FOREST CONSERVATION PROJECT
BR ARBO GESTÃO FLORESTAL S.A.

March/2023

SUMÁRIO

CHAPTER 1 - BR ARBO, THE PROPERTY AND THE PROJECT

BR ARBO Gestão Florestal S.A. describes, in this document, its Forest Conservation project.

The objective of this project is to permanently conserve the monumental native Amazonian biome of more than 900 thousand hectares that make up the BR ARBO property in the state of Amazonas, in order to benefit the environment, preserve the forest in its wide diversity, prevent global warming, maintain water regimes and support the local community, in its different needs.

A project where everyone wins: the planet, Brazil, the Amazon and local populations.

BR ARBO

BR ARBO GESTÃO FLORESTAL S.A. - CNPJ nº 04.310.918/0001-98
Av. Júlio de Castilhos, 44- 14º andar - CEP nº 90.030-130
Porto Alegre- RS
Premises in Carauari: Estrada do Gavião s/ nº - Fazenda da APLUB.

BR ARBO Gestão Florestal S.A. is a Brazilian company, with long-standing operations in the region, an integral part of its community for many years.

BR ARBO is the exclusive and private owner of an extensive piece of land in the state of Amazonas. The property has a high degree of preservation of the Amazon biome forest, which covers almost all of it.

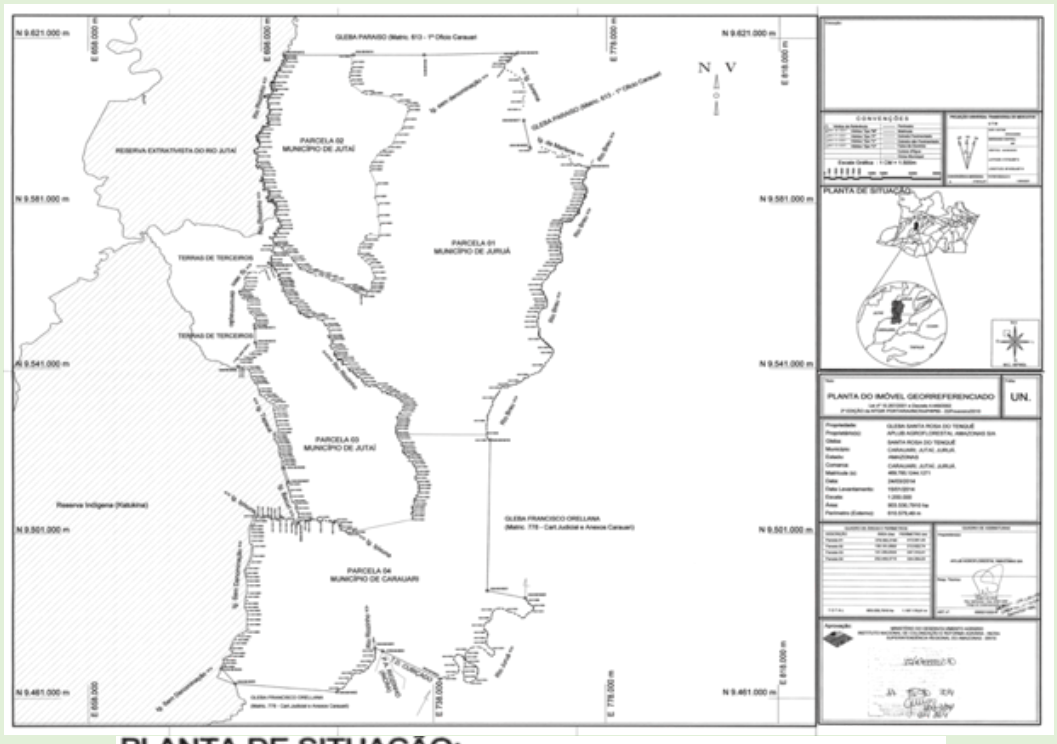
The owner considers that this roof, kept intact until now, is an asset of highly relevant value, both tangible and intangible, of great social interest not only locally but also globally, which must be maintained for the future. It intends to continue to preserve it, opposing the existing deforestation trends in the Amazon region, as is common knowledge.

PROPERTY

The area has the name of Gleba Santa Rosa do Tenquê - known as FAZENDA DA APLUB, where this enterprise is developed. It is located in the municipalities of Carauari, Juruá and Jutaí, in the heart of the central-west region of the state of Amazonas, in northern Brazil, belonging to the Solimões River basin.

The property is registered by the following registrations in the name of BR ARBO, totaling just over 900,000ha:

- Carauari/AM - Cartório 1, Matrícula 1780, Reg R-1, Livro 2-H, 252.459,3715 ha
- Juruá/AM - Cartório 1, Matrícula 371, Reg R-1, Livro 2-C, 379.595,2749 ha
- Jutaí/AM - Cartório 1, Matrícula 1344, Reg R-1, Livro 2-6, 271.476,1446 ha



The ownership line that falls on BR ARBO Gestão Florestal S.A. dates back to 1947. The company, therefore, has managed this property for decades, developing several small-scale agricultural and agro-industrial activities in the place, and the conservation of the native biome has always been a present objective in its operations, despite the difficulties naturally offered for this goal.

PROJECT

The project described in this report was initiated by BR ARBO in mid-2020, when the final decision was taken to implement the project.

From there, the planning, technical projects and financial structuring of the project began.

Some of the activities that are part of it were started earlier, including the sustainable forest management certified by the FSC in 2017, and the sawmill operation. Gradually they were organized in order to be included in the project described here, which gained new dimensions from 2020 onwards.

The project encompasses the following activities:

- **sustainable forest management** around 160 thousand hectares close to Carauari, at the southern portion of the propriety, over the next 30 years, in 30 plots of more than 5 thousand hectares, managed one each year, using the best techniques to secure the integrity of the native forest over time - a legally authorized activity that is known to be beneficial for the conservation of the native forest over the years;
- **installation of a new sawmill in Carauari** to process certified wood, harvested using sustainable management, including the installation of a renewable power plant in Carauari, fueled with the wood residues from the sawmill;
- **monitoring and surveillance system** in the entire area, in order to ensure that the existing deforestation pressure is avoided, relying also on the engagement of local communities with this objective.

For the activities above, the project will obtain, over the years, a certain amount of Carbon Credits, generating revenues that will make it possible to sustain its own activities and other positive impacts to be produced.

The foundations of this effort lie in the climate change issue, including greenhouse gas emissions, in the broad water issue, including rainfall patterns in agricultural areas in other regions, in the local water issue, in the protection of biodiversity and in the social issues that involve local populations. Several of these points go beyond local or regional interests and go to the national and even global level.

Next, we detail each of the activities to be developed by the project.

