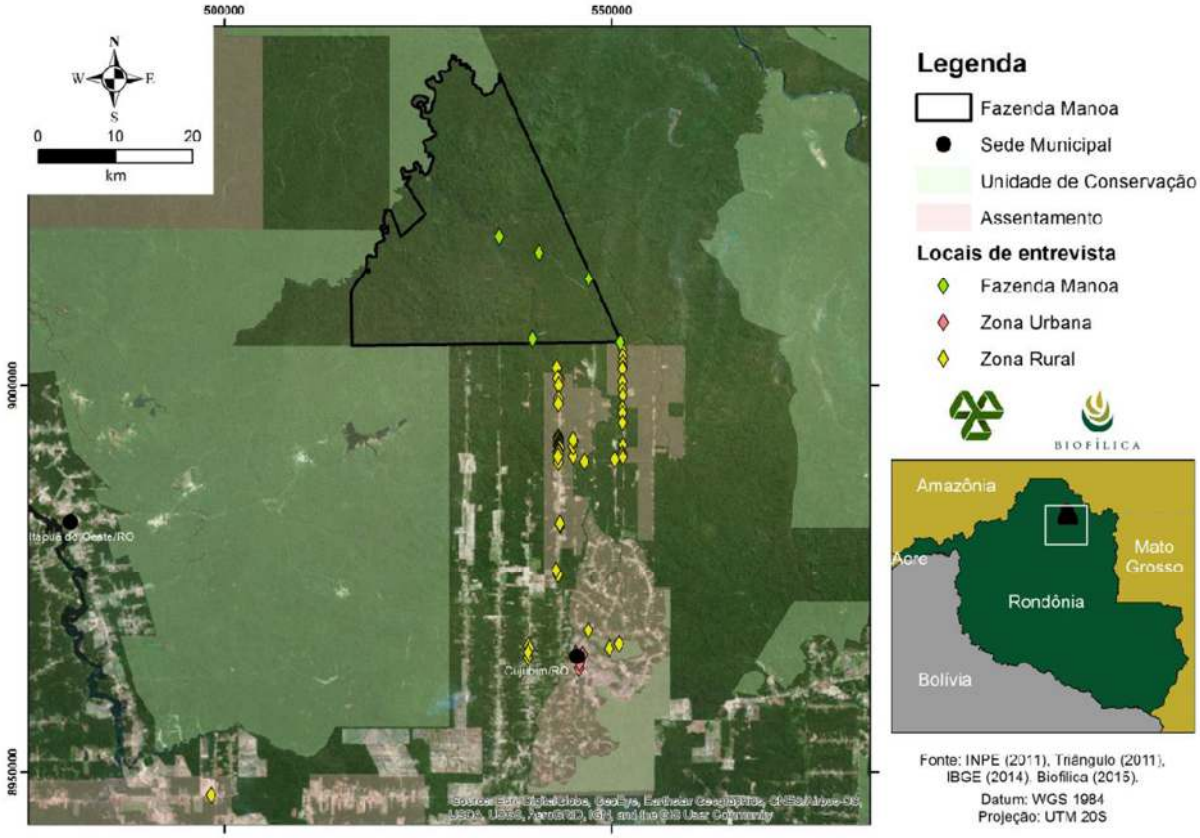


Figure 11. Location of the interview points carried out by the socio-economic study. Source: PD Manoa REDD+ Project, 2017.

The parties interviewed in the social study were identified as small livestock farmers, farmers and squatters in rural areas, employees of the Manoa farm, and in urban areas, representatives of the local population and public institutions such as the Cujubim Municipal Education Department (SEMEC). The questionnaires were administered during fieldwork carried out between October 8 and 17, 2014, with a total of 27 families interviewed in rural areas.

Educational Aspects

In the rural area of Cujubim, according to the 2013 school census, there were 838 enrolments, all in municipal schools (**Table *5***). Only students attending rural schools have access to transportation. There is no school transport for students who need to go to the urban center to study.

Table 5 Enrollment in rural schools in Cujubim in 2013. Source: INEP, School Census 2013.

EMEF Cujubim Rural Area/School Years	Enrollment in 2013
1st to 5th	447
6th to 9th	391
Total	838

Among the families interviewed during the fieldwork carried out in this municipality, the levels of schooling described in Figure 12 were verified. As in the urban area, there were a large number of people (52%) who had completed elementary school or part of it. It is also noticeable that 9% did not complete high school, suggesting the occurrence of school dropouts, possibly as a result of the need to attend high school in pole schools (rural) or in the urban area, requiring the use of school transportation.

The illiteracy rate is around 9%, which is the same as the Brazilian rate and slightly lower than that of the northern region, which is 10.6% (IBGE, 2010). The rate of people with complete or incomplete higher education, which did not appear in the interviews in the urban area, is noteworthy. This information should be analyzed with caution as it may not represent the reality of higher education professionals in Cujubim, given that the interviews conducted were by sampling and were within the limits of error.

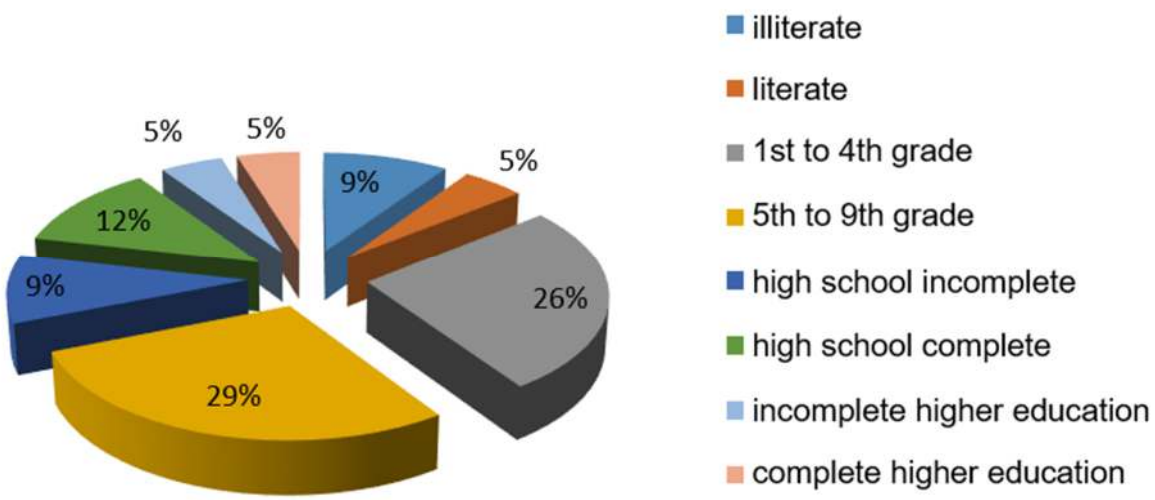


Figure 12. Levels of schooling of families in the rural area of Cujubim/RO.

Health aspects

The presence of sawmills in the city, the municipality's main economic activity, ends up having a direct influence on the health of its inhabitants, especially in the urban area of Cujubim. Sawmill waste is used as raw material for charcoal factories (Figure 13), which release smoke, contributing to the presence of respiratory diseases. This was reported by the Municipal Health Secretary when she was interviewed.

Figure 13. Charcoal located in the municipality of Cujubim/RO

As for household sanitation, Cujubim does not have a sewage treatment system and in rural areas the use of rudimentary cesspits and in urban areas the use of septic tanks prevailed (Figure 14). In both cases, this is a worrying issue in terms of health, because according to the CAERD official interviewed, the contamination of rivers and wells due to the use of cesspits can occur if they are not more than 600 meters away from the cesspit. According to this official, in the urban area, contamination of wells occurs in all homes that use them.

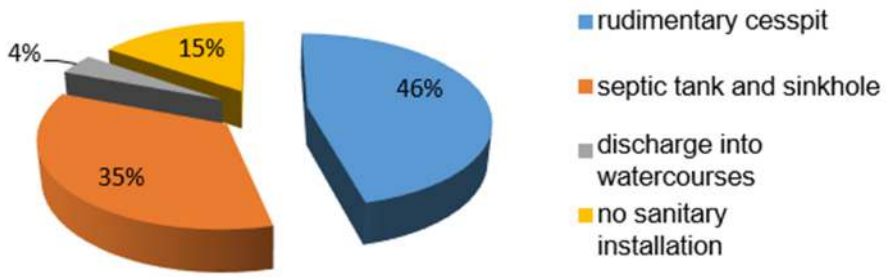


Figure 14. Sanitary Facility in Rural Area of Cujubim/RO

With regard to access to health services, dissatisfaction was found on the part of the population (Figure 15). Part of this is due to the existence of only one UBS (Basic Health Unit), which is insufficient to assist the entire population living in the rural and urban areas of the municipality.

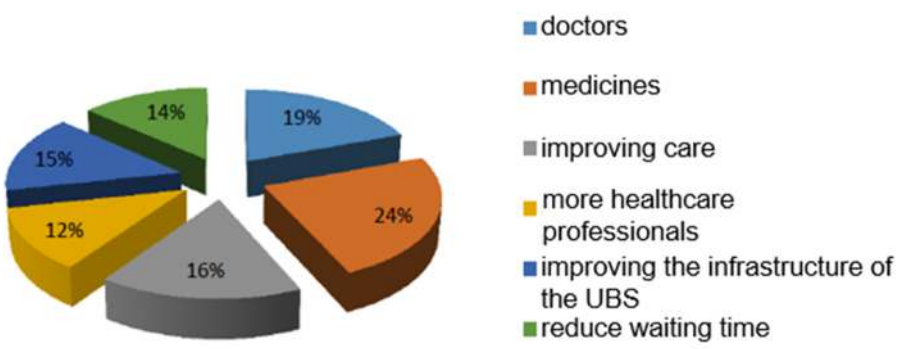


Figure 15. Municipal UBS needs pointed out by interviewees from the Rural Area

These graphs point to similar perceptions of the needs of the Basic Health Unit in the municipality of Cujubim. It was the same UBS because both the urban and rural populations of the municipality are assisted by the UBS located in the seat of the municipality, the urban area. This makes access to care especially difficult for families in rural areas, who often find it difficult to get to the urban center.

With regard to diagnosis of diseases, information from the official who feeds the SINAN - Information System for Diseases and Notification, demonstrated that the rate of cases of Leishmaniasis is worrying in the municipality, but none of the interviewees in urban or rural areas said they knew of any cases in the family. This official also reported a high incidence of Hepatitis, Leprosy and Syphilis, diseases that were also not mentioned and/or appeared in few interviews. The most common diseases reported by the interviewees were malaria and dengue fever. Another reason for coming to the UBS, which was described as very frequent by the official, were cases of accidents at work related to activities in the sawmills. These cases were also not mentioned by the people interviewed in the rural and urban areas.

Another important issue raised by the Cujubim health department official is that the biggest cause of death among inhabitants is homicide. This is an issue related to public safety and the provision of other social services, but this data ends up being computed by the health department, in view of admissions to the emergency room. Another problem pointed out was the high number of cases of abuse against minors, practiced mainly by the children's guardians, a fact also pointed out by the guardianship council during an interview.

Chemical dependency is a health problem, but because there are no CAPS (Psychosocial Care Center) in the municipality of Cujubim, cases are treated in Ariquemes, and there is no record of how many addicts living in Cujubim have been treated in this other municipality.

Gender-related characteristics

Women currently constitute a workforce working in services that were previously classified as exclusively male. In the context of urban households, the field research showed that women were heads of household and contributed to the household's monthly income, but in more than 50% of the interviews it was found that their income was less than R$1,000.00/month (Figure 16).

In the case of women's work in the rural area of the municipality of Cujubim, the majority of those interviewed said that women did not participate in the family's income. It is possible to think that in this context, although women often carry out various activities in the agricultural production phases, their labor is not accounted for and paid for. However, it is not possible to delve deeper into these discussions, as it would take more time in the field for the researchers to perceive some nuances of social life that do not immediately emerge from the interpretation of the questionnaires.

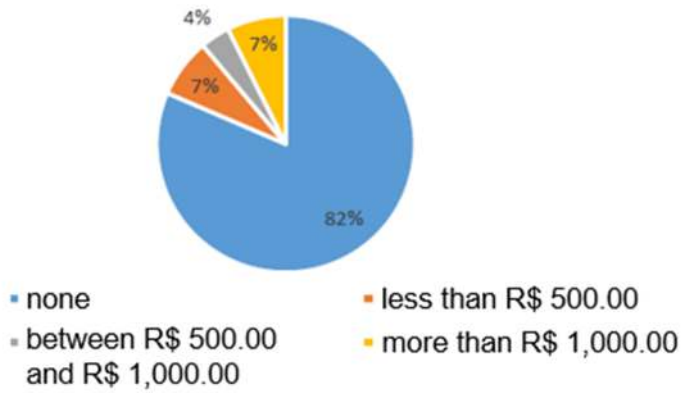


Figure 16. Women's contribution to the annual income of the rural property in Cujubim/RO.

Economic characteristics

In terms of rural income, it was difficult to quantify it on an annual basis, due to the lack of control over production on the part of the producers. For example, the sale of coffee, which is done when the product is still green, because the producers interviewed said they were unable to dry the coffee or wait for the price to go up, pointing to a lack of infrastructure for the activity, so they were unable to control how much was harvested and what the sale price was.

Figure 17 shows the income of the people interviewed. It should be noted that the income of the rural area was obtained taking into account only the annual production data of the property. In the case of the rural caretakers interviewed, there were cases in which they were unable to provide information on the annual income of the property or did not want to answer.

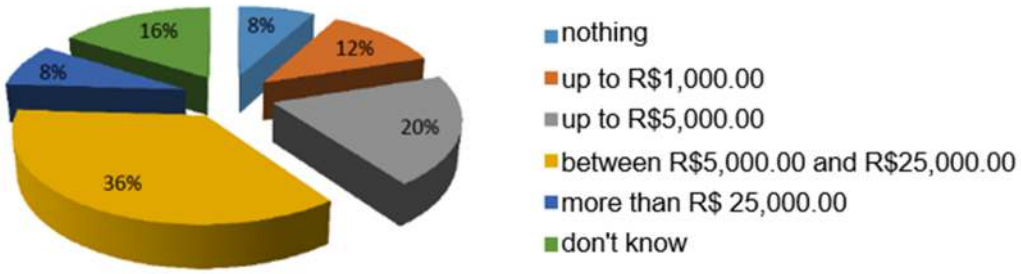


Figure 17. Average annual income of residents in the rural area of Cujubim/RO. Source: Ecoporé, 2014.

The sawmills scattered throughout the urban area of Cujubim represent the municipality's main economic activity and process the logs. According to the IBGE (2013), the production of wood in cubic metric logs was 354,418 (Table 6) making it the third largest in the state of Rondônia, behind only Porto Velho and Candeias do Jamari, both municipalities located in the project's reference region. The total amount in the region is 2,275,439 m3, which corresponds to 57% of the total extracted in the entire state of Rondônia. On the other hand, Cujubim has been identified as an illegal logger, and was the target of Operation Arco de Fogo in 2008, which, according to locals, brought the town to a standstill. Cujubim's economic sources also include the public service and agriculture.

Table 6 Production of timber and logs in the municipalities of the project's reference region, the total of other municipalities in the state of Rondônia and the state's overall total.

