ANDRADE SUN FARMS REDD+
FAZENDA SANTA RITA

Document prepared by Mata Nativa BR

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Project Title	ANDRADE SUN FARMS REDD+ FAZENDA SANTA RITA
Version	1.0
Date of Issue	26 July 2021
Prepared by	Mata Nativa BR
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1. PROJECT DETAILS

1.1. Short Description of the Project

Andrade Sun Farms REDD+ Fazenda Santa Rita promote forest conservation and the reduction of potential emissions of greenhouse gases (GHG), based on a local economic development model that values forest preservation through a mosaic of activities linked with the organic production of Tahiti lime (*Citrus latifolia*).

The project area is located in the Cerrado biome, the second-largest Brazilian biome, behind only the Amazon, where thousands of species of animals and plants that only exist in this region live. Also inhabiting the Cerrado are more than 14 million people, many of whom depend on agriculture and livestock to survive and help the economy grow. The "Brazilian savannah" is also the country's water tower: it concentrates the main river's sources and some of the most important tributaries of the three largest watersheds in South America (Amazonas, Paraguay, and São Francisco).

As long as the present REDD+ Project is approved, the owner intends to optimize management directed to forest areas, both legal reserves and forest surpluses, to promote high productivity in these areas ensuring a decrease in deforestation and GHG emissions. Such actions will be linked to sustainable management of the production areas.

Table 1. Project Summary

Project Proponent	Mata Nativa BR
Partner entities	-
Country	Brazil
Region	South/southeast region of the state of Minas Gerais
State	Minas Gerais
Property	Fazenda Santa Rita
Project Area	728.372 ha
Reference Region	Paraguaçu - MG
Project start date	August 05, 2021
Start date of credit generation	August 05, 2021
Project crediting period	20 years
Emissions in the baseline scenario	2.992,21 ton/year

Deforestation in the baseline scenario	16.92 ha
Estimated emissions avoided with the Project	169,13 tCO2e
Estimated annual average emissions avoided by the Project	9.396 tCO2e/year
Deforestation in the Project scenario	0 ha
Emissions in the Project scenario	2.982,81 ton/year
REDD Standards	VCS
Methodology	VM0007 - REDD+ Methodology Framework (REDD+MF), v1.6 VM0005 - Methodology for Converting Low Productivity Forest Into High Productivity Forest, v1.2 VM0017 - Adoption of Sustainable Agricultural Land Management, v1.0

1.2. Sector Scope and Project Type

- Sector Scope: 14 – Agriculture, Forests, and Other soil uses (AFOLU)
- Reduction of Emissions from Deforestation and Forest Degradation (REDD)
- This is not a Grouped Project

1.3. Project Eligibility

The ANDRADE SUN FARMS REDD+ FAZENDA SANTA RITA meets the necessary criteria for the validation of an AFOLU project. A careful analysis was performed to take into account all risks of non-permanence and leak assessments.

All activities were designed to preserve the natural and semi-natural areas of the forest fragments, linking to this a sustainable management for the production areas, cooperating for the reduction of GHG emissions and forest preservation, thus expanding its benefits for the protection of biodiversity in the area along with all environmental services related to it.

Potential negative environmental and socio-economic impacts have been taken into account and measures to mitigate them have been designed so that the project can bring benefits not only to nature but also to the climate and the entire community where it is located.

The project also met all the requirements set out in the VCS version 4.2 standard, applying eligible methodologies, not violating any applicable laws, demonstrating that project activities lead to the intended objectives, and not converting native ecosystems for GHG credit generation.

1.4. Project Design

This project was designed to be implemented in a single facility and include more than one project activity; it is an AFOLU project that includes REDD components. The set of methodologies used for the development took into account the conditions of applicability according to the areas where they would be implemented and were demonstrated from a single criterion for the demonstration of additionality while the baseline followed the parameters of the VM0007 methodology version 1.6 that provides the framework for REDD+ projects. The non-permanence risk evaluation report and the reserve retention determination were carried out separately.

1.5. Project Proponent

The mission of Mata Nativa BR is to reduce deforestation and carbon emissions into the atmosphere, conserve biodiversity and water resources, and promote social inclusion and social and economic development through the commercialization of environmental service credits and the development of sustainable business chains.

Table 3. Identification and responsibility of Project proponents

Name of the Organization	Mata Nativa BR
Contact Person	Jefferson Matioli
Title	Project Proponent - COO
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Name of the Organization	Mata Nativa BR
Contact Person	Erlon Honorato
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1.6. Other Entities Involved in the Project

Organization name	x
Project role	x
Contact person	x
Title	x
Address	x
Phone number	x
E-mail	x

1.7. Property

The company Mata Nativa BR, the proponent of the project, has an agreement with the area owner guaranteeing the ownership of the project and the right to operate the project activities in the area. Legal documents providing area ownership data and project ownership agreements will be made available to auditors during the validation process.

1.8. Project start date

The start date of ANDRADE SUN FARMS REDD+ FAZENDA SANTA RITA was August 05, 2021, when the first Socio-economic and Environmental Diagnosis development planning meeting was held.

1.9. Project Credit Period

The start date of the crediting period is August 05, 2021. The end date will be on August 05, 2040, completing the 20-year period.

1.10. Project scale and estimated GHG emission reductions and/or removals

Table 5. Project Scale

Project	**X**
Megaproject	

Table 6. Expected GHG emission reductions and removals

Years	Estimated GHG emission reductions (tCO2e)	Estimated GHG emission removals (tCO2e)
2021	00	6.237,25
2022	00	6.237,25
2023	9.396	6.237,25
2024	9.396	6.237,25
2025	9.396	6.237,25
2026	9.396	6.237,25
2027	9.396	6.237,25
2028	9.396	6.237,25
2029	9.396	6.237,25
2030	9.396	6.237,25
2031	9.396	6.237,25
2032	9.396	6.237,25
2033	9.396	6.237,25
2034	9.396	6.237,25
2035	9.396	6.237,25
2036	9.396	6.237,25
2037	9.396	6.237,25

2038	9.396	6.237,25
2039	9.396	6.237,25
2040	9.396	6.237,25
Total estimated of ERs	**169,13**	**124.744,99**
Total years	**20**	**20**
Annual average of	**8,46**	**6.237,25**

1.11. Description of Project Activity

The ANDRADE SUN FARMS REDD+ FAZENDA SANTA RITA Project combines two highly synergistic activities: forest management with complementary activities for the Reduction of Greenhouse Gas Emissions from deforestation and forest degradation and planting of shrub fruit species that naturally fix the carbon, monitoring of the Project area, and, in support of these actions, the promotion of activities of social inclusion and local socioeconomic development and patrimonial surveillance.

Thus, the Project activities were designed and completed in order to promote the responsible use of the resources of natural vegetation and forest areas, the reduction of deforestation and emission of greenhouse gases, related to the protection of biodiversity and water resources. This set of actions will allow the generation of financial resources by forest assets, aligned with social development and the conservation of natural resources.

The integration between certified organic production and commercialization of environmental services credits, especially of the credits registered in the VCS, seeks to ensure adequate financing so that the objectives mentioned above are achieved and maintained throughout the life cycle of the project.

This way, the two complementary components are executed as described below. For a better understanding, the activities specific to the Environmental and Social Management of the Project are described in Sections 7 and 8.

1.8.1. Forest Management and Forest Conservation

Under the responsibility of Fazenda Santa Rita is the elaboration of sustainable measures to safeguard the forest integrity of the Project area in the region, in a rational way, through the use of systems that associate the permanence of the forest, maintenance of ecological balance, socio-environmental responsibility, economic and financial efficiency, and sustainability of populations in the area of influence.

The methodology will use in planning the conservation and restoration directives of forest areas, based on the following assumption:

Cerrado areas are areas of ecological and environmental relevance and an essential natural resource for local communities and the regional environment, therefore, we seek sustained rational use in ensuring the perpetuation of the floristic resource and the consequent maintenance of economic, social, and environmental benefits.

In order to meet these foundations, the planning of actions is based on information on the structure and composition of natural and semi-natural vegetation areas and on the current uses of the area and surroundings. The development and methodological basis are referenced on a previously conducted forest inventory (Forest Inventory 100% described in Table 7), which enabled the planning for the implementation and execution of the Project over the next few years.

The total area of the Project is 748.96 hectares, within which coexist the Cerrado in its forest physiognomies Cerradão, Cerrado Stricto Sensu, Campo Cerrado, and Mata de Galeria; added to this the entire area of production of Tahiti lime (*Citrus latifolia*).

1.8.2. Agricultural Management Activities

Fazenda Santa Rita uses a quality management system registered under the certifications: Organic – EU Organic Production Regulation; Organic – American Organic Production Regulation; Organic – Brazilian Organic Production Regulation, and Good Agricultural Manufacturing Practices (BPA); Hazard Analysis and Critical Control Point (HACCP) – Only on Packinghouse Sedex; Social Standard – Aimed at the well-being of the employee; Grasp — Social Certification which has a Social Policy fixed on the Fairtrade company's notice board, which has a Protocol of Freedom of Association and Union fixed on the company's notice board; Packinghouse and properties of the state of Sao Paulo.

Some of these systems have a direct reflection on the natural vegetation areas of Fazenda Santa Rita. The main activities are briefly described in Table 7. Table 8 presents the chronology of micro activities related to the main activities of the Project component throughout the operation cycle.

Table 7. Summary of the main activities of Santa Rita REDD+ Agriculture and Forest Conservation in the Management component

Activity	Description	Applicable Procedure	Status
1. Activities feasibility verification and Project planning			
1.1 Forest Inventory diagnosis	Forest inventory conducted in a sampling manner in the 748.96	Inventory Diagnosis	Performed (started in 2021)

	hectares of the Cerrado area and agricultural production, with the objective of subsidizing forest compensation and rural properties inserted in the Cerrado biome		
1.2 Previous estimate of carbon storage	Previous measurement of carbon stock by sampling using dendrological measurements and nonlinear equations	Preparation of an action plan	Performed (started in 2021)
1.3 Previous diagnosis of the immediate surrounding population	Identification of possible local partners and actors for the execution of the project	Socio-Environmental Diagnosis	Performed (started in 2021)
2. Pre-project activities			
2.1 Implementation and mapping of installments	Delimitation of permanent preservation areas, areas with physiognomic variations. Determine the location of the installments to carry out the forest Inventory 100%.	Implementation and mapping of installments	Performed (started in 2021)
2.2 Implementation and measurement of permanent installments	Implementation and data collection of permanent installments, taking into account the relationship of existing species, number of trees per species, and the quality of species, to evaluate the impacts on the forest through the monitoring of its regeneration.	Permanent Installments	Performed (started in 2021)
3. Project activities			
3.1 Comprehensive stored carbon measurement of fixed installments	Once fixed installments are defined, they will be periodically examined to verify the real increase in biomass and carbon; thus, the quantities of carbon stored in each situation are calculated with greater specificity.	Annually, the measurement of carbon stored both in the soil and in the air will be carried out.	From the implementation of the Project.
3.4 Monitoring of vegetation area	Check conservation conditions, maintenance of vegetation/fauna fragments.	Monitoring will be carried out annually with the reinstallation of trap cameras for fauna evaluation and drone flights to verify changes in the floristic physiognomy of the Project areas.	From the implementation of the Project.
4. Post-cycle compensation activities (operational monitoring)			

4.1 New analysis of permanent installments	Data collection of permanent installments, taking into account the relationship of existing species, number of trees per species, and the quality of species, to evaluate the impacts of the operation on the forest through the monitoring of its regeneration.	A new floristic inventory will be carried out by checking the regeneration of natural areas.	After Project's completion.
4.2 Selection and distribution of installments for operational monitoring	Select previously demarcated installments for monitoring	Survey of monitored installments and analysis.	After Project's completion.

Table 8. Chronology of micro activities related to the main activities of the ANDRADE SUN FARMS REDD+ FAZENDA SANTA RITA Project

1 TO 2 YEARS BEFORE IMPLEMENTATION
▪ Delimitation of the Project area; ▪ Delimitation of fixed installments of stored carbon measurement; ▪ Measurement of stored carbon; ▪ Determination of the baseline for future measurements; ▪ Forest inventory 100%; ▪ Elaboration of maps indicating environmental variations; ▪ Approval with the competent body of the proposed management plan for the Project area; ▪ Contact with surrounding populations and communities for diagnosis and identification of possible socio-environmental actions.
IN THE YEAR OF IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ Implementation and measurement of permanent installments; ▪ Training of employees involved in operations (forest management, impact reductions, certification, operational procedures); ▪ Measurement of stored carbon; ▪ Execution of the activities indicated by the management plan; ▪ Execution of socio-environmental activities with local communities.
1 YEAR AFTER IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ New measurement of stored carbon; ▪ Execution of the activities indicated by the management plan; ▪ Execution of socio-environmental activities with local communities.
2 YEARS AFTER IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ Evaluation of management plan results after two years of implementation; ▪ Execution of a new stage of activities indicated by the management plan; ▪ Evaluation of the results of socio-environmental activities after two years of implementation; ▪ Implementation of new stages of socio-environmental activities with local communities and schools.
3 YEARS AFTER IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ Execution of a new stage of activities indicated by the management plan; ▪ Evaluation of the results of socio-environmental activities after three years of implementation; ▪ Execution of new stages of socio-environmental activities with local communities and schools.
4 YEARS AFTER IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ Execution of a new stage of activities indicated by the management plan; ▪ Evaluation of the results of socio-environmental activities after three years of implementation;

▪ Execution of new stages of socio-environmental activities with local communities and schools.
5 YEARS AFTER IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ Monitoring of permanent Project installments; ▪ Measurement of stored carbon after five years; ▪ Evaluation of management plan results after five years of implementation; ▪ Execution of a new stage of activities indicated by the management plan; ▪ Evaluation of the results of socio-environmental activities after five years of implementation; ▪ Execution of new stages of socio-environmental activities with local communities and schools.
10 YEARS AFTER IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ Monitoring of permanent Project installments; ▪ Baseline update; ▪ Measurement of stored carbon after ten years; ▪ Evaluation of management plan results after ten years of implementation; ▪ Execution of a new stage of activities indicated by the management plan; ▪ Evaluation of the results of socio-environmental activities after ten years of implementation; ▪ Execution of new stages of socio-environmental activities with local communities and schools.
15 YEARS AFTER IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ Monitoring of permanent Project installments; ▪ Measurement of stored carbon after fifteen years; ▪ Evaluation of the results of the management plan after fifteen years of implementation; ▪ Execution of a new stage of activities indicated by the management plan; ▪ Evaluation of the results of socio-environmental activities after fifteen years of implementation; ▪ Execution of new stages of socio-environmental activities with local communities and schools.
20 YEARS AFTER IMPLEMENTATION OF MANAGEMENT ACTIVITIES
▪ Monitoring of permanent Project installments; ▪ Measurement of stored carbon after twenty years; ▪ Evaluation of the results of the management plan after twenty years of implementation; ▪ Evaluation of the results of socio-environmental activities after twenty years of implementation; ▪ Final report of socio-environmental activities carried out in local communities and schools; ▪ Preparation of the final report.

1.8.3 Complementary activities to reduce emissions caused by deforestation and forest degradation ("REDD+")

Under the responsibility of Fazenda Santa Rita, the objectives of REDD+ activities are social inclusion and socio-economic development and the effective reduction of the occurrence of unplanned deforestation in the Project area, in order to reduce greenhouse gas emissions from these practices and generate REDD credits to be certified by the VCS and marketed in the carbon markets. In addition to reducing greenhouse gas emissions, the avoided deforestation is important for the maintenance of other environmental services provided by intact natural vegetation, such as regulation of water flows and water quality, climate regulation, maintenance of biodiversity gene flow, nutrient cycling, soil protection, shelter for fauna, food supply, fiber, and other products, scenic beauty, among others.

Thus, the ANDRADE SUN FARMS REDD+ FAZENDA SANTA RITA Project becomes more financially robust to invest in specific activities of conservation and monitoring of forest resources, since it has a

complementary income. These activities will intensify forest protection and monitoring, increase security and patrimonial surveillance, conduct scientific research that promotes the responsible use of natural resources, and establish business chains that create alternative revenues to deforestation for communities in the Project's area of influence.