CHAPTER 2 - SUSTAINABLE FOREST MANAGEMENT

SUSTAINABLE MANAGEMENT

The project considers the implementation of the Sustainable Forest Management activity with Reduced Impact Forest Exploitation (RIE).

It is recognized as a sustainable practice, through the cutting and selective management of native wood species of commercial interest, at a limited volume. The practice, besides keeping the forest standing and its functions and services to the environment, presents itself as viable to conserve the biodiversity of flora and fauna. The process of cutting mature trees and carbon "packaging" through the production of sawn wood, where a large number of wood species can last much longer than half a century without deteriorating (hardwood) enables the managed area to get the forest canopy open, increasing the rate of carbon fixation, acting as a true global carbon filter, where carbon cycling is increased until the second forest harvest and so on.

The forests found on the property are mostly classified as Dense Ombrophylous Forest, mainly non-flooding forests known as Dry Land - Dense Ombrophylous Forest of the Lowloands subformation, representing more than 95% of the property and the rest are Swamp Forests - Dense Ombrophylous Forest of the Alluvial Subformation (less than 5% of the property).

The project covers a total area of Sustainable Forest Management above 163,713 ha, corresponding to 18.12% of the total area of the property.

In general, the operational practices of Forest Management exploration differ from the practices of forest exploitation for plant suppression due to the need for greater care with the remaining forest, where the main differences consist of:

- Rigorous planning and selection of forest species and individuals that will be exploited and retained standing for seed bearing, regeneration and to compose the harvest stock in the second rotation cycle;
- Careful planning of forest exploitation infrastructure;
- Application of targeted tree cutting techniques and prior cutting of lianas, in order to better conserve the remaining trees that will make up the second harvest cycle;
- Elaborated planning process for the drag trails, including their demarcation in the field, aiming at less damage to the remaining trees and natural regeneration, in order to avoid unnecessary or exaggerated movement of forestry tractors;
- Implementation of a chain-of-custody control process for exploited trees and produced logs;
- Management through specific software for the activity and use of geoprocessing tools;

- Implementation of a monitoring plan to control the forest growth, maintenance of permanent infrastructure (main roads) and, above all, actions to monitor and protect the forest, especially to curb invasions.

Specifically, the main characteristics that outline the Sustainable Forest Management are presented below:

- Polycyclic forest management system, with a cutting cycle initially set at 30 years in accordance with Resolution 17/2013 of SDS/CEMAAM and Resolution 406/09 of CONAMA, which establishes maximum values of Annual Average Increment - IMA of 0 .86 m^3/ha/year (CONAMA) and one (01) m^3/ha/year (SEMA-AM); with a maximum permitted exploration volume of 25 m^3 per hectare (Resolution 17/2013 – SDS/CEMAAM) is 30 m^3 per hectare (CONAMA Resolution 406/09);
- Carried out through selective cuts of commercial species;
- Minimum cutting diameter for all species of 50 centimeters at breast height (DBH 1,30 meters from the ground);
- Forest inventory from 40 cm DBH;
- Forest exploitation system characterized as Reduced Impact Exploitation (RIE), adapted from the CELOS Exploitation System (SCE) and with some adaptations arising from the systems disseminated by IMAZON and FFT (Tropical Forest Foundation);
- Silvicultural System that recommends to conduct natural regeneration with adaptations of the CELOS Silviculture System (SCS), supported by regional experiences of the system recommended by EMBRAPA/CPATU (SILVA et al. 1995) and by the INPA Tropical Silviculture department (HIGUCHI et al., 1991).
- The maximum average volume for the UPF is 24,99 m^3/hectare. Considering the maximum increment values of resolution 406/09, there is a cut/rotation cycle of approximately 30 years.

TIMELINE

Timeline of activities that make up the silvicultural system and forest management:

E-1 (years)	Outlining and subdivision of the compartment	• outlining of the Forest Production Unit (FPU) and Work Units (UT's) based on the property boundaries • baseline opening for central tracks lanes • opening (parallel) trails central to the lanes (every 50 meters) to the property limits and marking the length of the trail (50 x 50m) • FPU identification.

E-1 (years)	100% inventory to plan the exploitation	• measurement of trees of all species, with DBH above 40 cm, quality of the bole and spatial location (obtaining geographic and Cartesian coordinates) • identification of trees, numbering and labeling and annotation of other environmental attributes to support microzoning
E-1 (years)	Silvicultural Treatment (liana trimming)	• liana trimming in trees of commercial species with a high degree of infestation to reduce exploitation damage and improve the safety of the tree cutting operation
E - 4 months	Exploitation planning	• selection of trees for felling • road network planning • drawing of exploitation maps with locations of selected trees for cutting and other exploitation and transport infrastructures
E - 1 month	Opening of forest roads, branches and patios	• opening forest access roads to the FPU (main road) • branch roads (secondary and temporary roads) • patios along the roads and branches
E*	Forest exploitation - reduced impact logging	• tree pre-selection to be felled according to criteria by species • exploration map for tree location in the field • hollowness test • fall direction to reduce damage and ease drag • daily update of the exploration map for drag trail planning • main haulage (to the nearest yard on the branches) • log transport
E + 3 months	Damage assessment	• information processing from exploration and control maps • trail area measurement • systematic evaluation of canopy openness percentage • up to three months at the most from the conclusion of the forest exploitation of the plot

E + 4 E + 9 E + 14 years	Silvicultural treatments (optional)	• release of trees of interest: girdling and poisoning of trees of non-commercial species that compete with future trees (DBH>=35 cm) • new treatment prescription based on analysis of data from permanent plots (and diagnostic inventory if possible / available at 8 and 13 years after logging) following the same guidelines as the first • decision to carry out the activity or not, supported by data from permanent plots
E + 2 E + 4 E + 6 E + 9 E + 13 E + 18 years	Maintenance of the Infrastructure of culverts, bridges, small bridges and other	• check the condition for the construction of culverts, bridges, small bridges or other equipment to avoid water damming inside the Forest Management Area (AMF) and the property • if there is any damming with continued water retention (for more than three months), clear the watercourse • even eliminate the infrastructure (as a last resort)
E + 29 years	100% inventory to plan the second cutting cycle	• measurement of trees of all species, with DBH above 40cm, quality of the bole and spatial location (obtaining geographic and Cartesian coordinates) • identification of trees, numbering and labeling of trees and annotation of other environmental attributes to support microzoning;
Anually	Forest protection	• go through the boundaries of the property and of the forest management area in order to curb invasions • If agriculture or livestock projects are implemented in neighboring areas, check the need to maintain “firebreak” areas to prevent fire from entering the forest.