Municipality	Cubic meters/year/2013	Participation in the reference region %	Participation in the state
Candeias do Jamari	379.380	17%	9%
Cujubim	354.418	15%	9%
Itapuã do Oeste	20.408	1%	1%
Porto Velho	1.521.233	67%	38%
Total region of reference	2.275.439	100%	57%
Other RO municipalities	1.727.865	0%	43%
General Total RO	**4.003.304**	**100%**	**100%**

Family farming for economic purposes appears timidly and only with the sale of coffee, still green, to grain merchants in the municipality of Cujubim. In other cases, subsistence farming is used, such as planting corn to feed the free-range chickens that share the space in the backyard with fruit orchards. However, conventional grain farming, especially rice and soybeans, is beginning to appear quite intensively in areas of the municipality, which according to the municipal agriculture department already exceeds 5,000 ha in area.

Looking for information on possible changes to land use, the continuation of activities already carried out, in this case dairy farming, was the most mentioned, but the cultivation of coffee, corn, bananas, manioc and fish farming appear as alternative land uses.

The indiscriminate use of fire, especially during the dry season, worries environmental authorities in Brazil and in Rondônia. In 2012, the State Secretariat for Environmental Development (SEDAM) issued the Ordinance 211 granting controlled burning and empowering SEDAM's Regional Offices to issue authorizations. The use of fire by rural producers is due to the productive activities on their properties. In the state of Rondônia, as already mentioned, authorization is required, but the Figure 18 below shows that

67% of those interviewed do not request the document and 22% did not answer, with only 11% of those interviewed saying that they request authorization for burning.

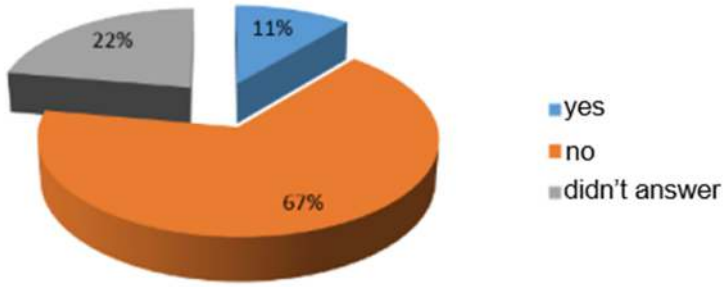


Figure 18. Percentage of interviewees who request authorization to conduct burnings on their properties in the municipality of Cujubim/RO.

Figure 19. Areas where there has been burning to clear pasture (photo on the left) and new felling using fire for clearing (photo on the right).

During fieldwork around Fazenda Manoa, the researcherssaw the presence of large farms, occupied by livestock and soybeans, as well as small properties producing milk, cocoa, coffee and subsistence farming. The above fact can be exemplified in two very clear moments found in the field, one referring to the incorporation of rural plots by farms and the other to the maintenance of family farming.

In the first case (Figure 20 and Figure 21), right after the main entrance to the Manoa farm there is a rural property owned by a businessman from the city of Machadinho do Oeste, the Bom Princípio farm, and after the entrance to this farm can be found three small houses on the side of the secondary road, which were certainly the homes of family farmers who once had their rural plots incorporated into the farm area.

Figure 20. Location of the entrance to the Manoa farm, and neighboring rural property (Bom Principio farm) and location of abandoned houses next to the farm, probably family farming plots incorporated into the farm.

Figure 21. Abandoned houses in the rural area of Cujubim, near the Manoa farm, possible rural plots of family farming incorporated into the Bom Principio farm.

In the second case, on the other two side roads that end at the Manoa farm boundary, most of the properties are small rural plots. However, the majority of those interviewed pointed to the inefficiency of public policies aimed at health, education in the countryside and technical assistance as the main causes of the abandonment and sale of rural properties, coupled with soil deficiencies and a lack of resources for investments in soil recovery and the purchase of inputs.

3.2 Expected Impacts on Stakeholders [29]

Impact #1	Development of relevant skills, including technical and professional skills, for employment, decent work and entrepreneurship (SDG Target 4.4).
Type of Impact	Positive, actual and direct.
Affected Stakeholder Group(s)	Universities and researchers from the state of Rondônia, Environmental agencies, Institutions in the municipality of Cujubim, and Manoa´s Employees.
Resulting Change in Well-being	Universities and researchers: A basis for increasing the quality and applicability of the researches carried out. Environmental agencies: Confidence to act in other contexts; Increased quality of work. Institutions in the municipality of Cujubim: Promotion of local skills and articulation between Manoa and the municipality Manoa employees: Increased quality of work and technical capacity

Impact #2	Ensuring the knowledge and skills needed to promote sustainable development (SDG Target 4.7).
Type of Impact	Positive, actual and direct.
Affected Stakeholder Group(s)	Institutions in the municipality of Cujubim.
Resulting Change in Well-being	To promote environmental education activities in order to spread environmental awareness and the knowledge and skills needed to promote sustainable development.

Impact #3	Decent Work and Economic Growth (SDG 8.0)
Type of Impact	Positive, actual and direct.

[29] The text of the SDG target is in accordance with that used on the Causal Chain

Affected Stakeholder Group(s)	Residents of Cujubim .
Resulting Change in Well-being	Increase in the number of decent jobs available locally.

Impact #4	Promoting safe and secure working environments for all workers (SDG Target 8.8)
Type of Impact	Positive, actual and indirect.
Affected Stakeholder Group(s)	Manoa´s Employees.
Resulting Change in Well-being	Avoiding the occurrence of accidents in the workplace.

Impact #5	Protection of labor rights (SDG Target 8.8)
Type of Impact	Positive, actual and direct.
Affected Stakeholder Group(s)	Manoa´s Employees.
Resulting Change in Well-being	Manoa will promote actions to ensure that all employees (own or outsourced) have access to their labor rights.

Impact #6	Sustainable management and efficient use of natural resources (SDG Target 12.2)
Type of Impact	Positive, actual and indirect.

Affected Stakeholder Group(s)	Sawmills in Cujubim.
Resulting Change in Well-being	Insertion of sawmills into a wider market and into value chains with greater added value. Supply of certified raw materials that guarantee the conservation of natural resources and social benefits.

Impact #7	Ensuring that people have relevant information and awareness for sustainable development and lifestyles in harmony with nature (SDG Target 12.8)
Type of Impact	Positive, actual and direct.
Affected Stakeholder Group(s)	Universities and researchers from the state of Rondônia.
Resulting Change in Well-being	Making resources available, incentive and making research possible.

Impact #8	Encourage and promote effective public, public-private and civil society partnerships (SDG Target 17.17).
Type of Impact	Positive, actual and direct.
Affected Stakeholder Group(s)	Universities and researchers from the state of Rondônia, Environmental agencies and institutions in the municipality of Cujubim.
Resulting Change in Well-being	Strengthening local governance

3.3 Stakeholder Monitoring Plan [30]

The project's main objectives for stakeholders include local training in issues related to sustainable economic development and the valorization of forest resources, quality of employment and the insertion of local sawmills into value and market chains. These actions are aimed at improving the quality of life of this population, social empowerment, and the dissemination of sustainable development practices in the region. It is also important for the population to understand that these activities can only take place if the forest remains standing, in other words, if it is conserved.

Regarding the labor aspect of the property, it is hoped to disseminate knowledge about labor rights and standards to its employees and collaborators, environmental education workshops and support in training specialized labor to work in the production chain of certified forest management.

Based on the Causal Chain diagrams presented in section 2.1.9, there are the following effects to be monitored with regard to stakeholders:

Indicators analyzed	Stakeholder Group Monitored	Frequency of monitoring/ reporting	SDG
Number of internal and external technical training courses carried out on low impact forest management issues Number of participants in forest management initiatives Number of institutions involved	• Manoa's employees • Environmental agencies • Universities and researchers from the state of Rondônia • Institutions in the municipality of Cujubim	Annual	SDG Target 4.4
Number of environmental education activities carried out Number of participants involved in the activities Number of Cujubim schools served	• Institutions in the municipality of Cujubim	Annual	SDG Target 4.7
Number of jobs offered locally over time	• Residents of Cujubim	Annual	SDG 8.0
Number of occupational accidents over time	• Manoa´s Employees	Annual	SDG Target 8.8

[30] The text of the SDG target is in accordance with that used on the Causal Chain

Indicators analyzed	Stakeholder Group Monitored	Frequency of monitoring/ reporting	SDG
Number of training courses on occupational health and safety and forest fire brigade			
Number of registered employees	• Manoa´s Employees	Annual	SDG Target 8.8
Number of sawmills benefited over time	• Sawmills in Cujubim	Annual	SDG Target 12.2
Number of research projects by regional educational institutions used to disseminate information about managed forest areas and REDD+ projects	• Universities and researchers from the state of Rondônia	Annual	SDG Target 12.8
Number of promoted partnerships	• Universities and researchers from the state of Rondônia • Environmental agencies • Institutions in the municipality of Cujubim	Annual	SDG Target 17.17

3.4 Net Positive Stakeholder Well-being Impacts

With the implementation of the project, it is possible that social, economic and environmental conditions will be strengthened in Cujubim, as it is believed that various initiatives can be triggered from the proposed actions, generating support for sustainable socio-economic development in the region. Among the actions, activities and programs must be considered a continuous process of capacitation and training of local actors in forest management techniques, among other possible initiatives. In addition, the project plans to work directly with schools to provide environmental education workshops. It is hoped that this will provide greater experience and technical knowledge, contributing to the development of the region.

These proposals are important tools for changing the common practice scenario in the region. The project appears to be an important opportunity for local society in terms of generating socio-economic development on a sustainable basis that makes it possible to maintain the integrity of the forests, so that it can guarantee a better quality of life for current and future generations.

The REDD+ Manoa project has the prospect of improving human relations and institutional strengthening, thereby seeking to improve the quality of life of the surrounding population. Taking these aspects into account, it is hoped that the project will contribute to several positive impacts such as:

- Direct and indirect generation of work and income;
- Development of conservation actions;
- Promotion of actions aimed at environmental education;

- Implementation of training courses focused on low-impact forest management;
- Support for local scientific development.

Regarding possible negative impacts generated by the implementation of the project, it is understood that such impacts could be triggered mainly by failures in the communication process between the social actors directly or indirectly impacted by the project. The project's communication procedures were listed in section 2.1.10 and 2.2.4, as well as the risk associated with communication failures, which could result in a lack of engagement, disbelief and conflicts between the actors involved.

The project's impacts will be assessed using the logic of the Causal Chain, as described in section 2.1.9, in other words, by monitoring the implementation of the activities proposed by the project, and the documentation of the procedures applied, results achieved and possible impacts generated in relation to each action carried out. The assessment of possible negative impacts, as well as the definition of mitigating measures, should be carried out by maintaining and strengthening the communication procedures proposed by the project in section 2.1.10 and 2.2.4 of this document.

It can be assumed that through good alignment between the parties involved in the project and the maintenance of an adequate communication procedure, a large part of the risks inherent to the implementation of the project, which would lead to negative impacts, can be properly mitigated. It is therefore hoped that by implementing appropriate measures to mitigate risks and negative impacts (which can be identified during the evaluation period of the activities carried out), the project will guarantee net positive impacts for the social groups and stakeholders directly and indirectly involved in the actions implemented during and after its duration.

4 BENEFITS FOR THE PLANET

4.1 Condition of Natural Capital and Ecosystem Services at Project Start

The studies to characterize the condition of natural capital and eco-systemic services at the start of the project were carried out by Casa da Floresta Assessoria Ambiental in 2014. Similarly to how the social information was addressed, this assessment was conducted in alignment with the VCS and CCB premises during the project's development and has served as a foundation since then. It is worth noting that, at the start of project monitoring under the SD VISta guidelines, no new studies were conducted, as these are scheduled to take place once the Carbon Project reaches 10 years, in 2023. Given that no significant changes have occurred in the region's biodiversity context, this content remains an accurate reflection of the reality in which the project is embedded.

In terms of biodiversity, the state of Rondônia has a large part of its territory located in the "Rondônia Endemism Center", considered one of the most important areas of bird endemism in South America (CRACRAFT, 1985[31]), and the region is classified as one of the few IBAs (Important Bird Area - important areas for global bird conservation). The area has extreme ecological complexity due to the fact that almost all the rivers in the interfluve flow into the Madeira River (WILLIS, 1969[32]).

The project area is located in the Madeira River basin, in the southwest of the Amazon biome, a region that is considered to have great potential for biodiversity, but which has historically had few studies (WHITTAKER, 2008[33]) and has suffered from increased anthropic pressure in recent decades (PY-DANIEL et al., 2007[34]). The region is made up of a mosaic of Conservation Units (Figure 22) such as National Forests, State Sustainable Yield Forests, Extractive Reserves and Ecological Stations, comprising one of the main focuses for biodiversity conservation in the state.

[31] CRACRAFT J. 1985. Historical biogeography and patterns of diferentiation within the South American Avifauna: areas of endemism. In: BUCKLEY, P. A. et. al. eds. Neotropical Ornithology. Washington, American Ornithologists' Union. p. 49-84 (Ornithological Monographs n. 36)
[32] WILLIS E. O. 1969. On the behavior of five species of rhegmatorhina, ant-following antbirds of the Amazon basin. American Museum of natural history, 81: 365-395
[33] WHITTAKER, A. Field evidence for the validity of White- tailed Tityra Tityra leucura Pelzeln, 1868. B.O.C. Bulletin. v.128, n.2, 2008
[34] PY-DANIEL, L.R.; DEUS, C.P.; HENRIQUES, A.L.; PIMPÃO, D.M.; RIBEIRO, O.M. (orgs). Biodiversidade do médio Madeira: bases científicas para propostas de conservação. MMA: MCT, Série Biodiversidade n.29, 244p, 2007.

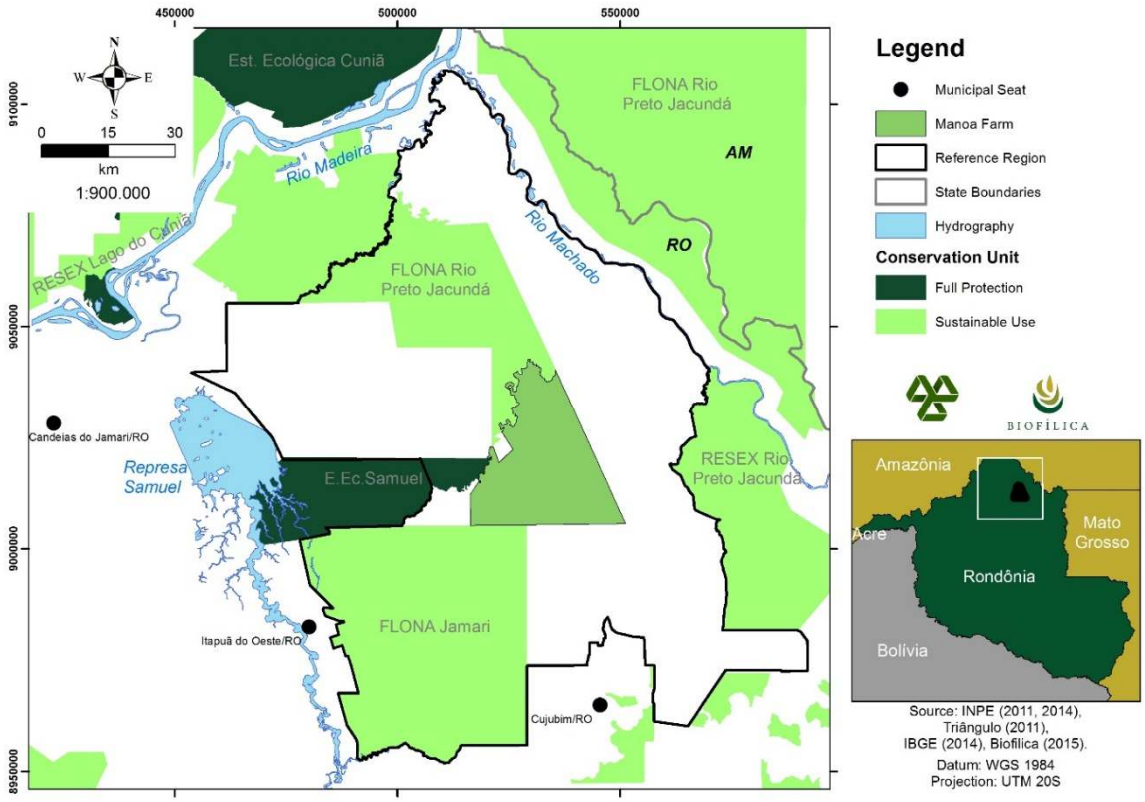


Figure 22. Location of the Project Area and surrounding Conservation Units. Source: PD Manoa REDD+ Project, 2017.

