



**Verified Carbon
Standard**

BOA ESPERANÇA GROUPED REDD+ PROJECT



Ecológica

Document Prepared by Ecológica Assessoria Ltda.

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Prepared By	Ecológica Assessoria Ltda.
Contact	Quadra 103 Norte, Av. LO-2, Lote 56, Sala 14, Edifício Olympia, Plano Diretor Norte, Palmas – TO, Brazil Postal Code: 77.001-022 T: +55 (63) 3219-7100 marcelo@ecologia.earth www.ecologica.org.br

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1 PROJECT DETAILS

1.1 Summary Description of the Project

In Brazil, 58.39% of its entire 851,029,591.4 ha territory¹ is covered by forests, representing almost 497 million hectares of forest area² and putting it in second place for nations with most forest area worldwide. Brazil has also been at times the country with the highest levels of deforestation in the world, having lost almost 15 million hectares of its forest area from 2010 to 2020³. The expansion of the agriculture frontier due to cattle ranching, soy farming, timber collection, infrastructure and colonization by subsistence agriculturalists has contributed to this historically high deforestation rate, which is concentrated in the northern portion of the country, where the Amazon Rainforest lies.

The Boa Esperança REDD+ Project is located at east Amazonas State, in the Northern region of Brazil. The region is rich in hydric resources, such as the Amazon River and the Balbina dam. The highway BR-174 crosses the town on a south-north axis, and on a higher level connects several states of Brazil: Mato Grosso, Rondônia, Amazonas and Roraima. Along its route, cattle raising and corn plantations can be found, which are some of the many drivers to deforestation in the region (WWF-Brasil, 2017⁴).

The primary objective of the Boa Esperança REDD+ Project is to avoid unplanned deforestation (AUD) of 8,943.38 ha of project area, consisting of 100% Amazon rainforest. The project area has 1 instance, which is located within a private property, in the municipality of Presidente Figueiredo, Amazonas State.

Besides the ecological and carbon benefits of the project, a proportion of the carbon credits generated will be dedicated to improving social and environmental conditions for the local community around the project area, specifically contribution to environmental education and other social activities. The contribution to sustainability is being monitored through the application of the SOCIALCARBON® Standard, which is based on six main indicators: Biodiversity; Natural; Financial; Human; Social and Carbon Resources.

¹ IBGE – Instituto Brasileiro de Geografia e Estatística. Brazil. 2019. Available at: <<https://www.ibge.gov.br/cidades-e-estados>>.

² FAO and UNEP. 2020. The State of the World's Forests 2020. Forests, biodiversity and people. Rome. Available at: <<https://doi.org/10.4060/ca8642en>>.

³ FAO. 2020. Global Forest Resources Assessment 2020: Main report. Rome. Available at: <<https://doi.org/10.4060/ca9825en>>.

⁴ WWF-Brasil. Perfil socioeconômico e Ambiental do sul do estado do Amazonas: Subsídios para Análise da Paisagem. 2017. Available at: <https://d3nehc6yl9qzo4.cloudfront.net/downloads/perfil_sul_amazonas.pdf>.

The present REDD project is expected to avoid a predicted 678 ha of deforestation, equating to 183,542 tCO₂e in emissions reductions over the 30-year project lifetime (07-March-2022 to 06-March-2052), with an annual average of 5,921 tCO₂e.

1.2 Sectoral Scope and Project Type

Sectoral Scope: 14 - Agriculture, Forestry, Land Use

Project Category: Avoided Unplanned Deforestation (AUD project activity)

This is a grouped project.

1.3 Project Eligibility

According to the VCS Methodology Requirements v4.1⁵, for Reduced Emissions from Deforestation and Degradation (REDD) projects, eligible activities are those that reduce net GHG emissions by reducing deforestation. Thus, the project is eligible under the scopes of the VCS Program, following the VCS Standard version 4.2⁶, sections 3.2 and Appendix A1.5 – A1.8:

Eligibility Conditions	Boa Esperança REDD+ Project Justification of Eligibility
Projects shall meet all applicable rules and requirements set out under the VCS Program, including this document. 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	Applied methodology is VM0015 - Methodology for Avoided Unplanned Deforestation, v1.1. Applicability conditions are detailed on section 3.2.

⁵ VERRA – Methodology Requirements. Available at <https://verra.org/wp-content/uploads/2022/01/VCS-Methodology-Requirements_v4.1.pdf>

⁶ VERRA – VCS Standard. Available at <https://verra.org/wp-content/uploads/2022/02/VCS-Standard_v4.2.pdf>

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 conservation of native Tropical Rainforest, including sustainable forest management plan or not. These activities are eligible under the Brazilian law according to conditions set out in section 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 VM0015 methodology.
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 VM0015 methodology, in addition to the VT0001 for Additionality assessment.
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	Not applicable. Project applies VM0015 methodology, in addition to the VT0001 for Additionality assessment.

<p>that uses a project method where such a performance method is applicable to the project).</p>	
<p>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</p>	<p>The project applies approved VCS methodology and tools. The project shall take precedence to the rules and requirements of the VCS Program over other approved GHG Program.</p>
<p>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.</p>	<p>The project applies approved VCS methodology and tools. The project shall take precedence to the rules and requirements of the VCS Program over other approved GHG Program.</p>
<p>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.</p>	<p>Project was designed under VCS Standard version 4.2 and VM0015 version 1.1. Any new requirements shall be adhered to at project crediting period renewal (i.e six years from Project Start Date).</p>

<p>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).</p>	<p>This is an eligible AFOLU project category under the VCS Program: Reduced Emissions from Deforestation and Degradation (REDD).</p>
<p>Where projects are located within a jurisdiction covered by a jurisdictional REDD+ program, project proponents shall follow the requirements in this document and the requirements related to nested projects set out in the VCS Program document Jurisdictional and Nested REDD+ Requirements.</p>	<p>This project is not located within a jurisdiction covered by a jurisdictional REDD+ program.</p>
<p>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</p>	<p>Any implementation partners are described in the project description and sections 1.5 and 1.6.</p>

<p>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.</p>	<p>This project does not convert native ecosystems to generate GHG. The project area only contains native forested land for a minimum of 10 years before the project start date;</p>
<p>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.</p>	<p>This project does not occur on wetlands and does not drain native ecosystems or degrade hydrological functions;</p>
<p>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).</p>	<p>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.</p>

<p>For all IFM, APDD (except where the agent is unknown), RWE, APWD, APC, and ALM project types, the project proponent shall, for the duration of the project, reassess the baseline every ten years and have this validated at the same time as the subsequent verification. For all AUDD, APDD (where the agent is unknown), AUC and AUWD project types, the project proponent shall, for the duration of the project, reassess the baseline every six years and have this validated at the same time as the subsequent verification.</p>	<p>The baseline reassessment will be conducted every six years as this is an AUDD project.</p>
<p>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.</p>	<p>Not applicable. The project activity does not occur on wetlands.</p>
<p>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 risk report shall be prepared using the VCS Non-Permanence Risk Report Template, which</p>	<p>The project has conducted a non-permanence risk analysis according to the VCS Program Document AFOLU Non-Permanence Risk Tool for validation and shall prepare the report during subsequent verifications.</p>

<p>may be included as an annex to the project description or monitoring report, as applicable, or provided as a stand-alone document.</p>	
<p>Eligible REDD activities are those that reduce net GHG emissions by reducing deforestation and/or degradation of forests. The project area shall meet an internationally accepted definition of forest, such as those based on UNFCCC hostcountry thresholds or FAO definitions, and shall qualify as forest for a minimum of 10 years before the project start date. The definition of forest may include mature forests, secondary forests, and degraded forests. Under the VCS Program, secondary forests are considered to be forests that have been cleared and have recovered naturally and that are at least 10-years-old and meet the lower bound of the forest threshold parameters at the start of the project. Forested wetlands, such as floodplain forests, peatland forests and mangrove forests, are also eligible provided they meet the forest definition requirements mentioned above.</p>	<p>Project Area is composed of 100% native forest. The area is considered forest as per the definition of forest adopted by FAO⁷: Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10%, or trees able to reach these thresholds in situ.</p>