REDD+ Activities

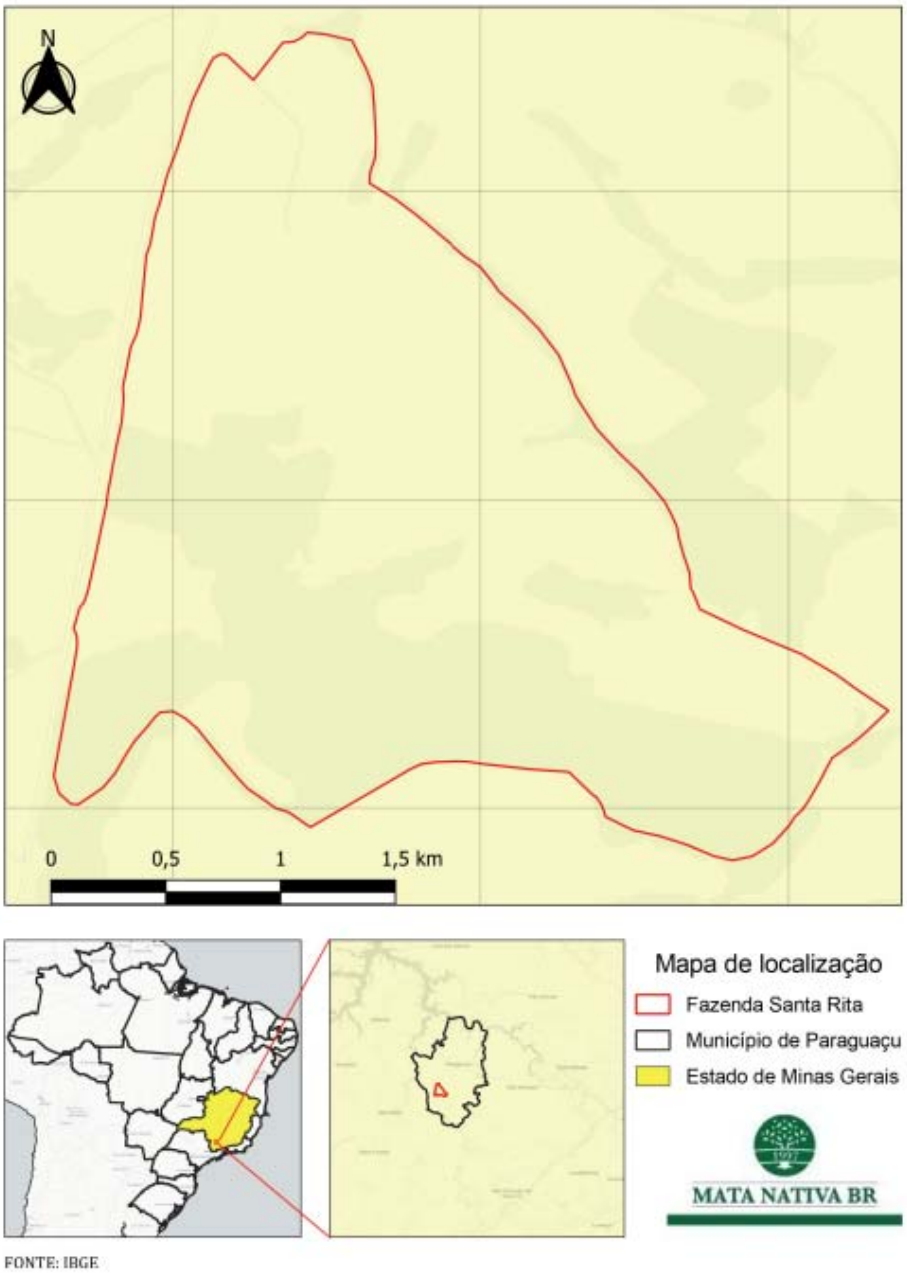
Fazenda Santa Rita, in addition to having a specialized team, is a reference in the development of Environmental Projects allied to the socio-environmental dynamics of the Project region, ensuring the quality and effectiveness to the REDD+ activities developed.

Throughout the Project cycle, the activities will have strict quality control and will be monitored by trained professionals, according to all the rules, specifications, criteria, and requirements of the VCS and its tools, as well as the employed methodologies.

1.12. Project location

The ANDRADE SUN FARMS REDD+ FAZENDA SANTA RITA Project is located in the municipality of Paraguaçu, state of Minas Gerais. The municipality is located about 400 km from Belo Horizonte, the capital of the state of Minas Gerais.

Image 1. Map demonstrating the location of the Project area relative to the municipality of Paraguaçu and the state of Minas Gerais



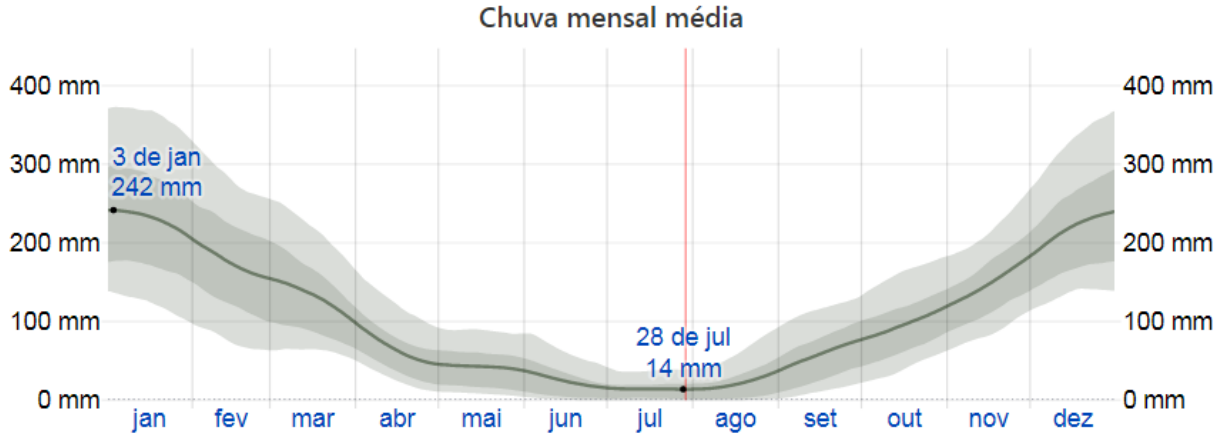
The project area has about 728.3725 ha, which are employed in Tahiti lime cultivation area (*Citrus latifolia*) and areas of native vegetation, which are under the full control of the Project proponent.

1.13. Conditions before the start of the Project

1.13.1 Climate

The municipality is characterized by warm weather throughout the year, with almost cloudless skies during dry seasons, a climate classified as Cfa on the Köppen climate classification (humid subtropical climate). It has an annual average rainfall of the order of 1200 mm. Rainfall occurs practically all year round with maximum accumulation in January and minimum in July.

Chart 1. Graph of climate indices for the municipality of Paraguaçu – MG



Source: Weatherspark.

1.13.2 Soil

Fazenda Santa Rita is in a Red-Yellow Latosol area. These mineral soils have a latosolic B horizon, developed from basic eruptive rocks, with high levels of Fe2O3 higher than 18.0%.

They have colorations with 5YR hues or more reddish and more yellow than 2.5YR in most of the first 100 cm of horizon B, and clayey or very clayey texture within the profile. The transition between horizons is usually gradual to diffuse, making differentiation difficult to visualize, except in humics, where differences between horizons A and B are more noticeable. They are under primary vegetation of the type Deciduous Seasonal Forest, Mixed Ombrophilous Forest, and Cerrado.

They usually occur in the most conserved areas of smooth undulating relief and to a lesser extent in the undulating relief, a fact that, combined with their excellent physical properties (good structure and high total porosity), qualifies them as soils of good agricultural potential, despite almost always presenting low natural fertility.

They are highly friable when wet, with a very small granular strong structure, known as “coffee powder”, and may have weakened to a moderately developed structure.

The good natural physical characteristics of these soils usually lead to a very intensive agricultural use, since they are very deep and occur in easily mechanizable areas. However, due to its clayish texture, the use of heavy machinery and conventional tillage practices with intensive soil turnover, most often outside the adequate moisture content, have caused rapid physical degradation of these soils. The formation of superficial crusts and subsurface compact layers is common, between 10 and 20 cm deep, which leads to serious soil losses due to water erosion. They are used with soybeans, wheat, barley, rye, and oats, mainly.

The main limitation to the agricultural use of these soils is the low natural fertility they present. Liming and fertilizing, especially with phosphorus and potassium, are essential for maintaining high levels of productivity, since, in their natural condition, they are acidic and very poor in bases and phosphorus, in addition to having zero or very low reserve of essential nutrients to plants. Eventually, eutrophic profiles can occur.

Image 3. Image indicating appearance of Red-Yellow Latosol at Fazenda Santa Rita

Source: Elaborated by the author, 2021.

1.13.3 Hydrography

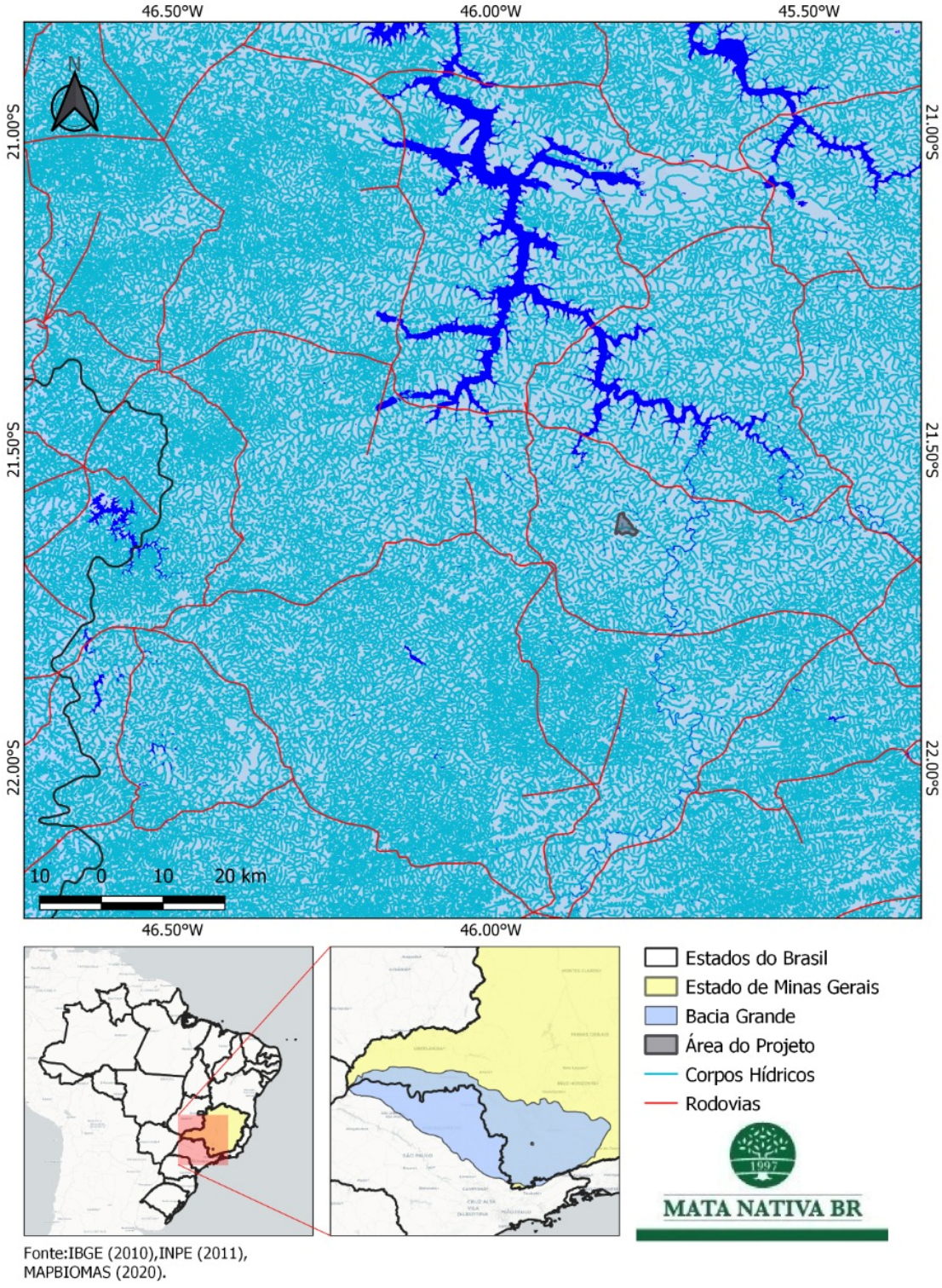
The study area is located in Paraguaçu-MG, a municipality part of the Rio Grande River Basin Committee (CBH), more specifically the GD3 — CBH from the Surroundings of Furnas Reservoir, with an area of 16,643 km2.

The GD3 — CBH from the Surroundings of Furnas Reservoir is composed of 50 more municipalities, 34 of which are based in the basin. The municipalities in question are: Aguanil, Alfenas, Alpinópolis, Alterosa,

Areado, Boa Esperança, Botelhos, Cabo Verde, Camacho, Campestre, Campo Belo, Campo do Meio, Campos Gerais, Cana Verde, Candeias, Capitólio, Carmo do Rio Claro, Conceição da Aparecida, Congonhal, Coqueiral, Córrego Fundo, Cristais, Divisa Nova, Elói Mendes, Espírito Santo do Dourado, Fama, Formiga, Guapé, Guaxupé, Ilicínea, Ipuiúna, Itapecerica, Juruaia, Machado, Monte Belo, Muzambinho, Nepomuceno, Nova Resende, Paraguaçu, Perdões, Pimenta, Poço Fundo, Santa Rita de Caldas, Santana da Vargem, São João Batista do Glória, São João da Mata, São José da Barra, São Pedro da União, Serrania, and Três Pontas.

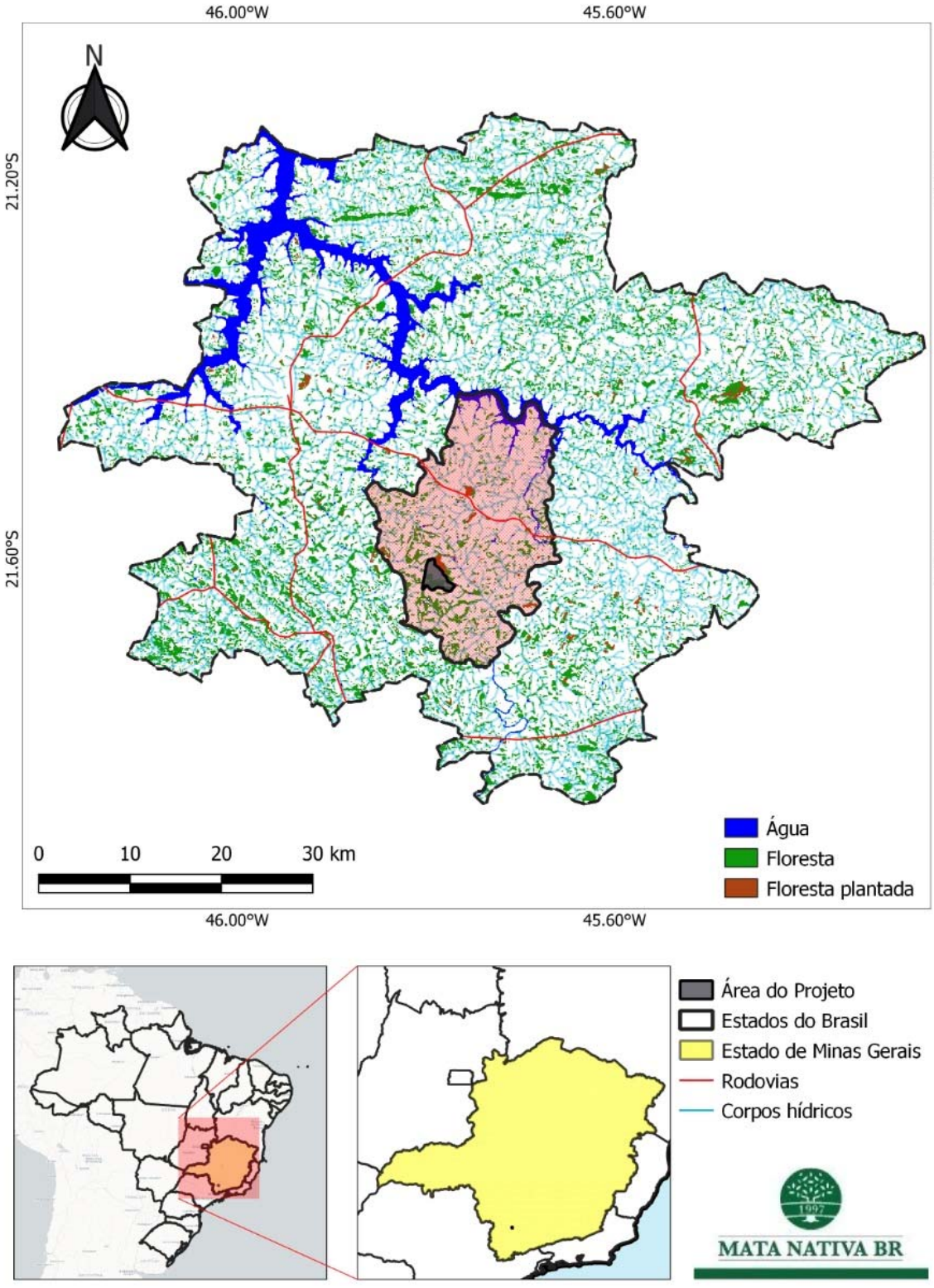
This hydrographic unit presents several environmental problems, such as marked loss of surface water caused by intense deforestation and acceleration of the erosive process in urban and rural areas; loss of fertile soils, silting, and risk of non-perennial watercourses; release of untreated urban sewage; irregular disposal of garbage, uncontrolled exploitation of groundwater, and the growing increase in water demand, especially for irrigation use.