Low impact forest management plus the generation of credits for avoided deforestation, which is carried out in the project area, can be considered an alternative for biodiversity conservation, as it generates financial resources and provides for forest maintenance compared to the scenario in the region, which is characterized by land conflicts and deforestation and forest degradation.

Flora

To describe the structure and composition of the existing forest cover in the Project Area, the methodology used for the carbon stock assessment inventory was adopted. The sampling of the vegetation was carried out in conglomerates in the shape of a Maltese cross, with four sampling sub-units measuring 10 m x 250 m (Figure 23). For the phytosociological assessment, the existing four sub-plots in each conglomerate were considered so that they corresponded to a single sampling unit, with a total area of 1 hectare.

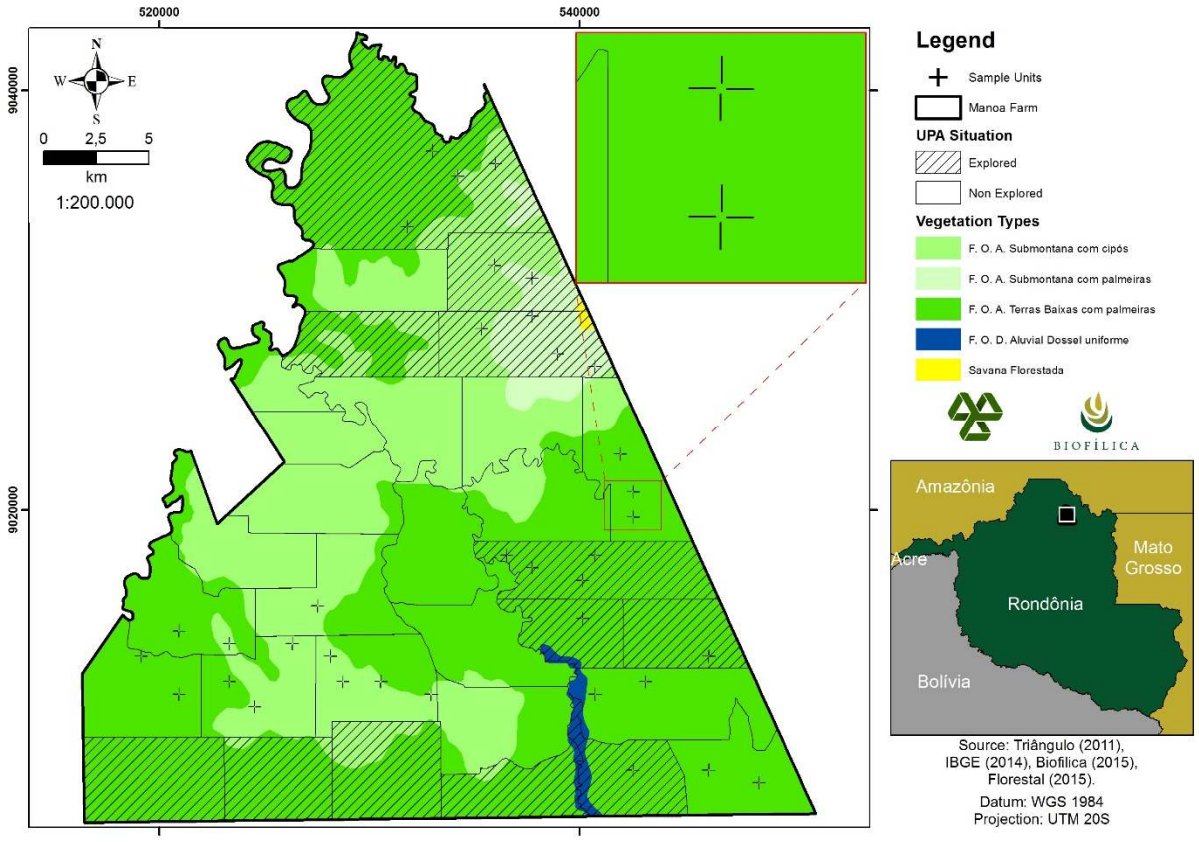


Figure 23. Allocation of forest inventory sampling units in the project area. Source: PD Manoa REDD+ Project, 2017.

The distribution of the plots was ordered by stratifying the Project Area according to the criteria of the forest typologies mapped in the IBGE database and the existence or absence of exploitation under a reduced-impact forest management regime. According to the approach to vegetation typologies presented by the IBGE (2014), there are four predominant types of formations, so only two typologies of greater scope and spatial representativeness were considered for the area of interest, the lowland open ombrophilous forest with palm trees and the submontane open ombrophilous forest with lianas.

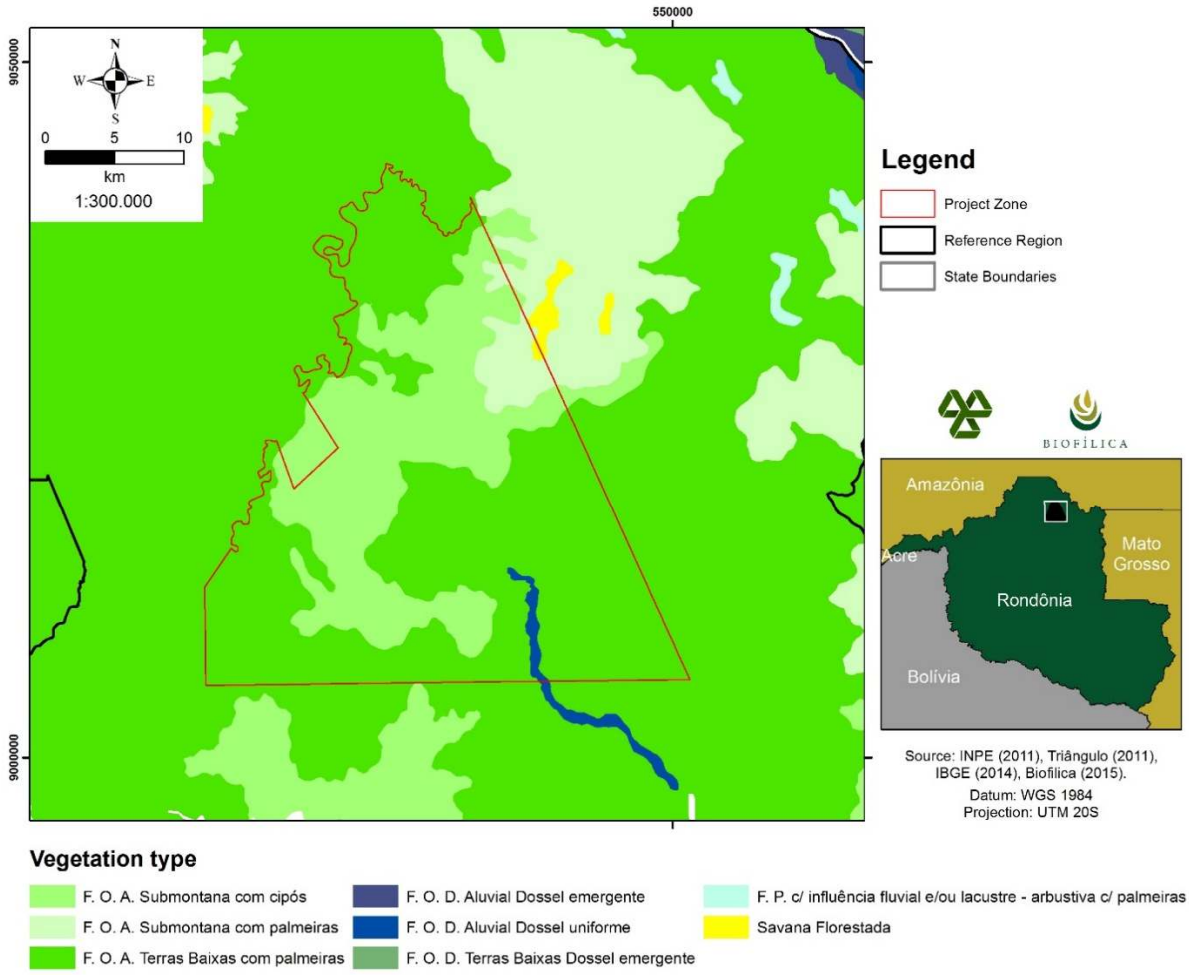


Figure 24. Forest formations present in the Project region. Source: PD Manoa REDD+ Project, 2017.

In each sampling unit, the Diameter at Breast Height (DBH) ≥ 10 cm was measured, so that only the individuals that reached the minimum diameter were identified. The identification of the individuals inventoried was based on the contribution of experienced woodsmen in recognizing the common names of the species, which were then correlated with the scientific names from identification reports carried out at Fazenda Manoa itself.

All the scientific names were updated following the nomenclature available in the database of the List of Species of the Flora of Brazil and checked in relation to the degree of threat in the national and international lists of the Ministry of the Environment (MMA) and the International Union for Conservation of Nature (IUCN).

Phytosociology

The survey carried out at Fazenda Manoa, taking into account the thirty-one hectare sampling units, recorded a total of 16,021 individuals distributed among 177 arboreal species belonging to 45 botanical families.

The analysis was carried out by comparing the species composition in the two formations defined by the IBGE mapping. In the lowland open ombrophilous forest the number of species identified was 155, distributed in 42 families. For the submontane open ombrophilous forest, 159 species and 45 families were recorded, of which 140 are present in both formations, 15 exclusively in lowland open ombrophilous forest with palm trees and 19 exclusively in the plots allocated in the submontane open ombrophilous forest with lianas.

Practically all of the exclusive species sampled in the two phyto-physiognomies had a low natural density in the forest, and for most of them only a single individual was recorded. Among the species sampled exclusively in each phyto-physiognomy, Cedrela odorata (red cedar) stands out in the submontane forest. This species was previously widely found throughout most of Brazil, but due to the high commercial value of its wood, it is currently restricted to a few areas and is cited as vulnerable in the list of threatened species (IUCN, 2015[35]). The Mauritia flexuosa (buriti) palm was found exclusively in the lowland open ombrophilous forest areas, and this species can be considered exclusive to lowland areas, always occurring close to watercourses and areas of variable affluence.

The two main forest typologies present in the area are very similar in terms of tree stratum, so that the occurrence of exclusive species is justified mainly by the low density of these species. In this way, a single forest typology was considered for the farm, stratifying the data obtained only into exploited and non-exploited areas. The aim of this assessment was to diagnose whether reduced-impact forest exploitation leads to significant variations in the natural patterns of the species.

The analysis of the phytosociology of the exploited and non-exploited areas was based on the Importance Value Index (IVI), which is determined from the sum of the density, frequency and relative dominance of a species expressed in percentages. The number of individuals surveyed in the areas that have not yet been managed at Manoa was 8,164, belonging to 155 species. For the managed areas, 7857 individuals and 162 species were recorded. In terms of the diversity of botanical families, there were 42 families in the unmanaged areas and 45 in the managed areas. Figure 25 shows the species with the highest IVI values in the fifteen plots in areas where exploitation occurs.

[35] INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN). Dispõe de informações sobre a lista internacional das espécies ameaçadas (Red List of Threatened Species). Versão 2014.3. Disponível em: http://www.iucnredlist.org. Acesso em: 20 de janeiro de 2015.

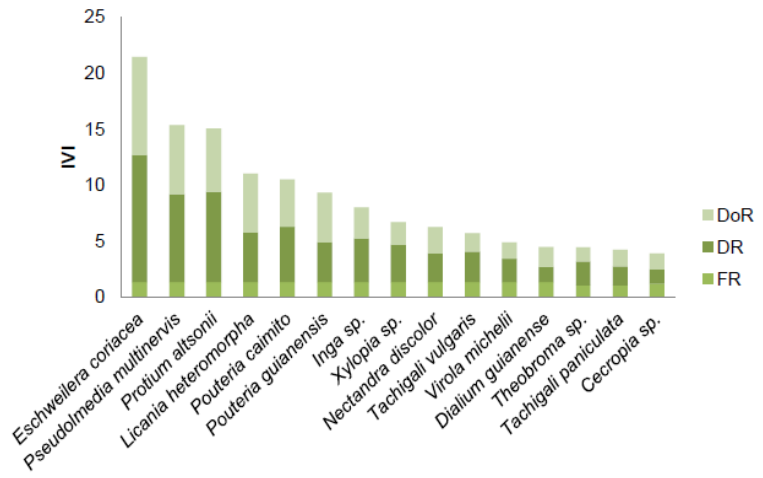


Figure 25. Importance Value Index (%) of the fifteen main species sampled in the logged areas of Fazenda Manoa. Source: Casa da Floresta (2015).

The same survey was carried out in the non-exploited areas (Figure 26), where some species, such as *Pouteria caimito (abiu)* and *Tachigali paniculata* (taxi) were found to have lower IVI values in the exploited area. On the other hand, the species *Peltogyne lecointei* (roxinho)*, Copaifera guyanensis* (copaíba) and *Dendrobangia boliviana* (caferana), which were among the first 15 species with the highest importance values in the non-exploited areas, are among the first 25 in the exploited areas.

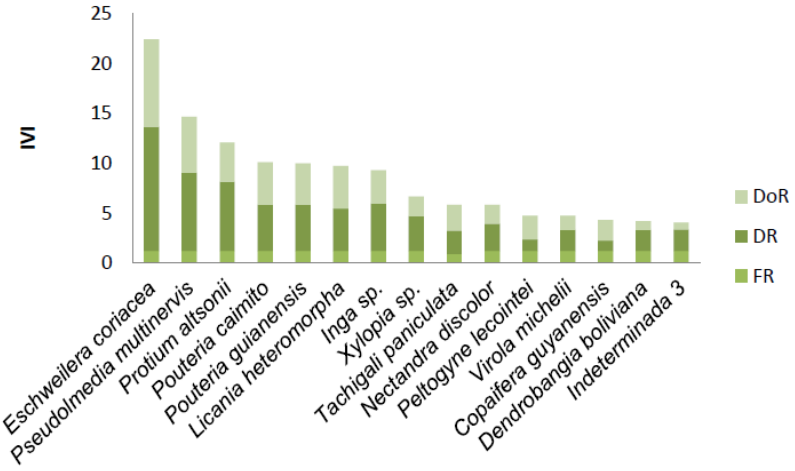


Figure 26. Importance Value Index (%) of the fifteen main species sampled in the unexploited areas of Fazenda Manoa. Source: Casa da Floresta (2015).