⁷ Comparative framework and Options for harmonization of delimitations. Available at <[https://www.fao.org/3/y4171e/y4171e10.htm#:~:text=FAO%202000a%20\(FRA%202000%20Main,of%20other%20predomina](https://www.fao.org/3/y4171e/y4171e10.htm#:~:text=FAO%202000a%20(FRA%202000%20Main,of%20other%20predomina)>

<p>Activities covered under the REDD project category are those that are designed to stop planned (designated and sanctioned) deforestation or unplanned (unsanctioned) deforestation and/or degradation. Avoided planned degradation is classified as IFM.</p>	<p>Project activity is designed to stop unplanned (unsanctioned) deforestation as described throughout the PD.</p>
<p>Activities that stop unsanctioned deforestation and/or illegal degradation (such as removal of fuelwood or timber extracted by non-concessionaires) on lands that are legally sanctioned for timber production are eligible as REDD activities. However, activities that reduce or stop logging only, followed by protection, on forest lands legally designated or sanctioned for forestry activities are included within IFM. Projects that include both avoided unplanned deforestation and/or degradation as well as stopping sanctioned logging activities, shall follow the REDD guidelines for the unplanned deforestation and/or degradation and the IFM guidelines for the sanctioned logging activities, and shall follow the requirements set out in Section 3.5.2.</p>	<p>In case future project activity instances have areas legally sanctioned for timber production, baseline and project activity shall comprehend unsanctioned deforestation and/or illegal degradation, not the reduction of logging.</p>
<p>Eligible REDD activities include:</p> <ol style="list-style-type: none"> 1) Avoiding Planned Deforestation and/or Degradation (APDD): This category includes activities that reduce net GHG emissions by stopping or reducing deforestation or degradation on forest lands that are legally authorized and documented for conversion. 2) Avoiding Unplanned Deforestation and/or Degradation (AUDD): This category includes 	<p>The Boa Esperança Grouped REDD+ Project is within category AUDD: Avoided Unplanned Deforestation and/or Degradation.</p>

activities that reduce net GHG emissions by stopping deforestation and/or degradation of degraded to mature forests that would have occurred in any forest configuration.

1.4 Project Design

When completing a draft project description for the purpose of listing on the pipeline as under development, complete the following information; otherwise, delete this text:

- ☐ The project includes a single location or installation only
- ☐ The project includes multiple locations or project activity instances, but is not being developed as a grouped project
- ☒ The project is a grouped project

Eligibility Criteria

A set of eligibility criteria for the inclusion of any new areas as instances willing to participate within the grouped project will be developed as per VCS Standard version 4.2 requirements.

Since Boa Esperança REDD+ is a grouped project, all instances implemented after validation shall meet the elements mentioned in Sections 3.5.15, 3.5.16 and the specific AFOLU Projects criteria (3.5.17 and 3.5.18) of VCS Standard v4.2. In addition, new areas willing to become instances of the project shall comply with the applicability conditions of the selected methodology, including conditions applicable to each activity, as described in Section 3.2.

Table 1. Grouped Project eligibility criteria

VCS Standard Eligibility criteria for the inclusion of new project activity instances	Boa Esperança REDD+ Grouped Project	Instance 1
Projects shall meet the applicability conditions set out in the methodology applied to the project.	The GHG emission reductions shall be calculated according to the approved VCS Methodology VM0015: Methodology for Avoided Unplanned Deforestation, version 1.1, published on 03-December-2012.	Instance 1 complies with this requirement because it adopts the Methodology VM0015: Methodology for Avoided Unplanned Deforestation, version 1.1, published on 03-December-2012.
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 - forest conservation by avoiding unplanned deforestation, with or without forest management in project scenario.	The Instance 1 project activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Boa Esperança REDD+ Project. Also, this instance is located within the same reference region described in the VCS PD.
Projects shall apply the technologies or measures in the same manner as specified in the project description.		Instance 1 applies the same technologies or measures specified in the Project description: forest conservation by avoiding unplanned deforestation.
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: "In the baseline scenario, forest is expected to be converted to non-forest by the agents of deforestation acting in the reference region, project area and leakage belt. Therefore, the project falls into the AFOLU-REDD"	The Instance 1 Project Activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Boa Esperança REDD+ Project. Therefore, this instance is in accordance with the same baseline scenario

		determined in Section 3.4 of the VCS PD.
<p>Projects must have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area. For example, the new project activity instances have financial, technical and/or other parameters (such as the size/scale of the instances) consistent with the initial instances, or face the same investment, technological and/or other barriers as the initial instances.</p>	<p>All instances must be additional to be included in the Grouped Project. The project activity must be consistent with Grouped Project Description: forest conservation by avoiding unplanned deforestation. In this case, the project activity may or may not include Sustainable Forest Management Plan.</p> <p>In additionality assessment, each instance shall determine the appropriate analysis method, whether to apply simple cost, investment comparison or benchmark analysis, according to STEP 2 of VCS VT001 v 3.0 tool.</p> <ol style="list-style-type: none"> 1) Instances may or may not include Sustainable Forest Management Plan. 2) In case the project activity does not involve Sustainable Forest Management Plan: <ul style="list-style-type: none"> - The instance should have financial, technical and scale consistent with the described in the VCS PD, facing similar investments, technological and/or other barriers as the initial instance. As the VCS AFOLU project generates no financial or economic benefits other than VCS related income, the simple cost analysis (Option I) shall be applied. 3) In case the project activity includes a Sustainable Forest Management Plan: 	<p>Since the PD was developed based on the characteristics, reference region and activity of the initial instance, Instance 1 complies with this additionality criterion.</p> <p>The additionality analysis for Instance 1 was made according to Option II of VCS VT001 v 3.0, as detailed in section 3.5.</p>

	<ul style="list-style-type: none"> - A new additionality analysis shall be provided. In this case, the investment comparison analysis (Option II) or the benchmark analysis (Option III) of the Tool VCS VT001 v 3.0 shall be used. - In addition, a new AFOLU non-permanence risk analysis shall be provided. 	
<p>New Project Activity Instances shall occur within one of the designated geographic areas specified in the project description.</p>	<p>Projects must be located within the Reference Region described in Section 3.4 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.</p> <p>- As per the VCS Standard, new AFOLU non-permanence shall be assessed for each geographic area specified in the project description (for requirements related to geographic areas of grouped projects see the VCS Standard). 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 generated by project activity instances within the area.</p>	<p>The area referring to instance 1 - project activity is within the project's reference region as described in section 3.4 of the VCS PD.</p>
<p>Instances shall comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial compliance with</p>	<p>All instances must comply with the complete set of eligibility criteria for the inclusion of new project activities instances.</p>	<p>Instance 1 complies with all eligibility criteria for the inclusion of new project activity.</p>

multiple sets of eligibility criteria is insufficient.		
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 Joint 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 complies with this criterion, as it is included in this Joint PD as the first project activity instance.
New Project Activity Instances must have evidence of project ownership, in respect of each project activity instance, held by the project 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).	All Project activity instances must provide evidence of Project ownership (land title and related documents) and Project start date (agreements, protection or management plan, or others in accordance with the applicable VCS Standard definitions).	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.

