# RAÍZES DO BEM GROUPED ARR PROJECT

Document Prepared by Future Forest

| | |
|---|---|
| Project Title | Raízes do Bem Grouped ARR Project |
| Version | 01 |
| Date of Issue | 12-May-2023 |
| Prepared By | Future Forest |
| Contact | Rua Elvira Ferraz, 250, Conjunto 601 Edifício F.L. Office, Vila Olímpia – São Paulo – SP, Brazil<br>Postal Code: 04552-040<br>forest@futurecarbon.com.br |

# CONTENTS

# 1 PROJECT DETAILS

## 1.1 Summary Description of the Project

The Raízes do Bem Grouped ARR Project aims to implement the reforestation with multifunctional forests in degraded lands and ecological restoration using species with timber potential and native species in the Cerrado and Amazon biomes located in the States of Mato Grosso do Sul and Mato Grosso, in Brazil.

Due to great biodiversity, the Cerrado biome is broadly recognized as a biodiversity hotspot and prioritized for conservation, expected to be especially vulnerable to climate change. Therefore, the protection of Cerrado is fundamental to avoid a decline in global biodiversity due to climate change[1]. The Amazon is also a biome with great biodiversity and importance for climate regulation, but it has suffered from the loss of extensive forest areas. Due to the loss of forest cover in both biomes, reforestation is an essential activity for recovery the vegetation and reestablishment of ecosystem services. Due to this importance, the Brazilian Nationally Determined Contribution (NDC) included the target of restoring and reforesting 12 million hectares of forests for multiple uses by 2030[2].

The Raízes do Bem Grouped ARR Project is a grouped project activity and will implement reforestation through an innovative model to boost carbon sequestration and storage. Instance 1 has a project area of 135 hectares with a mix of native and exotic species from different successional groups that were planted in plots. The first plantation activity was carried out on 15-October-2020, which defined the project start date. In addition, the project includes the management of natural regeneration and planting of native species. In this way, a multifunctional forests will be achieved, generating environmental, economic, and social benefits and functions associated with forestry potential.

The project area will remove GHG through the photosynthesis, a natural process of plants. Thus, the plants will gradually provide the ecosystem service of removing atmospheric carbon dioxide ($CO_2$) and storing carbon in the biomass. The composition of species and ecological groups are important in reforestation projects focusing on increasing the carbon stock, as these factors directly influence carbon sequestration[3].

Maintenance measures will be implemented to monitor the $CO_2$ removal process by the plants to assess the development of the areas and avoid carbon loss due to any external, internal, or natural risks. The measures implemented for this assessment include the construction of

[1] Available at: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_CCP1.pdf
[2] Bustamante, M. M. C et al. Ecological restoration as a strategy for mitigating and adapting to climate change: lessons and challenges from Brazil. Mitigation and Adaptation Strategies for Global Change, 2019.
[3] Pantaleão, L. C. Efeitos de grupos ecológicos no estoque de carbono em áreas de restauração ecológica na Mata Atlântica. Universidade Federal do Paraná, 2011. Available at: https://acervodigital.ufpr.br/handle/1884/40049

firebreaks, surveillance, satellite monitoring, on-site monitoring, ant control, replanting and any other activities that may be considered necessary for guaranteeing the success of reforestation and protecting the area. In addition to contributing to the sequestration of greenhouse gases, the project generates other environmental, economic, and social benefits. Including the local community working in the project's activities and managing non-timber forest products, such as baru (*Dipteryx alata*), are some of the social and economic benefits provided for in the project.

Instance 1 is located in Camapuã, State of Mato Grosso do Sul, Brazil and has a project area of 135 hectares. The main economic activity in the municipality is cattle ranching, and Camapuã is recognized as the "quality calf capital" [4]. The property is inserted in a landscape of extensive livestock characterized by degraded pastures. Prior to the implementation of the project in Instance 1, the property's land use was primarily intended for cattle ranching.

The First Instance is expected to generate around 31,329 $tCO_2e$ during the 60 years crediting period (15-October-2020 to 14-October-2080), with an annual average of 522 $tCO_2e$/year.

## 1.2 Sectoral Scope and Project Type

Sectoral Scope: 14 - Agriculture, Forestry, Land Use

Project Category: Afforestation, Reforestation and Revegetation (ARR)

This is a grouped project.

## 1.3 Project Eligibility

According to the VCS Methodology Requirements v4.[5], for Afforestation, Reforestation and Revegetation (ARR) projects, eligible activities are those that increase carbon sequestration and/or reduce GHG emissions by establishing, increasing or restoring vegetative cover (forest or non-forest) through the planting, sowing or human-assisted natural regeneration of woody vegetation. Eligible ARR projects may include timber harvesting in their management plan. Thus, the project is eligible under the scopes of the VCS Program, following the VCS Standard version 4[6], sections 3.2 and Appendix A1.1:

[4] Available at: https://sba1.com/noticias/noticia/21604/Camapua-e-conhecida-como-a-capital-do-bezerro-de-qualidade%C2%A0
[5] VERRA – Methodology Requirements. Available at < https://verra.org/wp-content/uploads/2022/06/VCS-Methodology-Requirements-v4.2.pdf>
[6] VERRA – VCS Standard. Available at < https://verra.org/wp-content/uploads/2022/06/VCS-Standard_v4.3.pdf>

**Table 1. Eligibility conditions**

| Eligibility Conditions | Raízes do Bem Grouped ARR Project Justification of Eligibility |
|---|---|
| Projects shall meet all applicable rules and requirements set out under the VCS Program. Projects shall be guided by the principles set out in Section 2.2.1 | The project meets all applicable rules and requirements set out under the VCS Program, as detailed in this section and in Applicability of Methodology. |
| Projects shall apply methodologies eligible under the VCS Program. Methodologies shall be applied in full, including the full application of any tools or modules referred to by a methodology, noting the exception set out in Section 3.13.1 | The applied methodology is AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands - Version 3.1. Applicability conditions are detailed in section 3.2. No applicable laws are violated. |
| Projects and the implementation of project activities shall not lead to the violation of any applicable law, regardless of whether or not the law is enforced. | The project activity involves the reforestation of degraded lands. These activities are eligible under the Brazilian law according to conditions set out in sections 1.14 and 3.5. |
| Where projects apply methodologies that permit the project proponent its own choice of model (see the VCS Program document Program Definitions for definition of model), such model shall meet with the requirements set out in the VCS Program document VCS Methodology Requirements and it shall be demonstrated at validation that the model is appropriate to the project circumstances (i.e., use of the model will lead to an appropriate quantification of GHG emission reductions or removals). | Not applicable. Project applies the AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands - Version 3.1. |

| Eligibility Conditions | Raízes do Bem Grouped ARR Project Justification of Eligibility |
|---|---|
| Where projects apply methodologies that permit the project proponent its own choice of third-party default factor or standard to ascertain GHG emission data and any supporting data for establishing baseline scenarios and demonstrating additionality, such default factor or standard shall meet with the requirements set out in the VCS Program document VCS Methodology Requirements. | Not applicable. Project applies the AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands - Version 3.1. |
| Projects shall preferentially apply methodologies that use performance methods (see the VCS Program document VCS Methodology Requirements for further information on performance methods) where a methodology is applicable to the project that uses a performance method for determining both additionality and the crediting baseline (i.e., a project shall not apply a methodology that uses a project method where such a performance method is applicable to the project). | Not applicable. Project applies the AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands - Version 3.1, which uses a project method. |
| Where the rules and requirements under an approved GHG program conflict with the rules and requirements of the VCS Program, the rules and requirements of the VCS Program shall take precedence | The project applies approved CDM methodology and tools. The project shall take precedence to the rules and requirements of the VCS Program over other approved GHG Program. |

| Eligibility Conditions | Raízes do Bem Grouped ARR Project Justification of Eligibility |
|---|---|
| Where projects apply methodologies from approved GHG programs, they shall comply with any specified capacity limits (see the VCS Program document Program Definitions for definition of capacity limit) and any other relevant requirements set out with respect to the application of the methodology and/or tools referenced by the methodology under those programs. | The project applies approved CDM methodology and tools. Therefore, the project shall comply with any specified capacity limits and any other relevant requirements set out with respect to the application of the methodology and/or tools referenced by the methodology under CDM. |
| Where Verra issues new requirements relating to projects, registered projects do not need to adhere to the new requirements for the remainder of their project crediting periods (i.e., such projects remain eligible to issue VCUs through to the end of their project crediting period without revalidation against the new requirements). The new requirements shall be adhered to at project crediting period renewal, as set out in Section 3.8.9. | Project was designed under the VCS Standard, v4 and AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands - Version 3.1. Any new requirements shall be adhered to at project crediting period renewal (i.e 60 years, which may be renewed up to 100 years from Project Start Date). |
| There are currently six AFOLU project categories eligible under the VCS Program, as defined in Appendix 1 Eligible AFOLU Project Categories below: afforestation, reforestation and revegetation (ARR), agricultural land management (ALM), improved forest management (IFM), reduced emissions from deforestation and degradation (REDD), avoided conversion of grasslands and shrublands (ACoGS), and wetland restoration and conservation (WRC). | This is an eligible AFOLU project category under the VCS Program: Afforestation, Reforestation and Revegetation (ARR). |