***E: Florest Exploitation (month or year of the activity)

The time schedule for a period corresponding to the Forest Management Rotation Cycle, for the project's 30-year period, is shown below, allowing the observation of the annual forest exploitation area under a sustainable management regime and the volumes of forest supplies produced from wood in logs for sawing and industrialization, annually and in total.

Project Activities	period	annual area (hectares)	log volume (m^3/ha/year)	log volume (m^3/year)	total area (hectares)	total volume (m^3)
Dryland Forest Management	years 1 to 26	5.457,10	20	109.142	141.884,60	2.837.692
Wetland Forest Management	years 27 to 30	5.457,10	10	54.571	21.828	219.160
Total					163.713	3.056.852

The table below presents the sequence of the main activities starting from the 100% forest inventory stage to the effective conclusion of the exploration stage that takes place with log transportation.

The correlation of these activities with the prevailing weather conditions in relation to monthly rainfall is also illustrated in the table below.

	year 1					year 2											
activities	aug	sep	oct	nov	dec	jan	feb	mar	apr	mai	jun	jul	aug	spt	oct	nov	dec	limit
100% forest inventory and projects																		5
Reduced Impact Forest Exploration																		7
directional tree cuttting																		5
trail and infrastructure plotting																		5
trail and infrastructure opening																		5
log hauling																		5
log transport																		6
	dry					rain						trans*		dry				

* transition dry/rain

It can be observed that:

i. The first effective activity in the field is the forest inventory, which should preferably be carried out during the period of less precipitation. Whenever possible, the subsequent inventory is carried out concurrently with the previous year's forest exploration;

ii. The activities involving the handling of machines and trucks are obviously concentrated in the dry season, starting in the last month of transition from the

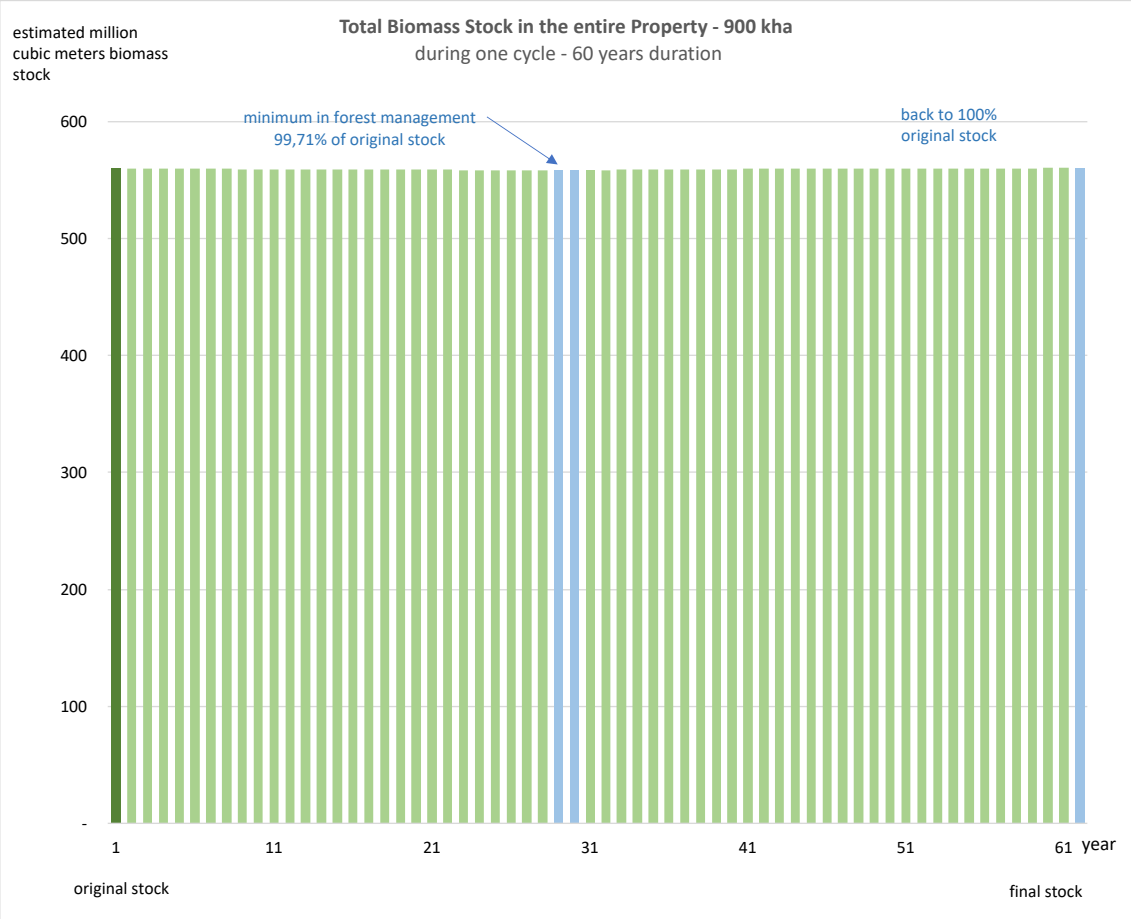
rainy season to the dry season (July) until the beginning of the transition period, in the case restricted to transport activities and mechanized deforestation (December).

iii. The tree-cutting activity can start earlier, even in the month of June, at the beginning of the transition period from the rainy season to the dry season. This is because the primary activity does not involve the use of heavy machinery.

iv. In turn, the opening of the exploration infrastructure is concentrated in the period of lower precipitation, since the excess of water in the soil would make the construction of most of the infrastructures unfeasible.

IMPACT

The impact of the Sustainable Forest Management activity on the biomass stock, as described above, may be estimated according to the following chart:



The overall biomass of the property is gradually reduced in a very slight proportion, as each plot is managed. The reduction is hardly visible in the chart. Right after the management each plot begins its recovery process, turning to the original biomass volume in the next 30 years.

The total volume of biomass in the property reaches the maximum reduction of around 0,3%, in year 30.

DIMENSIONING

Planning the number of equipment and teams needed for the main activities of Sustainable Forest Management, including forest inventory stages, reduced impact forestry exploration (RIF: directional tree felling, demarcation of trails for skidding, skidding and organization of logs in courtyard) and transportation are presented below.