The assessment of phytosociological parameters and the comparison between exploited and non-exploited areas showed that the forest at Fazenda Manoa, despite the management intervention, maintains its natural structure and composition characteristics.

The difference in floristic composition observed between the two categories of areas sampled can be attributed to the "Intermediate Disturbance" hypothesis (Connel apud Ribeiro Neto, 2009[36]), caused by disturbance factors that interfere with the dynamics of species establishment. It was observed that among the species that were identified exclusively in the managed areas, 45% correspond to pioneer species, a fact that points to the colonization of the open areas by individuals with tolerance to light, contributing to the increase in species richness in the area subjected to disturbance when compared to the areas where there was no exploitation.

The fact that there are differences in species richness between the two categories can therefore be attributed to the disturbance caused by forest management. However, it is important to point out that, as it is an area of Open Ombrophilous Forest, the Project Area does not necessarily show changes in floristic composition within the two categories due strictly to disturbance factors. Naturally, the regional phyto physiognomy corresponds to formations with widely spaced individuals, resulting in discontinuity in the canopy formed by the climatic arboreal stratum.

Based on the data collected, it is possible to state that the application of good management practices has maintained the integrity of the forest at Fazenda Manoa, guaranteeing its maintenance, which is of paramount importance in the regional landscape, where it forms a large forest massif with other adjacent conservation units.

As far as endangered species are concerned, the lists drawn up by IBAMA and IUCN are also instruments for controlling the exploitation of species at risk. The result of the survey of species that occur in the Project Area resulted in eight species being listed as endangered species with some degree of threat.

Table 7. List of threatened species that occur in the Project Area (with regard to the degree of threat of the species listed in the table: EN = Endangered, VU = Vulnerable and CR = Critically Endangered.

Family	Species	Popular Name	Degree of threat	
			IUCN	IBAMA
Fabaceae	*Apuleia leiocarpa*	garapeira		VU
Fabaceae	*Vouacapoua americana*	angelim-de-folha-larga	CR	EN
Lauraceae	*Mezilaurus itauba*	ataúba	VU	VU
Lecythidaceae	*Bertholletia excelsa*	castanheira	VU	
Lecythidaceae	*Couratari guianensis*	tauari	VU	VU
Meliaceae	*Cedrela odorata*	cedro-rosa	VU	VU
Rutaceae	*Esenbeckia leiocarpa*	guarantã	VU	
Sapotaceae	*Manilkara elata*	maçaranduba	EN	

Source: Adapted from Casa da Floresta (2015)

[36] RIBEIRO NETO, J. D. Eventos de —blowdown ‖, perturbações intermediárias e riqueza de plântulas em florestas de terra firme da Amazônia Central. INPA. 2009.

Among the species that should be given greater attention during management, it is important to highlight *Hevea brasiliensis* (rubber tree), which has a high potential for generating non-timber forest products (latex), and *Bertholletia excelsa* (chestnut tree), which, in addition to having the possibility of non-timber management, is restricted from exploitation (it is on the list of endangered species).

Fauna

The fauna survey based on primary field data within the Project Area aimed to contextualize and understand the importance of the forest on the farm in relation to the regional scenario. Secondary data was also collected for the municipalities of Porto Velho, Candeias do Jamari, Itapuã do Oeste and Cujubim, which are part of the project's Reference Region.

For primary data collection, which took place in November 2014, four sampling areas were selected, so that the sampling could serve as a comparison between different stages of management. Of these, three are called Annual Production Units (UPAs), in other words, they are areas earmarked for management, one of which was recently managed, with exploitation between 2013/2014 (UPA 07), one exploited in 2011 (UPA 14), and another with exploitation planned for 2015/2016 (UPA 27). The other site selected was the Absolute Reserve (AR), as it is an area that will not undergo management intervention, and was therefore considered a "control area" in the evaluation.

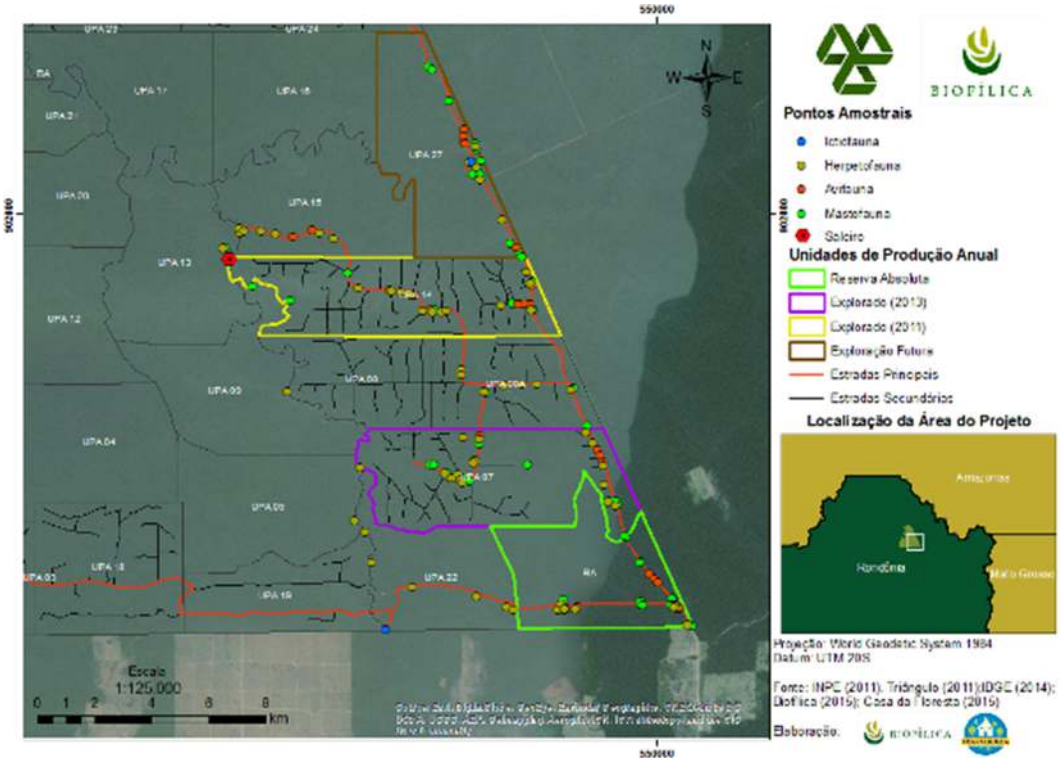


Figure 27. Location of the areas selected for fauna sampling and sampling points. Source: PD Manoa REDD+ Project, 2017.

Herpetofauna

In total, 235 species of herpetofauna with possible occurrences in the project region were compiled using secondary data. The amphibians correspond to 84 species belonging to 11 families; the 151 reptile species surveyed are represented by: six chelonians distributed in three families; four amphisbaenians from one family; while snakes correspond to most of the records, with 100 species distributed in eight families.

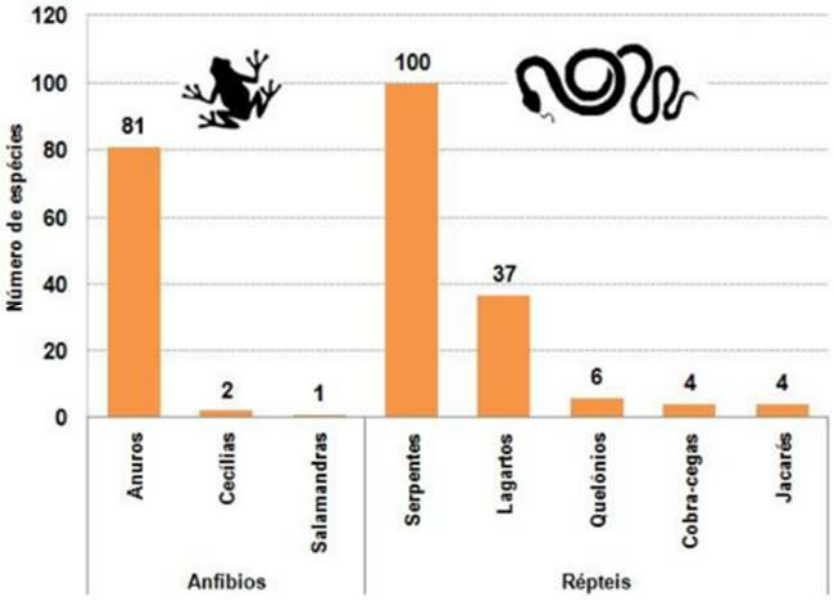


Figure 28. Number of species related to amphibians and reptiles obtained from secondary data for the project region. Source: Casa da Floresta (2015).

Among the species listed as threatened, only the *Allobates brunneus* (arrow frog) is classified as a critically endangered species (CR) on the Brazilian endangered species list (ICMBIO, 2014[37]); with regard to lizards and snakes, none of the species surveyed are under any degree of threat. According to IUNC criteria, two chelonians (*Podocnemis unifilis* and *Chelonoides denticulata*) and one caiman (*Caiman crocodilos*) are considered vulnerable (VU), a fact that is linked to exploitative hunting, loss and de-characterization of habitat and the low density with which these animals occur in the wild.

A total of 44 species of herpetofauna were recorded in the field at Fazenda Manoa, of which 30 are anuran amphibians and 14 are reptiles. Considering the low number of sampling days (ten), a high level of local diversity was evidenced, so that the number of data collected tends to increase with the number of sampling days. In the case of some species, such as anuran amphibians, distribution can be temporal as well as spatial, that is, they follow the seasons and climatic conditions throughout the year.

Of the 84 amphibian species likely to occur in the project area, 24 are common to the data presented; this means that there is a chance that another 60 different species inhabit the site, with six species proving to

[37] ICMBIO. Listas das Espécies da Fauna Brasileira Ameaçadas de Extinção. Portaria MMA nº 444, de 17 de dezembro de 2014. Disponível em: www.icmbio.gov.br acesso em 27/01/2015.

be exclusive to the project area and not found in the secondary data consulted (*Dendropsophus rhodopeplus, D. sarayacuensis, Phyllomedusa camba, Scinax cf. nebulosus, Trachycephalus resinifictrix* and *Chiasmocleis avilapiresae*). On the other hand, all the reptiles sampled directly were present in the secondary data, which points to the possible occurrence of another 137 species in the study area.

The 30 species of anuran amphibians recorded are distributed among seven families and the 14 species of reptiles are distributed among four groups: amphisbaenians, alligators, lizards and snakes. The list of species found is in APPENDIX I, Table 13.

The four sampling units visited had very similar species richness. The area with the highest number of herpetofauna species was the Absolute Reserve (AR) with 25 species, followed by UPA 07 with 24 species, UPA 14 with 22 and finally UPA 27 with 15 species. The area considered to be an absolute reserve (where forest management and intervention is not planned) had the highest species richness and could serve as the farm's control area in the future. The list of herpetofauna species detected in each UPA can be found in APPENDIX I (Table 11).

Ichthyofauna

Due to the difficulty in acquiring authorization to capture, collect and transport specimens of native wildlife, it was not possible to carry out the assessment using primary data, so the ichthyofaunal inventory was only carried out by compiling secondary data. The data collected was a compilation of information available in specific literature, such as articles published in journals, books, theses and dissertations, and also in digital databases. Data relating to the municipalities of Porto Velho, Candeias do Jamari, Itapuã do Oeste and Cujubim, which are part of the project's Reference Region, were taken into account in this case.

A total of 234 species were compiled for the project's Reference Region, present in the Jamari River drainage and in the stretch of the Madeira River within the limits of the municipality of Porto Velho. This amount of species is distributed among nine orders and 38 families. The species composition reflects the pattern observed for neotropical basins, in which the predominance of the orders *Characiformes and Siluciformes* (LOWE-MCCONNELL, 1999[38]) and the greater representation of the families *Cichlidae and Loricariidae* stand out.

It was possible to observe, through the secondary data collected, that the region has the potential occurrence of a considerable amount of species that carry out trophic and/or reproductive migrations *[Leporinus spp.* (piaus), *Brycon spp.* (Matrinchã), *Prochilodus spp.* (curimbas/curimbatás), *Rhaphiodon vulpinus and hydrolicus spp.* (dogfish), *Brachyplatystoma vailantii* (large catfish), *Zungaro zungaro* (jaú), among others]. It is important to note that many of these species are of considerable commercial importance to the fishing communities of the Madeira River, a fact that highlights the importance of the project's reference region as a potential breeding/feeding ground for these fish in particular, and a contribution to maintaining stocks. In terms of commercial importance, species of high value have been identified, but

[38] LOWE-McCONNELL, R. H. Estudos ecológicos de comunidades de peixes tropicais. Editora da Universidade de São Paulo, São Paulo, 533p. 1999

which do not necessarily make large migrations, such as *Pseudoplatystoma fasciatum* (surubim), *Pirinampus pirinampu* (barba-chata), *Sorubim lima* (bico-de-pato).

The survey also points to the potential occurrence of several species of small fish, typical of less voluminous waterways. These fish deserve to be highlighted due to the greater sensitivity of the environments in which they occur, since smaller watercourses and the ecosystem present in them are more sensitive to the anthropic activities carried out in their riparian areas (HELFMAN, 2007[39]).

The data collected was complemented by interviews with the staff of Fazenda Manoa, where 37 species were mentioned (all of them large), which somewhat underestimates the richness of species and does not provide precise taxonomic information. However, the results of the interviews are valid in reinforcing the potential occurrence of species of commercial value, as well as species that make trophic-reproductive migrations. The list of species surveyed through interviews is available in APPENDIX I Table 12.

At last, it is important to note that the data collected shows that the watercourses in the project area are in an excellent state of conservation and are of great importance as they are home to part of the Madeira River's migratory ichthyofauna. It is therefore plausible to infer that the project region has a high diversity of fish species, including representatives with high ecological importance, such as fruit dispersers, foragers and predators, as well as species with great economic significance.

Avifauna

Avifauna data was gathered from a compilation of secondary data from inventories carried out in surrounding Conservation Units (Flonas and Ecological Est.), and a diagnosis carried out in the Project Area by collecting primary data. From the data collected in the Project Area, it was possible to determine an index of species abundance, the Point Index of Abundance (IPA), which is the quotient of the total number of contacts by the number of points sampled (VIELLIARD et al., 2010[40]).

During the ten days of sampling, 273 species of birds were recorded, belonging to 22 orders and 53 families. Despite the high number, it is believed that new species could be recorded from a larger sample.

Compared to the secondary data collected, this total is considered representative, as it corresponds to 32% of that listed for the entire state of Rondônia (LEPAGE, 2015[41]). In addition, the richness values are higher

[39] HELFMAN, G. S. Fish conservation: a guide to understanding and restoring global aquatic biodiversity and fisheries resources. Island Press. 600p. 2007.
[40] VIELLIARD, J.M.E.; ALMEIDA, M.E.C.; ANJOS, L. dos; SILVA, W. R. Levantamento quantitativo por pontos de escuta e o Índice Pontual de Abundância (IPA). In: MATTER, S.V. STRAUBE, F.C.; ACCORDI, I. A.; PIACENTINI, V.Q.; CÂNDIDO-JR, J.F. (Org). Ornitologia e Conservação – Ciência Aplicada, técnicas de pesquisa e levantamento. 1ª edição. Rio de Janeiro, 2010. p. 47-60
[41] LEPAGE, D. Avibase – listas das aves de todo o mundo – Rondônia. Disponível em: acesso em 27 Jan 2015

than the units inventoried in the surrounding conservation units (DE LUCA et al., 2009[42]; YAMASHITA et al., 2005[43]; ICMBIO, 2010[44]; FRANÇA et al., 2011[45]).