| Eligibility Conditions | Raízes do Bem Grouped ARR Project Justification of Eligibility |
|---|---|
| Where an implementation partner is acting in partnership with the project proponent, the implementation partner shall be identified in the project description. The implementation partner shall identify its roles and responsibilities with respect to the project, including but not limited to, implementation, management and monitoring of the project, over the project crediting period | Any implementation partners are described on the Project Description, in sections 1.5 and 1.6. |
| Activities that convert native ecosystems to generate GHG credits are not eligible under the VCS Program. Evidence shall be provided in the project description that any ARR, ALM, WRC or AcoGS project areas were not cleared of native ecosystems to create GHG credits (e.g., evidence indicating that clearing occurred due to natural disasters such as hurricanes or floods). Such proof is not required where such clearing or conversion took place at least 10 years prior to the proposed project start date. | This project does not convert native ecosystems to generate GHG. The project area only contains reforestation in degraded areas that have been non-forest lands for more than 10 years prior to the project start date. |
| Activities that drain native ecosystems or degrade hydrological functions to generate GHG credits are not eligible under the VCS Program. Evidence shall be provided in the project description that any AFOLU project area was not drained or converted to create GHG credits. Such proof is not required where such draining or conversion took place prior to 1 January 2008. | This project does not occur on wetlands and does not drain native ecosystems or degrade hydrological functions. |

| Eligibility Conditions | Raízes do Bem Grouped ARR Project Justification of Eligibility |
|---|---|
| The project proponent shall demonstrate that project activities that lead to the intended GHG benefit have been implemented during each verification period in accordance with the project design. Where no new project activities have been implemented during a verification period, project proponents shall demonstrate that previously implemented project activities continued to be implemented during the verification period (e.g., forest patrols or improved agricultural practices of community members). | PP will demonstrate that project activities that lead to the intended GHG benefit have been implemented during each verification period in accordance with the project design. |
| Where ARR, ALM, IFM or REDD project activities occur on wetlands, the project shall adhere to both the respective project category requirements and the WRC requirements, unless the expected emissions from the soil organic carbon pool or change in the soil organic carbon pool in the project scenario is deemed below de minimis or can be conservatively excluded as set out in the VCS Program document VCS Methodology Requirements, in which case the project shall not be subject to the WRC requirements. | Not applicable. The project activity does not occur on wetlands. |
| Projects shall prepare a non-permanence risk report in accordance with the VCS Program document AFOLU Non-Permanence Risk Tool at both validation and verification. In the case of projects that are not validated and verified simultaneously, having their initial risk assessments validated at the time of VCS project validation will assist VCU buyers and sellers by providing a more accurate early indication of the number of VCUs projects are expected to generate. The non-permanence | The project has conducted a non-permanence risk analysis on validation, according to the VCS Program document AFOLU Non-Permanence Risk Tool, v4.0, and shall perform the same report during subsequent verifications. |

| Eligibility Conditions | Raízes do Bem Grouped ARR Project Justification of Eligibility |
|---|---|
| risk report shall be prepared using the VCS Non-Permanence Risk Report Template, which may be included as an annex to the project description or monitoring report, as applicable, or provided as a stand-alone document. | |
| Projects with tree harvesting shall demonstrate that the permanence of their carbon stock is maintained and shall put in place management systems to ensure the carbon against which VCUs are issued is not lost during a final cut with no subsequent replanting or regeneration | This project activity involves tree harvesting, therefore the project demonstrates the permanence of the carbon stock through the Long-term average. In addition, the trees will be replanted or assisted natural regeneration will be conducted to guarantee the maintenance of carbon stocks after the final cut. |

## 1.4 Project Design

The project is a grouped project. New instances will be added over time, following the eligibility criteria for grouped projects.

### Eligibility Criteria

**Table 2. Grouped Project eligibility criteria**

| VCS Standard Eligibility criteria for the grouped projects | Raízes do Bem Grouped ARR Project | Instance 1 |
|---|---|---|
| The project area shall not be deforested of native ecosystems within the 10-year period prior the implementation of the activities. | Only areas that were deforested more than 10 years prior the project start date will be included in the grouped project. | Instance 1 complies with this criterion, as the native vegetation was deforested more than 10 years prior the implementation of the first activities that defined the project start date. |

| | | |
|---|---|---|
| Projects shall meet the applicability conditions set out in the methodology applied to the project. | The project shall meet all applicability conditions set out in the CDM Methodology AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands - Version 3.1. | Instance 1 complies with this requirement because it adopts the Methodology AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands - Version 3.1 and meets all the applicability conditions. |
| Projects shall use the technologies or measures specified in the project description. | All new instances shall use and apply the same technologies or measures specified in the Project description | The Instance 1 project activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Project. Instance 1 uses and applies the same technologies or measures specified on the present Project Description: reforestation of degraded lands, except wetlands. |
| Projects shall apply the technologies or measures in the same manner as specified in the project description. | | |
| Projects are subject to the baseline scenario determined in the project description for the specified project activity and geographic area. | The Project shall be in accordance with the same baseline scenario established in Section 3.4. of the VCS PD | The Instance 1 Project Activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Project. Therefore, this instance is in accordance with the same baseline scenario determined in Section 3.4 of the VCS PD. |
| Projects must have characteristics with respect to additionality that are consistent with the initial instances for the specified project | All instances must be additional to be included in the Grouped Project. The project activity must be consistent with Grouped Project Description: reforestation of | Since the PD was developed based on the characteristics of the initial instance, Instance 1 complies with this additionality criterion. |

| | | |
|---|---|---|
| activity and geographic area | degraded lands except wetlands.<br>In the additionality assessment, all instances must follow the same method analysis. | |
| New Project Activity Instances shall occur within one of the designated geographic areas specified in the project description. | New Instances must be located in the States of Mato Grosso do Sul or Mato Grosso, provided that the covered biome is Cerrado and/or Amazon described in Section 3.3 of the VCS PD. The areas to be included must evidence the ownership of the property in accordance with Brazilian legislation, even if overlapping public areas such as Conservation Units.<br>In addition, as per the VCS Standard, new AFOLU Non-Permanence Risk assessments shall be carried out for each geographic area specified in the project description. Where risks are relevant to only a portion of each geographic area, the geographic area shall be further divided such that a single total risk rating can be determined for each geographic area. Where a project is divided into more than one geographic area for the purpose of risk analysis, the project's monitoring and verification reports shall list the total risk rating for each area and the corresponding net change in the project's carbon stocks in the same area, and the risk rating for each area applies only to the GHG emissions reductions | The project activity within the area referring to instance 1 is located in the State of Mato Grosso do Sul in the Cerrado Biome, as described in section 3.3 of the VCS PD. |

| | | |
|---|---|---|
| | generated by project activity instances within the area. | |
| Instances shall comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient. | All Instances must comply with the complete set of eligibility criteria for the inclusion of new project activities instances. | Instance 1 complies with all eligibility criteria for the inclusion of a new Project Activity. |
| Instances must be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body. | The Project Activity Instances must be included in the Monitoring Report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/ verification body. | Instance 1 complies with this criterion, as it is included in this PD as the first Project Activity Instance. |
| New Project Activity Instances must be validated at the time of verification against the applicable set of eligibility criteria | The addition of new Project Activity Instances shall be made in the monitoring report for the Grouped Project, being validated at the time of verification. | Instance 1 is included in this PD as the first Project Activity Instance for the validation. |
| New Project Activity Instances must have evidence of project ownership, in respect of each project activity instance, held by the project | All Project Activity instances must provide evidence of Project ownership (land title and related documents) and project start date. | Instance 1 is in accordance with this criterion. The evidence of Project ownership and Project start date were provided, as described in Sections 1.7 and 1.8 of the VCS PD. |

| | | |
|---|---|---|
| proponent from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions). | | |
| New Project Activity Instances must have a start date that is the same as or later than the grouped project start date. | The start date of the activity of each instance shall be the same as or after the start date of the grouped project, as established in Section 1.8 of the VCS PD. | The project start date of Instance 1 sets the project start date of the grouped project, as described in section 1.8 of the VCS PD. |
| Instances shall be eligible for crediting from the start date of the instance through the end of the project crediting period (only). Note that where a new project activity instance starts in a previous verification period, no credit may be claimed for GHG emission reductions or removals generated during a previous verification period and new instances are eligible for crediting from the start of the next verification period. | Instances shall be eligible for crediting from the start date of the instance activity until the end of the grouped project crediting period, i.e., the instance shall not generate credits after the end date of the Grouped Project. Where a new project activity instance starts in a previous verification period, no credit may be claimed for GHG emission reductions or removals generated during a previous verification period. New instances are eligible for crediting from the start of the next verification period. | Instance 1 project activity's crediting period has the same start and end dates of the grouped Project, as described in section 1.8 of the VCS PD. |