Image 4. Map showing water bodies



Fonte:IBGE (2010),INPE (2011), MAPBIOMAS (2020).

Image 5. Map showing water bodies



Fonte: IBGE (2010), EMBRAPA(2020), INPE (2011), MAPBIOMAS(2020).

1.13.4 Biome

The Cerrado is the second largest biome in South America, occupying an area of 2,036,448 km^2, about 22% of the national territory. Its continuous area is found on the states of Goiás, Tocantins, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Bahia, Maranhão, Piauí, Rondônia, Paraná, São Paulo, and Distrito Federal, in addition to the enclaves in Amapá, Roraima, and Amazonas. In this territorial space are the water sources of the three largest watersheds of South America (Amazônica/Tocantins, São Francisco, and Prata), which results in a high aquifer potential and favors its biodiversity.

Considered a global hotspot of biodiversity, the Cerrado has an extreme abundance of endemic species and suffers an exceptional loss of habitat. From the point of view of biological diversity, the Brazilian Cerrado is recognized as the richest savannah in the world, housing 11,627 native plant species already cataloged. There is a great diversity of habitat, which determines a remarkable alternation of species between different phytophysiognomies. About 199 mammal species are known, and the rich avifauna consists of about 837 species. The number of fish (1200 species), reptiles (180 species), and amphibians (150 species) is high. The number of endemic fish is not known, however the values are quite high for amphibians and reptiles: 28% and 17%, respectively. According to recent estimates, the Cerrado is the refuge of 13% of butterflies, 35% of bees, and 23% of tropic termites.

In addition to environmental aspects, the Cerrado has great social importance. Many populations survive from its natural resources, including indigenous ethnicities, quilombolas, geraizeiros, ribeirinhos, babaçueiras, vazanteiros, and quilombola communities that, together, are part of the Brazilian historical and cultural heritage, and hold a traditional knowledge of their biodiversity. More than 220 species have medicinal use and 416 more can be used in the recovery of degraded soils, as wind barriers, erosion protection, or to create habitat for natural pest predators. More than 10 types of edible fruits are regularly consumed by the local population and sold in urban centers, such as the fruits of Pequi (*Caryocar brasiliense*), Buriti (*Mauritia flexuosa*), Mangaba (*Hancornia speciosa*), Cagaita (*Eugenia dysenterica*), Bacupari (*Salacia crassifolia*), Cajuzinho-do cerrado (*Anacardium humile*), Araticum (*Annona crassifolia*), and the seeds of Barú (*Dipteryx alata*).

1.13.5 Flora

The floristic composition of the areas studied at Fazenda Santa Rita brings together species and phytophysiognomies that are characteristic of the Cerrado biome. The features identified in the area vary from Campo Sujo, Cerrado Típico, Cerradão, and Mata de Galeria in the wetter portions of the terrain.

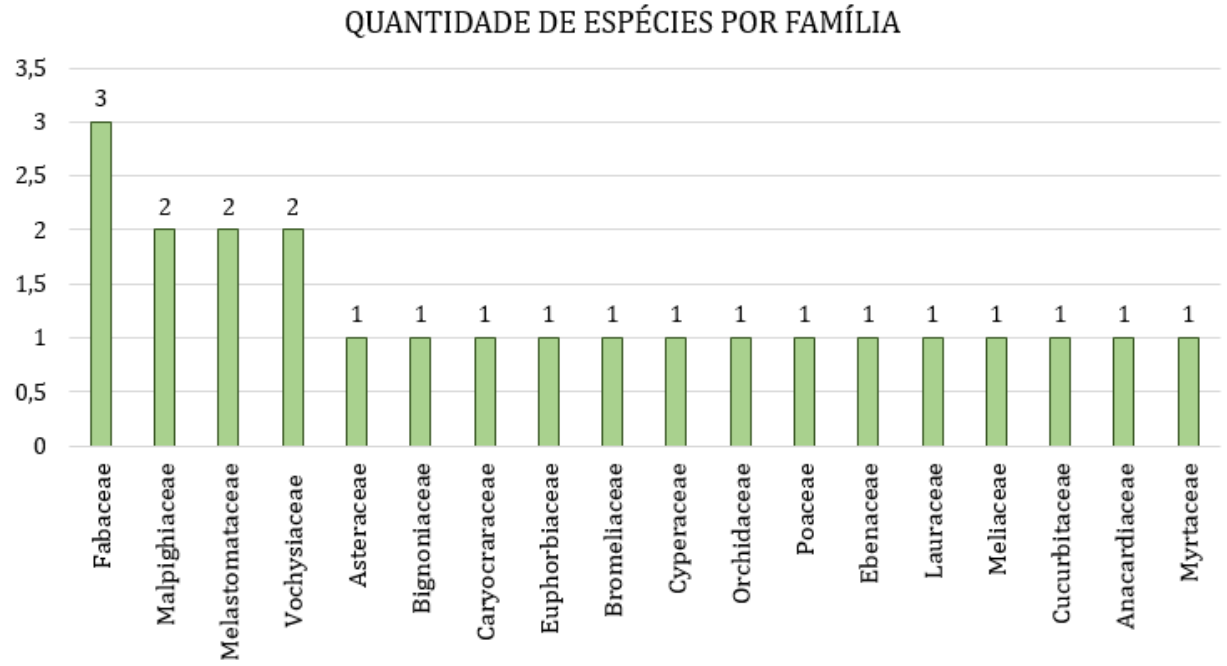
1.13.5.1 Cerrado Típico -21.623310° -45.789225°

Table 11. Table of tree and shrub species identified in the investigated area

	Family	Scientific name	Popular name
1	Asteraceae	*Achyrocline alata*	macela; macela-do-brejo
2	Bignoniaceae	*Pyrostegia venusta*	cipó-de-são-joão
3	Caryocraraceae	*Caryocar brasiliense*	pequi
4	Euphorbiaceae	*Mabea fistulifera*	mamona-do-mato
5	Malpighiaceae	*Banisteriopsis campestris*	cipó-prata
6	Melastomataceae	*Miconia albicans*	canela-de-velho
7	Melastomataceae	*Clidemia hirta*	-
8	Bromeliaceae	*Ananas ananassoides*	abacaxi-do-cerrado
9	Cyperaceae	*Cyperus haspan*	tiririca
10	Fabaceae	*Anadenanthera falcata*	angico-do-cerrado
11	Orchidaceae	*Epidendrum denticulatum*	boca-de-dragão
12	Poaceae	*Melinis minutiflora*	capim-gordura
13	Vochysiaceae	*Qualea grandiflora*	pau-terra
14	Ebenaceae	*Diospyros hispida*	caqui-do-cerrado
15	Lauraceae	*Ocotea spixiana*	canelão
16	Meliaceae	*Guarea guidonia*	marinheiro
17	Cucurbitaceae	*Melothria campestris*	melãozinho-do-campo
18	Malpighiaceae	*Byrsonima crassifolia*	muruci
19	Anacardiaceae	*Anacardium humile*	cajuzinho-do-cerrado
20	Fabaceae	*Clitoria guianensis*	espelina-falsa
21	Fabaceae	*Stryphnodendron adstringens*	barbatimão
22	Vochysiaceae	*Salvertia convallariaeodora*	colher-de-vaqueiro
23	Myrtaceae	*Campomanesia xanthocarpa*	gabiroba

Source: Elaborated by the author, 2021.

Graph 2. Number of species per botanical family present in the investigated area



Source: Elaborated by the author, 2021.

1.13.5.1.1 Floristic Summary

- Dimension — The fragment in question has 20.4 ha.
- Phytophysiognomy — The fragment is related to Cerrado Típico, a savannah formation characterized by the presence of defined arboreal and shrub-herbaceous stratum, the trees are randomly distributed over the terrain in different densities.

1.13.5.2 Cerradão -21.616942° -45.797720°

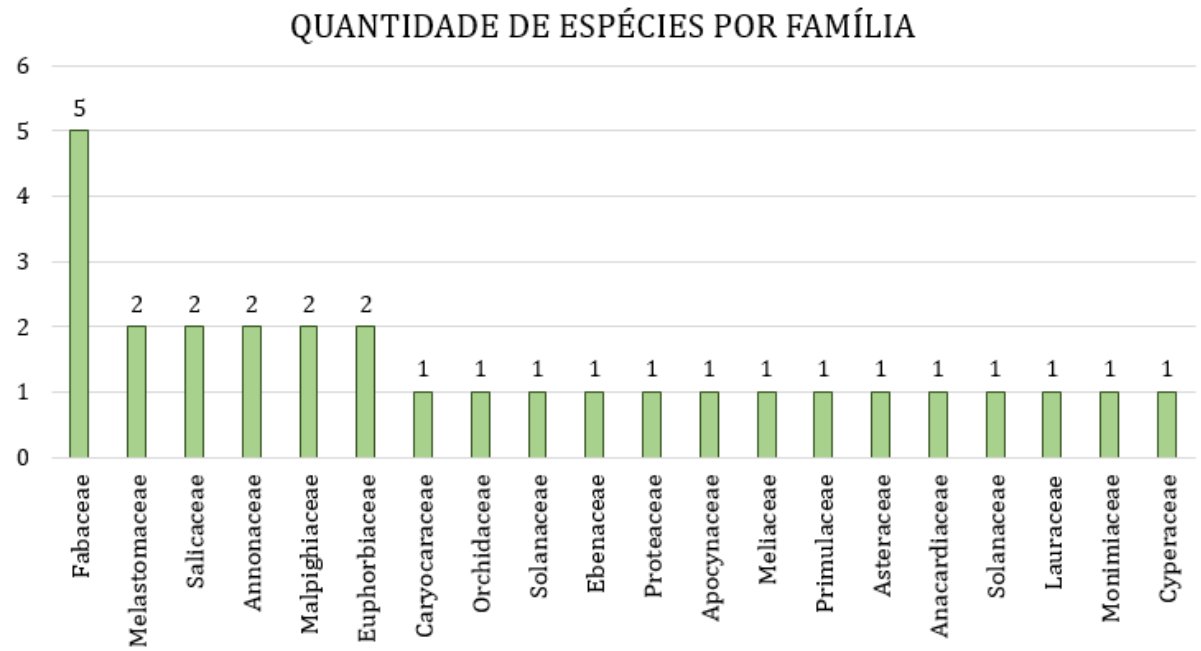
Table 12. Table of tree and shrub species identified in the investigated area

	Family	Scientific name	Popular name
1	Caryocaraceae	*Caryocar brasiliense*	pequi
2	Fabaceae	*Anadenanthera falcata*	angico-do-cerrado
3	Fabaceae	*Copaifera langsdorffii*	óleo-de-copaíba
4	Orchidaceae	*Epidendrum denticulatum*	boca-de-dragão
5	Solanaceae	*Solanum lycocarpum*	fruta-de-lobo
6	Melastomaceae	*Miconia albicans*	canela-de-velho
7	Salicaceae	*Casearia sylvestris*	guaçatonga
8	Ebenaceae	*Diospyros hispida DC.*	caqui-do-cerrado
9	Proteaceae	*Roupala montana*	cajueiro-bravo-da-serra

10	Fabaceae	*Bauhinia forficata*	pata-de-vaca
11	Apocynaceae	*Himatanthus drasticus*	janaguba
12	Annonaceae	*Annona coriácea*	araticum-do-brejo
13	Annonaceae	*Xylopia aromática*	pimenta-de-macaco
14	Meliaceae	*Guarea guidonia*	marinheiro
15	Malpighiaceae	*Byrsonima crassifólia*	muruci
16	Fabaceae	*Vatairea macrocarpa*	angelim-do-cerrado
17	Primulaceae	*Myrsine coriácea*	capororoca
18	Fabaceae	*Dalbergia miscolobium*	caviúna-do-cerrado
19	Asteraceae	*Achyrocline alata*	macela, macela-dobrejo
20	Euphorbiaceae	*Mabea fistulifera*	mamona-do-mato,
21	Malpighiaceae	*Banisteriopsis campestris*	cipó-prata
22	Melastomataceae	*Clidemia hirta*	-
23	Anacardiaceae	*Anacardium humile*	cajuzinho-do-cerrado
24	Solanaceae	*Solanum mauritianum*	fumo-bravo
25	Lauraceae	*Nectandra lanceolata*	canela-amarela
26	Monimiaceae	*Siparuna obovata*	limoeiro-bravo
27	Cyperaceae	*Cyperus haspan*	tiririca
28	Euphorbiaceae	*Alchornea triplinervia*	tanheiro
29	Salicaceae	*Casearia sylvestris*	guaçatonga

Source: Elaborated by the author, 2021.

Graph 3. Number of species per botanical family present in the investigated area



Source: Elaborated by the author, 2021.

1.13.5.2.1 Floristic Summary

- Dimension – The fragment in question has 25 ha.
- Physiognomy — The fragment is related to Cerradão, a forest formation with xeromorphic aspects and characterized by species that occur in the Cerrado Típico and forest species. Considered a forest, from a physiognomic point of view, but the floristic is more similar to a Cerrado Típico.

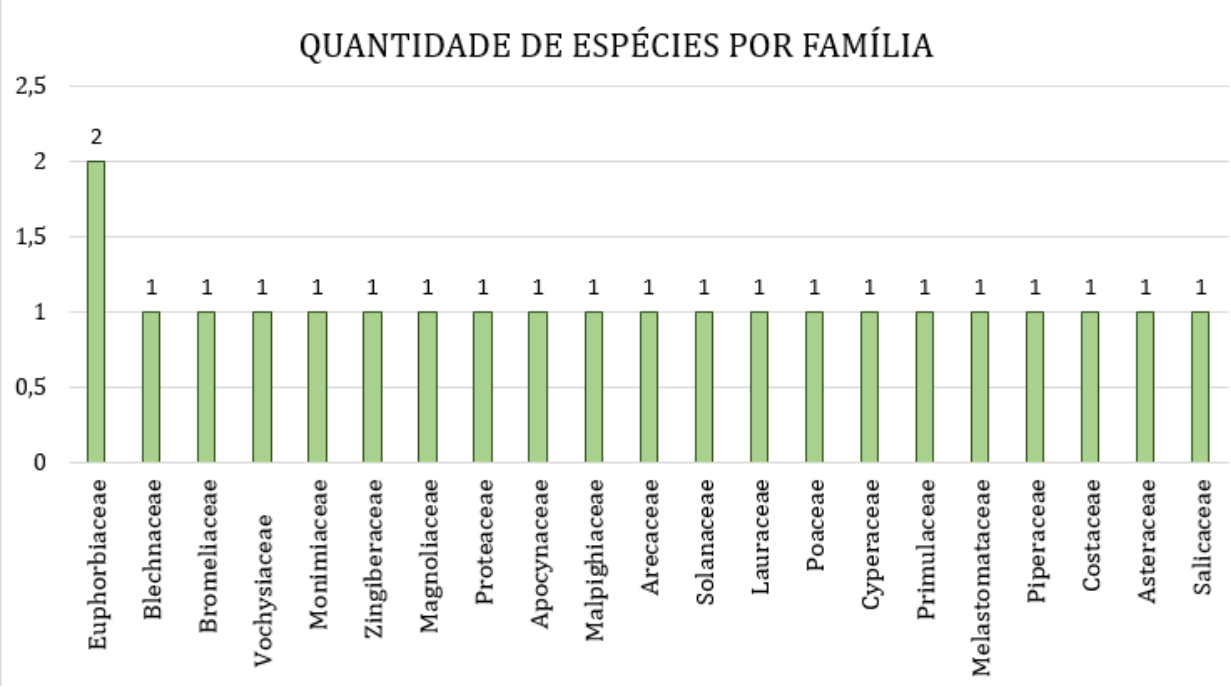
1.13.5.3 Mata de Galeria -21.629541° -45.771162°

Table 13. Table of tree and shrub species identified in the investigated area

	Family	Scientific name	Popular name
1	Blechnaceae	*Blechnum brasiliense*	xaxim-miúdo
2	Bromeliaceae	*Ananas ananassoides*	abacaxi-do-cerrado
3	Euphorbiaceae	*Alchornea glandulosa*	tamanqueiro
4	Vochysiaceae	*Qualea grandiflora*	pau-terra
5	Monimiaceae	*Siparuna obovata*	limoeiro-bravo
6	Zingiberaceae	*Hedychium coronarium*	lírio-do-brejo
7	Magnoliaceae	*Magnolia ovata*	pinha-do-brejo
8	Proteaceae	*Roupala montana*	cajueiro-bravo-da-
9	Apocynaceae	*Himatanthus drasticus*	janaguba
10	Malpighiaceae	*Byrsonima crassifólia*	muruci
11	Euphorbiaceae	*Mabea fistulifera*	mamona-do-mato
12	Arecaceae	*Syagrus oleracea*	guariroba
13	Solanaceae	*Solanum mauritianum*	fumo-bravo
14	Lauraceae	*Nectandra lanceolata*	canela-amarela
15	Poaceae	*Melinis minutiflora*	capim-gordura
16	Cyperaceae	*Cyperus haspan*	tiririca
17	Primulaceae	*Myrsine coriacea*	capororoca
18	Melastomataceae	*Miconia albicans*	canela-de-velho
19	Piperaceae	*Piper arboreum*	fruto-de-morcego
20	Costaceae	*Costus spiralis*	cana-do-brejo
21	Asteraceae	*Baccharis trimera*	carqueja
22	Salicaceae	*Casearia sylvestris*	guaçatonga

Source: Elaborated by the author, 2021.