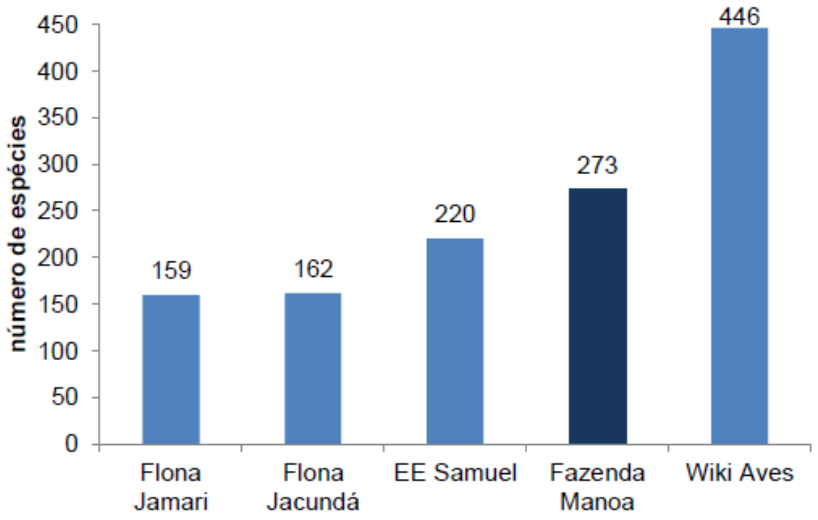


Figure 29. Bird richness recorded at Samuel Ecological Station (DE LUCA et al., 2009); Jacundá Flona (ICMBIO, 2010); Jamari Flona (YAMASHITA, 2005; FRANÇA et al., 2011), the Project Area and observer records in Cujubim, Candeias do Jamari, Itapuã do Oeste and Porto Velho (WIKIAVES, 2014).

A few forest species recorded in the Flonas and Ecological Station were not detected during the observation period. These are mainly highly mobile birds with large home ranges, and are less populous. In total, compiling all the secondary data collected (with the exception of the Project Area), 472 species were recorded. This great richness is attributable to the large forest remnants in the Project area and the fact that the municipality of Porto Velho is crossed by the Madeira River, which, in addition to forming its own environments (beaches, islands, floodplains, etc.), is a geographical divider for many taxa. The biogeographical division caused by the lowland Amazonian rivers leads to the formation of areas of endemism, and the Project Area falls within the region known as "Rondônia". Among the species with a distribution restricted to this division, the following have been recorded in the Project Area: *Hypocnemis ochrogyna* (ochraceous songbird), *Amazilia rondoniae* (blue-headed hummingbird), *Rhegmatorhina hoffmannsi* (taoca-papuda) and *Lepidocolaptes fuscicapillus* (rondônia arapaçu);

[42] DE LUCA, A. C.; DEVELEY, P. F.; BENCKE, G. A.; GOERK, J. M. Áreas importantes para a conservação das aves no Brasil: parte II – Amazônia, Cerrado e Pantanal. São Paulo: SAVE Brasil, 2009
[43] YAMASHITA, C.; SANFILIPPO, L.F.; LIETAUD, R.A. Levantamento de aves e de pequenos mamíferos que habitam a área do Taboquinha Dendrítico na FLONA do Jamari-RO. GEOFLORA, Relatório técnico, 2005.
[44] ICMBIO- Instituto Chico Mendes de Conservação da Biodiversidade; MMA- Ministério do Meio Ambiente. Plano de manejo da Floresta Nacional de Jacundá. Volume IIIAnexo III. Relatórios do Meio Biotico. Rondônia, RO, 2010
[45] FRANÇA, D.P.F.; LIMA, E.; FREITAS, M.A. Listagem preliminar das aves de bordas de mata e áreas degradadas da Floresta Nacional do Jamari, Itapuã do Oeste, Rondônia, Brasil. Atualidades Ornitológicas On-line n.164, p. 51-56, 2011

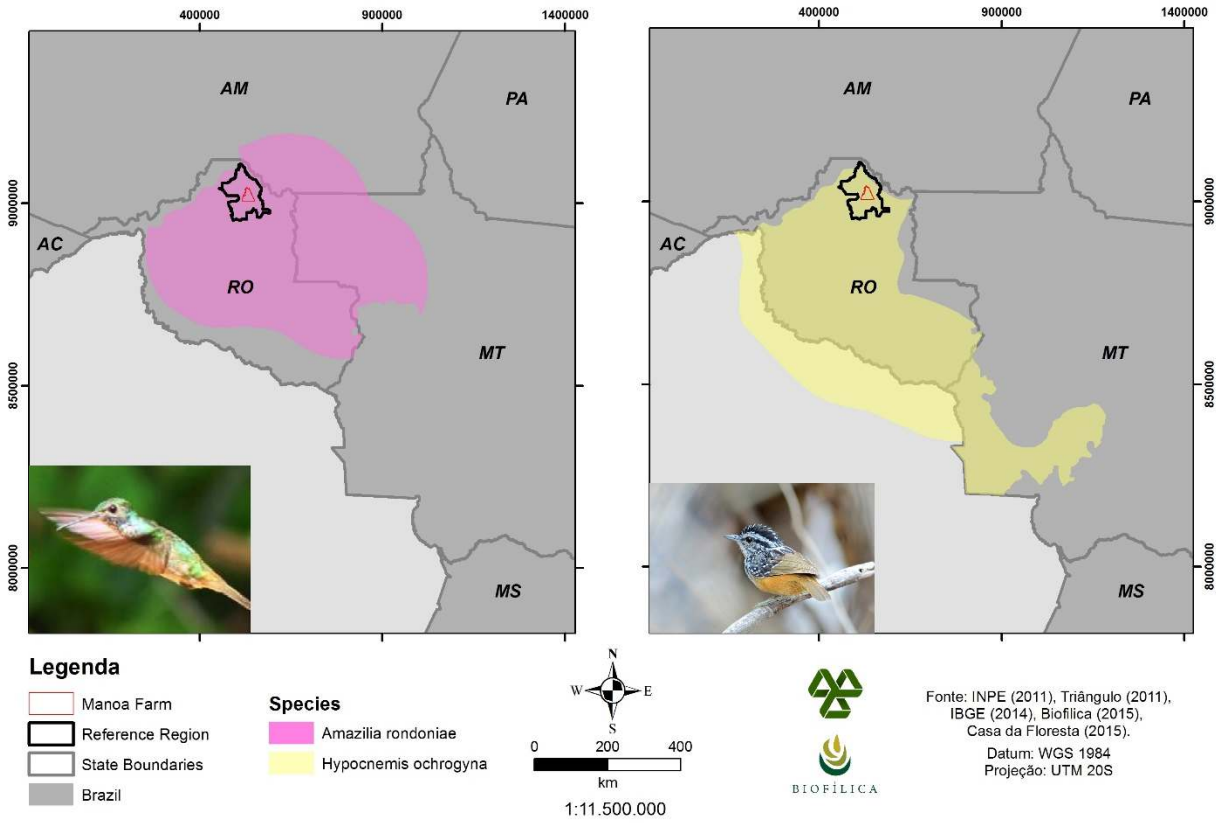


Figure 30. Distribution map of species of restricted occurrence recorded in the Project Area. Source: PD Manoa REDD+ Project, 2017.

With regard to Avifauna, the classification of endemism of the Amazon biome is divided into two zoogeographic regions (South and North). Twenty species considered endemic to the Southern Amazon region were recorded in the Project Area, all of them strictly forest species. Although the area is almost entirely within an IBA (Important Bird Area), the Project Area itself meets the criteria to be classified as such, since, according to De Luca et al. (2009[46]), at least 19 endemics from the Southern Amazon are required for inclusion in the category.

Table 8 lists the nine species considered to be threatened with extinction at national and/or global level, all in the Vulnerable (VU) category. The main threat to these species is deforestation and the consequent de-characterization of their habitat, since they are forest-dwelling and do not tolerate forest fragmentation. In addition, many species have a restricted distribution, intersecting with the arc of deforestation in the Amazon, especially in the state of Rondônia, as is the case with the ochraceous songbird (*Hypocnemis ochrogyna*), which in this case showed high abundance in almost all of the UPAs assessed. The Azulona (*Tinamus tao*) is not only sensitive to fragmentation, being restricted mainly to primary forests, but is also considered a cynegetic bird (a target for hunting), which makes its populations fragile to human occupation

[46] DE LUCA, A. C.; DEVELEY, P. F.; BENCKE, G. A.; GOERK, J. M. Áreas importantes para a conservação das aves no Brasil: parte II – Amazônia, Cerrado e Pantanal. São Paulo: SAVE Brasil, 2009.

(ICMBio, 2014). Psittacines, in turn, are also vulnerable because they are often hunted to supply the illegal pet trade, due to their exuberant colors and vocalization.

Table 8. Endangered bird species recorded in the Project Area.

Species (by Family)	Popular name	Brazil Threat	IUCN Threat
Tinimidae			
Tinamus tao	azulona	VU	VU
Psophiidae			
Psophia viridis	jacamim-de-costas-verdes		VU
Columbidae			
Patagioenas subvinacea	pomba-botafogo		VU
Ramphastidae			
Ramphastos vitallinus culminatus	tucano-de-bico-preto		VU
Psittacidae			
Pionites leucogaster xanthurus	marianinha-de-cabeça-amarela		VU
Pyrrhura perlata	tiriba-de-barriga-vermelha		VU
Pyrrhura snethlageae	tiriba-do-madeira		VU
Thamnophilidae			
Hypocnemis ochrogyna	cantador-ocráceo	VU	
Dendrocolaptidae			
Hylexetastes uniformis	arapaçu-uniforme		VU

Source: Adapted, Casa da Floresta (2015).

The avifauna recorded is characterized by a predominance of forest-dependent species (72%, n=198), many of which are highly sensitive to habitat changes (32%, n=87), which means they cannot tolerate fragmentation and deforestation. This corroborates the importance of conserving the local forest in order to preserve the bird population's habitat.

In general, properly managed logging has been shown to have little impact on the majority of bird species (WUNDERLE et al., 2006[47]). Maintaining the forest standing allows for the conservation of various forest taxa, and together with sustainable management prevents the main impacts that threaten the biome's avifauna, such as hunting and fire, which could be caused by irregular occupation and the opening of clandestine roads.

[47] WUNDERLE JR., J.M.; HENRIQUES, L.M.P.; WILLIG M.R. Short-Term Responses of Birds to Forest Gaps and Understory: An Assessment of Reduced-Impact Logging in a Lowland Amazon Forest. Biotropica. v.38, n.2, p.235–255, 2006.

Mastofauna

The inventory of mammals in the Project Area only included medium and large species, i.e. those with a body weight of more than 1.0 kg (BECKER and DALPONTE, 2013[48]), including primates. In order to make a comparison between the data collected and bibliographic research data, a preliminary search was conducted for secondary data on the mastofauna present in the region of influence of the project.

The richness of species detected in the Project Area through primary data collection culminated in the recording of 43 medium and large mammals, belonging to seven orders and 19 families, with the Carnivores and Primates being the most numerous orders, with 12 and 11 species, respectively (Table 14 in APPENDIX I). The data collected from studies carried out in areas surrounding the project area indicate the probable occurrence of 69 species of medium and large mammals, with the Manoa farm being one of the areas with the greatest richness, both in terms of the data collected and the inventory carried out.

In Brazil, the Amazon rainforest has the greatest diversity of mammals of all the neotropical biomes, with 399 species (PAGLIA et al., 2012[49]), with small flying and non-flying mammals included in this count. When considering only medium and large mammals, the number of species is close to 150, with primates (92 spp.) and carnivores (18 spp.) being the most representative groups (PAGLIA et al., 2012).

It is important to highlight the unprecedented and unexpected records that were not included in the secondary data. One of them is *M. rondoni* (Rondônia marmoset), a new species of small primate described in 2010 (FERRARI et al., 2010[50]), endemic to the state of Rondônia and already considered threatened, probably due to its extremely restricted distribution.

The other record concerns the rare South American canid *Atelocynus microtis*, found only in the absolute reserve (AR). It is a solitary mammal with an omnivorous diet and a geographic distribution that is still poorly defined (PERES 1991[51]; EISENBERG and REDFORD, 1999[52]; LEITE-PITMAN and WILLIAMS 2011[53]) (Figure 31). However, it is known that around 40% of its distribution lies exactly on the "arc of deforestation", a region that concentrates the highest distribution rates of the Amazon Rainforest (LEITE-PITMAN and BEISIEGEL, 2013[54]). According to Peres (1991) and Leite-Pitman and Williams (2011) its occurrence in

[48] BECKER, M.; DALPONTE, J. C. Rastros de Mamíferos Silvestres Brasileiros. Um Guia de Campo. Ed. Technical Books, 166 p, 2013.
[49] PAGLIA, A.P.; FONSECA, G.A. B. DA; RYLANDS, A. B.; HERRMANN, G.; AGUIAR, L. M. S.; CHIARELLO, A.G.; LEITE, Y. L. R.; COSTA, L. P.; SICILIANO, S.; KIERULFF, M. C. M.; MENDES, S.L.; TAVARES, V. DA C.; MITTERMEIER, R. A.; PATTON J. L. Lista Anotada dos Mamíferos do Brasil / Annotated Checklist of Brazilian Mammals.2ª Edição / 2nd Edition. Occasional Papers in Conservation Biology, n. 6. Conservation International, Arlington, VA. 76 p, 2012
[50] FERRARI, S., SENA, L., SCHNEIDER, M.P.C., JÚNIOR JR., J.S.S. 2010. Rondon´s Marmoset, Mico rondoni sp. M., from Southwestern Brazilian Amazonia. International Journal Primatology 31 (5): 693-714.
[51] PERES, C.A. Observations on hunting by small-eared (Atelocynus microtis) and bush dogs (Speothos venaticus) in central-western Amazonia. Mammalia. v. 55, n. 4, p. 635-639, 1991.
[52] EISENBERG, J. F.; REDFORD, K. H. Mammals of the Neotropics. The Central Neotropics: Ecuador, Peru, Bolivia, Brazil, v. 3. The University of Chicago Press, Chicago, IL, 609 p., 1999
[53] LEITE-PITMAN, M. R. P. e WILLIAMS, R. S. R. 2011. Atelocynus microtis. The IUCN Red List of Threatened Species. Version 2014.3. . Downloaded on 05 February 2015.
[54] LEITE-PITMAN, M. R. P e BEISIEGEL, B. M. Avaliação do risco de extinção do cachorrodomato-de-orelhas-curtas Atelocynus microtis (Sclater, 1883) no Brasil. Biodiversidade Brasileira, v. 3, n. 1, p.133-137, 2013.

fauna inventories is quite unusual. So far, what is known about the ecology of *A. microtis* allows us to state that it shows a preference for undisturbed or little disturbed forest environments (LEITE-PITMAN and WILLIAMS, 2011). Therefore, the detection of this species in the RA, in other words, in the control area, demonstrates its good conservation status and emphasizes the importance of maintaining environments with greater forest integrity.