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.	Instance 1 project activity has the same 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 and new instances are eligible for crediting from the start of the next verification period.	Instance 1 project activity crediting period has the same start and end date of the grouped Project, as described in section 1.8 of the VCS PD

1.5 Project Proponent

Organization name	Nigrum Capital Assessoria e Gestão de Negócios LTDA.
Contact person	Marcos Guilherme Alves Preto
Title	Legal representative
Address	Rua Arminda Fernandes de Almeida, 179 Vila Mariana, São Paulo/SP, Brazil Postal Code: 04117-170
Telephone	-
Email	marcos.preto@nigrumcapital.com.br

Organization name	Ecológica Assessoria LTDA.
Contact person	Marcelo H. S. Haddad
Title	Technical Consultant
Address	Quadra 103 Norte, Av. LO-2, Lote 56, Sala 14, Ed. Olympia Plano Diretor Norte, Palmas/TO, Brazil Postal Code: 77001-022
Telephone	+55 11 98903 4087
Email	marcelo@ecologica.earth

1.6 Other Entities Involved in the Project

Organization name	Jacob & Jacob Consultoria Agrícola Ltda.
Role in the project	Instance 1
Contact person	Fernando Jacob
Title	Owner of Fazenda Boa Esperança
Address	Rua Dr. Claudino dos Santos, 64, Apto 01, Sala A Centro, Coronel Vivida/PR, Brazil Postal Code: 85550-000
Telephone	-
Email	srfernandojacob@gmail.com

1.7 Ownership

The project area is located at Presidente Figueiredo municipality, at Amazonas State and is composed by the following area:

- Fazenda Boa Esperança

The property composing the Instance 1 is owned by Jacob & Jacob Consultoria Agrícola Ltda (hereafter “Instance 1” or “Jacob”). The legal documents proving the land title and ownership of the properties will be made available to the auditors during the validation process, in the Appendix.

1.8 Project Start Date

According to the rules established by the VCS Standard version 4.2 document, “The project start date of an AFOLU project is the date on which activities that led to the generation of GHG emission reductions or removals are implemented (eg, preparing land for seeding, planting, changing agricultural or forestry practices, rewetting, restoring hydrological functions, or implementing management or protection plans)”.

The Instance 1 properties were acquired by Arca S/A in 2005 and have always experienced a high risk of encroachment and illegal deforestation, as they border a settlement area. This risk has been increasingly intensified over the past 6 years, with many attempts by outside actors to deforest the area illegally.

Despite all efforts to curb illegal deforestation, the properties’ owner constantly receives many offers from outsiders to carry out illegal logging within the area, which he promptly declines, but it is not enough to stop the attempts of these illegal actors to extract wood from the Arca project area. That is why the opportunity of adopting a Sustainable Forest Management Plan (SFMP) was considered, in 2017, while they started fencing the properties.

However, in 2018, a great fire caused by illegal agents led to a severe deforestation in the properties. This was the company’s final motivation, among the many aforementioned, that led the SFMP to be put into effect. Their first sustainable logging happened on July 5th, 2018, and, therefore, this date is considered as the project start date. With the SFMP in place, a set of activities was also implemented, providing a bigger presence of the managing team in the project area, as well as giving the company a better control over people’s entries and exits within its boundaries. Furthermore, following the implementation of the SFMP, Arca S/A also put other conservation measures into action, such as building a guardhouse within the properties’ limits, hiring a security team to protect the properties, and filing a formal complaint to report these illegal activities to the police.

1.9 Project Crediting Period

The project has a crediting period of 30 years, from 07-March-2022 to 06-March-2052.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

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

- ☒ <20,000 tCO₂e/year
- ☐ 20,000 – 100,000 tCO₂e/year
- ☐ 100,001 – 1,000,000 tCO₂e/year

☐ >1,000,000 tCO₂e/year

Project Scale	
Project	X
Large project	

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
2022 (Starting on March 07)	5.454
2023	6.545
2024	6.546
2025	6.546
2026	6.546
2027	6.546
2028	6.546
2029	6.546
2030	6.546
2031	6.546
2032	6.198
2033	6.219
2034	6.219
2035	6.219
2036	6.219
2037	6.219
2038	6.219
2039	6.219
2040	6.219
2041	6.219

2042	5.558
2043	5.596
2044	5.596
2045	5.596
2046	5.596
2047	5.596
2048	5.596
2049	5.596
2050	5.596
2051	5.596
2052 (Ending on March 6)	1.091
Total estimated ERs	183,542
Total number of crediting years	30
Average annual ERs	5,921

1.11 Description of the Project Activity

The main objective of the Boa Esperança Grouped REDD+ Project (hereafter “the project”) is the conservation of 8,943.38 ha of Amazon rainforest area located within the municipality of Presidente Figueiredo, in the Amazonas State. This will be achieved through avoidance of unplanned deforestation.

The first instance of this Grouped Project presents 8,943.38 ha of forest area in the Fazenda Boa Esperança property. In the future, new instances may be added to the project, expanding the conservation of the forest.

The main deforestation agents within the Boa Esperança REDD+ project region are: cattle ranching, timber extraction and corn harvesters, acting both legally and illegally.

This REDD+ project is expected to avoid deforestation, equating to 183,542 tCO₂e in emissions reductions over the 30-year project lifetime (07-March-2022 to 06-March-2052), including buffer (RF), leakage (DLF) and project efficiency (EI) reductions.

The main mitigation action of the project is to avoid unplanned deforestation through the expansion of monitoring the area, mapping of deforestation, partnerships with education and research institutions and the insertion of the surrounding communities in the project activities,

aiming to minimize invasions and illegal deforestation, offering alternative income, education and professional training.

Therefore, besides forest conservation, the present project aims to improve and quantify its social and environmental activities that benefit the local communities, through application of the SOCIALCARBON® Methodology. This methodology measures the contribution of carbon projects towards sustainable development. The SOCIALCARBON® Methodology is based on six main indicators: Biodiversity; Natural; Financial; Human; Social and Carbon Resources and aims to deliver high-integrity benefits in each in order to improve social and environmental conditions in the project region.

The implementation of REDD + SOCIALCARBON mechanisms promotes sustainable forest use, as it carries on forest conservation and storage of carbon stocks in forests while reducing pressure for timber from other conserved areas. In this way, biodiversity conservation and development of the local economy can be achieved simultaneously.

All the aforementioned measures aid in achieving the net GHG emission reductions by preventing legal deforestation agents to advance with their activities, as well as by retrieving their practices and, therefore, protecting and even restoring the carbon pools.

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

1.12 Project Location

The first Project Activity Instance Area is situated in Presidente Figueiredo municipality, which belongs to Amazonas state, Brazil. This municipality is located around 107 km from Manaus, capital of the state of Amazonas. The project location is also close to Manaus, Rio Preto da Eva and São Sebastião do Uatumã municipalities.

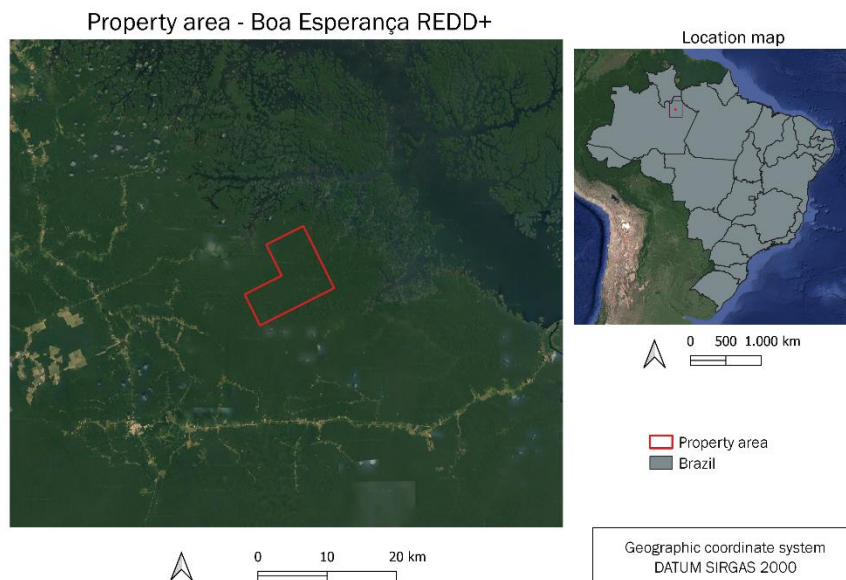
Geodetic coordinates of the project location have been submitted separately as a KML file.