Graph 4. Number of species per botanical family present in the investigated area



Source: Elaborated by the author, 2021.

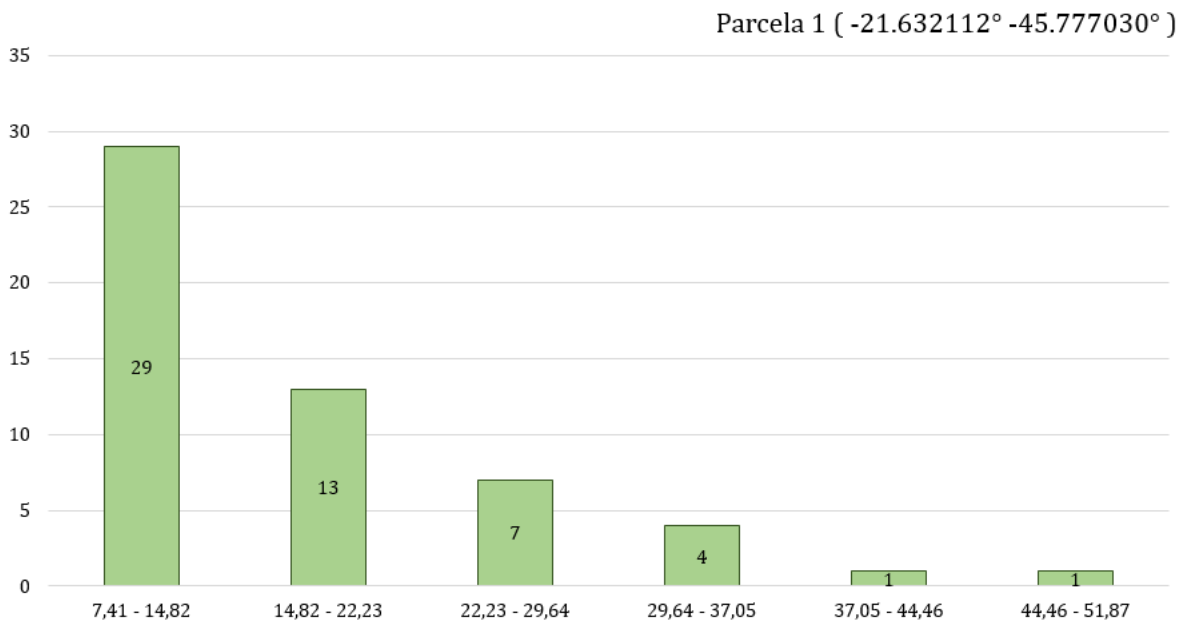
1.13.5.3.1 Floristic Summary

- Dimension – The fragment in question has 3.22 ha.
- Physiognomy – The fragment is related to Mata de Galeria, forest vegetation that follows small rivers and streams, forming closed currents over the watercourse. It is characterized by being a perennial physiognomy, not showing leaf fall in the dry season.

1.13.5.4 COMPOSITION AND SIZE

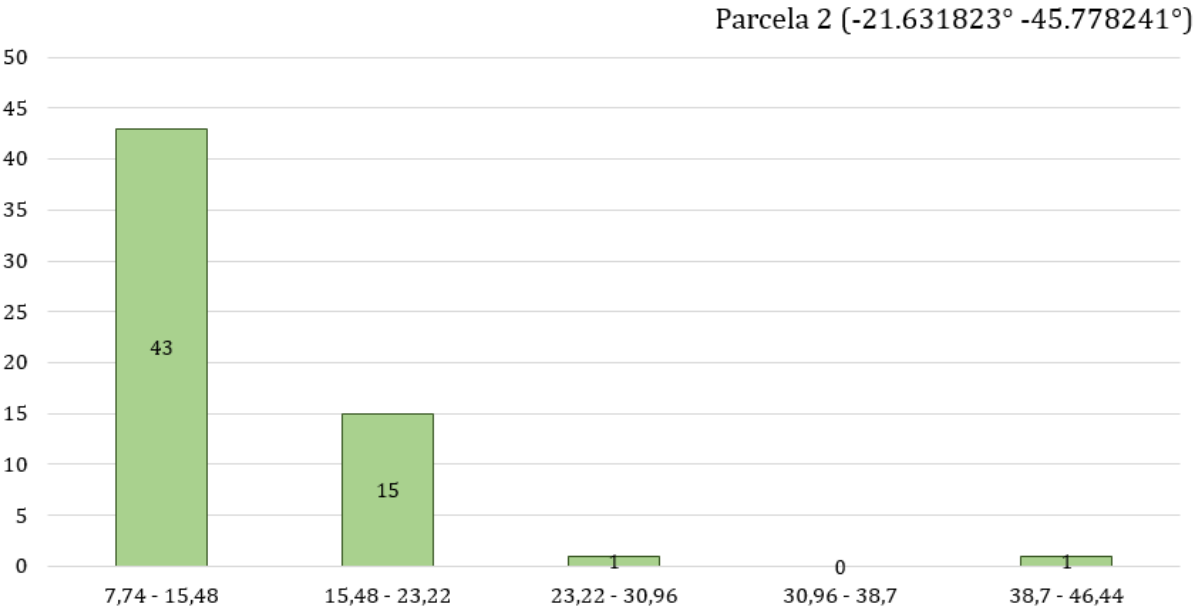
The dendrometric study of diameter at breast height (DBH) carried out on the installments, properly organized in coordinates, consists of an individual measurement technique of the trees. The diametric distribution of a vegetation area is defined by grouping the diameters of the trees into classes, which is fundamental to obtaining the growth stock and verifying if changes will be necessary for the maintenance of the forest.

Graph 5. Number of elements grouped by diametric class



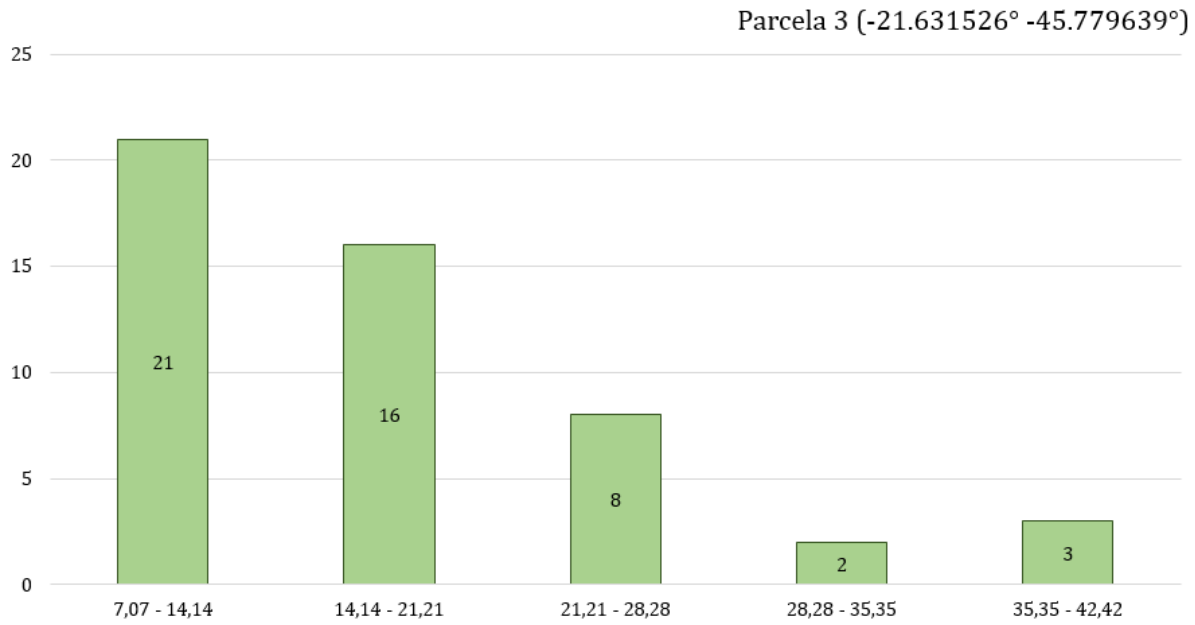
Source: Elaborated by the author, 2021.

Graph 6. Number of elements grouped by diametric class



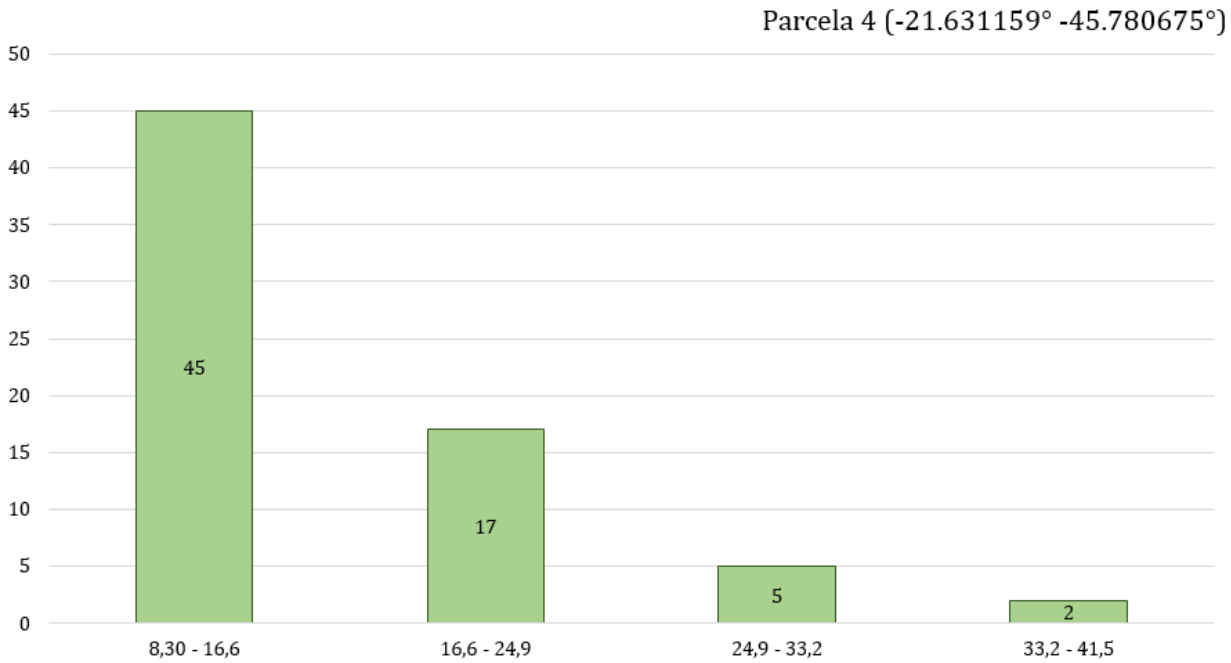
Source: Elaborated by the author, 2021.

Graph 7. Number of elements grouped by diametric class



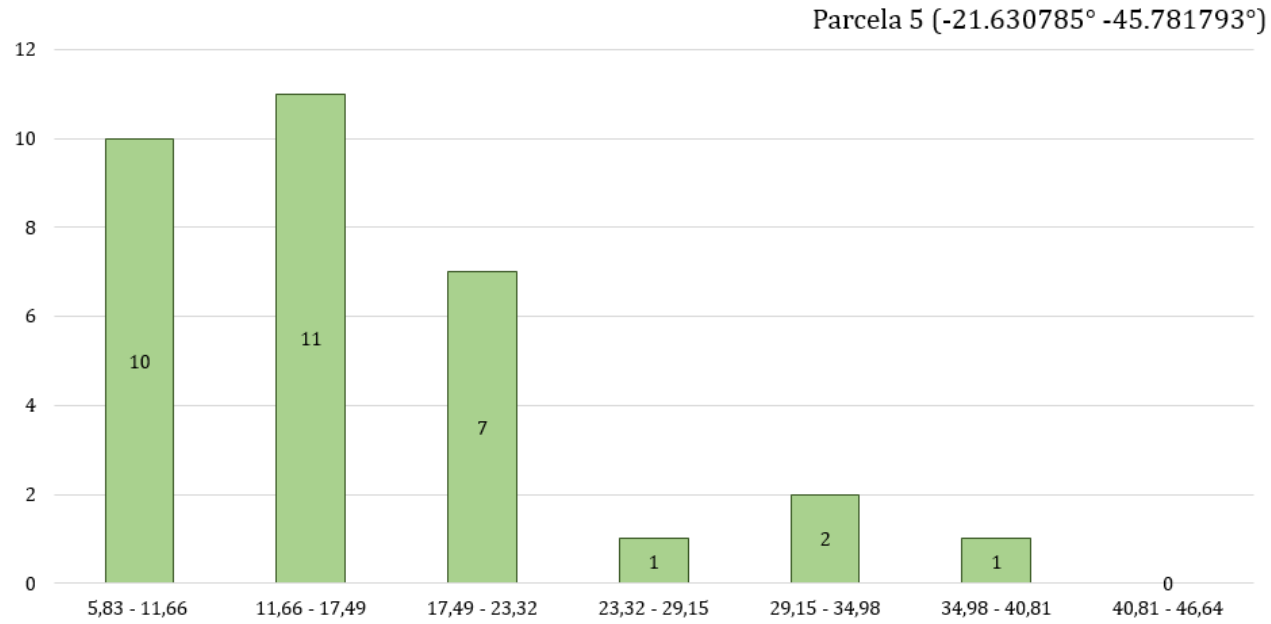
Source: Elaborated by the author, 2021.

Graph 8. Number of elements grouped by diametric class



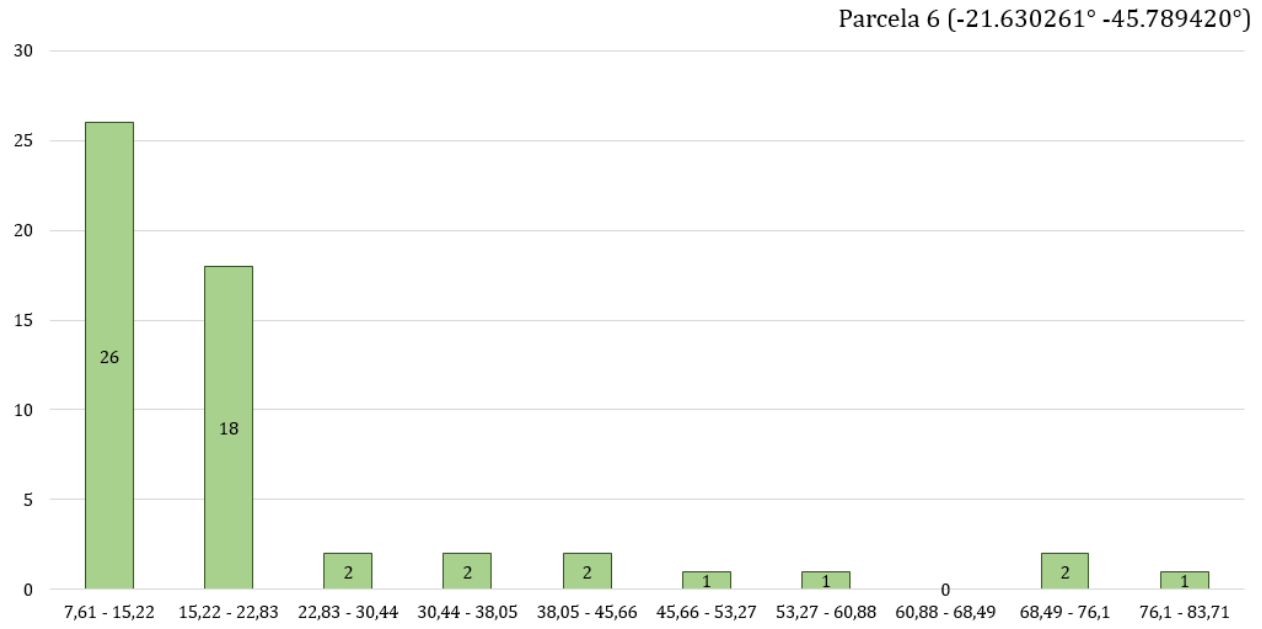
Source: Elaborated by the author, 2021.