Project Activities	Teams / Equipment	Quantity	Unit	Operational Performance	Units	Duration (months)	Minimum Quantity	complement
100% forest inventory	Inventory teams	5.457	ha	390	ha/month/team	5	4	teams of 6
Directional tree cuttting	Cutting teams	109.142	m^3	2.400	m^3/team/month	5	10	teams of 2
Houl trails plotting	Trail teams	5.457	ha	220	ha/team/month	5	5	teams of 2
Log hauling	Skidder tractors	109.142	m^3	4.500	m^3/equipmt/month	5	5	unit
Exploration infrastructure	D-6 Catterpillars	5.457	ha	1	1 catterpillar per 3 skidders	5	2	unit
Log loading	Wheel loaders	109.142	m^3	9.000	m^3/equipmt/month	5	3	unit
Log transportation	Semi-trailer truck	109.142	m^3	4.800	m^3/set/month	6	4	unit

Comments:

i. The number of needed equipment and teams are presented in an optimized way to minimally meet the demand over the estimated period of time for each step. At least 10% additional equipment should be considered in each activity, as contingency.

ii. A forest inventory carried out with excellence combined with a microzoning of the entire area of the Forest Production Unit (FPU - 5,457 hectares) that will be harvested that year is essential for the success of subsequent operations. A team of six people, including botanical identifiers, note takers and forestry assistants is capable to cover a minimum average area of 350 hectares per month. The activities are aimed at the end of the dry season and the transition to the season

with more precipitation. The team will also carry out the prior cutting of lianas. Thus, a total of four teams for a period of up to five months are sufficient for the operation.

iii. The directional cutting operation of the selected trees provides for an average yield per cutting team, projecting the cutting of 30 to 35 trees per day, normally composed of a chainsaw operator and an assistant, providing for a total volume of cuts of at least an average of 2,400 m3 of logs/month/team. Even though reduced impact logging techniques are applied in this operation (RIL – directional tree felling), the team training ensures that the same performance as in traditional operations is maintained.

iv. The planning of the exploration infrastructure using geoprocessing tools and the plotting of skidding trails in the field allow for the optimization of the log dragging operation and uses the principles of reduced impact exploration, providing the optimization of dragging distances, the reduction of machinery movement and avoiding unnecessary damage to the remaining trees from the second harvest. A team made up of two people, using the cutting and logging maps, allows the plotting of at least an area of 220 hectares per team per month.

v. The log hauling activity was dimensioned for the use of CAT 525 model forestry tractors, equipped with hydraulic grippers, without the use of steel cables and forestry assistants in the operation, providing for a minimum monthly average production of 4,500 m^3 of logs dragged to the month, which allows projecting the execution of the work even less than the projected five months, using only five skidders.

vi. In reduced impact logging operations (EIR) in forest management areas, for each set of three "skidders" a crawler tractor is required for the installation of the logging infrastructure, opening of transport branches and log accumulation yards for the transport. For the five "skidder" tractors, up to two D-6 type crawler tractors with coupled winch and blade (track-skidders) are required. It is worth noting that if there is operational surplus, the same equipment is also used for hauling logs.

vii. In operations involving the handling of logs, piling and loading, each machine is capable of moving around 400m^3 of logs, calculated for the project at a minimum monthly average of 9,000m^3 per loader equipped with a forestry fork, which imply the minimum need for three wheel loaders equipped with a forest “fork” to move the logs.

viii. Log transportation: it is estimated that for the first years, until around 45 thousand hectares of forest exploitation area is reached, the average log transport distance will be slightly less than 25 km. In this way, each semi-trailer truck set can provide about 3 trips a day. For calculation purposes, a transport amount of 4,800 m^3 of logs/month was considered, leading to the need of a minimum of four sets of semi-trailer trucks, during an operating period of up to six months a year.

ix. A dedicated support and support team is designed to handle reduced impact logging activities, namely:

a. One tracked tank truck (4X4 or 6X4) with a capacity to transport 12,000 liters of fuel, to transport fuel from the farm's headquarters to the work front, for distribution purposes to supply and maintenance convoys, and also for direct equipment supply;

b. One convoy truck for supplying and lubricating machines (“melosa”);

c. One mobile workshop, mounted on a 4X4 truck chassis, to be used for minor repairs and corrective maintenance, containing compressor, generator set, welding machine, grinder, hydraulic press, wrenches, and tools, for quick services in the field.

d. Three pick-up vehicles for supervision and support of reduced impact forestry activities.

CHAPTER 3 - INDUSTRIAL FACILITIES

The forest product from the Sustainable Forest Management activity with Reduced Impact Forest Exploitation, according to the project, will be processed in a sawmill to be installed in the area, in a place close to the urban concentration of Carauari, and close to the existing river pier in the place, of adequate draft, which will allow the flow of the respective wood products.

A thermoelectric power plant will be part of the complex. The power surplus will be available for distribution into the town.

SAWMILL

The sawmill will consist of a certain number of lines. Each of them is composed by the following operations and equipment:

i. Log yard to feed the sawmill with adequate size to ensure continuity of operations despite the seasonality of the log harvest, described in Chapter 2;

ii. Warehouse for equipment and industrial operation itself;

iii. Unfolding band saws (tandem) with flywheels of suitable diameters and saw thickness, this being the main sawing operation of the logs to the designed dimensions, depending on the planned product mix;

iv. Conveyor cart coupled to the tandem saws;

v. Additional and special equipment, such as circular saws for several trimming operations to manufacture produce with higher added value, such as, for panel production: molding circular saw, high frequency press, gluing machine , flat sander and cutting line among others;

ÁREA: 412.346,00m²

vi. Shed for separation and classification of by-products and storage of sawn and dry wood;

vii. Boilers and dryers;

viii. Product yard and drying area;

ix. Miscellaneous transport and stacking equipment.

The preliminary layout of the industrial area is presented above.

The equipment is organized in lines, and each line can operate in one or more shifts, which will define its production capacity.

The projected line numbers are:

- 5 unfolding lines
- 3 finished pannel lines
- 1 flooring line
- 1 decking line

The logs are initially classified by the respective species according to information coming from the field, in the process of sustainable management. They are then cubed, that is, subjected to a set of measurements that allow checking their precise shape and volume. Based on this information, planning for sawing and subsequent processing is established in each case, according to the defined product mix, maximizing the yield of each log in the operation.

After cubing and planning for sawing, the logs of each species and diameter class are first processed in tandem band saws, where the sideboards and boards are removed in successive operations, until the block is obtained. The block is then classified depending on its quality.

The sawing step is the process of reducing whole logs through longitudinal cutting into smaller pieces. These are planks, boards or pieces with a rectangular or square section (beams, joists, rafters, slats or slats).

The sawing method is one of the variables of special importance in the lumber yield. When using techniques to reduce the dimensions of the logs for subsequent splitting in other pieces, variations in yield may occur depending on the equipment used.

The parts generated on the band saws go to the trimmers where they are again classified according to their quality. Those that have knots, cracks or brittle cores have their width standardized in the trimming machine and are sent to shipment classified as inferior quality.

The pieces with the desired quality are trimmed in defined widths according to the desired products and are topped for length standardization and dispatch, or for further processing into panels and floors.