In accordance with VCS requirements, stipulated in Approved VCS Methodology VM0015, version 1.1, the project area may only include areas composed of “forest”⁸ for a minimum of ten years prior to the project start date. Therefore, satellite images between 2012 and 2022, were analyzed and classified. The areas within the property that were defined as forest in 2011 and in 2021 were separated and utilized to compose the project area. In addition, some non-forest areas were also excluded, such as rivers, rocks, and non-forest vegetation.

Figure below presents the location of the Project Area:

⁸ Brazilian Forestry Service. Brazil adopts FAO forest definition: “Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ.” Available at: <http://www.florestal.gov.br/snif/recursos-florestais/index.php?option=com_k2&view=item&layout=item&catid=14&id=158>.

Figure 1. Project location



1.13 Conditions Prior to Project Initiation

- **Ecosystem type**

The Project Area is 100% composed of native Amazon Rainforest Vegetation.

- **Current and historical land-use**

The property area remains standing forest and there is no activity being conducted.

- **Climate and hydrography**

The project region is classified as Tropical rainforest climate type – Am category – according to the Köppen climate classification⁹. It is characterized by having the average temperature of the coldest month always at 18°C, presenting a dry season of duration that is compensated by the highest of higher elevations. It is characterized by having the average temperature of the coldest month always at 18°C, presenting a dry season of duration that is compensated by the highest of higher elevations¹⁰.

- **Geology, topography and Soils**

⁹ KÖPPEN, W.; GEIGER, R. *Klimate der Erde*. Gotha: Verlag Justus Perthes. 1928.

¹⁰ EMBRAPA. *Clima*. Available at: <<https://www.cnpf.embrapa.br/pesquisa/efb/clima.htm>>

The state of Amazonas is characterized by Phanerozoic sedimentary cover, represented by the Acre, Solimões, Amazonas and Alto Tapajós basins, deposited on a pre-Cambrian rocky substrate where there is the presence of igneous, metamorphic and sedimentary rocks. In Amazonas, land with modest elevations, lower at 200m, with elevated portions restricted to the north of the state, with elevations that reach about 3,000m of altitude. The various state relief standards are included in nine geomorphological domains. The municipality of Presidente Figueiredo is located in the Low Plateaus of the Central-Eastern Amazon geomorphological domain. This domain is characterized by lowlands (below 200m) with thick, low fertility and well-drained soils, particularly Yellow Latosols¹¹. The project area is composed of dystrophic yellow latosols. These soils have low fertility and are generally intensively used for sugarcane cultivation and pasture.

- **Vegetation cover**

The state of Amazonas is entirely within the limits of the Amazon biome. In the project area is found the phytophysiology Submontane Dense Ombrophylous Forest. This vegetation is generally formed on red latosols and is conditioned to high temperatures and precipitation. The vegetation occurs in a tropical climate with high temperature and high well-distributed precipitation. In the Amazon, this phytophysiology has a canopy of 30 to 40m, with emergent trees that can reach up to 60m.

- **Biodiversity**

Brazil harbors the greatest concentration of biodiversity on the planet. It has a great abundance of life forms – which translates to over 20% of the total species on Earth – and raises Brazil to the main nation among the 17 countries with the highest biodiversity levels globally, containing over 70% of the planet's biodiversity¹².

Brazil has the greatest flora species richness globally, with 46,392 species described. Furthermore, it contains over 8,700 known species of vertebrates consisting of 720 mammals, 986 amphibians, 759 reptiles, 1,924 birds and 4,388 fish species. It is estimated that around 93 thousand invertebrate species are known¹³.

The Amazon is a biome that spans eight countries, and 60.1% of the biome is in Brazilian territory. The biome is known worldwide for its biodiverse forest. It is estimated that the biome has approximately 30,000 species of plants, with 2,500 species of large trees and more than 2,000 species identified as useful in food, medicine, and production of oils and waxes. Regarding fauna, the Amazon is the Brazilian biome with the highest number of species, with

¹¹ Available at: <<https://www.terrabrasilis.org.br/ecotecadigital/pdf/geodiversidade-do-estado-do-amazonas.pdf>>

¹² Available at: <Information System about the Brazilian Biodiversity (SiBBR). Available at: <<http://www.sibbr.gov.br/areas/?area=biodiversidade>>. Last visit on: March 18th, 2021>

¹³ Available at: Available at: <<https://www.icmbio.gov.br/portal/especies-ameacadas-destaque>>

73% of mammal species and 80% of bird species in the Brazilian territory. It is estimated that the biome is habitat to about thirty million animal species. In Brazil, there are about 331 mammals, 1,300 birds, 273 reptiles, 232 amphibians and 1,800 continental fish¹⁴.

The dense rain forest located in the Brazilian Amazon has leafy tree species, widely known they are andiroba (*Carapa guianensis*), Brazil nut tree (*Bertholettia excelsa*), rubber tree (*Hevea brasiliense*), ucuuba (*Virola surinamensis*), freijó (*Cordia goeldiana*), rosewood (*Aniba rosaeodora*), itaúba (*Mezilaurus itauba*), among others. In terms of fauna, in the region there are species threatened with extinction, such as the margay (*Leopardus wiedii*), the small wildcat (*Leopardus tigrinus*), the jaguar (*Panthera onca*) and the cockerel (*Rupicola rupicola*). According to the Management Plan for the Caverna do Maroaga Environmental Protection Area, the following primate species are found in the region: squirrel monkey (*Saimiri sciureus*), golden-hand monkey (*Saguinus midas*), capuchin monkey (*Aotus vociferans*), capuchin monkey (*Cebus nigrivatus*), capuchin monkey (*Cebus apella*). In addition, other animals such as giant otter (*Pteronura brasiliensis*), vinegar dog (*Speothus venaticus*), ocelot (*Leopardus pardalis*), red jaguar (*Puma concolor*). In addition, a high diversity of bats, turtles and aquatic mammals, avifauna and ichthyofauna is found.

- **Socio-economic conditions**

Presidente Figueiredo is a 24,459.099 km² municipality located in the State of Amazonas, Brazil. Its accounted population in the last sense in 2010 was 27,175 citizens, its demographic density being 1.07 inhab/km². Of all population, in 2019, only 5,335 people had formal or informal jobs, which is 14,7% of the municipality's population¹⁵. The average monthly wage of formal workers in 2019 was 3.2 minimum wages, and the minimum wage R\$ 998.00¹⁶. Of all population, in 2019, only 5,335 people had formal or informal jobs, which is 14,7% of the municipality's population¹⁷. The average monthly wage of formal workers in 2019 was 3.2 minimum wages, and the minimum wage R\$ 998.00¹⁸. This means a minimum wage of US\$ 259.89 (considering the average exchange rate between January and June of 2019 of US\$ 3,84¹⁹), and an average monthly wage of formal workers equivalent to US\$ 831.64.

¹⁴ Available at: <<https://ispn.org.br/biomas/amazonia/fauna-e-flora-da-amazonia/>>

¹⁵ Available at: <https://cidades.ibge.gov.br/brasil/am/presidente-figueiredo/panorama>

¹⁶ Available at: [http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/decreto/D9661.htm#:~:text=DECRETA%20%3A,e%20noventa%20e%20oito%20reais\).](http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/decreto/D9661.htm#:~:text=DECRETA%20%3A,e%20noventa%20e%20oito%20reais).)