Graph 9. Number of elements grouped by diametric class



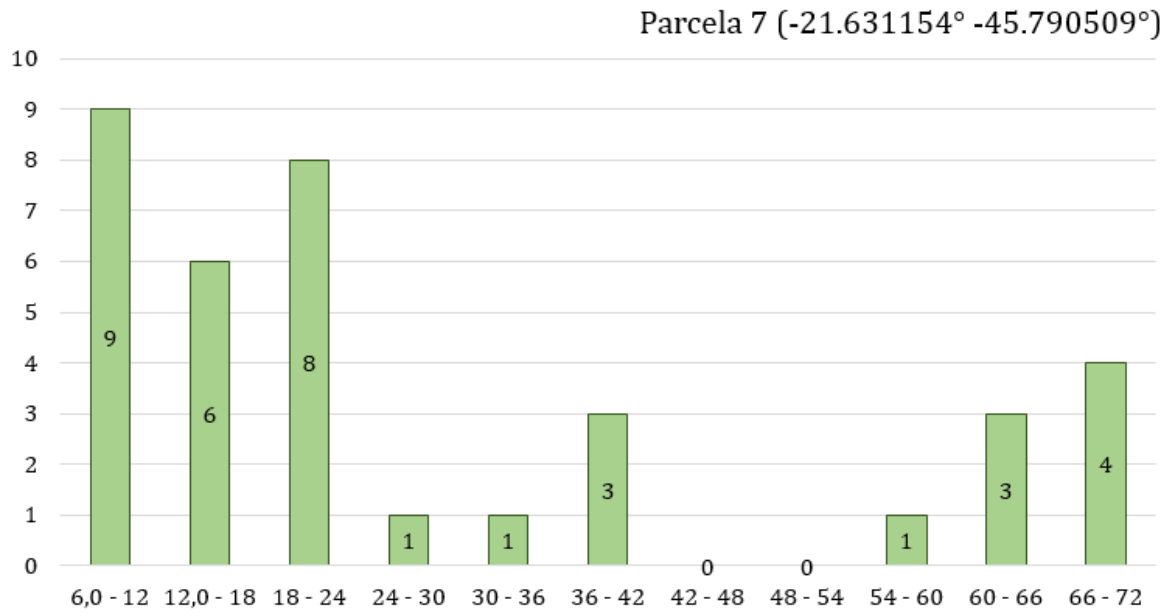
Source: Elaborated by the author, 2021.

Graph 10. Number of elements grouped by diametric class



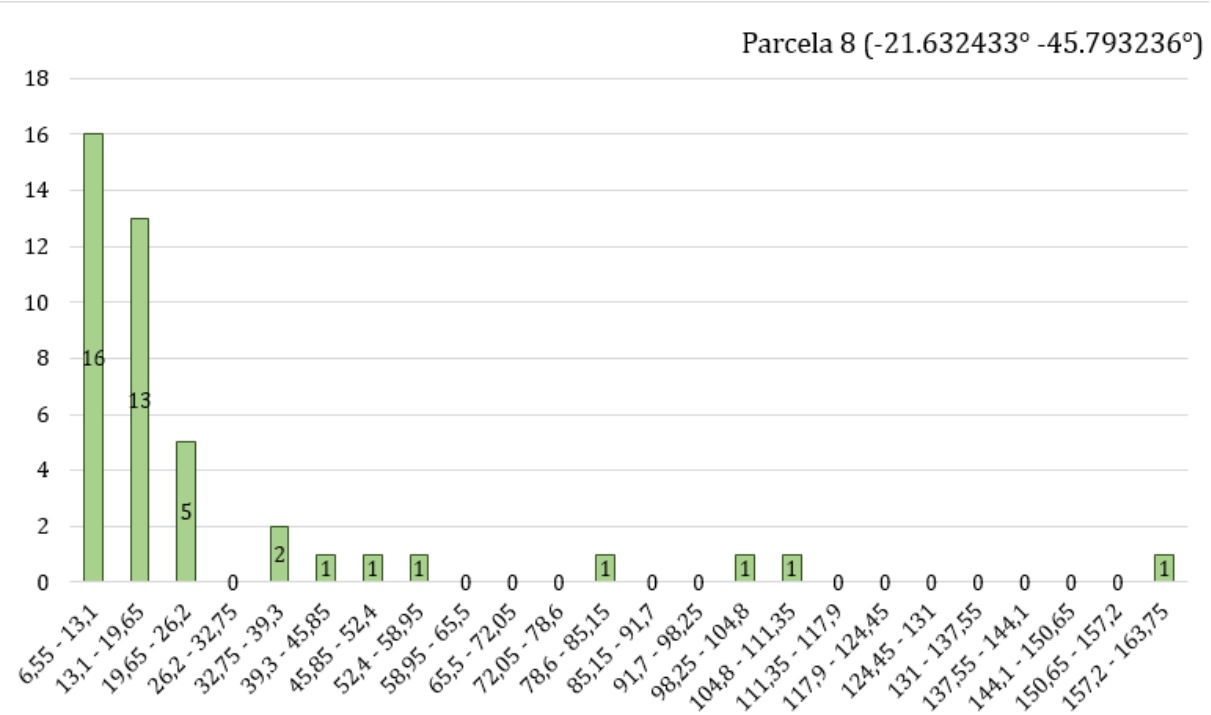
Source: Elaborated by the author, 2021.

Graph 11. Number of elements grouped by diametric class



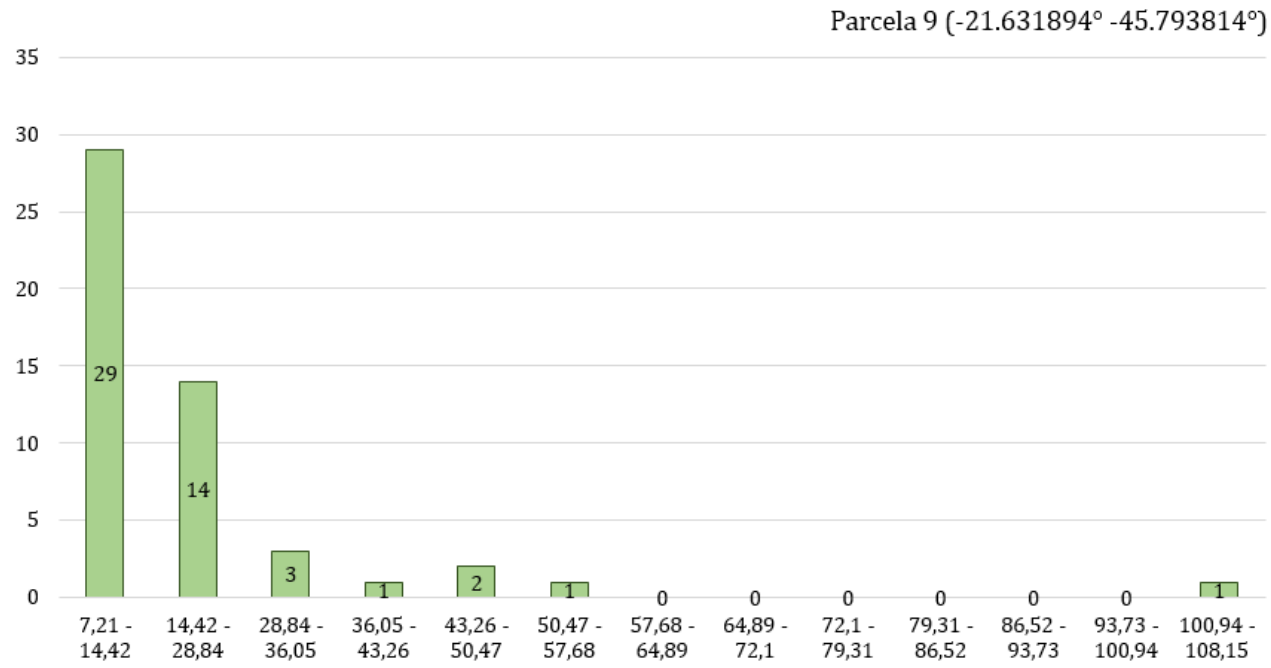
Source: Elaborated by the author, 2021.

Graph 12. Number of elements grouped by diametric class



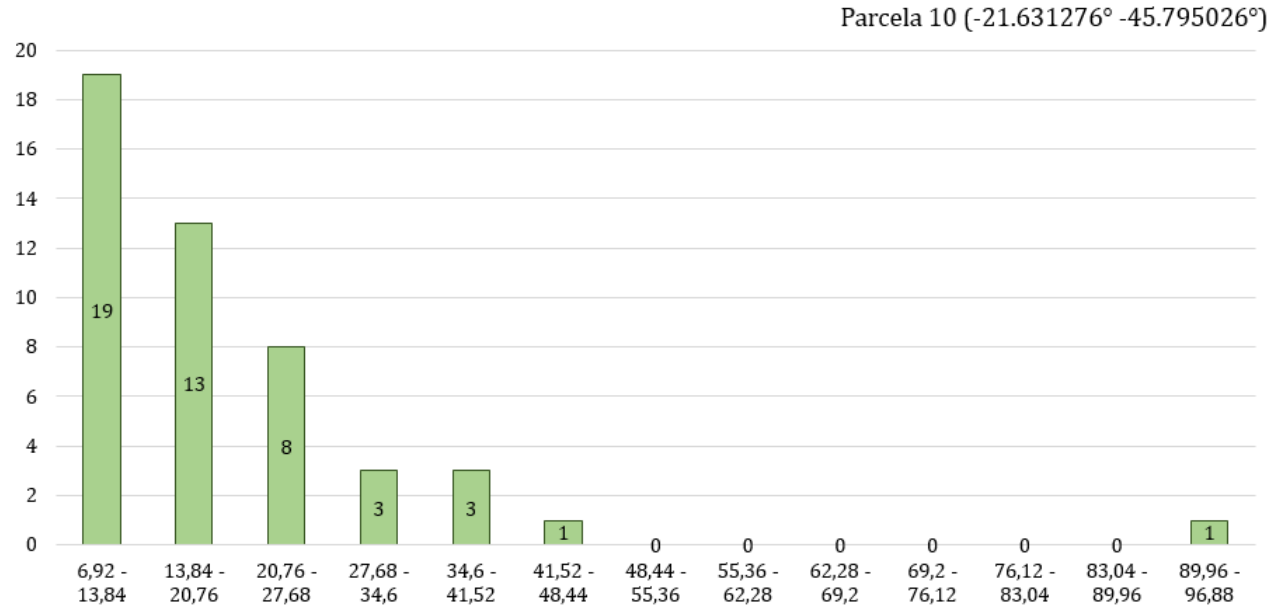
Source**:** Elaborated by the author, 2021.

Graph 13. Number of elements grouped by diametric class



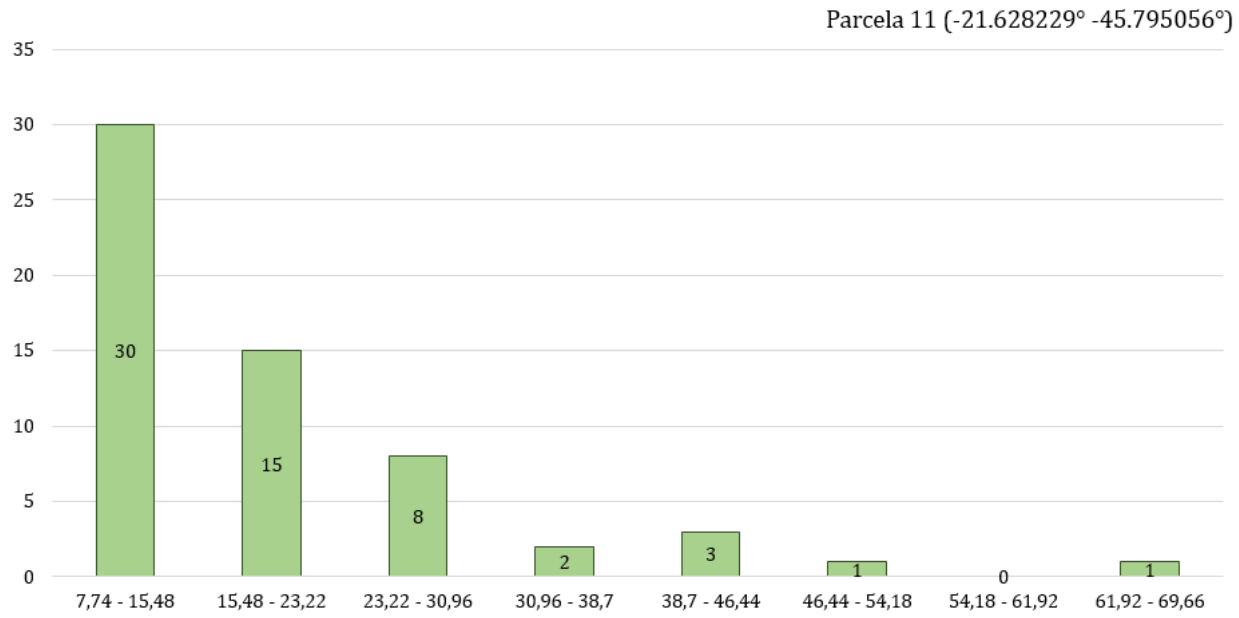
Source: Elaborated by the author, 2021.

Graph 14. Number of elements grouped by diametric class



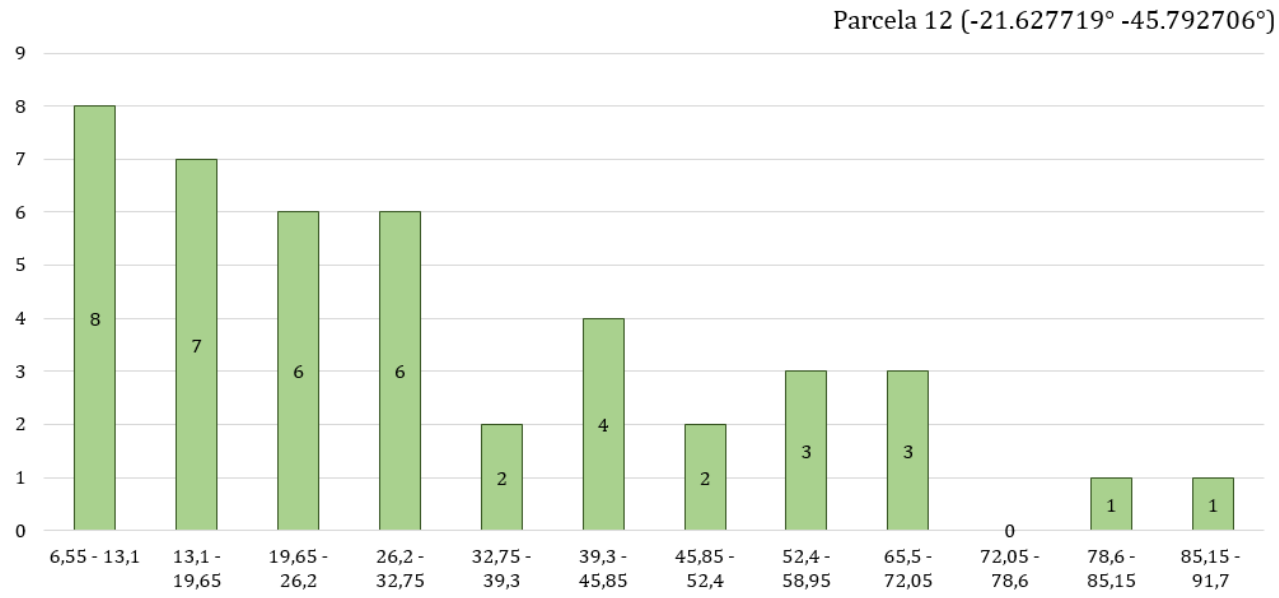
Source: Elaborated by the author, 2021.

Graph 15. Number of elements grouped by diametric class



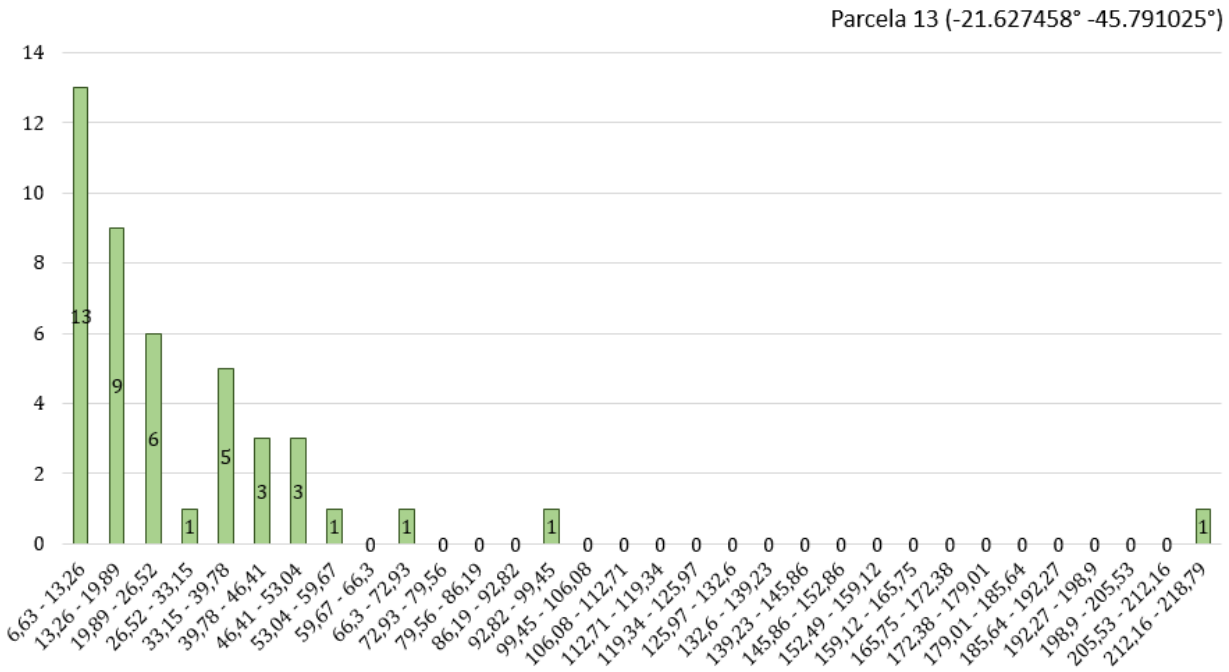
Source: Elaborated by the author, 2021.