## 1.5 Project Proponent

| | |
|---|---|
| **Organization name** | FUTURE Forest (Future Carbon Holding S.A.) |
| **Contact person** | Bruno Lustoza<br>Laura Cristina Pantaleão<br>Marcelo Hector Haddad |
| **Title** | Bruno Lustoza - Technical Analyst<br>Laura Cristina Pantaleão – Technical Analyst<br>Marcelo Hector Haddad – Head of Future Forest |
| **Address** | Rua Elvira Ferraz, 250, Conj. 601, Edifício F.L. Office – Vila Olímpia, São Paulo/SP, Brazil<br>Postal Code: 04552-040 |
| **Telephone** | +55 11 3045-3474 |
| **Email** | forest@futurecarbon.com.br |

## 1.6 Other Entities Involved in the Project

| | |
|---|---|
| **Organization name** | Caeté Florestal S.A. |
| **Role in the project** | Property owner |
| **Contact person** | André Almeida Pipponzi<br>Marcos Fernandes Barros<br>Laury Cullen Junior<br>Fabio Dalla Coletta de Mattos<br>Felipe Pedroso Leal |
| **Title** | André Almeida Pipponzi - shareholder and employee<br>Marcos Fernandes Barros - shareholder and employee<br>Laury Cullen Junior - shareholder and employee<br>Fabio Dalla Coletta de Mattos - shareholder and employee<br>Felipe Pedroso Leal - shareholder and employee |
| **Address** | Rua Rodésia, 110, Conj. 22 – Sumarezinho, São Paulo/SP, Brazil |
| **Telephone** | 55 11 35694321 |
| **Email** | marcos@caeteflorestal.com.br |

## 1.7 Ownership

**Instance 1**

Instance 1 is located in the municipality of Camapuã, in the State of Mato Grosso do Sul, Brazil. The property composing Instance 1, therefore the project area or "Fazenda Lagoa", is owned by Caeté Florestal S.A.. The legal documents proving the land title and ownership of the properties will be made available to the auditors during the validation process.

In Brazil, the owner of the area is entitled to all the resources resulting from it. The owner has the right to use, enjoy and dispose of the property. The limitation on the right to property occurs in the case of underground research and mining (article 20, item IX and article 176 of the Federal Constitution[7] and article 1,230 of the Civil Code[8]).

As far as carbon credits are concerned, they can be taken as the result of a property, so they belong to the owner. The legislation is expressed in this sense for the Permanent Preservation Areas and Legal Reserve, in art 41, § 4: "The maintenance activities of Permanent Preservation Areas, Legal Reserve and restricted use are eligible for any payments or incentives for services environmental issues, configuring additionality for the purposes of national and international markets for certified greenhouse gas emission reductions.[9]"

As per the rules stated at Section 3.7 Ownership of the VCS Standard v.4, project proponents must demonstrate that they have the legal right to control and operate project or program activities. Thus, an enforceable and irrevocable agreement was set between, Caeté Florestal S.A. – the holder of the property and contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions or removals –, and Future Carbon Holding S.A., which vests project ownership in the project proponent (Future Forest – Future Carbon Holding[10]). Evidence of such agreement will also be made available at the audit.

## 1.8 Project Start Date

According to the VCS Standard Version 4.2, section 3.7, the project start date for AFOLU projects is the date on which activities that lead to the generation of GHG emission reduction or removals are implemented.

The project start date is 15-October-2020. On this date, the first seedling was planted in Instance 1.

[7] Brazilian Constitution available at <http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm>

[8] Brazilian Civil Code available at < http://www.planalto.gov.br/ccivil_03/leis/2002/l10406compilada.htm>

[9] Brazilian Forest Code: http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12651.htm

[10] Future Forest (Future Carbon Consultoria e Projetos Florestais Ltda.) is a company controlled by Future Carbon Holding S.A. Therefore, partnership agreements for project developments are signed on behalf of Future Carbon Holding.

## 1.9 Project Crediting Period

The project has a crediting period of 60 years, from 15-October-2020 until 14-October-2080.

## 1.10 Project Scale and Estimated GHG Emission Reductions or Removals

The estimated annual GHG emission reductions/removals of the project are:

☒ <20,000 $tCO_2e$/year

☐ 20,000 – 100,000 $tCO_2e$/year

☐ 100,001 – 1,000,000 $tCO_2e$/year

☐ >1,000,000 $tCO_2e$/year

| Project Scale | |
|---|---|
| Project | X |
| Large project | |

| Year | Estimated GHG emission reductions or removals ($tCO_2e$) |
|---|---|
| **2020**<br>Starting on 15-October-2020 | 66.07 |
| **2021** | 610.41 |
| **2022** | 1,227.86 |
| **2023** | 2,187.79 |
| **2024** | 2,890.01 |
| **2025** | 4,545.48 |
| **2026** | 5,772.00 |
| **2027** | 6,108.85 |
| **2028** | -7,916.59 |
| **2029** | 9,593.34 |
| **2030** | 309.17 |
| **2031** | 309.17 |
| **2032** | 309.17 |
| **2033** | 309.17 |
| **2034** | 309.17 |
| **2035** | 309.17 |

| | |
|---|---|
| 2036 | 309.17 |
| 2037 | 309.17 |
| 2038 | 309.17 |
| 2039 | 309.17 |
| 2040 | 77.29 |
| 2041 | 77.29 |
| 2042 | 77.29 |
| 2043 | 77.29 |
| 2044 | 77.29 |
| 2045 | 77.29 |
| 2046 | 77.29 |
| 2047 | 77.29 |
| 2048 | 77.29 |
| 2049 | 77.29 |
| 2050 | 77.29 |
| 2051 | 77.29 |
| 2052 | 77.29 |
| 2053 | 77.29 |
| 2054 | 77.29 |
| 2055 | 77.29 |
| 2056 | 77.29 |
| 2057 | 77.29 |
| 2058 | 77.29 |
| 2059 | 77.29 |
| 2060 | 77.29 |
| 2061 | 77.29 |
| 2062 | 77.29 |
| 2063 | 77.29 |
| 2064 | 77.29 |
| 2065 | 77.29 |
| 2066 | 77.29 |
| 2067 | 77.29 |
| 2068 | 77.29 |
| 2069 | 77.29 |
| 2070 | 77.29 |
| 2071 | 77.29 |
| 2072 | 77.29 |
| 2073 | 77.29 |

| | |
|---|---|
| **2074** | 77.29 |
| **2075** | 77.29 |
| **2076** | 77.29 |
| **2077** | 77.29 |
| **2078** | 77.29 |
| **2079** | 77.29 |
| **2080**<br>Ending on 14-October-2080 | 60.77 |
| **Total estimated ERs** | **31,329.36** |
| **Total number of crediting years** | **60** |
| **Average annual ERs** | **522.16** |

ARR projects with harvesting activities shall not be issued GHG credits above the long-term average GHG benefit maintained by the project. According to VCS Standard requirements, where ARR projects meet or exceed the harvesting activity definition, the long-term average (LTA) shall be applied. The long-term average (LTA) was calculated based on a 100-year period because it includes the last harvest/cut in the cycle. For instance, the project crediting period is 60 years and has a harvest cycle of 18 years for some species, and 30 and 50 years for others, so the long-term average GHG benefit was determined for a period of 100 years when there will be 5, 3 and 2 cycles, respectively. However, it is important to note that the permanence of the carbon stock removed by this project activity will not be lost during a final cut with no subsequent replanting or regeneration.

More information about the calculation of the LTA will be indicated in sections 4 and 6.

## 1.11 Description of the Project Activity

The project aims to remove GHG through the reforestation of degraded lands. Reforestation activities are important means of mitigating climate change as plants naturally remove GHG from the atmosphere. Through the photosynthesis, plants can remove atmospheric carbon dioxide ($CO_2$) and incorporate it into the biomass. Thus, silvicultural and management activities can be carried out in reforestation areas, representing a carbon sink that can be manipulated by humans.