¹⁷ Available at: <https://cidades.ibge.gov.br/brasil/am/presidente-figueiredo/panorama>

¹⁸ Available at: [http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/decreto/D9661.htm#:~:text=DECRETA%20%3A,e%20noventa%20e%20oito%20reais\).](http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/decreto/D9661.htm#:~:text=DECRETA%20%3A,e%20noventa%20e%20oito%20reais).)

¹⁹ Available at: Available at: <https://www.bcb.gov.br/estabilidadefinanceira/historicocotacoes>

Almost 91.1% of the municipality's population studied until a 6 to 14 years old- range. Presidente Figueredo's IDHM in 2010 was 0.647. 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 development²⁰. The municipality's per capita GDP was R\$ 26,395.42 (equivalent to US\$ 6,873.80) in 2019.

- **Has the land been cleared of native ecosystems within 10 years of the project start date?**

☐ Yes

☒ No

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

According to the Brazilian Forest Code (Law N° 12.651, 25/05/2012²¹), 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 shelter, and protection of native flora and fauna. In the Brazilian Legal Amazon²², eighty percent (80%) of a rural property should be preserved.

However, there is a clear disregard for legal conservation requirements in the region. Much of the deforestation occurs in areas that should be preserved. Lack of law enforcement by local authorities along with public policies seeking to increase commodities production and encourage land use for agricultural, bio energy and cattle breeding purposes created a scenario of almost complete disregard of the mandatory provisions of the Forest Code. High rates of criminality associated with land disputes usually jeopardize efforts concerning law enforcement improvement. In addition to that, to cover vast distances of areas with low demographic density

²⁰Available at: <https://www.br.undp.org/content/brazil/pt/home/idh0/conceitos/o-que-e-o-idhm.html>

²¹ BRASIL. Law n°. 12.651, of 25 May 2012. Forest Code. Diário Oficial [da] República Federativa do Brasil, Brasília, DF, 25 May 2012.

²² The concept of Legal Amazonia was originated in 1953 and its boundaries arise from the necessity of planning the economic development of the region. For this reason, Legal Amazonia's boundaries do not correspond to those of the Amazon biome. The former has an area of approximately 5 million km², distributed through the entirety or a proportion of 9 Brazilian states.

makes tracking of illegal activities and land surveillance very difficult for the authorities²³. Accordingly, policies implemented to address illegal deforestation only by means of command-and-control approaches have proven to be ineffective so far.

Regarding other regulatory frameworks that exist in Brazil, on November 28th, 2019 occurred the approval of the Federal Decree 10,144/2019, which establishes the National Commission for Reducing Emissions of Greenhouse Gases from Deforestation and Forest Degradation, Conservation of Forest Carbon Stocks, Sustainable Management of Forests and Increase of Forest Carbon Stocks -REDD+²⁴.

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

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

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

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

²³MOUTINHO, P. *et al.* REDD no Brasil: um enfoque amazônico: fundamentos, critérios e estruturas institucionais para um regime nacional de Redução de Emissões por Desmatamento e Degradação Florestal – REDD. Brasília, DF: Instituto de Pesquisa Ambiental da Amazônia, 2011.

²⁴The Decree is available in Portuguese at: <http://www.planalto.gov.br/ccivil_03/_Ato2019-2022/2019/Decreto/D10144.htm#art12> Last visited on 13/01/2022.

Not applicable. This project is not requesting registration in any other GHG Programs nor has the project been rejected by any other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

Does the project reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading?

☐ Yes

☒ No

1.16.2 Other Forms of Environmental Credit

Has the project sought or received another form of GHG-related credit, including renewable energy certificates?

☐ Yes

☒ No

1.17 Sustainable Development Contributions

The Boa Esperança REDD+ Project main contributions to the Brazilian Priority Goals are listed below²⁵:

- SDG 1: No poverty

Part of the funds from the sale of carbon credits will go to the education and sustainable development of the communities present in the reference region. Thus, the project collaborates with targets such as:

- 1.3 “Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable”;
 - 1.4 “By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance”;
 - 1.5 “By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters”.
- SDG 2: Zero hunger

²⁵ Available at: < <https://odsbrasil.gov.br/> >.

The project aims to expand training related to the management of non-timber forest products, such as nuts and fruits. Guideline targets are:

- 2.4 “By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

- SDG 3: Good health and well-being

Part of the funds from the sale of carbon credits will go to the communities surrounding the project. Social Carbon Report contains the indicator “Public Health”, thus the project may contribute to the following targets:

- 3.3 “By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases”.

- SDG 4: Quality education

The project aims to invest in education for the communities affected by the project, such as basic education, professional training, environmental education, among others. The targets determined by the UN that will act as a guideline for monitoring actions are:

- 4.1 “By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes”;
- 4.4 “By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship”;
- 4.5 “By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations”;
- 4.6 “By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy”;
- 4.7 “By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development”.

- SDG 5: Gender equality

Part of the funds from the sale of carbon credits will go to the communities surrounding the project. Social Carbon Report contains the indicator “Women inclusion” thus the project may have initiatives that contribute to the following targets:

- 5.2 “Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation”;
- 5.4 “Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate”;

- **SDG 8: Decent work and economic growth**

The Social Carbon indicators and perspectives aim to offer training and income generation in the project region. Guideline targets are:

- 8.3 “Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small-and medium-sized enterprises, including through access to financial services”;
- 8.6 “By 2020, substantially reduce the proportion of youth not in employment, education or training”;

- **SDG 12: Ensure sustainable production and consumption patterns**

The project is based on encouraging sustainable development and maintaining the standing forest through the sustainable use of its resources, and it aims to optimize access to non-timber forest products and the consumption of local inputs. One of the main objectives is to reduce illegal deforestation and profit from this activity, offering alternatives for income and extraction. The Boa Esperança REDD+ Project has the following target and guideline:

- 12.2 “By 2030, achieve the sustainable management and efficient use of natural resources”

- **SDG 13: Take urgent action to combat climate change and its impacts**

Another of the main objectives of the REDD project is to reduce greenhouse gas emissions through the conservation of standing forest. Thus, its activity is already an action to combat climate change and its effects. The targets and guidelines for this objective are:

- 13.2 “Integrate climate change measures into national policies, strategies and planning”;
- 13.3 “Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

- **SDG 15: To protect, restore and promote the sustainable use of terrestrial ecosystems, to manage forests sustainably, to combat desertification, to halt and reverse land degradation, and to halt the loss of biodiversity.**

The project is based on the conservation and restoration of forests in the Amazon biome, ensuring forest services, preservation of natural resources and biodiversity. The targets and guidelines related to this objective are:

- 15.1 “By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements”;
- 15.2 “By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally”;
- 15.5 “Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species”;
- 15.9 “By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts”;

- 15.a “Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems”;
- 15.c “Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities”.

Reducing deforestation and promoting sustainable development in the Amazon is also a key component to Brazil’s Nationally Determined Contribution (NDC) under the Paris Agreement. According to the Brazilian Government Ministry for the Environment (in Portuguese, Ministério do Meio Ambiente), the implementation of REDD+ activities are an important component to meet the Country’s contribution under the United Nations Framework Convention on Climate Change while preserving natural forest resources²⁶.

The following components of the Brazilian commitments under the Convention are reinforced by the development of the Boa Esperança REDD+ Project:

- Strengthening and enforcing the implementation of the Forest Code, at federal, state and municipal levels;
- Strengthening policies and measures with a view to achieve, in the Brazilian Amazon, zero illegal deforestation by 2030 and compensate for greenhouse gas emissions from legal suppression of vegetation by 2030;
- Enhancing sustainable native forest management systems, through georeferencing and tracking systems applicable to native forest management, with a view to curb illegal and unsustainable practices.