Graph 16. Number of elements grouped by diametric class



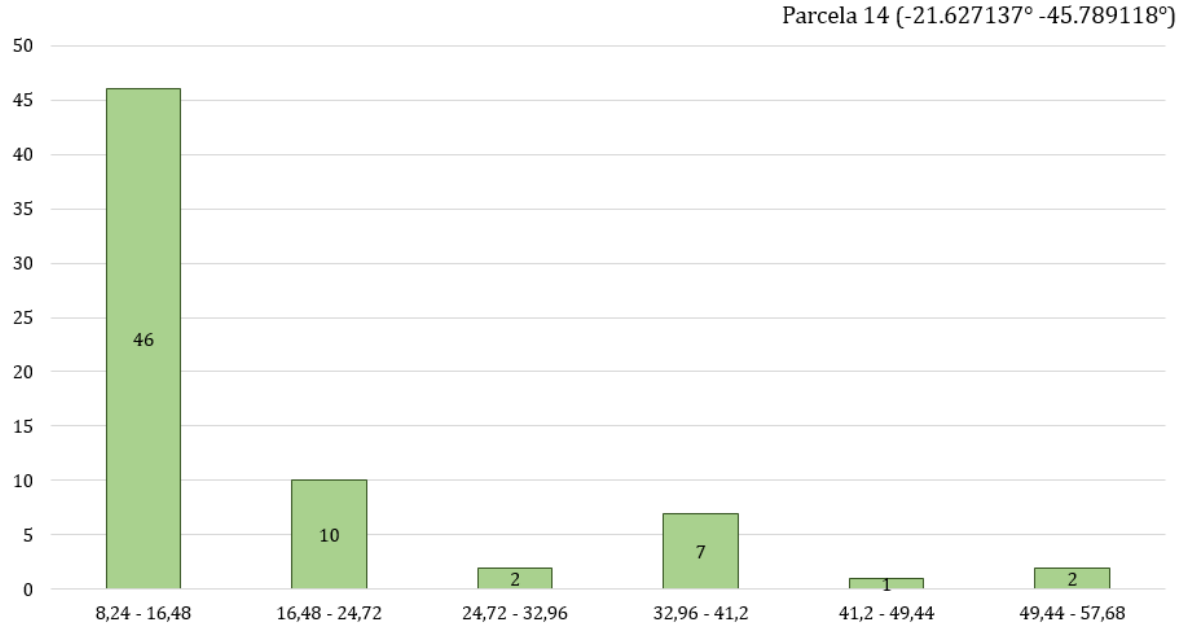
Source: Elaborated by the author, 2021.

Graph 17. Number of elements grouped by diametric class



Source: Elaborated by the author, 2021.

Graph 18. Number of elements grouped by diametric class



Source: Elaborated by the author, 2021.

1.14. Compliance with Laws, Statutes, and other Regulatory Frameworks

According to the Brazilian Forest Code (Federal Law nº 12.651, of 05/25/2012[1]), all rural properties located in forest areas must have:

I — Permanent preservation area: protected areas covered or not by native vegetation, with the environmental function of preserving water resources, landscape, geological stability, biodiversity, gene flow of plants and animals, protecting the soil, and ensuring the well-being of human populations.

II — Legal Reserve (RL): area located within rural property or ownership, except for permanent preservation, necessary for the sustainable use of natural resources, conservation, and rehabilitation of ecological processes, conservation and shelter of biodiversity, and protection of native flora and fauna. At the Project site, specifically in the state of Minas Gerais, twenty percent (20%) of a rural property must be preserved as a Legal Reserve.

One of the main ways to fight deforestation in Brazil is command and control mechanisms, such as effective monitoring, requiring compliance with environmental legislation and a greater presence of the state. However, this does not seem effective in most regions of the country, as the government's failure to fulfill these responsibilities compared to other social goals and economic interests has placed Brazil among the world's largest deforesters[2].

Cerrado is one of the most threatened Brazilian biomes in terms of loss of remaining vegetation cover. Deforestation and forest fires cause landscape change, habitat fragmentation, species extinction, invasion of exotic species, soil erosion, pollution of aquifers, silting of rivers, and imbalance in the carbon cycle.

The production of information on native vegetation regarding the most appropriate management for the economic use of non-timber species, growth, biomass, and carbon stock, will serve as a subsidy to promote the sustainable use of the Cerrado, to the detriment of the current model.

Therefore, all calculations were made assuming that the reference region has a legal liability in the environmental area. Thus, the baseline scenario considers the potential for unplanned deforestation in the project area to exceed the limits stipulated by the law.

1 BRAZIL. Law nº. 12.651, of 25 May 2012. Forest Code. Official gazette of the Federative Republic of Brazil, Brasília, DF, May 25 2012.

2 UN Food and Agriculture Organization (FAO) (2011), "State of the World's Forests 2011." FAO's Forestry Role Rome, Italy.

That said, it is worth mentioning that the project respects the legal provisions at all levels (Federal, State, and Municipal), in addition to promoting environmental balance and sustainable use in Cerrado areas.

1.15 Participation in Other GHG Programs

1.15.1 Projects Registered in Other GHG Programs (s)

The project has not been registered and is not seeking registration in any other program.

1.15.2 Projects rejected by other GHG programs

The project was not rejected by other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

It does not apply to the project.

1.16.2 Other Forms of Environmental Credit

It does not apply to the project.

1.17 Contributions to Sustainable Development

The main objective of the project is to prevent planned deforestation and forest degradation of the project area, aligning this with sustainable organic agriculture and management plans that enrich the areas of natural vegetation.

In this way, the project collaborates with some Sustainable Development Goals (SDGs) present in the world agenda adopted during the United Nations Conference on Sustainable Development in September 2015.

With a certified organic production by bodies such as the EU Organic Production Regulation, American Organic Production Regulation, Brazilian Organic Production Regulation, and the certification of Good Agricultural Manufacturing Practices. The area cooperates with Goal 12, which provides for Responsible Consumption and Production in its sustainable management and an environmentally healthy organic management to significantly reduce the release of chemicals into the air, water, and soil, minimizing their negative impacts.

The implementation of measures, through this project, to reduce GHG emissions from the areas also contributes to Goal 13 - Action against global climate change, promoting mechanisms and actions that cooperate with effective management and are committed to reducing GHG.

The protection of ecosystems present in the area is also a relevant point for the project. Located in the Cerrado area, a biome considered a biodiversity hotspot, the project aims to protect and reverse degradation, thus promoting high productivity in the capture of CO2 in forest areas and ensuring the preservation of ecosystems, thus contributing to Objective 15, which is intended with protecting, restoring, and promoting the sustainable use of terrestrial ecosystems.

1.18 Additional Information Relevant to the Project

According to AR-TOOL15, "Estimation of the increase in GHG emissions attributable to the displacement of pre-project agricultural activities in CDM A/R Project activity", Version 2.0, the leak is all those emissions that occur when the displacement of pre-project agricultural activities leads to an increase in GHG emissions relative to GHG emissions attributable to the activity as it exists within the project limit.

The leak definitions have no application in the Project because there is no displacement of emissions to other sectors; the proponent has no other areas for the displacement of activities and, therefore, emissions; the Project also does not provide for the suppression of forest fragments, and all emissions contained in the baseline are circumscribed to the perimeter of the Project area.

- **Market leakage** - Does not apply, since the restoration Project to be carried out does not aim at the subsequent extraction of the forest area. Part of the area in which the Vm0005 Methodology version 1.2 applies is a Legal Reserve, therefore, registered as an area protected by federal legislation. The rest of the area will be converted into Environmental Reserve quotas and, in this context, will be legally protected like the rest of the area.
- **Displacement leakage** - Does not apply, because the activities of the Project are limited to the perimeter of Fazenda Santa Rita, an independent legal figure which does not possess other areas for production.
- **Ecological leakage** - The Project is based on the conservation and preservation of the standing forest, thus, all the benefits that come from this fact will be maintained and expanded, without negative impacts on neighboring areas, whether they are covered by native vegetation or agricultural crops.

1.19 Social Project

From the National Education Guidelines and Bases Act (LDB) of December 1996, the Ministry of Education proposed an educational reform at all levels.

However, the implementation, after 26 years, still runs into problems inside and outside the classroom, among which we can mention:

- helplessness of teachers, who regret that they have not been prepared to understand the reform proposals in general;
- most of the teachers tried to change their practice and seek didactic alternatives to approach the guidelines contained in the official documents, but they understand that little has changed in the classroom, especially regarding the skills necessary for the development of the Environment as a transversal theme and the subsequent development of the skills;
- difficulty to seek a more adequate understanding of the environmental concepts of training by skills and abilities, central to the National Curriculum Parameters (PCNs);
- the reduction in the workload of most disciplines and the difficulty of including sociology in the educational proposal, in order to reinforce the transversality of environmental issues.

The municipality of Paraguaçu-MG has, according to the Brazilian Institute of Geography and Statistics (IBGE), 21,693 inhabitants. The municipality also has a 6 to 14 years schooling age group rate of 99.4%. The municipality presents conflicting data regarding the number of public educational institutions; according to the IBGE, Paraguaçu has 8 elementary schools and only 1 high school, while other sources account for 7 elementary schools and 3 high schools.

Data from 2020 accounted for 2930 students enrolled, of which 2314 were enrolled in elementary school and 616 were enrolled in high school.

Education and environment

Objective:

Promote the continuing education of teachers from the public network of the city of Paraguaçu-MG, enabling them to act in their school communities as agents of socio-environmental transformation engaged in the development of themes focused on local and regional sustainability.

Justification:

There is a demand in the continuing education of teachers who can act in their school communities both in the scope of global and regional themes. Usually, when dealing with global environmental issues, there are gaps that allow students to understand the dynamics of the local environment. As it is a transversal

topic, it is an important opportunity to deal with the local reality in its various aspects: economic, social, cultural, political, and environmental. Thus, the promotion of a proposal that equips teachers with acting techniques and tools in the classroom can certainly transmit to students positive concepts and attitudes in relation to dealing with the environmental issue.

Fazenda Santa Rita maintains an internal policy of valorization of the environment and social issues so that the Project proposal extends its action to education, society, and the environment.

Method:

The Project consists of four modules, with 4 hours each, ministered outside school hours, preferably on Saturdays in the morning. The topics will be elaborated by the facilitators in a participatory way, using expository classes as didactic tools, conversation wheels, theater, and staging, as well as films and documentaries whose themes will have been defined previously in the planning period.

The evaluation will have as a central aspect the presentation and an environmental project developed in the school environment of the teacher.

And the teacher's certification will be carried out with the presentation and publication, on social networks, of the results of classroom projects.

Project Stages — PHASE 1

1- Contact with the teaching stations and Municipal Secretariat of Education of Paraguaçu-MG;
2- Identification of public education units;
3- Census of teachers working in the municipality;
4- Identification of the demands present in the school curriculum that may be related to the objectives of the Carbon Credits Certification project.

Physical Structuring — PHASE 2

1- Elaboration of a physical schedule;
2- Hiring facilitators training;
3- Determination of the headquarters where classes and workshops will be held;
4- Disclosure, with the Secretary of Education and Teaching Station, of the dates and places of the classes;
5- Sending electronic messages notifying registered teachers of the dates of the courses;
6- Preparation of didactic material printing.

The course — PHASE 3

Module 1: - Environment — Community, identity, and knowledge

- Definitions of environment

Module 2: - Environment, economy, and society

- Education for sustainability

Module 3: - Workshop 1 — Knowledge transposition

- Workshop 2 — Breaking disciplinary barriers

Module 4: - Evaluation — Results of projects in schools

- Delivery of certificates

2. PROTECTIONS

2.1. No net damage

The Project in question is a REDD+ initiative, which is based on reducing GHG emissions through a program of avoided deforestation, thus generating benefits for biodiversity as well.

Still, due attention was given to avoiding any impacts on biodiversity and leaks resulting from deforestation, degradation, and pressures as a result of Project activities. Thus, the activities aim to generate positive net impacts within the project zone and throughout its useful life, measured in relation to the baseline.

The activities in the areas of natural vegetation were planned so that there are positive benefits for the preservation of biodiversity, since the area is located in a biome with a wide variety of endemic and threatened species of fauna and flora, and the maintenance of environmental services provided, once the preservation of existing ecosystems in the area is guaranteed.

The production areas will be managed through sustainable land-use practices, thus ensuring the protection of soils, watercourses, and all biodiversity.

2.2. Local Stakeholder Consultation

The area has certifications that prove the care to the workers who perform functions at Fazenda Santa Rita, such as Sedex – Social Norm, which aims at the well–being of the employee, and Grasp – Social Certification and Fairtrade. In this way, sustainable development aligned with workers' rights is guaranteed based on dialogue, transparency, and respect.

2.3. Environmental Impact

It does not apply to the project.

2.4 Public Comments

Irrelevant to the project.

2.5 AFOLU Specific Safeguards

The project is structured by a REDD proposal, thus the main objective is to avoid planned deforestation by ensuring the protection of natural areas and not offering risks to the social aspect. In addition, the project follows transparent and aligned communication with the laws, not impacting on property rights of the area.

3. APPLICATION OF THE METHODOLOGY

3.1. Title and Reference of the Methodology

The ANDRADE SUN FARMS REDD+ FAZENDA SANTA RITA Project was designed according to the VM0007 methodology, based on the reduction of emissions from deforestation and forest degradation (REDD). The activities of the AFOLU Project were also designed to include components of the respective VM0005 — Version 1.2 methodologies, for the conversion of low productivity forests into high productivity forests, and VM0017 — Version 1.0, for the sustainable management of agricultural land.

The addition of other methodologies was made according to the needs of each existing fragment within the delimitations of the geographical area of the Project.

The determination of the baseline scenario of the area was carried out according to the VM0007 methodology — Version 1.6. To this end, all relevant factors, such as common practices carried out in the area, deforestation rates, damage factor caused by deforestation, pre-records of above and below ground carbon stock, and records of emissions caused by activities carried out in the area were taken into account.

3.2. Applicability of the Methodology

The REDD+ VM0007 methodological framework is applicable to the project objective, since all necessary parameters have been complied with. The land is legally authorized and obey the laws and comply with its rights and responsibilities; the forest areas qualify as forests for at least 10 years, according to the definition used by the VCS parameters; the Project aims to prevent deforestation in all its areas, having a

commitment to the objective of the methodology, and, in addition, all Project activities do leak prevention and do not include flooding of agricultural land for increased production.

3.3. Limits of the Project

The northern limit of the Project is 7 km from the municipality of Paraguaçu, the western limit is near the Rodovia Machado-Paraguaçu, and the eastern and southern limits are near areas of other owners.