In Instance 1, two reforestation techniques are used: planting seedling and conduction of natural regeneration. In addition to the areas with native species in the Legal Reserve and Permanent Preservation Area of the property, there are two plots (Area 06 and Area 07) with native and exotic species with timber potential (Table 3). The objective of this planting model is to boost carbon removals through the mix of species from different ecological groups. Characteristics such as wood density and tree growth pattern are determining factors in the removal capacity and

carbon storage of these species[11]. Thus, the composition of species and ecological groups are important points in reforestation areas with a focus on GHG removal[12].

**Table 3. Description of planting and natural regeneration areas**

| Name/Plot | Area (hectares) | Technique | Species | Goal |
|---|---|---|---|---|
| Area 06 | 56 | Planting seedling– mix of native and exotic species | *Khaya grandifoliola*<br>*Toona cilata*<br>*Dipteryx alata* | Economic use |
| Area 07 | 51 | Planting seedling – mix of native and exotic species | *Khaya grandifoliola*<br>*Tectona grandis*<br>*Cariniana legalis*<br>*Zeyheria tuberculosa* | Economic use |
| Preservation Permanent Area | 5 | Planting seedling – native species | 40 native species | Recovery of the Permanent Preservation Area |
| Preservation Permanent Area | 3 | Conduction of natural regeneration | - | Recovery of the Permanent Preservation Area |
| Legal Reserve | 20 | Conduction of natural regeneration | - | Recovery of the Permanent Preservation Area |

[11] Philips O. L. et al. Species matter: wood density influences tropical forest biomassat multiple scales. Surveys in Geophysics, 2019. Available at: https://link.springer.com/article/10.1007/s10712-019-09540-0
[12] Pantaleão, L. C. Efeitos de grupos ecológicos no estoque de carbono em áreas de restauração ecológica na Mata Atlântica. Universidade Federal do Paraná, 2020. Available at: https://acervodigital.ufpr.br/handle/1884/40049

All the reforestation activities are implemented in areas previously occupied by degraded pasture for more than 10 years with little or no resilience and low carbon stock. Thus, the planting trees is of great importance for the provision of several ecosystem services, including carbon removal. Through an approach of multifunctional forests, the project intends to increase the ecosystem services provided by the vegetation, in addition to social and economic benefits.

To achieve success in reforestation areas, several activities beyond planting must be carried out. Pre-planting, planting and post-planting activities in the initial years performed in instance 1 are described in the table below:

**Table 4. Description of planting activities**

| Step | Activity | Age | Operating |
|---|---|---|---|
| Pre-planting | Area and soil preparation | 4 months before planting | - Intensive livestock management.<br>- Soil collection for physical-chemical analysis.<br>- Start ant control with ant baits.<br>- Allocate terraces.<br>- Raising terraces with a terracer.<br>- Breaking corners of terraces.<br>- Apply limestone to correct the soil. Dosage is determined by soil analysis.<br>- Mechanized mowing with Tatu mower. This activity will be carried out if the size of the competition bush is with an average height greater than 50cm.<br>- Scratch to mark planting rows.<br>- Post-emergence herbicide chemical weeding located in the row at a dosage of 1.5 lt/ha, in a strip of 1.5 meters above the risk, 20 to 30 days before furrowing for planting.<br>- Furrow and apply reactive phosphate (350 kg/ha) on the dried lines.<br>- Apply pre-emergent, at a dosage of 02 lt/ha on the planting furrow. |
| Planting | Planting | - | - Application of Trichodermil on seedlings in the nursery.<br>- Preparing the seedlings to go to the field:<br>- Seedlings in tubes: Remove the seedlings from the tube and pack them in plastic boxes.<br>- Seedlings in roulade: Keep the seedlings in the rocambole.<br>- Immersion of the root of the seedlings in a termitecide solution.<br>- The seedlings to go to the field must be packed in a trailer, with a shade to protect the seedlings from the sun.<br>- Planting should be carried out at a spacing of 5 meters between the seedlings and then irrigate with hydrogel, at a dosage of 150 grams of hydrogel (Hydroplan) and 100 grams of HB10 (Hydroplan) for 4,000 liters of water.<br>- Repeat irrigation if it does not rain every 03 days.<br>- Maintain total area ant control daily. |
| Post planting | Maintenance | Up to three months | - After 10 days of planting, base fertilization in the amount of 350 g/plant.<br>- 15 days after planting, irrigate with MAP, 02 liters of syrup/plant. |

| | | | |
|---|---|---|---|
| | | | - Maintain weekly total area ant control.<br>- Replanting should be carried out 30 days after planting aiming at 95% survival rate.<br>- Cover fertilization with NPK (20-00-20) at 30, 60 and 90 days after planting, at a dosage of 50 g/plant per application. The application must be carried out in a semicircle around the seedlings, at a distance of 20 cm from the base of the plant.<br>- Micronutrient fertilization should be carried out 90 days after planting at a dosage of 15 g/plant.<br>- Between 60 and 90 days after planting, carry out chemical weeding with post-emergence herbicide in the planting rows.<br>- Installation of fire breaks and fences surrounding the reforestation area. |
| Post planting | Maintenance | 1 year after planting | - Chemical weeding with post-emergence herbicide located in the line, one (01) application in the first semester after planting (this activity is also described in the planting phase) and one (01) application in the second semester. The application of the herbicide in the planting line should be 1.5 meters wide, carried out with a tractor with a spray tank and 02 employees accompanying the tractor, applying the herbicide in a localized way in the planting line.<br>- Perform manual control of herbicide resistant broad leaves.<br>- Sprout the natural regenerations with a hoe, making a deep cut in the ground to avoid regrowth and being careful around the seedlings, 03 times a year.<br>- Top dressing. Three (03) fertilizations must be performed with NPK (20-00-20) at a dosage of 75 g/plant/fertilization with an interval of 30 days between each fertilization.<br>- Micronutrient fertilization. One (01) fertilization at a dosage of 25 g/plant must be carried out.<br>- In the 06 months after planting, maintain ant control in the total area fortnightly, after 06 months monthly.<br>- Mechanized mowing every 45 days between rows<br>- Maintenance of fire breaks and fences surrounding the reforestation area. |
| Post planting | Maintenance | 2 years after planting | - Post-emergence herbicide chemical weeding located on the line every 03 months during the rainy season, totalling three (03) chemical weeding in the year. The application of the herbicide in the planting line should be done semi-mechanized, with a tractor with a spray tank and 02 employees accompanying the tractor, applying the herbicide in a localized way in the planting line. |

| | | | |
|---|---|---|---|
| | | | - Thinning of natural regenerations with a hoe, making a deep cut in the ground to avoid regrowth and being careful around the seedlings, 01 per year.<br>- Top dressing. Three (03) fertilizations must be performed with NPK (20-00-20) at a dosage of 75 g/plant/fertilization with an interval of 30 days between each fertilization.<br>- Micronutrient fertilization. One (01) fertilization at a dosage of 25 g/plant must be carried out.<br>- Maintain external ant control weekly and total area monthly.<br>- Maintenance of fire breaks and fences surrounding the reforestation area. |
| Post planting | Maintenance | 3 years after planting | - Post-emergence herbicide chemical weeding located on the line every 03 months during the rainy season, totalling three (03) chemical weeding in the year. This application will be carried out mechanized, with a tractor with a spray tank and a spray nozzle at each end of the boom, directed towards the planting line and adjusted at an angle of 45°. If the seedlings are less than 1.50 meters tall, the activity must be carried out with a tractor with a spray tank and 02 employees accompanying the tractor, applying the herbicide in a localized way in the planting row.<br>- Thinning of natural regenerations with a hoe, making a deep cut in the ground to avoid regrowth and being careful around the seedlings, 01 per year.<br>- Maintain external ant control weekly and total area monthly.<br>- Mechanized mowing (tractor) bimonthly in the rainy season (September – March) between the rows<br>- Maintenance of fire breaks and fences surrounding the reforestation area. |

In the Permanent Preservation and Legal Reserve areas, sites with high potential for natural regeneration were identified. Thus, natural regeneration was carried out, facilitating the development of regenerating native species.

In addition to maintenance activities, reforestation areas will undergo monitoring to follow the development of trees and implement adaptive management, if necessary. Restoration monitoring will be carried out together with the Monitoring Report of the ARR project, according to the CDM methodology AR-AMS0007 - Version 3.1 requirements.