The final products envisaged will, of course, all be made from certified tropical hardwood, comprising:

- blocks
- boards
- rafters
- beams
- slats
- panels
- floors
- other wooden manufactured products

The products are classified and stored, being cubed into volumes of individual products and products per log of each diametric class, for shipment.

The outbound product logistics will always be by river, from the existing port next to the industrial installation, with adequate draft, to international ports located in the Amazon basin, from which they will be exported.

Sawmill waste will be sent to be used as fuel in the thermoelectric plant to be installed in the same complex, as indicated in the next topic.

DIMENSIONING

The annual average potential processing volumes are:

	total gross volume directed to processing (m^3 / year)	total net volume processed (m^3 / year)	residue directed to power generation (m^3 / year)
unfold (intermed. product)	109.142,00	76.399,40	32.724,60
processing	7,639,79	4.965,95	2.673,99
sawing	26.739,79	26.739,79	
panels and other products	42.019,67	23.110,78	18.908,89

THERMOELECTRIC POWER PLANT

A thermoelectric power plant will be part of the industrial complex to be installed by the project, supplied exclusively with wood waste produced at the sawmill. The energy generated will therefore be of renewable origin.

The thermoelectric plant will be dimensioned to supply the sawmill's entire demand, and generate a surplus that can be distributed in the city of Carauari, replacing the current energy that comes from burning Diesel, given that the location of the city does not allow its connection to the National Interconnected Energy System, thus being an off-grid situation.

This is yet another contribution to the reduction of global greenhouse gas emissions, in addition to the other environmental benefits of the project.

The main data of renewable energy to be generated based on waste are:

Power Generation	
generation plant power	3,59 MW
energy consumed by the sawmill	25.863,68 MWh / ano
excess energy available for sale	7.460,10 MWh / ano

CHAPTER 4 - ENVIRONMENTAL IMPACT

GENERAL INFORMATION ON THE TERRITORY AND THE PROJECT

The objective of the project is the forest conservation on the property, implementing sustainable forest management and carrying out forest protection to prevent the opening of new areas, throughout the property.

BR ARBO's property is located in the largest biome in Brazil, the Amazon, one of the most diverse on the planet. The biome occupies 49% of the country's territory and has great biodiversity and environmental benefits.

The global benefits are, in short:

- contribution to the climate change mitigation trough avoided Greenhouse Gases Emissions,
- conservation of the native vegetation of the Amazonian biome, a remarkable value *per se*,
- conservation of the broad biodiversity that lives in it,
- conservation of the complex water system and rain regimes that operate not only in, but far beyond the Amazonian region,
- support to the local communities that make their living from the standing forest.

According to Gatti (GATTI et al, 2020), the complex relationships between water flows, climate and ecosystemic carbon are exhibited by the Amazon, where evapotranspiration is responsible for 35% of total rainfall.

The air flows of water that operate in the region receive the enormous contribution of evapotranspiration from the Amazon Forest, which move in different directions, giving rise to extremely important rainfall patterns in regions such as the Midwest, Southeast, and parts of the South and Brazilian Northeast.

However, also according to GATTI, “In the last 40-50 years, human impact has increasingly affected the Amazon, causing a loss of forests of around 17%, of which 14% converted mainly into agricultural land (89% pastures and 10% crops).”

According to the Köppen classification, the climate in the region is equatorial “Am”, with an average precipitation of 1400 mm, average annual temperature > 18 ºC throughout the year, super-humid climate and without droughts. The region's landscape varies from flat to slightly mountainous formations, with a maximum altitude of 220 m (IBGE).

The soils are mainly classified as Plintosols, Gleissols and Argisols (IBGE). The geomorphological location is the Amazon plain and part of the Solimões River depression. The dominant vegetation is the Dense Ombrophylous Forest (Db) and the Open Ombrophylous Forest (Da) (INPE).

Given the importance of the project region, local benefits are the maintenance of the biome's native vegetation cover and support for local communities. The plant potential for this region is approximately 4,268 tree species, 102 amphibians, 170 mammals, 505 birds (RESTOR).

The closest urban occupation is the town of Carauari-AM to the south of the property. There are also indigenous lands and relevant conservation units in the surroundings, which will benefit from forest protection.

ENVIRONMENTAL IMPACTS OF THE PROJECT

The environmental impact of the project boils down, in general terms, to the preservation of the existing forest mass on the property. It is an impact of enormous relevance.

The first component of this impact is the avoided CO_2 emissions, which are described in more detail in Chapter 6. The so-called "carbon emissions" are today the main negative environmental vector operating on our planet, and need to be mitigated swiftly and significantly to hold the effects of climate change that are already happening around the globe. By avoiding emissions from deforestation, the project makes a positive contribution to the entire global society.

Additionally, there is the issue of biodiversity. According to the World Wildlife Fund (WWF), the Amazon, to date, has an average scientific classification of at least "40,000 species of plants, 427 mammals, 1,294 birds, 378 reptiles, 427 amphibians and about 3,000 fish in the region". Furthermore, it is known that between 96,660 and 128,840 species of invertebrates have been described in the Brazilian part of the Amazon alone. Furthermore, “More than a third of the species on the planet live and reproduce in the Amazon. It is a tropical giant of 4.1 million km^2.

The project also has a positive impact on the surrounding communities through the conservation of this native vegetation cover, favoring the maintenance of ecosystem services provided by this area.

No less important, there is also the relevant impact on the maintenance of water systems, whether local or broader, including the regulation of hydrological and rainfall regimes in very important agricultural regions in the South American continent.

However, despite this richness, the local ecosystem is fragile. The forest lives on its own organic matter, in a humid environment with abundant rainfall. The slightest imprudence can cause irreversible damage to its delicate balance (WWF).

The deforestation rates observed in the Amazon region are relevant, the object of concern for all of society, locally, regionally and globally, with widely publicized information.

The Sustainable Forest Management with Reduced Impact Forest Exploitation (EIR) to be used in the project guarantees the conservation of the Forest with all its environmental and social values, as it will even be certified by the **FSC** - Forest Stewardship Council®, timely.

Maintaining the integrity of the Amazonian forest biome on the property through its conservation, thus opposing the different deforestation vectors and trends operating today, constitute the most relevant environmental impact of this project.

CHAPTER 5 - IMPACT ON SOCIOECONOMIC DEVELOPMENT

BACKGROUND

In 1910, the legal term called xibauá was created. A year later, through state law number 683, part of its territory is separated from the municipality of Tefé, creating a new municipality with the village of Xauá as its headquarters.

It is elevated to the status of town in 1912, with state law number 1006 and its seat is transferred to Carauari. Afterwards, the municipality was renamed Carauari. In 1928, the Comarca of Carauari was created and, in 1938, ten years later, state law 311 gave Carauari city rights.