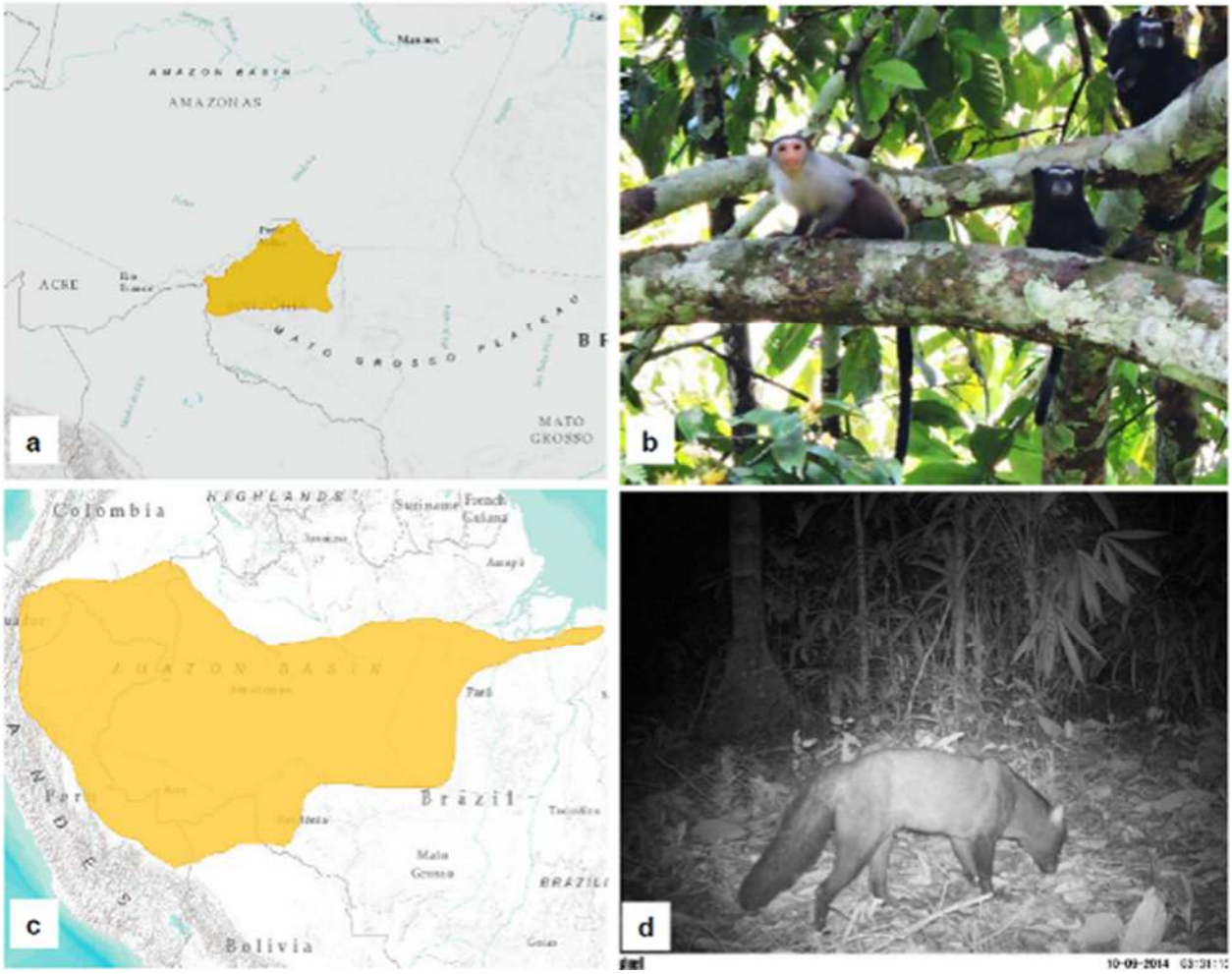


Figure 31. Two unpublished records in the project area. a. distribution map of *M. rondoni* (rondônia marmoset), adapted from IUCN (2015); b. record made of the primate in the project area; c. distribution map of *Atelocynus microtis* (short-eared bush dog), adapted from IUCN (2015); d. *A. microtis* recorded exclusively in AR. Source: PD Manoa REDD+ Project, 2017.

Of the 43 species recorded, 12 are under some degree of threat according to the international (IUCN, 2015) and/or national (IBAMA, 2014) lists, which corresponds to approximately 28% of the medium and large mammals at Fazenda Manoa (Table 9). Eight species are considered vulnerable (VU) to extinction by both lists consulted, except for the giant otter (*P. brasiliensis*) and the spider monkey (*Ateles chamek*), classified as endangered (EN) by the IUCN. The remaining four species: *Panthera onca* (jaguar), *Leopardus sp.* (bush cat), *S. venaticus* (vinegar dog) and *A. microtis* (short-eared bush dog), are only threatened by the Brazilian list, in the vulnerable category. It is worth noting that half of all mammals at risk are species of the order of carnivores, all of which are vulnerable to extinction according to at least one of the lists adopted.

In general, the main threats to wild carnivores consist of habitat loss and fragmentation (COSTA et al., 2005[55]), which de-characterize the environment and reduce the area of use available to populations, as well as hunting, either directly or indirectly by reducing the availability and density of prey species.

Table 9. Endangered medium and large mammal species recorded in the Project Area.

ORDER/Family/Species	Common Name	Threat IUCN	Threat IBAMA
PRIMATES			
Atelidae			
Ateles chamek	macaco-aranha-de-cara-preta	EN	VU
Callitrichidae			
Mico rondoni	sagui-de-rondônia	VU	VU
CARNIVORES			
Felidae			
Panthera onca	onça-pintada		VU
Puma concolor	onça-parda		VU
*Leopardus sp.**	gato-do-mato	VU	VU/EN
Procyonidae			
Pteronura brasiliensis	ariranha	EN	VU
Canidae			
Speothos venaticus	cachorro-vinagre		VU
Atelocynus microtis	cachorro-do-mato-de-orelhas-curtas		VU
CINGULATE			
Dasypodidae			
Priodontes maximus	tatu-canastra	VU	VU
PERISSODACTYLA			
Tapiridae			
Tapirus terrestris	anta-brasileira	VU	VU
PILOSA			
Myrmecophagidae			
Myrmecophaga tridactyla	tamanduá-bandeira	VU	VU
ARTIODACTYLA			
Tayassuidae			
Tayassu pecari	queixada	VU	VU

*It may correspond to the species *Leopardus tigrinus* ou *L. wiedii*

Source: Adapted, Casa da Floresta (2015).

Among the species with the highest relative frequency of occurrence, the tapir (*Tapirus terrestris*) and the jaguar (*P. onca*) stand out, with 67% and 17% relative frequency respectively. The tapir is considered to be a major seed disperser, feeding on at least 39 species of plants, where it is often the only disperser. The

[55] COSTA, L. P., LEITE, Y. L. R. MENDES, S. L., DITCHFIELD, A. B. Conservação de Mamíferos do Brasil, Megadiversidade, v. 1, n. 1, 2005.

discrepancy in relative frequency between the tapir and the other species is mainly due to the records obtained in the salt pans, which account for approximately 90% of all records. The jaguar is the largest feline in the Americas, occupies the top of the trophic chain, has a low reproductive rate and requires an extensive living area (CHEIDA et al., 2011[56]), characteristics that define it as a species with high ecological requirements in terms of habitat and diet (CASO et al., 2008[57]). Therefore, the moderate frequency of records obtained during the inventory activities allows us to infer that the Project Area concentrates important attributes for the species.

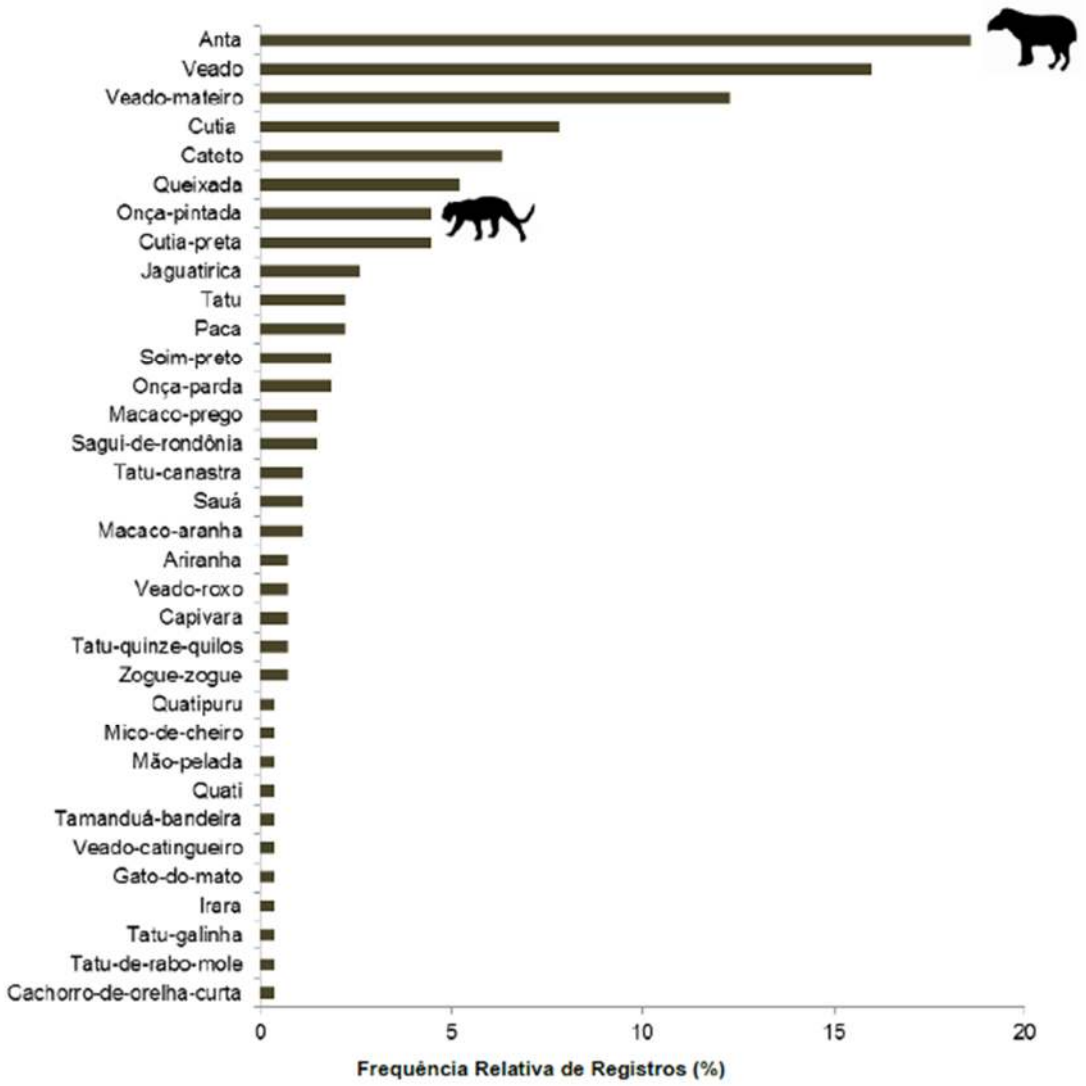


Figure 32. Relative Frequency (%) calculated from the number of records of medium and large mammals in the Project Area. For better graphic visualization, the bar relating to the number of tapir

[56] CHEIDA, C.C., NAKARO, E.O., FUSCO-COSTA, R., ROCHA-MENDES, F., QUADROS, J. Ordem Carnivora. In: REIS, N. R., PERACCHI, A. L., PEDRO, W. A., LIMA, I. P. (Eds.). Mamíferos do Brasil. 2ª ed. Londrina, p. 242-275, 2011.

[57] CASO, A., LOPEZ-GONZALEZ, C., PAYAN, E., EIZIRIK, E., DE OLIVEIRA, T., LEITEPITMAN, R., KELLY, M. & VALDERRAMA, C. 2008. Panthera onca. The IUCN Red List of Threatened Species. Version 2014.3. . Downloaded on 06 February 2015

(*Tapirus terrestris*) records has been sectioned off, as it corresponds to 67% of the total number of records. Source: Casa da Floresta (2015).

Taking into account the areas where the mastofauna data was collected (areas in the process of management, already managed and absolute reserve), it was possible to observe that the management activity did not have a direct impact on the distribution and number of species, so that there was a balance between the richness values observed in all areas.

The results of the biodiversity inventory allowed us to get to know and characterize the community of medium and large mammals present in the Project Area and in the surrounding forest remnants, as well as illustrating the momentary reality in each of the sample areas evaluated. However, in order to be able to more accurately assess the impacts of the management activity and other impacts related to the project's activities on medium and large mastofauna, a longer period of evaluation and monitoring is needed. Constant monitoring is therefore necessary in order to determine possible impacts and changes in local ecological parameters.

4.1.1 Attributes of High Conservation Value

Forests have environmental and social values such as wildlife habitat, protection of hydrographic basins and provision of essential ecosystem services. Forests where these values are considered exceptional or of critical importance can be defined as High Conservation Value Forests (HCV) (JENNINGS et al., 2003[58]).

During the assessment of biodiversity in the Project Area, the Saleiro area was identified, which can be classified as a "High Conservation Value Area" and is of significant importance for maintaining local biodiversity.

Salt pans or mud pans are places in the middle of native vegetation, usually close to watercourses, with little vegetation and exposed soil, rich in macro and micronutrients (COELHO, 2006[59]) (Figure 33). The soil in salt pans is rich in magnesium, calcium, phosphorus, boron and copper (MONTENEGRO, 2004[60]), but its composition varies according to the location (VARANASHI, 2014[61]).

These sites are used by various animals, especially mammals, particularly herbivores, frugivores (BLAKE et al., 2011[62]) and omnivores (KLAUSS et al., 1998[63]), where they practice geophagy, in other words, they ingest the soil. The consumption of soil in these areas has been attributed to its various functions for animal

[58] JENNINGS, S.; NUSSBAUM, R.; JUDD, N.; EVANS, T; The High Conservation Value Forest Toolkit. ProForest. Edition 1, December 2003.
[59] COELHO, I.P. Relações entre barreiros e a fauna de vertebrados no nordeste do Pantanal, Brasil. Dissertação (Mestrado em ecologia), Universidade Federal do Rio Grande do Sul, 62p., 2006
[60] MONTENEGRO, O. L. Natural licks as keystone resources for wildlife and people in Amamzonia. 128f. Dissertacion (Doctor in Philosophy) - University of Florida, 2004
[61] VARANASHI, G. Clay Licks as a Keystone Resource and Their Potential in Conservation in the Las Piedras Watershed. paper 16, Senior Projects Spring 2014.
[62] BLAKE, J. G.; MOSQUERA, D.; GUERRA, J.; LOISELLE, B. A.; ROMO, D.; SWING, K. Mineral Licks as Diversity Hotspots in Lowland Forest of Eastern Ecuador. Diversity, v. 3, p. 217-234, 2011.
[63] KLAUS, G.; KLAUS-HUGI, C.; SCHMID, B. Geophagy by large mammals at natural licks in the rain forest of the Dzanga National Park, Central African Republic. Journal of Tropical Ecology, v. 14, p. 829–839, 1998

communities, such as: source of essential nutrients for foraging species (REDMOND, 1982[64]; RUGGIERO and FAY, 1994[65]); detoxification by secondary compounds found in food of plant origin (SOUZA et al., 2002[66]); and it can serve as a food source in times of resource scarcity (HEYMANN and HARTMANN, 1991[67]; MOE, 1993[68]).

Figure 33. Salt pan (saleiro), or mud pan, evaluated in the Project Area.