For all field activities involving the project, workers from Fazenda Lagoa are involved and, when necessary, workers are hired. These workers are usually people residing in the community surrounding the project area. In this way, project activities can generate social and economic benefits for the local population.

The project is not located within a jurisdiction covered by a jurisdictional REDD+ program.

## 1.12 Project Location

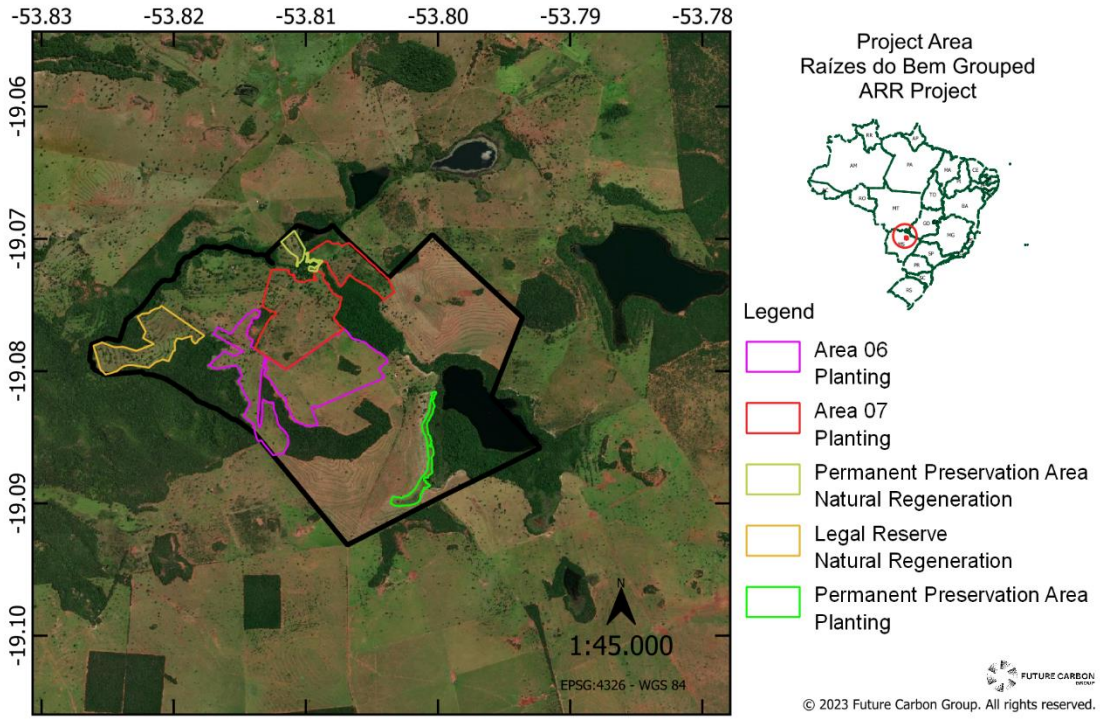
The first Instance of the project is located within the municipality of Camapuã, in the State of Mato Grosso do Sul, comprising the Cerrado biome. The grouped project intends to add new instances, expanding the project beyond the borders of Instance 1 to also cover the State of Mato Grosso and the Amazon biome in Mato Grosso and Mato Grosso do Sul States.

**INSTANCE 1 – FAZENDA LAGOA**

The Fazenda Lagoa is located in the northwestern region of Mato Grosso do Sul and 199 km from the capital Campo Grande. From Campo Grande, access to the property is via the BR-163, BR-060 and MS-422 highways.

Geodetic coordinates of the project location have been submitted separately as a KML file.

**Figure 1. Instance 1 location and Project Area**




## 1.13 Conditions Prior to Project Initiation

### INSTANCE 1 – FAZENDA LAGOA

The Instance 1 is located in the Cerrado biome. The Cerrado is considered the most biodiverse savannah formation in the world. With approximately two million square km, it occupies about 25% of the Brazilian territory[13]. Between 1985 and 2020, the biome lost about 26.5 million hectares of native vegetation cover, with 98.9% of this loss due to agricultural land use, both for pasture and agriculture[14].

### Current and historical land use

Prior to the purchase of Fazenda Lagoa and project initiation, land use was primarily intended for cattle ranching. Cattle ranching is a common activity in the region and represents the baseline scenario of the project (see more details in Section 3.4 - Baseline Scenario).

It is important to highlight that in the project area, there was no removal of native vegetation in the ten years prior to the project start date.

[13] Available at: http://cerrado.obt.inpe.br/
[14] Available at: https://mapbiomas.org/produtos

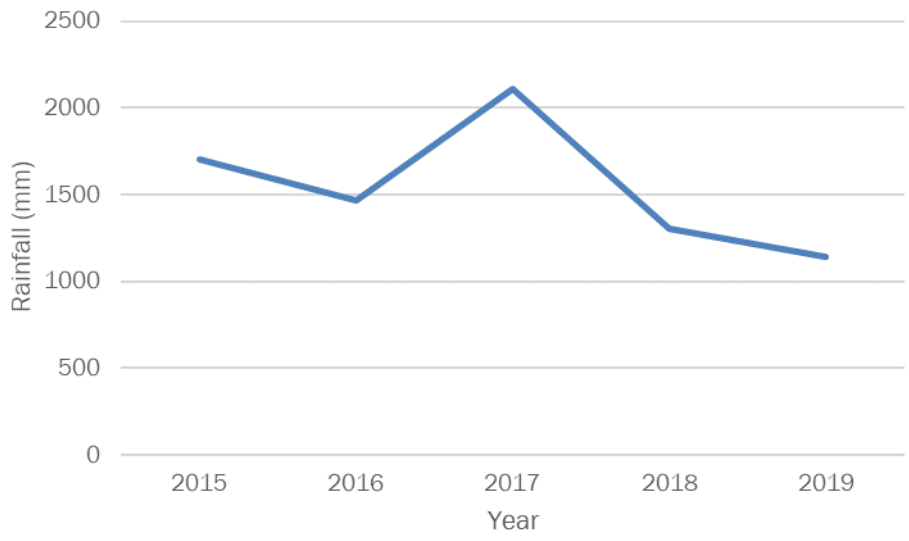
### Climate

According to the macroclimatic classification of Koppen-Geiger (1948), in the municipality of Camapuã, MS, the climate is tropical, with a dry winter (typology 'Aw'). In summer there is a rainy season, between the months of November and April, and in winter the predominant season is the dry one, between the months of May and October. The average air temperature of the coldest month is above 18°C. The annual rainfall is greater than 750 mm, reaching 1,800 mm[15].

Considering the available water capacity equal to 100 mm, the region has an annual water deficit of approximately 50 mm, with a water surplus exceeding 300 mm on average. The period of water deficiency generally covers the months of June to August. The average annual temperature is 22.9°C, with 1,415 mm of rainfall[7].

Since 2005, annual rainfall has been monitored at Fazenda Lagoa to correlate this information with the challenges in the field[16].

**Figure 2. Annual rainfall at Fazenda Lagoa (adapted from the RPPN Fazenda Lagoa Management Plan)**




### Hydrology

In the territory of Mato Grosso do Sul, there are two Brazilian Hydrographic Regions: the Hydrographic Region of Paraguay, formed by the basin of the Paraguay River, to the west, and the Hydrographic Region of the Paraná River, formed by the Paraná River, to the east. The

[15] Pereira, N.R., Chagas, C.S., Bhering, S.B, Carvalho Júnior, W., Amaral, F.C.S., Zaroni, M.J., Gonçalves, A.O., Dart, R.O., Aglio, M.L.D., Daniel Filho, A.C.B., e Lopes, C.H.L. 2011. Zoneamento Agroecológico do município de Camapuã – MS. Embrapa Solos, 2011.
[16] Available at: https://www.imasul.ms.gov.br/wp-content/uploads/2021/02/Plano-de-Manejo-RPPN-Fazenda-Lagoa_livro-digital_FIM25.11.2020-1.pdf

municipality of Camapuã presents a watershed, covering in its territory the two hydrographic basins of the Paraguay River and the Paraná River.

Fazenda Lagoa is part of the Planning and Georeferencing Unit (PGU) Taquari, in the Hydrographic Region of Paraguay.

### Topography and soils

The Camapuã region is part of the Botucatu Formation, which, in turn, is under the Serra Geral Formation, in the central and north-central part of the State of Mato Grosso do Sul and in the extreme south of the State of Mato Grosso[17]. Considering the Geoenvironmental Units, Camapuã is inserted in the Region of the High Basins of the Taquari and Itiquira Rivers and the Region of the Ramped Plateaus[18].