1.18 Additional Information Relevant to the Project

2 SAFEGUARDS

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Approved VCS Methodology VM0015 “Methodology for Avoided Unplanned Deforestation”, Version 1.1, 3 December 2012. At: <http://www.v-c-s.org/methodologies/VM0015>

²⁶ Commitments available in Brazil’s iNDC, from 2016, and reinforced in its update in 2020/2021. Available at <<https://www4.unfccc.int/sites/NDCStaging/Pages/Party.aspx?party=BRA>>

Tool for the demonstration and assessment of additionality in VCS agriculture, forestry and other land use (AFOLU) project activities Version 3.0, 1 February 2012. At: <http://www.v-cs.org/methodologies/VT0001> (last visited 19/05/2021).

AFOLU “Non-Permanence Risk Tool” VCS Version 4, Procedural Document, 19 September 2019, v4.0. At: <http://www.v-c-s.org/program-documents>

CDM – Executive Board “Tool for testing significance of GHG emissions in A/R CDM project activities (Version 01)” EB 31. At: <https://cdm.unfccc.int/methodologies/ARmethodologies/tools/aram-tool-04-v1.pdf>

3.2 Applicability of Methodology

VM0015	
Applicability Conditions	Instance 1 Project Activity Justification of Applicability
a) Baseline activities may include planned or unplanned logging for timber, fuel-wood collection, charcoal production, agricultural and grazing activities as long as the category is unplanned deforestation according to the most recent VCS AFOLU requirements.	<p>None of the baseline land-use conversion activities are legally designated or sanctioned for forestry or deforestation, and hence the project activity qualifies as avoided unplanned deforestation. This is in accordance with the definition of unplanned deforestation under the VCS Standard v4.1.</p> <p>The primary land uses in the baseline scenario are: cattle ranching, mainly for producing beef cattle; and timber harvesters, acting both legally and illegally. These unplanned deforestation and degradation agents have been attracted due to infrastructure expansion, such as waterways and roads. Therefore, the present criteria are fulfilled.</p>
b) Project activities may include one or a combination of the eligible categories defined	The instance 1 project activity falls within category B, “Avoided Deforestation with Logging in the Project Case”. The project area

in the description of the scope of the methodology (table 1 and figure 2).	contains 100% native vegetation. In addition, it is important to note that degradation is not included in either the baseline or project scenario.
c) The project area can include different types of forest, such as, but not limited to, old growth forest, degraded forest, secondary forests, planted forests and agro-forestry systems meeting the definition of “forest”.	<p>The forest classes that compose the project area are named as per Technical Manual for Brazilian Vegetation²⁷. The area is considered forest as per the definition of forest adopted by FAO²⁸: Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10%, or trees able to reach these thresholds in situ.</p> <p>No deforested, degraded or areas otherwise modified by humans were included in the project area at Project Start Date.</p>
d) At project commencement, the project area shall include only land qualifying as “forest” for a minimum of 10 years prior to the project start date.	The project area consisted of 100% tropical rainforest in 2010 – 10 years prior to the project start date – all of which conformed to the Brazilian definition of forest ²⁹ . This was ascertained using satellite images, as described in the section Project Location of the present VCS PD.

²⁷ Available at <<https://www.terrabrasil.org.br/ecotecadigital/pdf/manual-tecnico-da-vegetacao-brasileira.pdf>>

²⁸ Available at <[https://www.fao.org/3/y4171e/y4171e10.htm#:~:text=FAO%202000a%20\(FRA%202000%20Main,of%20other%20pre dominant%20land%20uses.>](https://www.fao.org/3/y4171e/y4171e10.htm#:~:text=FAO%202000a%20(FRA%202000%20Main,of%20other%20pre dominant%20land%20uses.>)

²⁹ Brazil adopts the FAO forest definition: “Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ.” Available at: <<http://www.fao.org/docrep/006/ad665e/ad665e06.htm>>.

e) The project area can include forested wetlands (such as bottomland forests, flood plain forests, mangrove forests) as long as they do not grow on peat. Peat shall be defined as organic soils with at least 65% organic matter and a minimum thickness of 50 cm. If the project area includes a forested wetlands growing on peat (e.g. peat swamp forests), this methodology is not applicable.	Project Area is not composed of wetland. Therefore, none of the project region grows on peat, satisfying this applicability criterion.
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VT0001	
Applicability Conditions	Instance 1 Project Activity Justification of Applicability
AFOLU activities the same or similar to the proposed project activity on the land within the proposed project boundary performed with or without being registered as the VCS AFOLU project shall not lead to violation of any applicable law even if the law is not enforced;	The activities in the proposed project boundary does not lead to violation of any applicable law even if the law is not enforced. The sustainable forest management plan is an activity authorized and endorsed in Brazil, and the landowner has all the environmental and legal authorizations necessary to conduct the activity.
The use of this tool to determine additionality requires the baseline methodology to provide for a stepwise approach justifying the determination of the most plausible baseline scenario. Project proponent(s) proposing new baseline methodologies shall ensure consistency between the determination of a baseline scenario and the determination of additionality of a project activity.	The methodology provides a stepwise approach to justify determination of the most plausible baseline scenario.

3.3 Project Boundary

The Grouped REDD project boundaries are defined by the limits of the project area, reference region and leakage belt. The first project instance area is composed of one property. The area contour coordinates of the properties composing this REDD Project will be presented in Appendix I.

- **Spatial Boundaries**

Project Area

The Project Area (PA) of the present project is covered 100% by native vegetation, being composed by 7 properties that comprise Fazenda Boa Esperança (Boa Esperança farm), as described at section 1.7, its location and physical boundaries detailed at section 1.12. The total area of the Fazenda Boa Esperança property is 8.985.49 ha. Given that the coordinates represented by these properties are extensive, the area contour coordinates of the fazenda (farm) composing the Boa Esperança Grouped REDD+ Project were presented as a KML file.

In accordance with VCS requirements stipulated in the Approved VCS Methodology VM0015, version 1.1, the project area may only include areas composed of “forest”³⁰ for a minimum of ten years prior to the project start date. Therefore, satellite images between 2012 and 2022 were analyzed and classified. The areas within the properties that were defined as forest in 2012 and in 2022 were identified and utilized to compose the project area. In addition, some non-forest areas were also excluded, such as rivers, rocks, and non-forest vegetation.

Therefore, the estimated Project Area is 8,943.38 ha, and is displayed below:

Figure 2. Project Area



³⁰ Brazilian Forestry Service. Brazil adopts FAO forest definition: “Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ.” http://www.florestal.gov.br/snif/recursos-florestais/index.php?option=com_k2&view=item&layout=item&catid=14&id=158.

Reference Region

The reference region (RR) is an analytical domain through which information on rates, agents, drivers and underlying causes of land-use and land-cover (LU/LC) change are obtained, and subsequently used for future projection and monitoring.

The RR was defined in accordance with two criteria:

- The methodology recommendation that projects over 100,000 ha in size should have RRs 5 to 7 times bigger than the project area.
- The conditions determining the likelihood of deforestation within the project area being similar or expected to become similar to those found within the reference region, depending on: the landscape configuration and ecological conditions (elevation, slope, vegetation and rainfall), socio-economic and cultural conditions, and agents and drivers of deforestation (agent groups, infrastructure or other drivers). Specifically, this was based on the waterways (watersheds) and infrastructure (roads), which are the main means of human and product transportation in the region.

As detailed above, the project area is located in the State of Amazonas, in municipality that are expanding livestock and agriculture.

Taking this into account, in order to define the limits of the Reference Region, a socioeconomic analysis of the region has to be carried out and the existence of governmental forest preservation programs or even REDD projects was surveyed, since this municipality is within the limits of the Amazon biome, and also in agriculture and livestock expansion. For the socioeconomic analysis it was necessary to analyze the region where the project area is located, considering hydrographic basins, types of vegetation and existing land structure.