Salt pans can also cause environmental costs associated with the energy expenditure required by species to travel to the specific location to supplement their diet (KLEIN and THING, 1989[69]). In addition, there is also an increased chance of predation (MATSUBAYASHI et al., 2006[70]), and the risk of transmission of parasites and diseases through the species that use the area (HENSHAW and AVENI, 1977[71]). Despite this, the benefits that salt pans provide to the animal community seem to outweigh the costs (KLAUS et al., 1998), because salt pans are one of the few places in the forest where it is possible to observe a high density of animals with great frequency (VARANASHI, 2014).

The salt pan in question is located in a Permanent Preservation Area (APP) and is already protected under the New Brazilian Forestry Law (Law No. 12.727 of 2012), as it stipulates that rivers between 10 and 50 m wide must have a minimum 50 m strip of vegetation from the edge of the channel to the regular bed (which

[64] REDMOND, I. Salt mining elephants of Mount Elgon. Swara, v. 5, p.:28–31, 1982
[65] RUGGIERO, R. G.; FAY, J. M.. Utilization of termitarium soils by elephants and its ecological implications. African Journal of Ecology, v. 32, p. 222–232, 1994.
[66] SOUZA, L. L.; FERRARI, S. F.; DA COSTA, M. L.; KERN, D. C. Geophagy as a correlate of folivory in red-handed howler monkeys (Alouatt a belzebul) from eastern Brazilian Amazonia. Journal of Chemical Ecology, v. 28, p. 1613–1621, p. 2002
[67] HEYMANN, E. W.; HARTMANN, G. Geophagy in moustached tamarins, Saguinus mystax (Platerrhini: Callitrichidae), at the Rio Blanco, Peruvian Amazonia. Primates, v. 32, p. 533–537, 1991.
[68] MOE, S. R. Mineral content and wildlife use of soil licks in southwestern Nepal. Canadian Journal of Zoology, v. 71, p. 933–936, 1993.
[69] KLEIN, D. R.; THING, H. Chemical elements in mineral licks and associated muskoxen feces in Jameson Land, northeast Greenland. Canadian Journal of Zoology, v. 67, p. 1092–1095, 1989.
[70] MATSUBAYASHI, H.; LAGAN, P.; MAJALAP, N.; TANGAN, J.; ABD SUKOR, J. M.; KITAYAMA, K. Importance of natural licks for the mammals in Bornean inland tropical rainforests. Ecological Research, v. 22, p. 742–748, 2006.
[71] HENSHAW, J.; AYENI, J. Some aspects of big-game utilization of mineral licks in Yankari Game Reserve, Nigeria. East African Wildlife Journal, v. 9, p. 73–82, 1977

fits in with the salt pan in question, as the Preto River is approximately 35 m wide). However, this measure doesn't seem to be entirely effective in protecting it. In studies on edge effects on the plant community, Chen et al. (1995[72]) state that the influence of the edge effect extends to a distance equivalent to two or three times the height of the canopy. Laurance et al. (1998[73]) indicated that most edge effects exceed 100 m within the vegetation. The intensification of the edge effect alters the local ecosystem, changing the microclimate, increasing luminosity and causing the air and soil to dry out, as well as allowing more generalist species to enter (METZGER, 2010[74]).

Thus, based on studies that measure the minimum distance to avoid interference in a forest habitat, it is recommended that in order to minimize the impacts caused by forest exploitation on the salt pans, management should not be carried out at a distance of less than 100 meters, thus characterizing a buffer zone for impacts on the fauna that uses the site, even if the species recorded are quite mobile.

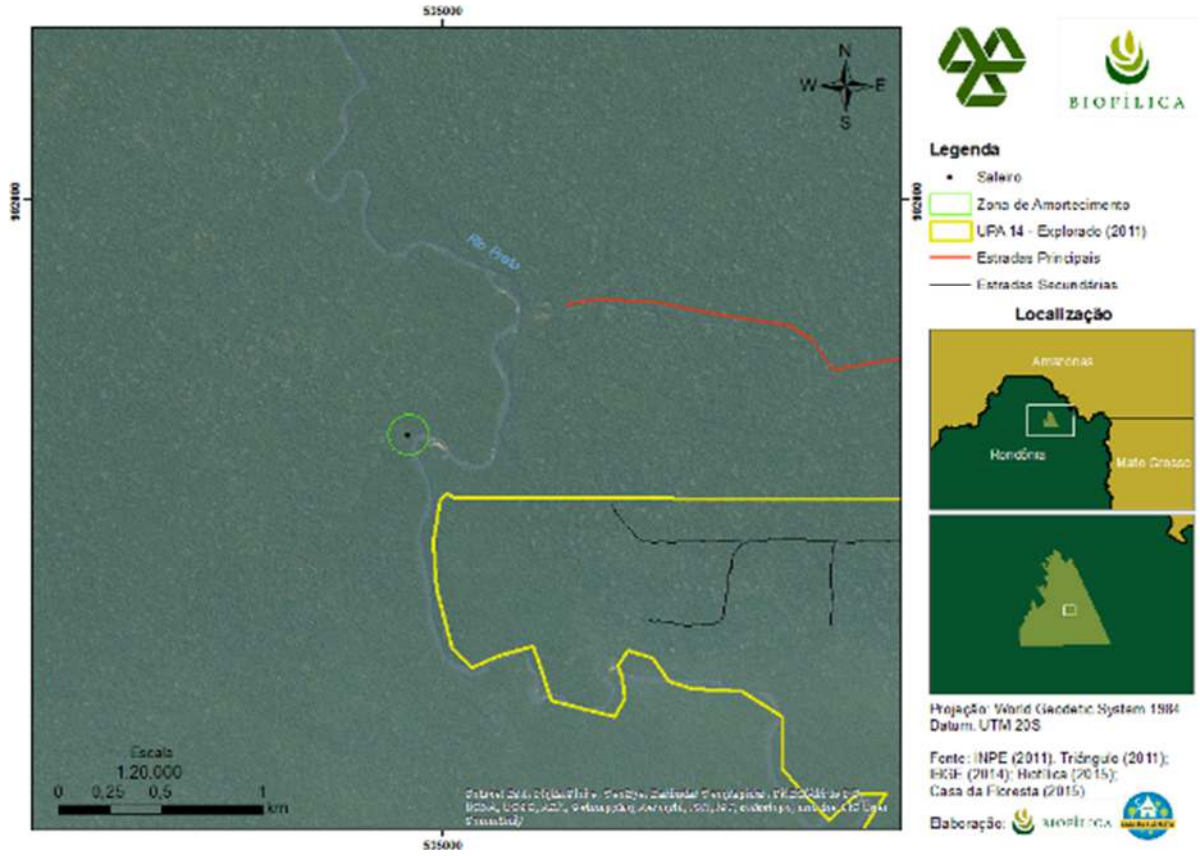


Figure 34. Location map of the salt pan within the project area. Source: PD Manoa REDD+ Project, 2017.

[72] CHEN, J.; FRANKLIN, J. F.; SPIES, T. A. Growing-season microclimatic gradients form clearcut edges into old-growth Douglas-fir forests. Ecological Applications, v. 5, n. 1, p. 74-86, 1995.
[73] LAURANCE, W. F.; FERREIRA, L. V.; MERONA, J. M. R. D.; LAURANCE, S. G. Rain Forest fragmentation and the dynamics of Amazonian tree communities. Ecology, v. 79, n. 6, p. 2032- 040, 1998.
[74] METZGER, J.P. O código florestal tem base científica? Nat. Conservação. 8. In press, 2010. MOE, S. R. Mineral content and wildlife use of soil licks in southwestern Nepal. Canadian Journal of Zoology, v. 71, p. 933–936, 1993.

In order to carry out a preliminary assessment of High Conservation Value Attributes, the document "Assessment, management and monitoring of High Conservation Value Forest: A practical guide for forest managers" produced by Proforest was used. Table 10 represents an adaptation of the assessment model suggested by Proforest and indicates the parameters surveyed and the respective justifications for HCVAs.

Table 10. Initial identification of high conservation value attributes.

Value	Present	Potential	Absent	Justification
HCV 1 - Areas containing significant concentrations of biodiversity values, either globally, regionally or nationally (e.g. endemism, threatened species, refuge).	X			As shown in section 4.1, there is 1 species of flora in danger (EN), 1 in critical danger (CR) and 6 vulnerable (VU). As for fauna, there are 2 species in danger (EN), 1 in critical danger (CR), and 21 vulnerable (VU). As well as forming a large part of the Rondônia endemism zone, the project region is made up of a mosaic of Conservation Units which is a major focus for biodiversity conservation. Emphasis should also be placed on the presence of the salt pan in the Project Area.
HCV 2 - Areas on a significantly large scale, whether global, regional or national, where most, if not all, viable populations of certain species occur naturally in natural patterns of distribution and abundance.			X	Despite the importance of the Project Area as a major biodiversity stronghold, and as an ecological corridor, the area is not of superior or unique relevance in relation to the entire forest mosaic that makes up the region's Conservation Units.
HCV 3 - Areas that are or are contained in rare and/or threatened ecosystems.	X			Noteworthy is the presence of the "salt marsh", which is considered a habitat with a concentration of endemic and threatened species, and the fact that it is a rare ecosystem attribute.

4.1.2 Possible threats

The likely future scenarios for biodiversity can be predicted based on a joint analysis of the initial biodiversity conditions in both the Project Area and its region of influence. In addition, these initial conditions can be correlated with future deforestation projections for the without-project scenario, taking into account the fact that the advance of deforestation is directly related to impacts on biodiversity.

In the regional context, the Project Area is a private area in the midst of a mosaic of conservation units, and these conservation units in its surroundings have suffered major threats to the maintenance of biodiversity over the last few decades. These areas have a history of degradation related to timber theft, invasions, land grabbing, among other activities, so that despite the protection determined by law, the security and surveillance of these areas are extremely weak, enabling such illegal activities.

Future impacts on biodiversity in the without-project scenario could include the loss of restricted species, loss of habitat, loss of connectivity and loss of ecosystem services, as well as the biodiversity studies and monitoring that would no longer be carried out without the incentive of the project.

The loss of connectivity and consequently the loss of habitat for species are directly related to the advance of deforestation, which causes a reduction in gene flow between populations, affecting the movement of fauna and the dispersal of propagules (LAURANCE and VASCONCELOS, 2009[75]). Forest fragmentation caused by deforestation tends to cause a drastic reduction in species richness, where the density and distribution is lower in small fragments, mainly affecting more specialist taxa (LAURANCE and VASCONCELOS, 2009), many of which are threatened, endemic or have a restricted distribution. The fact that there are species with restricted ranges in the region, as mentioned in the survey of birds and mammals (*M. rondoni*), highlights the importance of protecting the region's forests.

According to Silva et al. (2005), connectivity between fragments provides a large resilient conservation system with the potential to mitigate future global changes, make significant improvements to the living standards of local populations and provide ecosystem services to the population. In the same way, forest fragmentation leads to opposite effects, especially edge effects, which alter the dynamics of the fragments, strongly affecting the forest's microclimate, tree mortality, carbon storage and fauna, among other ecological aspects (LAURANCE, 2011[76]).

The baseline deforestation projections in the without-project scenario point to a total area of 126,685 hectares deforested over the first 10 years in the project's Reference Region, while in the Project Area 1,547 hectares are expected to be deforested over the same period, with the annual deforestation rate for the Reference Region over the historical reference period being 0.91%. These figures show that in the non-project scenario it is unlikely that the biological richness of the area will be maintained, and conservation initiatives in the region (such as the creation of protected areas) have so far proved to be ineffective.

[75] LAURANCE, W.F.; VASCONCELOS, H.L. Consequências ecológicas da fragmentação florestal na Amazônia. O ecologia Brasiliensis. v.13, n.3, p. 434-451, Setembro 2009

[76] LAURANCE, W.F.; CAMARGO, J.L.C.; LUIZAO, R.C.C.; LAURANCE, S.G.; PIMM, S.L.; BRUNA, E.M.; STOUFFER, P.C.; WILLIAMSON, G.B.; BENITEZ-MALVIDO, J.; VASCONCELOS, H.L.; VAN HOUTAN, K.S.; ZARTMAN, C.E.; BOYLE, S.A.; DIDHAM, R.K.; ANDRADE, A.; LOVEJOY, T.E. The fate of Amazonian forest fragments: a 32-year investigation. Biological Conservation. 2011

4.2 Expected Impacts on Natural Capital and Ecosystem Services

Impact #9	Protection of ecosystems related to water (SDG Target 6.6).
Type of Impact	Positive, actual and direct
Affected Natural Capital and/or Ecosystem Service(s)	Hydric resources; Climate; Biodiversity.
Resulting Change in Condition	Quality and integrity of hydric resources; Maintenance of vegetation, Preservation of fauna; Maintenance of microclimate.

Impact #10	Tons of greenhouse gas emissions avoided (SDG 13.0)
Type of Impact	Positive, actual and direct.
Affected Natural Capital and/or Ecosystem Service(s)	Climate.
Resulting Change in Condition	Maintenance of carbon stocks.

Impact #11	Ensure the conservation and sustainable use of terrestrial and inland freshwater ecosystems and their services (SDG Target 15.1)
Type of Impact	Positive, actual and direct.
Affected Natural Capital and/or Ecosystem Service(s)	Forestry resources; Climate, Biodiversity.
Resulting Change in Condition	Quality and integrity of forestry resources; Maintenance of vegetation, Preservation of fauna; Climate maintenance.

Impact #12	Promote the implementation of sustainable forest management and halt deforestation (SDG Target 15.2)
Type of Impact	Positive, predicted and direct.
Affected Natural Capital and/or Ecosystem Service(s)	Forestry resources; Biodiversity.
Resulting Change in Condition	Quality and integrity of forestry resources; Maintenance of vegetation, Preservation of fauna; Climate maintenance.

Impact #13	Take significant measures to reduce the degradation of natural habitats, halt the loss of biodiversity and protect and prevent the extinction of endangered species (SDG Target 15.5)
Type of Impact	Positive, actual and indirect.
Affected Natural Capital and/or Ecosystem Service(s)	Biodiversity.
Resulting Change in Condition	Maintenance of biodiversity; Conservation of endangered species.

4.3 Natural Capital and Ecosystem Services Monitoring Plan

The main benefits that the project will bring to natural capital are related to the maintenance of forest cover, avoiding the deforestation of approximately 18,150 hectares over the 30 years of the project, and consequently avoiding the emission of greenhouse gas. In addition to the conservation of 177 species of flora and more than 360 species of fauna identified, of which 12 are mammals and 9 are birds under some kind of threat, according to the IUCN, and the maintenance of "ecological corridors" with Conservation Units in the state of Rondônia and Permanent Preservation Areas (APP), reducing the negative impacts of degradation in the region.

Based on the Causal Chain diagrams presented in section 2.1.9, there are the following effects to be monitored in relation to Natural Capital and Ecosystemic Services:

Variable analyzed	Natural Capital/Ecosystem Service Monitored	Frequency of monitoring/reporting	SDG
Amount of forest area in areas of importance for the protection of aquatic ecosystems (APP)	• Hydric resources • Climate • Biodiversity	Annual	SDG Target 6.6
Tons of greenhouse gas emissions avoided or removed	• Climate	Annual	SDG 13.0
Number of hectares of reduced forest loss in the project area measured against the without-project scenario	• Forestry resources • Climate • Biodiversity	Annual	SDG Target 15.1
Exploitation volume of sustainable forest management	• Forestry resources • Biodiversity	Annual	SDG Target 15.2
Number of endangered flora and fauna species preserved	• Biodiversity	Annual	SDG Target 15.5

4.4 Net Positive Natural Capital and Ecosystem Services Impacts

The Project Area is a site of great importance for biodiversity conservation. Thus, during the data collection, either secondarily or in the field, the biota was very rich, containing typical taxa and indicators of intact environments. These results are mainly related to the fact that the forest remains standing due to the good management practices applied in the area. Additionally, the large territorial extension of the Project Area, the absence of hunting (predatory or subsistence) within its boundaries and the connectivity presented with other large remnants, such as Conservation Units, contribute to the high species richness detected in the area.