The name of the municipality originated from the "Carauari" lake, which is close to the municipality's headquarters and is connected by a canal to the Juruá river. Orio Juruá, which was originally inhabited by the Canamari, Catuquina and other Indians.

RECENT HISTORY

In the period from 1977 to 1988, Carauari was subjected to the impacts of a significant internal and external migration, resulting from the oil and gas prospecting activities carried out by Petrobras, when there was the discovery of some deposits of natural gas, however with sub-commercial characteristics.

In 1977, the total population of the municipality was 20,162 inhabitants, with 5,536 in the urban area (27.5%) and 14,626 in the rural area (72.5%). With the start of the company's activities that year, the prospect of better salary gains was created. The rural caboclo abandoned his swidden and went in search of a job with a formal contract and the respective labor rights.

Eleven years later, when the company's activities in the municipality were deactivated in February 1988, the socioeconomic scenario presented the following indicators:

- total population of 28,719 inhabitants, with 13,508 in the urban area (70.0%) and 5,789 in the rural area (30.0%),
- depopulation of the rural area with the consequent abandonment of traditional extractive activities, both in native rubber plantations and in other primary sector activities,
- disorderly growth of the urban and suburban areas of the municipal seat, with the consequent increase in deficits in infrastructure, services and urban equipment,
- deactivation of numerous commercial establishments and services,
- worrying rates of unemployment and destabilization and weakening of hundreds of families.

Despite the urban chaos created, most workers originally coming from the rural area, who carried out activities in extractivism, fishing and agriculture, did not accept to return to these activities, starting to demand solutions to their problems, such as housing, work and other basic needs from the Municipal Public Authorities.

CURRENT SITUATION

- Location: Juruá Region, on the left bank of the Juruá River, 780.0 km away from Manaus in a straight line and 1,676.0 km by river.
- Access: waterway and air
- Life expectancy at birth: 61.25 years
- Rural communities: 43
- Communications: AM station (Yes); FM Station (Yes); TV Generator (Yes); Internet Service Provider (Yes); Cell Phone (Yes).
- Voters: 13,939 (2006)

Some social indicators provided by IBGE - Brazilian Institute of Geography and Statistics are:

CARAUARI	
Gentile denomination	carauariense
Territorial area	25.778,658 km2 [2021]
Estimated population	28.719 pessoas [2021]
Demographic density	1,00 hab/km2 [2010]
Schooling 6 to 14 years	90,2 % [2010]
Municipal human development index	0,549 [2010]
Revenues realized	61.010,46 R$ (×1000) [2017]
committed expenses	52.252,86 R$ (×1000) [2017]
GDP per capita	12.591,08 R$ [2020]

A comparative analysis of some socially relevant indices indicates that the municipality, due to several reasons, starting with the regional and isolated location, presents a very poor situation.

In the table below we indicate in yellow the parameters below 50% in Carauari's position in relation to the national ranking.

Carauari - Relevant Social Indicators	Value	position in the ranking among 5,570 Brazilian municipalities
GDP per capita [2020]	BRL 12.591,08	3.906°
Percentage of revenues from external sources [2015]	94,1 %	1.124°
Municipal Human Development Index (HDIM) [2010]	0,549	5.209°
Average monthly salary of formal workers [2020]	1,9 minimum wages	2.558°
Busy staff [2020]	1.516 people	
Employed population [2020]	5,3 %	5.139°
Schooling rate from 6 to 14 years old [2010]	90,2%	5.462°
Early years of elementary school (Public network) [2021]	4,7	4.177°
Final years of elementary school (Public network) [2021]	4,2	4.001°
Enrollments in elementary school [2021]	5.848	
Enrollments in high school [2021]	1.577	
Elementary school teachers [2021]	296	
Teachers in high school [2021]	80	
Number of elementary education establishments [2021]	57	
Number of secondary education establishments [2021]	5	
Infant Mortality [2020] deaths per thousand live births	11,97	2.326°
Hospitalizations for diarrhea [2016] hospitalizations per thousand inhabitants	0,7	2.889°
SUS Health Facilities [2009]	6	
Urbanized area [2019]	5,37km^2	
Adequate sanitary sewage [2010]	23,9%	
Afforestation of public roads [2010]	2,8%	
Population exposed to risk [2010]	477 people	

It is concluded that the project brings important opportunities to positively influence some of the above indicators, with relevant impacts for the local population, as well as for the Amazon region as a whole.

NEW DIRECT JOBS

The project will create new jobs, as described below.

Industrial activity

activity	position	position per shift (approx.)
Organization of the yard and supply of production lines	loader operators	2
Sawmill (2 production lines)	foreman	1
	line operators	30
	forestry chain of custody controller	1
Palletizing	operators	2
Warehouses	operators	1
Sharpening rooms	operators	4
Pannels	foreman	1
	line operators	28
	operators	2
Floors	foreman	1
	line operators	12
	operators	2
Decking	foreman	1
	line operators	15
	operators	1
Line maintenance	mechanics	3
	electricians	2
	construction assistants	2
Thermoelectric	central supervisor operators	1
	operators	3
	operators	3
	operators	1
Head office in Carauari	responsible	1
	administrative assistants	5
	logistical assistants	3
	auxiliaries	6
lLcensing office	forest engineer	1
	forest technicians	3
Forest exploitation	forest engineer	5
	forest technicians	5
Deposits	foreman	2
	operators	10
Transport from warehouse to port	lorry operators	3
Ferry loading	operators	3
Total	Permanent jobs per shift (aprox	167
	Total permanent jobs (aprox)	340

Field activity

Project Activities	Team/equipment	Duration (in months)	Minimum quantity	Positions per team	Total positions
100% Forest Inventory	Inventory Teams	5	4	6	24
Directional Cutting of Trees	cutting teams	5	10	2	20
Demarcation of Drag Trails	trail teams	5	5	2	10
dragging the logs	skidder tractors	5	5	1	5
exploration infrastructure	D-6 Crawler Tractors	5	2	1	2
Accommodation and loading of logs	wheel loaders	5	3	1	3
transport of logs	semi trucks	6	4	1	4
logistics and general support to field activities		6	8	2	8
supervision, administration and general management			20	1	20
Total	Total jobs during e months per year (approx.)				96

The composition of the teams has, at the top of the qualification, the presence of forest engineers, going to technical level operators of different specialties, operators of specific equipment, and field assistants.

The teams will operate during the indicated months, due to the climatic conditions of the region, during a cycle of at least 30 years, which tends to be perpetuated.

In summary, it is the creation of approximately 436 new direct jobs at the site, part of which are fixed and permanent in the city (340) and part in the countryside, on a rotating basis (96).