Hydrographic basins were initially defined around the project area, from the drainage network produced by the digital model of elevation of the Shuttle Radar Topography Mission (SRTM). For each of these basins the average values of elevation, slope and precipitation and the percentages of the different vegetation types were determined. From the definition of this area, the criteria related to the type of vegetation, elevation, slope and precipitation were tested to verify the similarity in relation to the project area and the rest of the reference region.

Thus, based on the project area definition, the Reference Region was delimited encompassing the leakage belt. The criterion of the minimum area was adopted as mentioned in the applied methodology. A concentric buffer was developed around the Project Area. After this first delimitation, adjustments were made based on:

- Agents and drivers of deforestation expected to cause deforestation within the project area in absence of the proposed REDD project activity (i.e., cattle ranching and agriculture) caused deforestation in the reference region during the historical reference period;

- History of deforestation and economic growth of the region, expansion of the agricultural frontier, land conflicts, land structure in the region (presence of conservation units, indigenous lands and agrarian reform settlements);
- Existing infrastructure with the presence of navigable rivers, roads and highways and their respective production outflow routes;
- Socioeconomic characteristics of the municipalities involved, such as Gross Domestic Products (GDP;
- Urban or rural areas and main economic products;
- The legal status of the land and the land tenure system found within the project area, i.e. private land, is also found in the reference region;
- Current and projected land use within the project area are found in the reference region;
- The project area is governed by the same policies, legislation and regulations that apply in the reference region;
- Elevation, Slope, Climate and Forest Classes characteristics in the Project Region: at least 90% of the project area have landscape configurations and ecological conditions that exist in at least 90% of the rest of the reference region.

Considering all criteria above, the reference region will be defined.

Leakage Belt

To determine the leakage belt area, the opportunity cost methodology will be used. Therefore, the economic viability of livestock and agriculture production will be spatialized in the Reference Region of the project, which consists of the difference between the sale price of the cattle and the average cost of production (per ton) plus the cost of transportation to take the product to the nearest consumer center.

The methodology for calculating road transport costs for livestock and agriculture in the region considered the sum of the distance that would be travelled in a straight line between the production areas and the open accesses (local highways and roads) with the distance travelled to the nearest commercial center.

Combining these two data, the economically viable areas for livestock and agriculture production would be where the sum of revenues minus total costs are positive. Thus, the calculation of the potential profitability was carried out for each territorial unit in the reference region, which can be summarized using the following formula:

$$PPx_i = S\$x - PCx_i - \sum_{v=1}^v (TDv * TCv)$$

Where:

PPxl: Potential profitability of product Px at location l (pixel or polygon); \$/t

S\$x: Selling price of product Px; \$/t

PCxi: Average in situ production costs for one ton of product Px in stratum i; \$/t

TCv: Average transport cost per kilometer for one ton of product Px on land, river or road of type v; \$/t/km

TDv: Transport distance on land, river or road of type v; km

V: 1, 2, 3 ...V, type of surface to on which transport occurs; dimensionless

Within this analysis, it was considered that areas with a higher profitability value would be more attractive for the activity. Thus, a classification by natural breaks based on the profitability values will be conducted, highlighting the values. In addition, it was considered that areas adjacent to the project area viable according to the opportunity cost analysis within a 10 km radius would be where deforestation could occur directly due to the project's actions. In more distant areas, the increase in deforestation as it is already occurring is probably associated with the proximity to rivers and roads.

Leakage Management Area

The leakage management area (LMA) is designed to implement the activities which reduce the risk of leakage in the project scenario. These activities must include the agents of deforestation and involve seeking new sources of income which contribute to forest conservation. Leakage management could involve agricultural, agro-forestry, reforestation, education, or other activities.

The leakage management area may change with the addition of new instances. The leakage management area will be chosen according to the presence of the closest community, as education, employment, alternative income and mobility activities are planned to be carried out during the project's lifetime.

Table 1. Carbon pools included or excluded within the boundary of the proposed AUD project activity

Carbon pools	Included / Excluded	Justification / Explanation of choice
Above-ground	Included	Carbon stock change in this pool is always significant
	Non-Tree: Included	Included in carbon stocks estimates
Below-ground	Included	Stock change in this pool is significant
Dead wood	Excluded	Excluded for simplification. This exclusion is conservative.

Harvested wood products	Included	Stock change in this pool is considered significant in the case a project instance implements sustainable forest management. The first instance of this grouped project does not conduct a SFMP, thus this carbon stock is considered insignificant.
Litter	Excluded	Excluded as it does not lead to a significant over-estimation of the net anthropogenic GHG emission reductions of the AUD project activity. This exclusion is conservative.
Soil organic carbon	Excluded	Recommended when forests are converted to cropland. Not to be measured in conversions to pasture grasses and perennial crop according to VCS Methodology Requirements, 4.0.

In accordance with the Methodology, approximately 1/10 of the carbon stock in the below-ground pool of the initial “forest” class will be released in a ten-year interval. This is further discussed in the section Baseline Emissions.

In addition, the Methodology considers the two sources of GHG emissions listed in the Table below. Their inclusion or exclusion within the boundary of the proposed AUD project activity, as well as the respective justification/explanation, are described in the Table below.

Source		Gas	Included?	Justification/Explanation
Baseline	Biomass burning	CO ₂	Excluded	Excluded as recommended by the applied methodology. Counted as carbon stock change.
		CH ₄	Included	Included as non-CO2 emissions from biomass burning in the baseline scenario, according to the methodology.
		N ₂ O	Included	Included as non-CO2 emissions from biomass burning in the baseline scenario, according to the methodology.
		Other	Excluded	No other GHG gases were considered in this project activity.
	Livestock emissions	CO ₂	Excluded	Not a significant source
		CH ₄	Excluded	Excluded for simplification. This is conservative.

Source		Gas	Included?	Justification/Explanation
Project		N ₂ O	Excluded	Excluded for simplification. This is conservative.
		Other	Excluded	No other GHG gases were considered in this project activity.
	Biomass burning	CO ₂	Excluded	Excluded as recommended by the applied methodology. Counted as carbon stock change.
		CH ₄	Included	Included as non-CO ₂ emissions from biomass burning in the project scenario, according to the methodology.
		N ₂ O	Included	Included as non-CO ₂ emissions from biomass burning in the project scenario, according to the methodology.
		Other	Excluded	No other GHG gases were considered in this project activity.
	Livestock emissions	CO ₂	Excluded	Not a significant source
		CH ₄	Excluded	No livestock agriculture increase is predicted to occur in the project scenario compared to the baseline case. Therefore, considered insignificant.
		N ₂ O	Excluded	As above.
		Other	Excluded	No other GHG gases were considered in this project activity.

3.4 Baseline Scenario

The baseline scenario described in this section is valid for the Boa Esperança Grouped REDD+ Project and its instances, present and future.

In the baseline scenario, forest is expected to be converted to non-forest by the agents of deforestation acting in the reference region, project area and leakage belt, as described below. Therefore, the project falls into the AFOLU-REDD category, specifically: Avoided unplanned deforestation (AUD). The revenue from the present REDD project is essential to maintain this area as standing forest, as described under additionality (section 3.5), as well as to carry out the present project's leakage management activities.

Degradation was not considered in the present REDD project, in accordance with methodology requirements, which define “forest” and “non-forest” as the minimum land-use and land-cover classes.

Analysis of agents, drivers, and underlying causes of deforestation

As specified in the methodology, it is necessary to understand “who” the deforesting agent is and what drives land-use decisions (“drivers” and “underlying causes”). This analysis is important for two main reasons: (i) Estimating the quantity and location of future deforestation; and (ii) Designing effective measures to address deforestation, including leakage prevention measures.

- **Identification of agents of deforestation**

In recent years, the project region has been deforested for the expansion of agricultural and livestock activities. This pressure is expected to continue, given the globalization of markets in the amazon region and international development policies planned for the region³¹.