The coordinates generated from georeferencing are listed below:

Table 10. Table with georeferenced coordinates of the boundary of the area

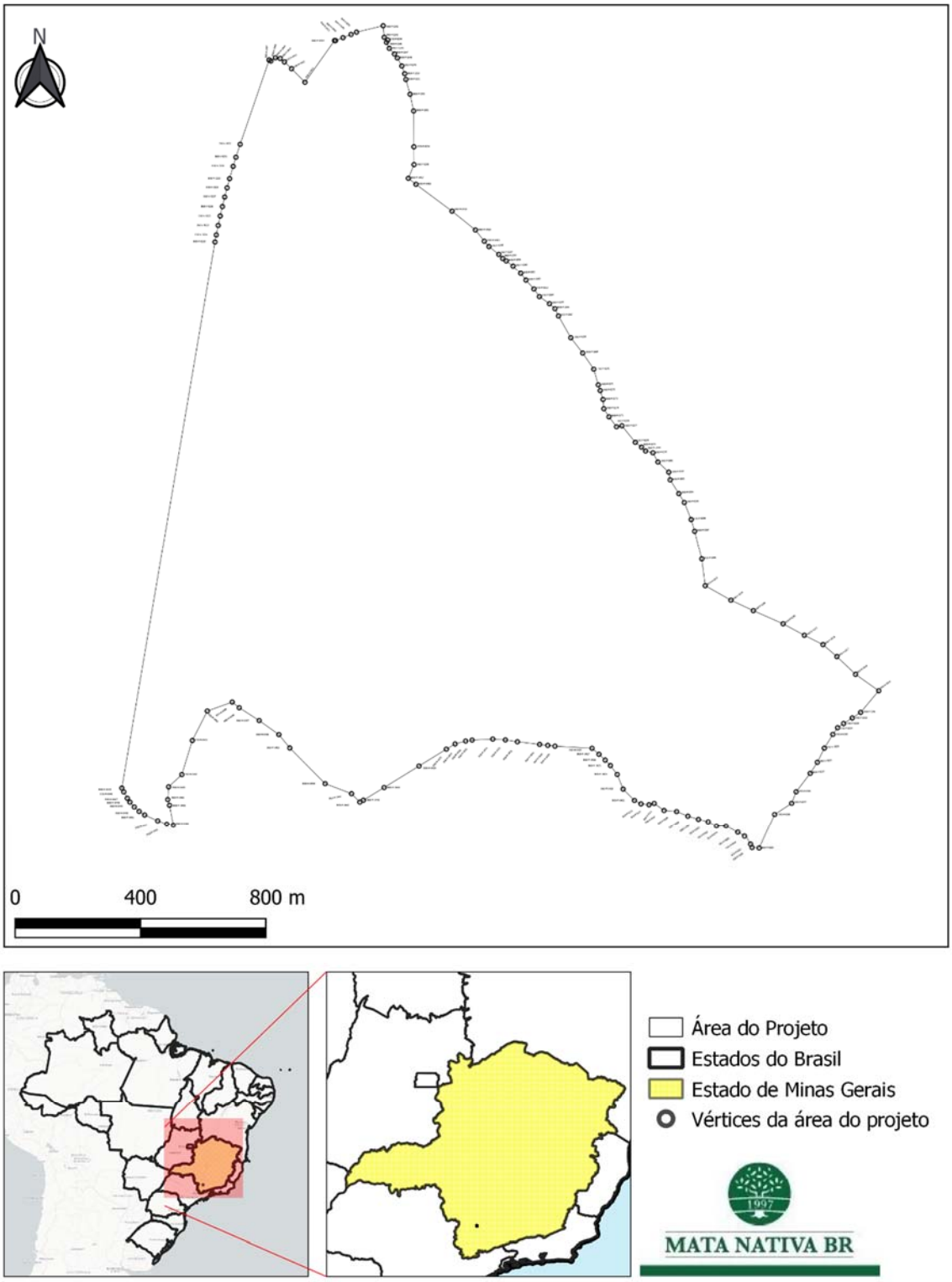
Meridiano Central: 45° W - Sistema Geodésico de Referência (SGR):SIRGAS2000					
VÉRTICE ESTAÇÃO			VÉRTICE VANTE		
				Azimute	Distância (m)
Código (Vértice)	E(m)	N(m)	Código (Vértice)	UTM	UTM
B60-P-0299	-419.839,386	-7.607.383,184	B60-P-0300	273°29'43"	34,036
B60-P-0300	-419.805,413	-7.607.385,259	B60-P-0301	335°22'51"	18,280
B60-P-0301	-419.797,798	-7.607.401,877	B60-P-0302	331°04'08"	41,413
B60-P-0302	-419.777,764	-7.607.438,122	B60-P-0303	298°04'27"	46,883
B60-P-0303	-419.736,397	-7.607.460,186	B60-P-0304	298°18'28"	64,854
B60-P-0304	-419.679,299	-7.607.490,940	B60-P-0305	270°15'29"	45,938
B60-P-0305	-419.633,361	-7.607.491,147	B60-P-0306	297°48'08"	45,262
B60-P-0306	-419.593,324	-7.607.512,258	B60-P-0307	284°34'59"	48,557
B60-P-0307	-419.546,331	-7.607.524,484	B60-P-0308	287°06'25"	53,441
B60-P-0308	-419.495,254	-7.607.540,204	B60-P-0309	292°06'38"	58,630
B60-P-0309	-419.440,936	-7.607.562,272	B60-P-0310	275°18'00"	60,830
B60-P-0310	-419.380,366	-7.607.567,891	B60-P-0311	305°19'57"	58,545
B60-P-0311	-419.332,604	-7.607.601,749	B60-P-0312	255°47'40"	25,782
B60-P-0312	-419.307,610	-7.607.595,422	B60-P-0313	276°18'21"	38,867
B60-P-0313	-419.268,978	-7.607.599,691	B60-M-0422	297°53'08"	35,802
B60-M-0422	-419.237,333	-7.607.616,436	B60-M-0423	315°04'14"	77,418
B60-M-0423	-419.182,658	-7.607.671,246	B60-M-0424	337°55'31"	76,062
B60-M-0424	-419.154,073	-7.607.741,732	B60-M-0425	322°43'26"	54,092
B60-M-0425	-419.121,312	-7.607.784,774	B60-M-0426	316°05'22"	36,519
B60-M-0426	-419.095,985	-7.607.811,083	B60-M-0427	313°11'40"	40,957
B60-M-0427	-419.066,126	-7.607.839,117	B60-M-0428	310°46'53"	44,495

B60-M-0428	-419.032,434	-7.607.868,180	B60-M-0429	273°14'20"	179,158
B60-M-0429	-418.853,562	-7.607.878,302	B60-M-0430	276°42'28"	34,938
B60-M-0430	-418.818,863	-7.607.882,383	B60-M-0431	276°47'45"	39,735
B60-M-0431	-418.779,407	-7.607.887,085	B60-M-0432	276°41'39"	108,058
B60-M-0432	-418.672,086	-7.607.899,681	B60-M-0433	278°43'44"	58,600
B60-M-0433	-418.614,165	-7.607.908,574	B60-M-0434	273°46'29"	61,047
B60-M-0434	-418.553,250	-7.607.912,593	B60-M-0435	267°14'39"	99,897
B60-M-0435	-418.453,469	-7.607.907,790	B60-M-0436	261°23'26"	31,450
B60-M-0436	-418.422,373	-7.607.903,082	B60-M-0437	254°38'26"	52,836
B60-M-0437	-418.371,424	-7.607.889,087	B60-M-0438	239°17'56"	49,258
B60-M-0438	-418.329,070	-7.607.863,938	B60-M-0439	238°18'13"	155,133
B60-M-0439	-418.197,076	-7.607.782,428	B60-M-0440	238°22'57"	197,810
B60-M-0440	-418.028,627	-7.607.678,727	B60-M-0443	238°31'21"	117,334
B60-M-0443	-417.928,559	-7.607.617,459	B60-M-0442	242°15'51"	19,306
B60-M-0442	-417.911,471	-7.607.608,474	B60-M-0441	315°15'49"	57,180
B60-M-0441	-417.871,225	-7.607.649,092	B60-M-0454	290°51'26"	136,215
B60-M-0454	-417.743,936	-7.607.697,590			

Meridiano Central: 45° W - Sistema Geodésico de Referência (SGR):SIRGAS2000					
VÉRTICE ESTAÇÃO			VÉRTICE VANTE		
				Azimute	Distância (m)
Código (Vértice)	E(m)	N(m)	Código (Vértice)	UTM	UTM
B60-M-0454	-417.743,936	-7.607.697,590	B60-M-0455	315°15'01"	242,266
B60-M-0455	-417.573,378	-7.607.869,644	B60-M-0456	320°37'20"	83,416
B60-M-0456	-417.520,456	-7.607.934,123	B60-M-0457	305°33'18"	116,889
B60-M-0457	-417.425,360	-7.608.002,092	B60-M-0458	302°43'19"	114,464
B60-M-0458	-417.329,061	-7.608.063,967	B60-M-0459	308°50'42"	43,422
B60-M-0459	-417.295,242	-7.608.091,202	B60-M-0460	250°13'41"	127,682
B60-M-0460	-417.175,087	-7.608.048,010	B60-M-0461	207°01'59"	159,719
B60-M-0461	-417.102,494	-7.607.905,741	B60-M-0462	197°06'18"	172,179
B60-M-0462	-417.051,852	-7.607.741,178	B60-M-0463	227°06'52"	86,893
B60-M-0463	-416.988,184	-7.607.682,044	B60-M-0466	183°54'44"	61,573
B60-M-0466	-416.983,983	-7.607.620,614	B60-M-0465	163°09'19"	29,105
B60-M-0465	-416.992,417	-7.607.592,758	B60-M-0464	169°15'56"	98,809
B60-M-0464	-417.010,821	-7.607.495,678	B60-M-0453	278°40'24"	31,890
B60-M-0453	-416.979,296	-7.607.500,487	B60-M-0452	290°43'48"	46,959
B60-M-0452	-416.935,377	-7.607.517,109	B60-M-0451	294°38'53"	69,170
B60-M-0451	-416.872,509	-7.607.545,956	B60-M-0450	303°08'41"	31,828
B60-M-0450	-416.845,860	-7.607.563,358	B60-M-0449	312°16'37"	31,850
B60-M-0449	-416.822,294	-7.607.584,784	B60-M-0448	318°21'23"	31,474
B60-M-0448	-416.801,380	-7.607.608,304	B60-M-0447	325°37'31"	22,557
B60-M-0447	-416.788,644	-7.607.626,922	B60-M-0446	330°53'46"	35,013
B60-M-0446	-416.771,614	-7.607.657,514	B60-M-0445	333°33'06"	20,831
B60-M-0445	-416.762,336	-7.607.676,165			

Meridiano Central: 45° W - Sistema Geodésico de Referência (SGR):SIRGAS2000					
VÉRTICE ESTAÇÃO			VÉRTICE VANTE		
				Azimute	Distância (m)
Código (Vértice)	E(m)	N(m)	Código (Vértice)	UTM	UTM
B60-P-0242	-418.023,978	-7.611.363,614	B60-P-0243	174°50'47"	55,819
B60-P-0243	-418.028,992	-7.611.308,021	B60-P-0244	127°56'38"	21,989
B60-P-0244	-418.046,333	-7.611.294,500	B60-P-0245	210°35'01"	12,642
B60-P-0245	-418.039,901	-7.611.283,617	B60-P-0246	154°38'08"	32,037
B60-P-0246	-418.053,625	-7.611.254,668	B60-P-0247	137°33'14"	37,023
B60-P-0247	-418.078,612	-7.611.227,348	B60-P-0248	144°31'03"	23,606
B60-P-0248	-418.092,314	-7.611.208,126	B60-P-0249	150°36'15"	44,397
B60-P-0249	-418.114,106	-7.611.169,445	B60-P-0250	159°36'34"	39,720
B60-P-0250	-418.127,945	-7.611.132,214	B60-P-0251	168°41'26"	28,336
B60-P-0251	-418.133,502	-7.611.104,428	B60-P-0252	164°05'17"	73,979
B60-P-0252	-418.153,784	-7.611.033,284	B60-P-0253	167°50'50"	82,785
B60-P-0253	-418.171,212	-7.610.952,354	B60-P-0254	179°36'03"	172,983
B60-P-0254	-418.172,417	-7.610.779,375	B60-P-0255	179°35'16"	86,041
B60-P-0255	-418.173,036	-7.610.693,336	B60-M-0417	202°28'51"	71,404
B60-M-0417	-418.145,733	-7.610.627,358	B60-M-0418	128°26'07"	46,727
B60-M-0418	-418.182,335	-7.610.598,311	B60-M-0419	126°39'53"	217,179
B60-M-0419	-418.356,544	-7.610.468,627	B60-M-0420	128°49'18"	144,864
B60-M-0420	-418.469,408	-7.610.377,812	B60-M-0421	141°32'07"	69,075
B60-M-0421	-418.512,375	-7.610.323,727	B60-P-0256	138°54'04"	34,401
B60-P-0256	-418.534,989	-7.610.297,803	B60-P-0257	128°45'01"	60,655
B60-P-0257	-418.582,293	-7.610.259,837	B60-P-0258	136°20'27"	27,044
B60-P-0258	-418.600,963	-7.610.240,272	B60-P-0259	124°24'34"	20,872
B60-P-0259	-418.618,183	-7.610.228,477	B60-P-0260	127°15'06"	41,727
B60-P-0260	-418.651,397	-7.610.203,219	B60-P-0261	135°51'21"	53,016
B60-P-0261	-418.688,321	-7.610.165,175	B60-P-0262	142°57'40"	41,598
B60-P-0262	-418.713,378	-7.610.131,970	B60-P-0263	137°57'56"	57,648
B60-P-0263	-418.751,978	-7.610.089,152	B60-P-0264	144°22'59"	45,259
B60-P-0264	-418.778,335	-7.610.052,360	B60-P-0265	125°12'06"	59,567
B60-P-0265	-418.827,009	-7.610.018,022	B60-P-0266	132°33'08"	35,729
B60-P-0266	-418.853,329	-7.609.993,860	B60-P-0267	153°56'31"	38,970
B60-P-0267	-418.870,448	-7.609.958,851	B60-P-0268	150°26'03"	120,774
B60-P-0268	-418.930,041	-7.609.853,803	B60-P-0269	142°08'39"	93,631
B60-P-0269	-418.987,500	-7.609.779,876	B60-P-0270	145°35'35"	94,426
B60-P-0270	-419.040,857	-7.609.701,970	B60-P-0271	163°53'19"	78,921
B60-P-0271	-419.062,758	-7.609.626,149	B60-P-0272	161°23'28"	28,972
B60-P-0272	-419.072,003	-7.609.598,692	B60-P-0273	162°28'39"	44,892
B60-P-0273	-419.085,519	-7.609.555,883	B60-P-0274	174°46'26"	44,957
B60-P-0274	-419.089,614	-7.609.511,113	B60-P-0275	147°43'47"	46,171
B60-P-0275	-419.114,265	-7.609.472,074	B60-P-0276	142°35'22"	60,241
B60-P-0276	-419.150,863	-7.609.424,224	B60-P-0277	80°05'21"	26,360
B60-P-0277	-419.176,830	-7.609.428,761	B60-P-0278	140°59'07"	102,786
B60-P-0278	-419.241,536	-7.609.348,898	B60-P-0279	127°52'34"	37,854
B60-P-0279	-419.271,416	-7.609.325,657	B60-M-0444	132°55'05"	27,017
B60-M-0444	-419.291,201	-7.609.307,260			

Image 2. Map demonstrating the coordinates of the boundary of the area



Fonte: EMBRAPA (2020), IBGE (2010), INPE (2011).

The Project was planned to take place in 20 years, starting on August 05, 2021, and concluding on August 05, 2041.

The reservoirs of CO_2 considered for this work were: above-ground biomass, below-ground biomass, and organic CO_2 in the soil.

3.4. Baseline scenario

Fazenda Santa Rita is located in the municipality of Paraguaçu, Minas Gerais, Brazil. The region, although classified by IBGE as Atlantic Forest, assumes phytophysiognomic features of the Cerrado biome, either by the structure of the forest fragments or by the floristic composition that shelters endemic species of this biome.

Paraguaçu is located in the central-south region of the state of Minas Gerais, in the mesoregion of Alfenas. According to demographic estimates, the population of the municipality in 2021 was 21,693 inhabitants. Economically, the municipality has as its main activities agriculture, cattle breeding, milk and coffee production, commerce, and industry, especially in the textile area.

Located in the southwest region of the municipality of Paraguaçu, Fazenda Santa Rita has 712 ha occupied by native forests in different stages of regeneration and organic lime cultivation areas. Such areas were identified in the property for the generation and credits of carbon thanks to the possibility of increasing management that can boost their efficiency in fixing atmospheric carbon.

Inventories carried out on the property refer to a floristic environment, in evolution and substantially diverse, linked to the flora, both of regional relevance.

Floristic studies have identified species belonging to botanical families, including Cerrado indicator species, such as the pequi (*Caryocar brasiliense*) and barbatimão (*Stryphnodendron barbatimão*).

The local fauna proved to be rich and diverse, with rare species for both invertebrates and vertebrates.

The floristic inventory was the basis for the measurement of the carbon stored in the soil and litter of forest and production areas; the inventory was based on the collection of dendrometric data for both areas and the stock was determined through allometric equations for the determination of biomass and carbon stored as being 50% of the biomass. The carbon content in the soil was determined in laboratories, being accredited from samples always taken from the geometric center of each installment.

Considering the installments, fixed or not, the following stocks were determined:

Table 20. Table demonstrating carbon stock

STORED CARBON	
Forest — Rate of Increase (1.7)	4,119.20
Forest Soil — Rate of Increase (1.72)	11,180.30
Citruculture (Aerial) — Increment Rate (3.88)	3,913.57
Citruculture (Soil) — Increment Rate (7.33)	6,889.84

Source: Elaborated by the author, 2021.

In the absence of the Project, forest degradation will be generated by the possibility of using part of the area, currently covered by forests, for conventional agricultural land use, with carbon emissions. In the national legislation, despite protecting areas figured as Legal Reserves, there is no effective obligation by the owners to apply the management of floristic increment, remaining only the conservation of these spaces, in many isolated scenarios and with decreasing diversity, which tends, in various situations, to environments full of grasses and with decreasing carbon stock. This scenario is designed as the most likely, based on the history of agricultural land use in the region, predominantly occupied by pastures and coffee plantations.