Other characteristics linked to the relief and soils in the municipality of Camapuã involve i) the slope, considered one of the most important attributes of the land that control the pedogenetic processes; ii) soil fertility, which relates to levels of supply of minerals and other substances which plants require to express their productive potential; iii) the capacity of the soil to store water, related to various physical and chyme attributes of soils, such as granulometry, structure, cation retention capacity (CEC) and matter content soil organic; iv) the internal drainage classes of soils, which have to do with some types of plants that present higher productivity when cultivated in deep and well-drained soils; v) the potential risk of degradation of the natural environment, related to soil erosion; and vi) land use and vegetation cover[10].

In the area of Instance 1, Argisol is predominantly present. Its occurrence is related to more rugged landscapes and have a lower level of natural fertility and are more susceptible to erosion.

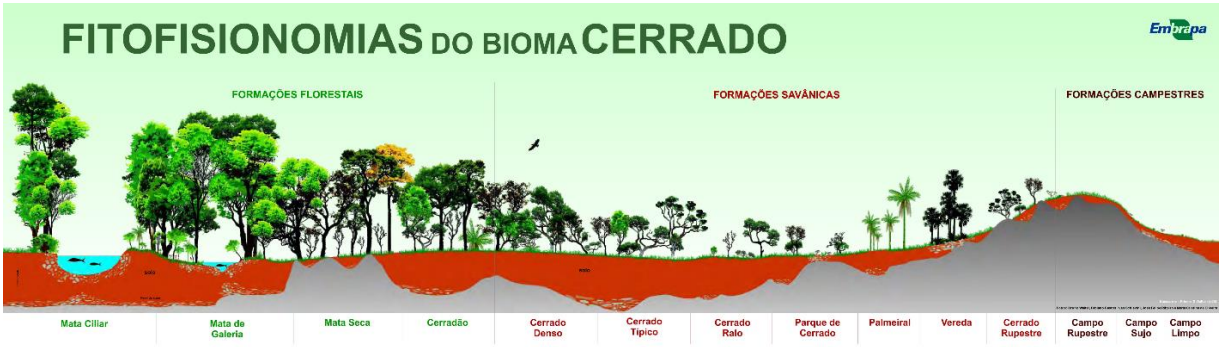
### Vegetation and ecosystems

The region covered by the Instance 1 is the Cerrado biome, the second largest biome in Brazil, which covers an area of approximately 2 million km$^2$. The Cerrado is a biodiverse tropical savannah, with different phytophysiognomies. Eleven main types of vegetation are described for the Biome, framed in forest formations (Riparian Forest, Gallery Forest, Dry Forest and Cerradão), savannah (Cerrado restricted sense, Cerrado Park, Palmeiral and Vereda) and grassland (Campo Sujo, Campo Clean and Campo Rupestre). The figure below, created by Brazilian Agricultural Research Corporation (EMBRAPA – Empresa Brasileira de Pesquisa Agropecuária, in Portuguese), shows the existing phytophysiognomies in the Cerrado[10].

[17]Machado, F.B., Nardy, A.J.R., Rocha Júnior, E.R.V., Marques, L.S., e Oliveira, M.A.F. 2009. Geologia e litogeoquímica da Formação Serra Geral nos Estados de Mato Grosso e Mato Grosso do Sul. São Paulo, UNESP. Geociências, v. 28, n. 4, p. 523-540. Available at: https://www.ppegeo.igc.usp.br/index.php/GEOSP/article/view/7093

[18] Available at: https://www.embrapa.br/cerrados/colecao-entomologica/bioma-cerrado.

**Figure 3. Cerrado phytophysiognomies**[10]




Among the formations and phytophysiognomies of the Cerrado, Fazenda Lagoa presents three forest formations (gallery forest, dry forest, Cerradão) and one savannah formation (Vereda) in primary and advanced successional stages and also in regeneration.

Socio-economic conditions

Camapuã is a 6,238.127 km² municipality located in the State of Mato Grosso do Sul, in Brazil[19]. Its accounted population in the last census in 2010 was of 13,625 citizens, its demographic density being of 2.19 inhab/km². Of all population, in 2020 2,014 people had formal or informal jobs, which is 14.7% of the municipality's population[18]. The average monthly wage of formal workers in 2020 was of 2.2 minimum wages, and the minimum wage R$ 1,045.00[20]. This means a minimum wage of US$ 214.58 (considering the average exchange rate between January and June of 2020, of US$ 4.87[21]), and an average monthly wage of formal workers equivalent to US$ 472.07.

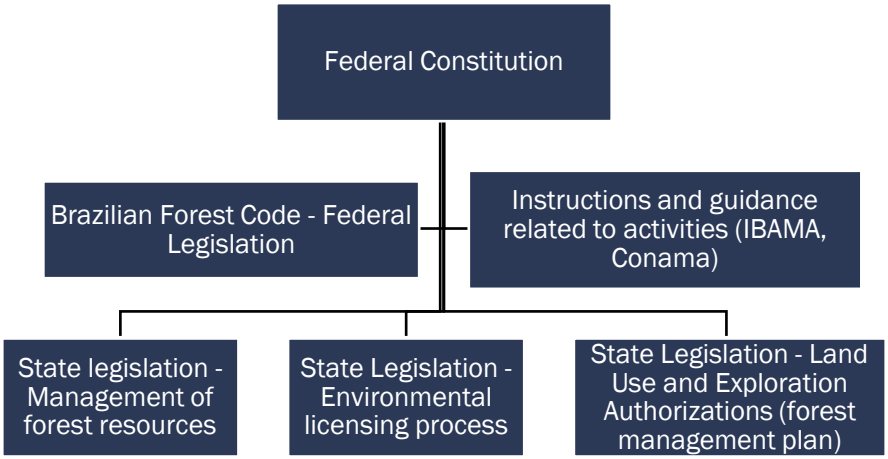
Almost 97.9% of the municipality's population studied until a 6 to 14 years old- range Camapuã's IDHM in 2010 was of 0.703. The IDHM - *Índice de Desenvolvimento Humano Municipal* (Municipal Human Development Index in free translation) is a measurement composed by indicators of three dimensions of human development: longevity, education, and income. The index ranges from 0 to 1. The closer to 1, the greater human development[22]. Per capita GDP of the municipality in 2020 was R$ 39,439.24 (equivalent to US$ 8,098.40) in 2020[18].

## 1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

[19] Available at https://cidades.ibge.gov.br/brasil/ms/camapua/panorama
[20] Available at http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2020/lei/L14013.htm#:~:text=e%20dois%20centavos).-,Art.,Par%C3%A1grafo%20%C3%BAnico.
[21] Available at https://www.bcb.gov.br/estabilidadefinanceira/historicocotacoes
[22] Available at https://www.br.undp.org/content/brazil/pt/home/idh0/conceitos/o-que-e-o-idhm.html

In a brief context of Brazilian legislation, the Federal Constitution determines that it is concurrent between the Union, Member States and the Federal District the competence to legislate on matters related to the protection of the environment, conservation of nature, defense of the soil, protection of landscape heritage and responsibility for damages to the environment. The same document establishes that municipalities are responsible for legislation at the local level[23]. However, in the absence of a qualified environmental agency or environmental council in the municipality, the state must carry out municipal administrative actions until its creation. In turn, in the absence of a qualified environmental agency or environmental council in the state and municipality, the Union will have to carry out administrative actions until its creation in one of those federative entities[24]. It is also necessary to observe that a municipal law cannot contradict a state law, which in turn cannot contradict a federal law, under penalty of unconstitutionality.

**Figure 4. Structure of the Brazilian legislation**




- National legislation

According to the current Brazilian Forest Code (Law Nº 12.651, 25/05/2012[25]), all rural estates located in forest zones shall have:

I. Permanent Preservation Area (APP): 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 population.

II. Legal Reserve: an area located within a rural property or possession which is required to be segregated, as well as the permanent preservation area, for the sustainable use of natural resources, conservation and rehabilitation of ecological processes, biodiversity conservation and

[23] Available at http://www.pge.sp.gov.br/centrodeestudos/bibliotecavirtual/Congresso/ztese17.htm
[24] Available at http://pnla.mma.gov.br/competencias-para-o-licenciamento-ambiental
[25] BRASIL. Law nº. 12.651, of 25 May 2012. Forest Code. Diário Oficial [da] República Federativa do Brasil, Brasília, DF, 25 May 2012.

shelter, and protection of native flora and fauna. The percentage of vegetation that must be maintained as a Legal Reserve is as follows:

- Eighty percent, on a rural property located in a forest area located in the Legal Amazon[26];
- Thirty-five percent, on a rural property located in a cerrado area located in the Legal Amazon;
- Twenty percent, on the rural property in the Campos Gerais area located in the Legal Amazon;
- Twenty percent, on a rural property located in other regions of the country.