The measures taken to adopt good sustainable forest management practices, such as the maximum number of trees removed per hectare, the rotation and latency period of production units, allowing for future exploitation (BARRETO et al., 1998[77]), and pre-exploitation planning, determine the impacts (positive or negative) and their extent on biodiversity (GARDNER, 2010[78]). The possible negative impacts related to

[77] BARRETO, P. et al. Custos e benefícios do manejo florestal para produção de madeira na Amazônia oriental. Série Amazônia. Belém, Imazon, v.10, 1998.
[78] GARDNER, T. Monitoring Forest Biodiversity: improving conservation through ecologicallyresponsible management. London: New York: Earthscan, 2010. 360 p

management refer to the intervention carried out in the forest, which can cause soil compaction, damage to the remaining forest and the scaring away of fauna, among other impacts.

Given the results presented, although initial, the forest management carried out in the Project Area appears to have little impact on the biotic community. In addition, the REDD+ project seeks to complement the conservation activities already carried out, contributing even more efficiently to the conservation of local species and their ecosystemic services. In addition, the project seeks to guarantee socio-environmental benefits, since it aims to minimize impacts in the region through activities focused on environmental education, which encourages the protection of native forest areas.

The project's activities are not expected to introduce invasive species or increase their population, nor is the use of genetically modified organisms planned. The forest management plan for the area does not contemplate planting for regeneration or enrichment, so that if it does occur, native species will be used and the appropriate standards required by the certification in force.

5 APPENDIX I: LIST OF SPECIES IDENTIFIED

Table 11. Presence of herpetofauna species detected in each UPA sampled.

CLASS/ Family/ Species	Area			
	RA	UPA7	UPA14	UPA27
AMPHIBIA (25)				
Aromobatidae				
*Allobates femoralis**	X		X	
*Allobates gr. marchesianus**	X	X	X	X
Bufonidae				
*Rhaebo guttatus**	X	X	X	X
*Rhinella margaritifera**			X	
Rhinella marina	X	X	X	X
Craugastoridae				
*Pristimantis cf. fenestratus**	X	X		
*Pristimantis sp.**		X	X	
Hylidae				
*Dendropsophus marmoratus**	X	X		
Dendropsophus minutus	X	X	X	X
Dendropsophus rhodopeplus	X	X	X	
Dendropsophus saraycuensis			X	
*Osteocephalus taurinus**	X		X	
*Phyllomedusa camba**	X	X	X	X
*Phyllomedusa tomopterna**	X	X	X	X
Scinax ruber	X	X	X	X
Scinax cf. nebulosus	X			
*Trachycephalus resinifictrix**	X	X	X	X
Leptodactylidae				
*Adenomera andreae**	X	X	X	X
Adenomera hylaedactyla	X	X		
Leptodactylus fuscus	X	X	X	X
Leptodactylus knudseni	X			
Leptodactylus mystaceus		X		
Leptodactylus pentadactylus	X	X	X	
Leptodactylus petersii		X		
Microhylidae				
*Chiasmocleis avilapiresae**	X		X	
REPTILIA (11)				
Amphisbaenidae				
*Amphisbaena fuliginosa**	X			

CLASS/ Family/ Species	Area			
	RA	UPA7	UPA14	UPA27
Gymnophthalmidae				
*Cercosaura eigenmanni**				X
Mabuyidae				
Copeoglossum nigropunctatum	X	X	X	X
Sphaerodactylidae				
*Chatogekko amazonicus**	X	X	X	X
Teiidae				
Ameiva ameiva		X		X
*Cnemidophorus aff. cryptus**				X
*Kentropyx calcarata**	X			X
Boidae				
*Corallus hortulanus**			X	
Dipsadidae				
Leptodeira annulata		X	X	
Taeniophallus occipitalis	X	X		
Alligatoridae				
*Paleosuchus trigonatus**		X		
Total de espécies (36)	**25**	**24**	**22**	**16**

* Animals that occur strictly in primary and secondary forests

Table 12. Fish species mentioned in interviews conducted with Fazenda Manoa employees.

Nomenclature mentioned in interviews	Possible taxonomic diagnosis
raia	Potamotrygonidae
cachorra	*Hydrolycus, Raphiodon*
peixe-cachorro	Acestrorhynchus
branquinha	Curimatidae
corimba	Prochilodontidae
lambari	Characidae
lambari-alto	*Tetragonopterus chalceus*
piau-três-pintas	*Leporinus fridericci*
matrinxã	Brycon
peixe-voador	Hemiodus
piranha-preta	*Serrasalmus cf. rhobeus*
piranha- vermelha	*Pygocentrus nattereri*
tambaqui	Colossoma
pacu	Serrasalmidae
traíra	*Hoplias malabaricus*
jeju	*Hoploerythrinus unitaeniatus*
urumará	*Boulengerella sp.*
bicuda	*Boulengerella sp.*
peixe-cobra	Gymnotiformes
peixe-elétrico	*Eletrophorus eletricus*

Nomenclature mentioned in interviews	Possible taxonomic diagnosis
cascudo	Loricariidae
tamoatá	*Hoplosternum littorale*
jundiá	Heptapteridae
sacaca	Pimelodidae ou Heptapteridae
mandubé	*Agenelosus sp.*
mandi	Pimelodidae
jaú	*Zungaro zungaro*
barba-chata	*Pirinampu pirinampu*
barrigudinho	Poeciliidae
boca-de-veia/apaiari	Cichlidae
tucunaré	Cichla
acará	Cichlidae
pirarucu	*Arapaima gigas*

Table 13. List of anuran amphibian species inventoried with their taxonomy, popular name, preferred habitat and predominant habit.

ORDER/Family/Species	Popular Name	Habitat	Habit
ANURA			
Aromobatidae			
Allobates femoralis	sapo-flecha	Forest	Terrestrial*
Allobates gr. m*archesianus*	sapinho	Forest	Terrestrial*
Bufonidae			
Amazophrynella minuta	sapinho	Forest	Terrestrial*
Rhaebo guttatus	sapo-dourado	Forest	Terrestrial
Rhinella margaritifera	sapo-folha	Forest	Terrestrial*
Rhinella marina	sapo-cururu	Forest/Open	Terrestrial
Craugastoridae			
Pristimantis cf. f*enestratus*	rã	Forest/Open	Terrestrial**
Pristimantis sp.	rã	Forest	Terrestrial**
Eleutherodactylidae			
Phyzelaphryne miriamae	rãzinha	Forest	Terrestrial*
Hylidae			
Dendropsophus marmoratus	perereca	Forest	Arboreal
Dendropsophus minutus	pererequinha-do-brejo	Open	Arboreal
Dendropsophus rhodopeplus	pererequinha	Forest/Open	Arboreal
Dendropsophus saraycuensis	pererequinha	Forest/Open	Arboreal
Hypsiboas cinerascens	perereca-verde	Forest	Arboreal
Hypsiboas cf. *geographicus*	perereca	Forest/Open	Arboreal
Osteocephalus leprieurii	perereca-macaco	Forest	Arboreal
Osteocephalus taurinus	perereca-macaco	Forest	Arboreal
Phyllomedusa camba	filomedusa	Forest	Arboreal

ORDER/Family/Species	**Popular Name**	**Habitat**	**Habit**
Phyllomedusa tomopterna	filomedusa	Forest	Arboreal
Scinax ruber	perereca	Forest/Open	Arboreal
Scinax cf. *nebulosus*	perereca	Forest/Open	Arboreal
Trachycephalus resinifictrix	rã-de-leite	Forest	Arboreal
Leptodactylidae			
Adenomera andreae	rãzinha-da-mata	Forest	Terrestrial*
Adenomera hylaedactyla	rãzinha-da-mata	Forest/Open	Terrestrial*
Leptodactylus fuscus	rã-assobiadora	Open	Terrestrial
Leptodactylus knudseni	rã	Forest	Terrestrial
Leptodactylus mystaceus	rã-marrom	Forest	Terrestrial
Leptodactylus pentadactylus	rã-pimenta	Forest/Open	Terrestrial
Leptodactylus petersii	rãzinha	Forest	Terrestrial*
Microhylidae			
Chiasmocleis avilapiresae	rãzinha	Forest	Fossorial*

* leaf litter animals, which are not very flexible and dependent on leaf litter moisture.

** animals that breed in litter, spending much of their time on the ground, but that also have arboreal habits.

Table 14. Species of medium and large mammals recorded during the biodiversity inventory at Fazenda Manoa, Cujubim – RO, in the months of October and November 2014. The recording methods for each species are indicated by the following acronyms: E = Interview, Av = Sighting, Vo = Vocalization, Fz = Feces, Peg = Footprint, AF = Camera Trap. Endemisms (End) and diet and habitat classifications are in accordance with Paglia et al. (2012). The species were classified as vulnerable (VU) and/or endangered (EN) of extinction according to the international (IUCN, 2014) and Brazilian (BRASIL, 2014) list.

ORDER/Family/Species	Popular Name	Registration method	Area				Saleiro	Waterfall	Rio Preto	IUCN	IBAMA	End	Diet[1]	Habit[2]
			RA	UPA7	UPA14	UPA27								
PRIMATES														
Aotide														
Aotus sp.	macaco-da-noite	E	X									X	On	Arb
Atelidae														
Alouatta sp.	bugio	E										X	Fo/Fr	Arb
Ateles chamek	macaco-aranha-de-cara-preta	Av, Vo, E	X		X	X	X		X	EM	VU	X	Fr/Fo	Arb
Callitrichidae														
Mico rondoni	mico-de-rondônia	Av	X	X	X	X				VU	VU	X	Fr/In/Go	Arb
Saguinus fuscicollis	soim-preto	Av, Vo, E	X	X	X	X						X	Fr/In	Arb
Saguinus midas	soim-mão-dourada	E										X	Fr/In	Arb
Cebidae														
Sapajus apella	macaco-prego	Av, Vo, E	X		X	X	X		X			X	Fr/On	Arb
Saimiri ustus	mico-de-cheiro	Av, E	X		X			X	X			X	Fr/In	Arb
Pithecidae														
Callicebus brunneus	zogue-zogue	Av, Vo, E	X	X	X	X						X	Fr/Fo	Arb
Callicebus sp.	sauá	Vo	X	X	X								Fr/Fo	Arb

ORDER/Family/Species	Popular Name	Registration method	Area				Saleiro	Waterfall	Rio Preto	IUCN	IBAMA	End	Diet[1]	Habit[2]
			RA	UPA7	UPA14	UPA27								
Pithecia irrorata	parauaçu	E										X	Fr/Gr Arb	
CARNIVORA														
Felidae														
Panthera onca	onça-pintada	AF, Fz, E, Peg, Vo	X	X	X	X	X				VU		Ca	Te
Puma concolor	onça-parda	AF, Peg			X	X					VU		Ca	Te
Leopardus pardalis	jaguatirica	AF, Av, Peg		X	X	X							Ca	Te
Leopardus sp.	gato-do-mato	E, Fz				X				VU	VU/EN		Ca	Sc
Procyonidae														
Nasua nasua	quati	AF, Av, E		X									Fr/On	Te
Procyon cancrivorus	mão-pelada	AF		X									Fr/On	Sc
Potos flavus	jupará	E	X										Fr/On	Arb
Mustelidae														
Eira barbara	irara	Av		X									Fr/On	Te
Lontra longicaudis	lontra	E							X				Ps	SA
Pteronura brasiliensis	ariranha	Av, E, Vo							X				Ps	SA
Canidae														
Speothos venaticus	cachorro-vinagre	E									VU		Ca	Te
Atelocynus microtis	cachorro-do-mato-de-orelhas-curtas	AF, Av, E	X								VU	X	Ca	Te
CINGULATA														

ORDER/Family/Species	Popular Name	Registration method	Area				Saleiro	Waterfall	Rio Preto	IUCN	IBAMA	End	Diet[1]	Habit[2]
			RA	UPA7	UPA14	UPA27								
Dasypodidae														
Cabassous unicinctus	tatu-do-rabo-mole-pequeno	Av	X										Myr	SF
Dasypus sp.	tatu	AF	X		X	X							Ins/On	SF
Dasypus kappleri	tatu-quinze-quilos	AF, Av, E, Peg		X		X						X	Ins/On	SF
Dasypus novemcinctus	Tatu-galinha	AF, E, Peg	X			X							Ins/On	SF
Priodontes maximus	tatu-canastra	E, Peg		X						VU	VU		Myr	SF
PERISSODACTYLA														
Tapiridae														
Tapirus terrestris	anta-brasileira	AF, Av, E, Fz, Peg	X	X	X	X	X		X	VU	VU		Hb/Fr	Te
Tapirus kabomani	anta-pretinha	E										X	Hb/Fr	Te
RODENTIA														
Cuniculidae														
Cuniculus paca	paca	AF, E, Peg	X	X									Fr/Hb	Te
Caviidae														
Hydrochoerus hydrochaeris	capivara	Av, Fz						X					Hb	SA
Dasyproctidae														
Dasyprocta fuliginosa	cutia-preta	Av, AF, E, Peg	X	X	X	X		X				X	Fr/Gr	Te
Dasyprocta sp.	cutia	Av, AF, E, Peg	X	X	X	X							Fr/Gr	Te
Sciuridae														

ORDER/Family/Species	Popular Name	Registration method	Area				Saleiro	Waterfall	Rio Preto	IUCN	IBAMA	End	Diet[1]	Habit[2]
			RA	UPA7	UPA14	UPA27								
Urosciurus sp.	quatipuru	AF	X									X	Fr/Gr	Sc
PILOSA														
Myrmecophagidae														
Myrmecophaga tridactyla	tamanduá-bandeira	E, Peg		X					X	VU	VU		Myr	Te
Tamandua tetradactyla	tamanduá-mirim	E											Myr	Sc
Bradypodidae														
Bradypus variegatus	preguiça-bentinho	E											Fo	Ar
ARTIODACTYLA														
Cervidae														
Mazama sp.	veado	AF, Fz, Peg	X	X	X	X	X						Fr/Hb	Te
Mazama gouazoubira	veado-catingueiro	Peg		X									Fr/Hb	Te
Mazama americana	veado-mateiro	Av, AF, E, Peg		X	X		X						Fr/Hb	Te
Mazama nemorivaga	veado-roxo	Av, AF, E, Peg		X	X	X						X	Fr/Hb	Te
Tayassuidae														
Tayassu pecari	queixada	Av, AF, E, Peg, Vo		X	X	X	X		X	VU	VU		Fr/Hb	Te
Pecari tajacu	caititu	Av, AF, E, Peg	X	X	X	X	X						Fr/Hb	Te

[1] Diet categories: On = Omnivore; Fo = Folivore; Fr = Frugivorous; Ins = Insectivore, Go = Gomivore, Gr = Granivore, Hb = Herbivore; Myr = Myrmecophagus; Ca = Carnivore; Ps = Piscivore.

[2] Types of locomotion: Arb = Arboreal; Te = Earthly; Sc = Scansorial; AS = Semi-aquatic; SF = Semi-Fossorial.