In this scenario, in addition to the emissions generated by forest degradation, there would be a decrease in GHG fixation.

In the agricultural scenario, the use of newer technology allows such areas to become more efficient in carbon storage, especially in the soil; in the absence of the Project, or in the replacement of the crop by pastures and/or coffee, there would be substantial loss of carbon stored in trees and soil, and significant losses in storage capacity.

3.5. Additionality

RESERVOIR	METHODOLOGY	MANAGEMENT	ADDITIONALITY
NATIVE VEGETATION SURPLUS TO THE LEGAL RESERVE (100.1157 ha)	VM0007: REDD+ Methodology Framework v1.6 -This methodology provides a set of modules for various components of a deforestation and forest degradation (REDD) emission reduction methodology. The modules, when used together, quantify GHG emission reductions and removals by avoiding unplanned and planned deforestation and forest degradation.	Rehabilitation is achieved through the implementation of silvicultural techniques to increase forest density, such as cutting vines, exotic bamboos, and lianas, thinning to release space or planting enrichment.	Preservation and area of native vegetation that can be suppressed by exceeding the legally required amount in the country; increasing of carbon stored through specific forest management.
LEGAL RESERVE (153.2130 ha)	VM0005: Methodology for Converting Low Productivity Forest into High Productivity Forest, v1.2 - this methodology quantifies the reductions and removals of GHG emissions generated when rehabilitating previously exploited and/or degraded forests.	Rehabilitation is achieved through the implementation of silvicultural techniques to increase forest density, such as cutting vines, exotic bamboos, and lianas, thinning to release space or planting enrichment.	Increase of stored carbon through specific forest management.
AGRICULTURAL PRODUCTION AREA (301.01 ha)	VM0017: Adoption of Sustainable Agricultural Land Management, v1.0 - The methodology quantifies GHG emissions reductions from practical sustainable land management activities that increase aboveground, underground, and soil-based carbon stocks of agricultural areas. The methodology applies input parameters to peer-reviewed analytical models to estimate soil organic carbon density in balance with management practices identified in each land-use category.	Application of managements that allow it to maintain vegetation between the lines, use of plaster for the induction of more roots, reinsertion of organic matter from maintenance pruning into the system as organic matter.	Increase of carbon stored through specific management, reduction of annual emissions by incorporation of equipment that generate less emissions.

Table 21. Table demonstrating Project additionality

3.6 Deviations of Methodology

There were no methodological deviations in the realization of this project.

4. QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1. Baseline emissions

The elaboration of the Fazenda Santa Rita GHG emissions report was based on the methodologies of the GHG Protocol Agricultural Project, which created two technical resources: the Brazilian Agricultural Guidelines and the Calculation Tool; we also used the GHG Spreadsheet Protocol, provided by FGVces, as well as the ABNT NBR ISO 14.064-1.

The Brazilian Agricultural Guidelines (DAB) were developed through a joint construction process with several organizations and industry experts, and it consists of a protocol for accounting for agricultural emissions. This suggests a uniform and consistent structure for mapping and delimiting the sources of emissions that should be included in the GHG inventory of an agricultural company or a rural unit, as well as a way of reporting the emission data from these inventories.

The calculation tool is a product resulting from a partnership between the World Resources Institute (WRI), the Brazilian Agricultural Research Corporation (Embrapa), and the State University of Campinas (Unicamp), which enables the calculation of GHG emissions using specific methodologies for the national reality and focused on non-mechanical emission sources.

The GHG protocol spreadsheet was developed by FGVces and WRI, in partnership with the Ministry of Environment, the Brazilian Business Council for Sustainable Development (CEBDS), the World Business Council for Sustainable Development (WBSCD), and 27 founding companies, allowing us to perform calculations from mechanical sources as well.

It is essential that the DAB and the Calculation Tool are used together to prepare an agricultural GHG inventory, ensuring the consistency of GHG emissions results with the guidelines proposed by the GHG Protocol Agricultural Project.

4.2. Project emissions

The elaboration of the Fazenda Santa Rita GHG emissions report was based on the methodologies of the GHG Protocol Agricultural Project, which created two technical resources: the Brazilian Agricultural Guidelines and the Calculation Tool; we also used the GHG Spreadsheet Protocol, provided by FGVces, as well as the ABNT NBR ISO 14.064-1.

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It is essential that the DAB and the Calculation Tool are used together to prepare an agricultural GHG inventory, ensuring the consistency of GHG emissions results with the guidelines proposed by the GHG Protocol Agricultural Project.

Combined, these resources allow producers, as well as other companies in the value chains of agriculture, livestock, forestry, among others, to include the reporting and mitigation of GHG emissions in their production strategies and annual planning. Specifically, they will enable companies to identify opportunities to reduce GHG emissions, track progress toward reduction targets, communicate results to investors and end consumers, and respond to national and international demands for less carbon-intensive products. These values are based on the different decision-making throughout the process, as described below:

* Relevance: ensure that the GHG inventory adequately reflects the company's GHG emissions, within appropriately defined limits, in order to meet the decision-making needs of data users.

* Integrity: report all GHG emission sources and relevant activities within defined limits. Disclose and justify any important exclusions.

* Consistency: use consistent methodology to allow emission comparisons over time. Transparently document any changes in data, inventory limit, methods, or any other relevant factors in the time series.

* Transparency: reveal with transparency all relevant information, in a clear, factual, neutral, and understandable way, in order to meet the decision-making needs of data users. The information should be sufficient to allow a third party to achieve the same results based on the same data source.

* Accuracy: achieve sufficient accuracy to allow users to make decisions with reasonable security regarding the integrity of the information reported. Ensure that the quantification of GHG emissions is not systematically higher or lower than actual emissions and that uncertainties are reduced to the extent possible.

4.2.1 Calculation Tool

The Calculation Tool focuses on GHG emission and removal sources, covering the following areas:

* Organic fertilization.

* Application of limestone and plaster.

* Application of synthetic nitrogen fertilizer.

* Urea application.

* Electricity consumption.

* Rice cultivation.

* Animal waste in pastures.

* Enteric fermentation.

* Secondary sources (atmospheric deposition and leaching or surface runoff).

* Waste management.

* Handling of animal waste (except animals in pastures).

* Change of land use.

* Mechanized operations.

* Burning of plant residues.

* Crop residues.

Fazenda Santa Rita will focus on "Fuel Burning", "Organic Fertilization", and "Electricity Consumption."

- Fuel Burning

The equation used to calculate emissions from fuel burning is below:

$$CO_2\ DIESEL = QDIESEL \times FEDIESEL$$

Where,

$CO^2DIESEL$ is the emission of CO_2 associated with diesel oil consumption (Kg CO_2e);

QDIESEL is the amount of diesel oil consumed (L);

FEDIESEL is the emission factor of diesel oil (kg CO_2/L).

- Organic Fertilizing

The equation used to calculate emissions from organic fertilization is below:

$$N_2OAD.ORG = QORG \times Nad \times (1 - FRACGASM) \times EF1 \times 44/28$$

Where N2OAD.ORG is the emission of nitrous oxide associated with the application of organic fertilizers (Kg N2O/ Kg of fertilizer applied); QORG is the amount of organic fertilizer applied(Kg); Nad is the nitrogen percentage of organic fertilizer (%); FRACGASM is the fraction of the applied N that volatilizes in the form of NDAP and NOx (%); EF1 is the emission factor (%). 44/28 is the conversion of N-N_2O to N_2O.

- Electric Power

The equation used to calculate emissions from organic fertilization is below:

$$CO_2\ EE = EE \times FE$$

Where, CO2 EE is the emission of CO2 (t CO2); EE is the electricity consumption (MWh); FE is the national emission factor (t CO2/MWh).

4.3 Leak

The leak definitions have no application in the Project because there is no displacement of emissions to other sectors; the proponent has no other areas for the displacement of activities and, therefore, emissions; the Project also does not provide for the suppression of forest fragments, and all emissions contained in the baseline are circumscribed to the perimeter of the Project area.

4.4 Net Reductions and Removals of GHG Emissions

The quantification of net removals will be obtained through floristic surveys, which, grouped together, will compose a floristic and carbon stock inventory in the project areas.

The data will be obtained every 2 years, with the revisit of the fixed installments, established during the initial studies for the determination of the baseline.

The carbon stock will be based on the calculation of the carbon contained in a given portion, obtained by the dendrometric equation:

Biomass per individual = ***(EXP(-2,289+2,64*LN(DAP)-0,021*(LN(DAP*DAP))2)***

Organic carbon per individual = ***(EXP(-2,289+2,64*LN(DAP)-0,021*(LN(DAP*DAP)))*0,5***

The result is obtained through the sum of the data of each installment or others that are necessary and extrapolated statistically to the total area of the Project.

Organic carbon present in the installment =

∑((((EXP(-2,289+2,64*LN(DAP)-0,021*(LN(DAP*DAP))))*0,5))/1000)

Organic carbon present in the installment=

∑((((=(∑(((EXP(-2,289+2,64*LN(DAP)-0,021*(LN(DAP*DAP))))*0,5)/1000))* 3,67 eqCO2ton

Balance =

∑(((EXP(-2,289+2,64*LN(DAP)-0,021*(LN(DAP*DAP))))*0,5)/1000) **current**

∑(((EXP(-2,289+2,64*LN(DAP)-0,021*(LN(DAP*DAP))))*0,5)/1000) **baseline**

The value obtained will be corrected to the eqCO_2 pattern, and the carbon stock value measured in the determination of the baseline will be subtracted from it; the value obtained is the volume stored in the period between inventories and this value corresponds to the net change of removals.

5 MONITORING

5.2 Data and Parameters Available in Validation

Aerial and forest soil carbon stock	
Data unit	ton CO_2eq/ha
Description	The carbon stock in the soil is one of the parameters considered in the study and it will indicate the efficiency of management in increasing carbon concentrations in the forest soil; for this, dendrometric data will be collected.

Data source	Forest inventories produced during periodic inspections of the project areas, taken from the fixed installments of the Project.
Justification of the choice of data or description of the measurement methods and procedures applied	This module allows the estimation *ex ante* of carbon stocks in above- and below-ground and non-arboreal woody biomass in the case of baseline (for pre-and post-deforestation stocks), and for estimation *ex post* of change in carbon stocks and biomass of trees above- and below-ground.
Purpose of Data	Quantifications of GHG removals.
Comments	

Carbon stock in organic lime production area	
Data unit	ton CO2eq /ha.
Description	The carbon stock in the soil is one of the parameters considered in the study and it will indicate the efficiency of the managements in increasing the carbon concentrations in the forest soil.
Data source	Forest inventories produced during periodic inspections of the project areas, taken from the fixed installments of the Project.
Description of the measurement methods and procedures to be applied	The forest inventory will comprise the diameter, the breast height (DBH), measured from the diameter of the tree to 1.30 meters high relative to ground level; the total height is the length of the tree or its shaft/trunk; and the form factor expresses the tapering of the shaft along its length. The results will be analyzed statistically.
Monitoring/recording frequency	Biannual.
Monitoring equipment	Hand percussion auger, 2 kg sledgehammer, plastic bags, labels, digital scale, GPS device.
QA/QC procedures to be applied	The devices will be measured and calibrated according to the rules in force in the country, defined by INMETRO, in DIN EN ISO 9000 and DIN EN ISO / IEC 17025, or other more appropriate.
Purpose of data	Quantifications of GHG removals.
Calculation method	Allometric equations for biomass based on dendrometric data, adjusted to estimate the carbon present in each specimen.

5.3 Monitored Data and Parameters

Describe the process and schedule for obtaining, recording, compiling, and analyzing the monitored data and parameters set out in Section 5.2 (Monitored Data and Parameters) above.

The monitoring will be carried out biannually, revisiting the fixed installments and other areas that are necessary. In the installments, will be recorded:

- the number of arboreal and shrub individuals;
- the general state of conservation;
- collection of forest litter;
- obtaining dendrometric data, the DAP (1.30 m) of individuals with DAP greater than 5 cm and the height of the shaft of the arboreal and shrub elements contained in each installment;
- soil samples will be collected at 20 cm depth for laboratory analysis of amount of organic carbon.

5.4 Sample

The samples will be collected and stored in plastic bags labeled, weighed, and with the indication of the location of the sample given in UTM coordinate.

5.5 Routing

After fieldwork for the elaboration of the monitoring inventories has been carried out, the data will be put in sheets and submitted to statistical tests. The samples will be taken to laboratories to measure organic carbon and other parameters that are deemed necessary, including granulometry, macronutrients, and micronutrients.

Once the results are obtained, they will be treated statistically to define the stocks accumulated in that period and the verification of the partial balance related to the Project baseline.

Include details about the following: the methods for measuring, registering, storing, aggregating, grouping, and reporting data and parameters. Where relevant, include the procedures for calibrating the monitoring equipment; the organizational structure, responsibilities, and competencies of the personnel who will carry out the monitoring activities; the supervisory and accountability policies of the monitoring activities; the procedures for internal audit and QA/QC; the procedures for dealing with non-conformities to the validated monitoring plan; any sampling approaches used, including target accuracy levels, sample sizes, sampling locations, stratification, measurement frequency, and QA/QC procedures.

Number of arboreal and shrub individuals	
Data unit	Specimens per installment.
Description	Individuals will be counted by fixed installments to verify the recruitment of specimen names in the area, and therefore the floristic evolution.

Data source	Forest inventories produced during periodic inspections of the project areas, taken from the fixed installments of the Project.
Description of the measurement methods and procedures to be applied	Numerical data of quantities.
Monitoring/recording frequency	Biannual.
Monitoring equipment	Identification guide, digital photo camera, and manual counter.
QA/QC procedures to be applied	
Purpose of data	Evaluation of managements applied to the area.
Calculation method	Simple counting and density calculation.

The General State of Conservation	
Data unit	Specimens per installment.
Description	Individuals will be counted by fixed installments to verify the recruitment of specimen names in the area, and therefore the floristic evolution.
Data source	Forest inventories produced during periodic inspections of the project areas, taken from the fixed installments of the Project.
Description of the measurement methods and procedures to be applied	The quantities of regenerating specimens will be counted, as a recruitment index and floristic evolution of the fragments. The counting of lianas, bamboos, and grasses will be carried out as a way to verify the infestation rate.
Monitoring/recording frequency	Biannual.
Monitoring equipment	Digital photo camera, manual counter, indication, and AutoCad or ArqGis.
QA/QC procedures to be applied	
Purpose of data	Evaluation of managements applied to the area.
Calculation method	Simple counting and density calculation.

Collection and Quantification of Litter	
Data unit	Kg/installment or tonne per hectare.
Description	The collection of forest litter will be carried out.
Data source	Forest inventories produced during periodic inspections of the project areas, taken from the fixed installments of the Project.
Description of the measurement methods and procedures to be applied	The collection of forest litter will be carried out in an area of $1m^2$ using two 0.5m jig measures^2, the material will be collected by scraping not considering the soil, and

	packed in numbered plastic bags, labeled, and georeferenced. The samples weighed in the field by means of digital scale.
Monitoring/recording frequency	Biannual.
Monitoring equipment	0.5m^2 jig, shovel, gardener's gloves, plastic bags, labels, pens, and digital scale with at least two decimal places.
QA/QC procedures to be applied	For the check scale, it meets the standard ABNT NBR ISO/IEC 17025.
Purpose of data	Evaluation of managements applied to the area.
Calculation method	Weighing and statistical calculations to verify the variation during the management period.

Dendrometric Data	
Data unit	Specimens per installment.
Description	Individuals will be counted by fixed installments to verify the recruitment of specimen names in the area, and therefore the floristic evolution.
Data source	Forest inventories produced during periodic inspections of the project areas, taken from the fixed installments of the project.
Description of the measurement methods and procedures to be applied	Numerical data of quantities.
Monitoring/recording frequency	Biannual.
Monitoring equipment	Identification guide, digital photo camera, and manual counter.
QA/QC procedures to be applied	
Purpose of data	Evaluation of managements applied to the area.
Calculation method	Simple counting and density calculation.

Soil sampling	
Data unit	Ton CO_2eq.
Description	Holes will be made using manual percussion auger to collect samples at 20 cm.
Data source	Forest inventories produced during periodic inspections of the project areas, taken from the fixed installments of the Project.
Description of the measurement methods and procedures to be applied	The hole will be made with a percussion auger and the samples will be collected at 20 cm depth; the material will be packed in labeled plastic bags, weighed, and georeferenced. These samples should be collected from the geometric center of each installment. The material will be taken for analysis as soon as possible.
Monitoring/recording frequency	Biannual.

Monitoring equipment	Hand percussion auger, 2 kg sledgehammer, plastic bags, labels, digital scale, GPS device.
QA/QC procedures to be applied	GPS device calibration and verification of the accuracy of the scales.
Purpose of data	Measurement of carbon stock in the soil.
Calculation method	Simple counting and density calculation.