OTHER BENEFITS

In addition to the creation of direct jobs, the project will naturally bring socioeconomic benefits linked to its activity, such as:

- general increase in the level of local economic activity through the development of additional offers of goods and services of various kinds, which will spontaneously develop around the project, either in its implementation or in its permanent operation;
- increase in the level of tax generation, increasing the capacity for public investments of various types.

The total investments to be made in the industrial installations and in the field works amount to above USD 40 million, concentrated in the first years of the venture.

The project, however, will go further: it intends to directly address priority points of social deficiency existing in the region, which are being identified through surveys with different communities and relevant related parties.

In this sense, a stakeholder engagement process is underway, with the following activities, all currently ongoing:

- interviews in riverside communities,
- interviews in the communities that live in the interior of the area,
- interviews in communities located in the urban area of Carauari,
- interactions with local governments,
- interactions with regional governments (AM and related bodies),
- interactions with the Federal Government through bodies relevant to the project,
- interactions with local non-governmental organizations,
- interactions with non-local non-governmental organizations, but with relevant activity and interest in the region,
- interactions with universities and research institutions with relevant interests in the region.

Based on the result of all these interactions and on the best applicable practices, a Social Project is being prepared, focusing on the local community. The project will prioritize some actions to receive support, whether financial, technical or operational, in order to make a relevant contribution to the socio-economic development of its area of influence.

Support will preferably materialize through joint actions and partnerships to be established with relevant entities. The additional benefits currently being considered span the following areas:

- health care for the urban and extra-urban population,

- improvement of the sanitary conditions of the population in general,
- improvement of physical infrastructure and services, in various aspects, including:
    - energy,
    - telecommunications and internet,
    - basic sanitation,
    - housing,
    - transport at the local level and access to places relevant to the local population, including with regard to access to goods and services,
- quantitative and qualitative increase in the offer of education, at various levels,
- support for valuing and developing relevant local cultural aspects,
- qualification of the population in practices and techniques, traditional or not, capable of generating income based on the natural resources existing in the place and in the region, such as in the field of extractivism, and others,
- other items, in the process of being identified.

This report has, among others, the aim of informing the parties listed above about its composition and main characteristics, so that they can respond with their observations and points of view, which will be used as guides for its development over time.

CHAPTER 6 - GREENHOUSE GASES AND CARBON CREDITS

CARBON CREDITS

An activity with a highly positive impact related to Greenhouse Gases emissions, as is the case of this project, receives recognition and the corresponding international certification through the issuance of Carbon Credits.

Carbon Credits are flexibility instruments for meeting goals or objectives in reducing global emissions of Greenhouse Gases. This instrument was created within the framework of the United Nations Organization - UNO, on the occasion of the Kyoto Protocol, in 1997. Since then, all the world's efforts to reduce greenhouse gas emissions have included this fundamental tool, whose market has been developing consistently.

The Voluntary Carbon Markets, where the project is inserted, are led by the private sector through voluntary targets for reducing and offsetting emissions, such as net zero corporate targets.

In 2021, voluntary carbon markets moved over USD 1 billion. With the exponential growth of targets assumed by large companies to offset their carbon footprint, the expectation is that they mobilize a reduction of 2 $GtCO_2e$ and investments of USD 30 billion, by 2030.

Credits generated in the voluntary market are defined as VCUs (Verified Carbon Units), each unit corresponding to $1tCO_2e$ (one ton of carbon dioxide equivalent).

In Brazil, there are still no regulatory structures in operation, except for the RenovaBio system, specific for renewable fuels in the country. This fact brings the focus of this project to the field of voluntary systems.

CREDITS REDD+

REDD+ credits mean Reduction of Emissions from Deforestation and Forest Degradation, added (+) to the conservation of forest Carbon stocks, sustainable management of forests and increase in forest Carbon stocks.

REDD+ is an official mechanism recognized by the UN as an important instrument for achieving global targets for reducing GHG emissions.

In Brazil, REDD+ is particularly relevant due to the country's emissions profile, which is largely associated with deforestation and changes in land use.

The connection of corporate emission reduction goals with REDD+ initiatives can generate a package of economic incentives that originate robust and transparent Carbon Credits, composing a portfolio of mitigation options for the fulfillment of net zero corporate goals by companies and entities around the world. around the world.

Additionally, good REDD+ initiatives allow the generation of a series of social and environmental co-benefits, such as biodiversity preservation and investments.

After more than a decade of development, REDD+ projects now rely on rigorous systems for technical analysis and certification, socio-environmental safeguards and systems for recording generated credits.

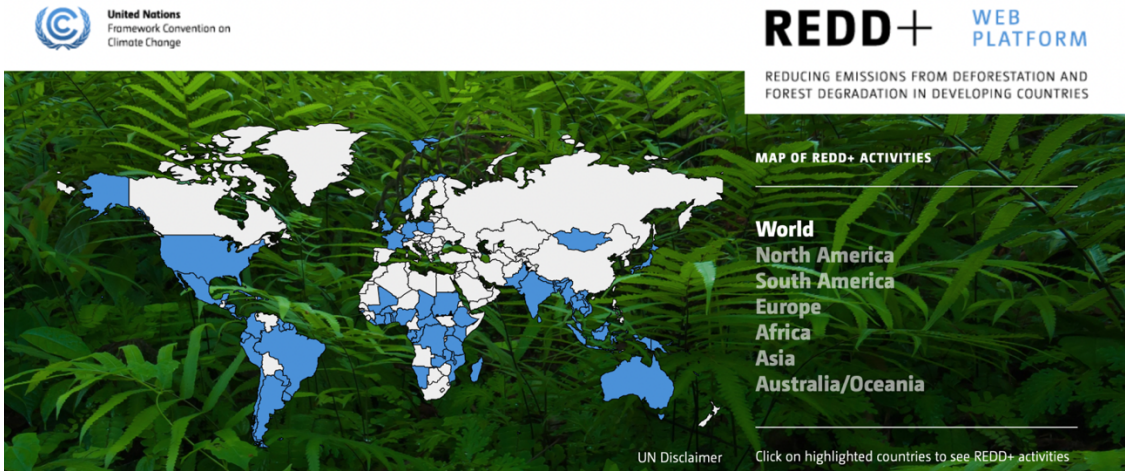
Good REDD+ projects enable innovation in local activities aimed at forest conservation, allow generating a package of social benefits (income, employment), economic (fostering local production chains, such as agroforestry systems, sustainable forest management, family farming, among others) , in addition to conserving biodiversity and hydrological cycles.

Primary forests store “unrecoverable carbon”, as once emitted it will not be possible to recapture and store it within reasonable timeframes.