- State legislation

  In the state of Mato Grosso do Sul, the Instituto de Meio Ambiente do Mato Grosso do Sul (IMASUL) is the body responsible for promoting environmental management by proposing and executing policies and actions aimed at the sustainable development of the State, including environmental licensing.

**Table 5. Applicable Laws and compliance**

| Law | Content | Compliance |
|---|---|---|
| **Federal Legislation** | | |
| Law Nº 6.938[27] | This Law establishes the National Policy for the Environment to preserve, improve and recover the environmental quality conducive to life, aiming to ensure, in the country, conditions for socio-economic development, the interests of national security, and the protection of the dignity of human life. The Law complies with several environmental principles, including recovering degraded areas and rationalizing land use. | The project area complies with this Law due to activities to recover degraded areas carried out by private entities, subject to inspection by federal, state, or municipal agencies. |
| Law Nº 10.711[28] | This Law provides for the National Seeds and Seedlings System. It aims to guarantee the identity and quality of plant multiplication and reproduction material produced, marketed, and used throughout the national territory. Establishes the National Registry of Seeds and Seedlings –Renasem, mandatory for activities of | The project area complies with this Law by using seeds and seedlings from certified forest nurseries. |

[26] Note: The Legal Amazon corresponds to the area of operation of the Superintendence for the Development of the Amazon - SUDAM delimited under Art. 2 of Complementary Law n. 124, of 01.03.2007. The Legal Amazon was established to define the geographical delimitation of the political region in which SUDAM operates, to promote the inclusive and sustainable development of its area of operation and the competitive integration of the productive regional base in the national and international economy.
[27] Available at: http://www.planalto.gov.br/ccivil_03/leis/l6938compilada.htm
[28] Available at: https://legislacao.presidencia.gov.br/atos/?tipo=LEI&numero=10711&ano=2003&ato=ee9gXR610dRpWT07f

| | | |
|---|---|---|
| | production, processing, packaging, storage, analysis, trade, import and export of seeds and seedlings. | |
| Law Nº 12.651[29] | This Law establishes general rules on the protection of vegetation, Permanent Preservation areas and Legal Reserve areas; forest exploitation, the supply of forest raw materials, the control of the origin of forest products and the control and prevention of forest fires and provides economic and financial instruments to achieve its objectives. | The project area complies with current legislation, as evidenced by the regularity in the CAR, authorizations issued and the absence of legal pending issues on the environmental side. The project contemplates the restoration of native vegetation in the Permanent Preservation Areas and Legal Reserve. The planting of commercial species is not implemented in these areas protected by law. |
| Decree Nº 8.972[30] | This decree establishes the National Policy for the Recovery of Native Vegetation - PROVEG which includes the creation of PLANAVEG -National Plan for the Recovery of Native Vegetation and CONAVEG -National Commission for the Recovery of Native Vegetation. Its objective is to articulate, integrate and promote policies, programs and actions that induce the recovery of forests and other forms of native vegetation, as well as promote the environmental regularization of Brazilian rural properties, in accordance with Federal Law No. 12,651/2012. PLANAVEG foresees the restoration of 12 million hectares in Brazil by 2030. | The project area complies with this decree through the recovery of native vegetation using total planting techniques and conducting natural regeneration implemented by private organizations with the objectives of (i) adapting to climate change and mitigating its effects, (ii) preventing natural disasters, (iii) protect water resources and conserve soils, (iv) promote social benefit. |
| INMETRO Ordinance No. 547, October 25, 2012[31] | This ordinance outlines the requirements for obtaining and maintaining the Sustainable Forest Management Unit certificate | Instance 1 complies with this ordinance. Caeté Florestal has two FSC (Forest Stewardship Council) certifications, translating its commitment to socio-environmental responsibility and forest management into action. |
| **State legislation** | | |

[29] Available at: https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12651.htm
[30] Available at: https://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/decreto/d8972.htm
[31] Available at: http://www.inmetro.gov.br/legislacao/rtac/pdf/RTAC001921.pdf

| | | |
|---|---|---|
| Law n. 214, of march 25, 1981[32] | This Law prohibits the cutting of wood of endangered species | Instance 1 complies with this Law. The project activities will not cut the species cited in the norm. |
| Decree No. 13,977, of June 5, 2014[33] | Deals with the Rural Environmental Registry of Mato Grosso do Sul; on the More Sustainable (MS) Program and other provisions. | Instance 1 complies with this Decree. Fazenda Lagoa is registered in the Rural Environmental Registry of Mato Grosso do Sul and maintains the vegetation in permanent preservation and legal reserve areas. |
| Resolution SEMADE n. 9, of May 13, 2015[34] | This resolution establishes norms and procedures for environmental licensing, including forest planting and conduction of native forest species or exotic, to produce and cut or extract various forest products. | Instance 1 complies with this resolution. It is not necessary to apply for an environmental license for the activity carried out, but only communicate the activity to IMASUL (Institute for the Environment of Mato Grosso do Sul, in Portuguese) before starting the activities. Caeté Florestal S.A. sent this communication to IMASUL. |
| **Legislation on climate change and carbon market** | | |
| Decree 11075[35] | Establishes the procedures for the elaboration of Sectoral Plans for Mitigation of Climate Changes, institutes the National System for the Reduction of Greenhouse Gas Emissions. | The decree defines the carbon credit as a financial asset, the institution of the National System for the Reduction of Greenhouse Gas Emissions and organizes the functioning of the Government about the carbon agenda. Its application is restricted to the federal entities of the Public Administration, and, because it is a decree, a normative type that only grants regulation to the matter of law, does not establish duties or obligations to the society. |

[32] Available at: https://leisestaduais.com.br/ms/lei-ordinaria-n-214-1981-mato-grosso-do-sul-dispoe-sobre-a-proibicao-de-corte-de-madeira-de-especie-em-extincao-e-da-outras-providencias?q=Lei%20Complementarf

[33] Available at: http://aacpdappls.net.ms.gov.br/appls/legislacao/secoge/govato.nsf/1b758e65922af3e904256b220050342a/de70a7c8af0fefbe04257cef004b6b41?OpenDocument&Highlight=2,car

[34] Available at: https://www.imasul.ms.gov.br/wp-content/uploads/2019/11/Res-Semade-09-2015-compilada.pdf

[35] Available at <https://presrepublica.jusbrasil.com.br/legislacao/1505298704/decreto-11075-22>

## 1.15 Participation under Other GHG Programs

### 1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

This project has not been registered and is not seeking registration under any other GHG Programs.

### 1.15.2 Projects Rejected by Other GHG Programs

Not applicable. This project has not requested registration under any other GHG Programs, therefore, the project has not been rejected by any other GHG programs.

## 1.16 Other Forms of Credit

### 1.16.1 Emissions Trading Programs and Other Binding Limits

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

### 1.16.2 Other Forms of Environmental Credit

The project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program. This project has not been registered under any other credited activity, and no VCUs have been assigned to the project area so far. Thus, any possibility of double counting of credits is eliminated.

#### Supply Chain (Scope 3) Emissions

The present ARR project's GHG emission reductions are not in a supply chain, i.e., the is no network of organizations (e.g., manufacturers, wholesalers, distributors, and retailers) involved in the production, delivery, and sale of a product or service to the consumer. Therefore, there are no organization upstream and downstream of the goods and services whose GHGs are impacted by the present ARR project activity.

## 1.17 Sustainable Development Contributions

The Raízes do Bem Grouped ARR Project aims to reforest degraded areas to reestablish important ecosystem services such as carbon removal. In addition, the project aims to positively impact the local community by generating social, economic, and environmental benefits.

These measures contribute to nationally stated sustainable development priorities, such as the objectives from the Brazilian Government related to the UN Sustainable Development Goals (SDGs) and the Nationally Determined Contribution (NDC).

In Brazil, the National Commission for Sustainable Development Objectives (CNODS) is responsible for internalizing, disseminating, and providing transparency to the process of implementing the 2030 Agenda for Sustainable Development in Brazil. The Commission is made up of eight government representatives (Government Secretariat of the Presidency of the Republic; Civil House of the Presidency of the Republic; Ministry of Foreign Affairs; Ministry of Citizenship; Ministry of Economy; Ministry of Environment; representative of the state/district levels; representative of the municipal level) and by eight representatives of civil society and the private sector. The monitoring of the country's advances in relation to the SDGs established as priorities is carried out by the Institute of Applied Economic Research (IPEA) and the Brazilian Institute of Geography and Statistics (IBGE), which are also permanent technical advisory bodies.

There is no monitoring at the specific level of projects, and progress at the national level can be accompanied by the synthesis report carried out by IBGE and by the IPEA reports. In addition, in 2018 there was the SDG Award, an initiative of the Federal Government whose objective is to encourage, value and give visibility to practices that contribute to achieving the goals of the 2030 Agenda throughout the national territory. The first edition of the Award had 1045 entries to compete in four categories: government; for-profit organizations; non-profit organizations; and teaching, research, and extension institutions.

The Project main planned contributions to the Sustainable Development Goals are listed below.

**Table 6. Sustainable development goals and project contributions**

| Sustainable Development Goal | Project contributions |
|---|---|
| Goal 1: No poverty | The project contributes to reducing poverty mainly by offering employment to the local community in reforestation activities and in the collection of non-timber forest products. |
| Goal 5: Gender equality | The project aims to promote employment opportunities without distinction of gender and increase the employability of women in all activities and job positions. |
| Goal 6: Clean water and sanitation | The project contributes to clean and potable water through the protection and restoration |

| | |
|---|---|
| | of related-water ecosystems, mainly the Permanent Preservation Areas and Legal Reserve. |
| Goal 8: Decent work and economic growth | The project promotes the increase of jobs for the local community in reforestation activities. In this way, the community can improve and grow its economy through sustainable activities. |
| Goal 11: Sustainable cities and communities | Through the reforestation of degraded areas, the provision of ecosystem services, the project reduces the adverse effects of natural disasters and the environmental impact of cities. |
| Goal 12: Responsible consumption and production | The project achieves the sustainable management and efficient use of natural resources through certified wood and implementing sustainable practices. |
| Goal 13: Climate action | The project reduces greenhouse gas emissions through the reforestation of degraded lands, thus, strengthen resilience and adaptive capacity to climate related disasters and integrate climate change measures into national policies, strategies, and planning, such as federal law n. 12651. |
| Goal 15: Life on land | Through reforestation and the introduction of native species, the project ensures sustainable use of forests, end deforestation, and restore degraded lands and soils, protecting biodiversity and natural habitats. |

## 1.18 Additional Information Relevant to the Project

### Leakage Management

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

### Commercially Sensitive Information

Not applicable.

### Further Information

Not applicable.

# 2 SAFEGUARDS

## 2.1 No Net Harm

Section not required for DRAFT PD. Further information will be inserted into VCS PDVCS PD Version 1.

## 2.2 Local Stakeholder Consultation

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 2.3 Environmental Impact

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 2.4 Public Comments

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 2.5 AFOLU-Specific Safeguards

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

# 3 APPLICATION OF METHODOLOGY

## 3.1 Title and Reference of Methodology

This project uses the approved CDM methodology AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands - Version 3.1 [36].

Furthermore, the following tools were used:

[36] Available at < https://cdm.unfccc.int/methodologies/DB/J6ZHLX1C3AEMSZ52PWIII6D2AOJZUB >

- AR Tool 08: Estimation of non-$CO_2$ greenhouse gas (GHG) emissions resulting from burning of biomass attributable to an A/R CDM project activity. Version 04.0.0[37].
- AR Tool 12: Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities. Version 3.1[38].
- AR 14: Estimation of carbon stocks and the change in carbon stocks of trees and shrubs in A/R CDM project activities. Version 4.2[39].
- AR Tool 15: Estimation of the increase in GHG emissions attributable to the displacement of pre-project agricultural activities in A/R CDM project activities. Version 02.0[40].
- AR Tool 16: Estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities Version 01.1[41].

## 3.2 Applicability of Methodology

| AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands — Version 3.1 | |
|---|---|
| **Applicability Conditions** | **Justification of Applicability** |
| a) The land subject to the project activity does not fall in wetland category | The project area does not fall into the wetland category.<br><br>Instance 1 is not located in wetlands. Future instances shall comply with this applicability condition through Geoprocessing or other methods to prove the existence or non-existence of wetlands. |
| b) Soil disturbance attributable to the project activity does not cover more than 10 per cent of area in each of the following types of land, when these lands are included within the project boundary:<br><br>(i) Land containing organic soils;<br><br>(ii) Land which, in the baseline, is subjected to | As demonstrated in section 1.13, there is no presence of organic soils in the project area. In Instance 1, Argisols are mostly present, and prior to the start of activities, the soil was under pasture use, with a high degree of degradation.<br>Analyzes through Geoprocessing techniques, literature or soil samples are carried out to |

[37] Available at < https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-08-v4.0.0.pdf>
[38] Available at < https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf>
[39] Available at < https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-14-v4.2.pdf>
[40] Available at https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-15-v2.0.pdf>
[41] Available at https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-16-v1.1.0.pdf>

| | |
|---|---|
| land-use and management practices and receives inputs in appendices 2 and 3 to this methodology | identify the presence or absence of organic soils. In case future instances present organic soils or are subjected to land-use and management practices and receives inputs in appendices 2 and 3 of the methodology in the baseline, the Soil disturbance attributable to the project activity shall not cover more than 10% of the area. |

| Tool 08: Estimation of non-CO2 greenhouse gas (GHG) emissions resulting from burning of biomass attributable to an A/R CDM project activity. V 04.0 | |
|---|---|
| a) The tool is applicable to all occurrence of fire within the project boundary | The project activity does not include biomass burning. Constant monitoring will be carried out to analyze possible accidental fire outbreaks in the project area. If it occurs, the tool will be applied. |
| b) Non-CO2 GHG emissions resulting from any occurrence of fire within the project boundary shall be accounted for each incidence of fire which affects an area greater than the minimum threshold area reported by the host Party for the purpose of defining forest, provided that the accumulated area affected by such fires in a given year is ≥5% of the project area | The project activity does not include biomass burning. Constant monitoring will be carried out to analyze possible accidental fire outbreaks in the project area. If it occurs, the tool will be applied. |

| Tool 12 – Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities | |
|---|---|
| Applicability Conditions | Justification of Applicability |
| This tool has no internal applicability conditions | There are no specific conditions for applicability |

| Tool 14 – Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities | |
|---|---|
| **Applicability Conditions** | **Justification of Applicability** |
| This tool has no internal applicability conditions | There are no specific conditions for applicability |

| Tool 15 – Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity | |
|---|---|
| **Applicability Conditions** | **Justification of Applicability** |
| a) This tool is applicable for estimating the increase of GHG emissions attributable to the displacement of pre-project agricultural activities due to implementation of an A/R CDM project activity, which can not be considered insignificant | This project activity does not cause the displacement of pre-project agricultural activities. |
| b) This tool is not applicable if the displacement of agricultural activities attributable to the A/R CDM project activity is expected to cause any drainage of wetlands or peatlands. | The project area does not occur on wetlands or peatlands. |

| Tool 16 – Estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities Version 01.1 | |
|---|---|
| **Applicability Conditions** | **Justification of Applicability** |
| a) This tool is applicable when the areas of land, the baseline scenario, and the project activity meet the following conditions:<br>- The areas of land to which this tool is applied:<br>(i) Do not fall into wetland category; or | The project area does not fall into wetland category and do not contain organic soils. The area is not subject to management practices and application of inputs, as listed in the tool. |

| | |
|---|---|
| (ii) Do not contain organic soils;<br><br>(iii) Are not subject to any of the land management practices and application of inputs as listed in the Tables 1 and 2; | |
| b) The A/R CDM project activity meets the following conditions:<br><br>(i) Litter remains on site and is not removed in the A/R CDM project activity; and<br><br>(ii) Soil disturbance attributable to the A/R CDM project activity, if any is:<br><br>- In accordance with appropriate soil conservation practices, e.g. follows the land contours;<br>- Limited to soil disturbance for site preparation before planting and such disturbance is not repeated in less than twenty years | The litter is not removed in project activities e.g. during soil preparation, planting and/or harvesting, the litter is not removed.<br><br>The project activity does not disturb the soil as it uses good conservation practices. |

## 3.3 Project Boundary

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 3.4 Baseline Scenario

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 3.5 Additionality

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 3.6 Methodology Deviations

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

# 4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

## 4.1 Baseline Emissions

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 4.2 Project Emissions

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 4.3 Leakage

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 4.4 Net GHG Emission Reductions and Removals

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

# 5 MONITORING

## 5.1 Data and Parameters Available at Validation

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 5.2 Data and Parameters Monitored

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

## 5.3 Monitoring Plan

Section not required for DRAFT PD. Further information will be inserted into VCS PD Version 1.

# APPENDIX

*Use appendices for supporting information. Delete this appendix (title and instructions) where no appendix is required.*