In this context, the Brazilian Amazon forest, being the largest tropical forest in the world, is one of the main carbon reservoirs on the planet, acting not only in the balance of the climate, but in the protection of 10% of global biodiversity and an immense cultural and cultural diversity. Social.

In this way, a REDD project for avoided deforestation, above and beyond the levels required by the Forest Code and by the Terms of Conduct Adjustment already signed, will allow the company to play a vital role in the maintenance and conservation of the ecosystem services provided by this biome.

In this sense, the activation of the mechanisms foreseen by the United Nations Framework Convention on Climate Change - UNFCCC and its market-based instruments for generating revenue from the carbon market is part of an innovative strategy.



Due to the importance of the biome in terms of vegetation cover and maintenance of its ecosystem services, the REDD project allows for the conservation of this area and its ecological functions, forming part of public policies for mitigating climate change undertaken by Brazil.

In this way, the proposal for a carbon project for the entire area proves to be real and capable of quantifying the benefits generated, responding to the principles advocated by the Climate Convention (UNFCCC) and its subsequent agreements, in particular the Paris Agreement of which Brazil is a signatory and has positioned itself with commitments to reduce deforestation.

BR ARBO is in line with Brazil's commitments and, for that, proposes a transparent metric to quantify the benefits, respecting national and territorial laws, the legality of operations and demonstrating that it operates above and beyond the limits established by law and, therefore, it is considered eligible to seek to participate in the market mechanisms available to rural entrepreneurs in Brazil.

THE PROJECT

A Carbon Credit Project of the REDD+ kind is under development, as described above.

The carbon project is being developed with the technical participation of ATA Consultoria em Sustentabilidade Ltda., a Brazilian company specialized in the subject.

A project for a large area like this one has to it a high degree of complexity, being composed of a series of activities, some stages of approval by third parties, and some strategic decisions to be taken, taking into account the desired speed, the risks involved, and the amount of Credits to be earned.

The **VCS / VERRA** platform will be used, currently the most renown in the international voluntary carbon credits market.

The VCS platform implies the use of the corresponding standard, as well as the applicable methodologies, in addition to a set of specific tools and rules.

Once the project is registered, the monitoring of its performance is followed by the issuance of Carbon Credits (Verified Carbon Units) in annual cycles, which will be operated on the same platform, as well as the clearing of sales of Credits in the market.

VCS Standard: The VCS Standard lays out the rules and requirements which all projects must follow in order to be certified.

Independent Auditing: All VCS projects are subject to desk and field audits by both qualified independent third parties and Verra staff to ensure that standards are met and methodologies are properly applied.

Accounting Methodologies: Projects are assessed using a technically sound GHG emission reduction quantification methodology specific to that project type.

Registry System: The registry system is the central storehouse of data on all registered projects, and tracks the generation, retirement and cancellation of all VCUs. To register with the program, projects must show that they have met all standards and methodological requirements.

The Carbon Credits to be generated by this project are based on the fact that deforestation or forest degradation are avoided.

Within the scope of the VCS, the following base documents will apply:

- VCS Program Guide,
- VCS Standard,
- VM0007 REDD+ Methodology Framework (REDD+MF),
- Other supporting VCS tools, technical rules and procedures.

Additionally, the project will follow the:

- **CCB Standards - Certification to the Climate, Community & Biodiversity** / VERRA, which demonstrates that a project simultaneously addresses climate

change, supports local communities and smallholders, and conserves biodiversity.

The crediting periods of the project correspond to its total duration, which in the case in question can vary from a minimum of 20 years to a maximum of 100 years, at the option of the proponent. We are proposing the adoption of 20 to 30 years, in this case.

The VCS / VERRA definitions above tend to be revised periodically and may modify these parameters.

The potential gross volume of VCUs associated to the BR ARBO Project activities is expected to be up to 70,000 thousand tCO_2e over 30 years, an average of 2,300 thousand tCO_2e / year.

We anticipate that the registration of the REDD+ BR ARBO project in the VCS will take place by late 2023.

Timely, due care will be taken to communicate to the other participants of the supply chain about this project being in place, when these players are properly identified, in order to prevent any double claiming of Carbon Credits.

Monitoring of forest conservation must be proposed in the PDD. In this regard, we asked ESALQ - Luiz de Queiroz College of Agriculture, at USP, University of São Paulo, especially FEALQ - Luiz de Queiroz Agricultural Studies Foundation, for a satellite image monitoring system.

A methodology for issuing deforestation alerts based on satellite images and artificial intelligence (AI) will be used. Furthermore, when events occur, a specialized technical team is called to verify them, based on photointerpretation analyses.

To implement the best monitoring strategy, it is necessary to assess regional weather conditions and the presence of clouds. Clouds interfere with satellite imagery acquisition and therefore may limit the ability to monitor a specific area. To enable monitoring during periods of high cloud cover that occur in the region, two strategies will be employed.

- The first corresponds to the use of images from several satellites (using optical sensors), namely SENTINEL 2A and 2B (European Union), CBERS-4 from INPE/CRESDA (Brazil/China) and Landsat 8-9 (USGS/NASA). This increases the number of images analyzed and, consequently, the possibility of filming the property on clear days.
- The second strategy corresponds to the use of radar data from the SENTINEL 1 satellite. This equipment is less affected by clouds and, therefore, is able to obtain information, even in rainy periods. Although it has a lower spatial resolution (detecting only larger disturbances), combining it with optical sensor data maximizes the monitoring potential.

Frequency: alerts will be issued every 30 days, minimum monitored area - 1 hectare.

The project considers specific actions to prevent wildfire and to protect the rich biodiversity present in the area. Additionally, communities located at suitable points

will be engaged in a forest safeguarding process, to be created in conjunction with the Social Project mentioned on page 25 above.

CHAPTER 7 - CERTIFICATIONS

The project will be submitted to at least three relevant international certifications:

- VCS - VERRA: The Verified Carbon Standard (VCS) Program is the most widely used greenhouse gas (GHG) credit program in the world. It directs funding towards activities that reduce and remove emissions, improve livelihoods and protect nature. VCS projects have reduced or removed nearly a billion tons of carbon and other GHG emissions from the atmosphere. The VCS Program is a critical and evolving component in the ongoing effort to protect our shared environment.

- CCB - VERRA: The Climate, Community and Biodiversity Standards (CCB Standards) assess land management projects from the early stages of development through implementation. The CCB Standards were developed by the CCBA and have been managed by Verra since November 2014. The CCB Standards promote the integration of best practices and multi-benefit approaches into project design and implementation.

- FSC - Forest Stewardship Council®, is a non-governmental, non-profit organization created in 1994 to promote responsible forest management around the world through a pioneering and unique certification system, that equally incorporates the perspectives of social, environmental, and economic groups. Headquartered in Germany and Mexico, it is present in over eighty countries.