The main agents of deforestation identified in the area are detailed below:

a) Cattle ranching

Cattle farming in the Amazon is primarily due to low land prices combined with adequate rainfall levels³². The Amazon region attends to national and regional demand. Analysis of supply and demand show that livestock farming could expand even more to attend to the majority of global demand. This scenario is extremely worrying in relation to Amazon deforestation levels.

Livestock farmers do not pay for the public lands which they acquire legally or illegally, and furthermore they harvest timber without paying the government and, in this way, they accumulate capital freely to reinvest into their operations. Thus, land speculation and cattle farming contribute to the advancement of deforestation in more isolated regions³³.

b) Timber harvesting

Timber logging (both legal and illegal) is an important economic activity within the reference region. Timber is one of the largest contributors to the value of annual production when compared to all extractivism products in the Amazon region.

Usually, deforestation in the region involves spatially overlapping activities: firstly, extraction of commercially valuable tree species for sale to timber companies. The final step is the slash-and-burn deforestation of the area above for cattle ranching or agriculture production.

³¹ Nepstad, D. C.; C. M. Stickler e O. T. Almeida. 2006. Globalization of the Amazon Soy and Beef Industries: Opportunities for Conservation. *Conservation Biology* 20(6):1595-1603

³² BRANDÃO, Fernanda. Tendências para o consumo de carne bovina no Brasil. 2013. 102 f. Thesis (Doctor grade) - Curso de Agronegócio, Universidade Federal do Rio Grande do Sul, Porto Alegre, 2013.

³³ RAZERA, Allan. Dinâmica do desmatamento em uma nova fronteira do sul do Amazonas: uma análise da pecuária de corte no município do Apuí. 2005. 109 f. Thesis (Master grade) - Curso de Biologia, Universidade Federal do Amazonas - UFAM, Amazônia, 2005.

After harvesting the most valuable commercial species, the deforestation continues both in areas already explored and unexplored, and thus providing conditions for further expansion of logging, cattle ranching and agriculture production.

- **Identification of deforestation drivers**

Some of the factors that characterize and drive deforestation are the low cost of the forested area; reasonable soil fertility (provided by the ashes after the burning of the forest); well-structured soil and mainly flat conditions of the area; tradition of farming existing in the municipalities and the meat market of the region³⁴.

Key driver variables are detailed in section below.

a) Driver variables explaining the quantity (hectares) of deforestation:

- Population growth and density

Population is a variable that significantly predicts future deforestation quantity. Local residents are expected to carry out unplanned deforestation, which involves economic activities.

The population growth is tightly correlated with deforestation. Local population is primarily composed of migrants, crop and livestock farmers, and timber harvesters, the majority of whom come from other regions of Brazil. The lack of economic alternatives then turns this population into the primary deforestation agents in the region. As these cities rely on livestock and agriculture for income generation, forest areas will likely be deforested for cattle ranching, and other land uses, following historical patterns.

The increasing rate identified in the population data is an important variable affecting the amount of deforestation in the reference region.

- **Prices of timber and cattle**

Timber and cattle prices have much higher value than other products exploited in the region.

Furthermore, forested property values are almost 4 times cheaper than established pasturelands or agricultural lands³⁵. Thus, this disparity promotes the purchase of new forested areas, deforestation, and further creation of new pasturelands.

b) Driver variables explaining the location of deforestation:

- Access to forests – Rivers and Highways

³⁴ Available in <<http://www.idesam.org.br/publicacao/cadeia-produtiva-corte-amazonas.pdf>>

³⁵ REYDON, Bastiaan Philip. O desmatamento da floresta amazônica: causas e soluções. Economia Verde: Desafios e Oportunidades, Campinas, v. 8, p.143-155, jun. 2011. Available at: <<https://silو.tips/download/o-desmatamento-da-floresta-amazonica-causas-e-solucoes>>.

The region of Presidente Figueiredo, in the State of Amazonas, is very well connected to other regions of Brazil. This condition makes the land in these regions extremely attractive to agricultural and livestock activities, due to easy transportation and access to other regions.

In addition, there are some regions within the reference region where the transportation is done through navigable rivers. The Project area is surrounded by many rivers.

The proximity to waterways historically determined the locations of settlements in relation to extraction of non-timber forest products (NTFPs) and timber. Waterways remain the overwhelmingly predominant means of transport and access to forest products.

- Slope

The project area has very low slope class, being considered mostly flat. This is a great condition to cattle ranching and agricultural expansion.

- **Identification of underlying causes of deforestation**

Underlying causes of deforestation include the political scenario related to environment in the baseline period. This political instability would probably reflect in the increase of deforestation.

Environmental governance in Brazil can be divided into three major periods: pre-2005, a period with very poor governance and high rates of deforestation; 2005-2011, a period with improvements in environmental governance and effective results in reducing deforestation; and after 2012, when governance suffered a gradual erosion with the large amnesty granted to past illegal deforesters in the revision of the Forest Code and a return of deforestation rates to the peak levels of the last decade.

2012's political scenario, with the flexibilization of the forest code legislation and amnesty to deforesters, the interruption of the creation of protected areas, including the unprecedented reduction of several of these protected areas in the Amazon, among other actions, proved to be the beginning of a series of setbacks, which have continued over the past 5 years.

In the pre-election period in 2018, the country was already discussing the threat of political bargaining to climate mitigation and the forest conservation in general. In exchange of political support, the government offered landholders to increase deforestation, and the signature of provisional acts and decrees lowering environmental licensing requirements, suspending the ratification of indigenous lands, reducing the size of protected areas and facilitating land grabbers to obtain the deeds of illegally deforested areas.

In the beginning of 2019, the fusion of Environment and Agriculture Ministries was a clear attempt to obtain more rights for the expansion of agriculture and livestock. The decision was canceled a few days later, after pressure from environmentalists and others in the sector; however, major changes occurred in the ministerial office, limiting the reach and autonomy of

the Environmental Ministry, with the absence of mention to combat of deforestation in the office's functions being highlighted by specialists³⁶.

In addition, the transference of policies and instruments of water resources, including the National Water Agency (ANA) to the Ministry of Regional Development and the Brazilian Forest Service and the Rural Environmental Registry (main instrument for controlling the regularization of large and small properties in forest regions) to the Ministry of Agriculture, Livestock and Supply demonstrated the dismantling of the Environment Ministry. The officialization of indigenous lands, in addition to other land issues, such as the agrarian reform and land regularization in the legal Amazon and traditional territories has been also transferred to the Ministry of Agriculture, Livestock and Supply.

As a consequence, the deforestation in the Amazon Rainforest was widely reported in 2019, as it was the third largest in history, with an increase of 29.5% in comparison to 2018. In total, 10,129 km² of the forest were deforested during that year. In August, during the peak of fire warnings in the forest, fact that caused climate effects in São Paulo, 2,790 km away from the Amazon³⁷, the government tried to deviate attention from the fires, claiming they were fake news³⁸. The number of wildfires in Brazilian forests increased 70% in 2019, the highest rate in 7 years. According to National Spatial Research Institute (INPE), the most affected biome was the Amazon, with 51.9%.

This situation continued during the following years, with 10,851 km² deforested within the Amazon biome in 2020, and 13,235 km² in 2021 – the highest value since 2006. Therefore, there is a clear increasing deforestation trend in Brazil, which have underlying political and historical causes mentioned in this section.

Even though deforestation and fire alerts increased in the period between 2019 and 2021, the Brazilian Government reduced the budget for forest fire prevention and deforestation control personnel. A reduction of 58% reached the brigade teams³⁹.

Government agencies such as INPE and IBAMA, responsible for deforestation monitoring have suffered funding cutoffs, dismissals and had their functions and increasing deforestation data publicly questioned and denied by the government⁴⁰.

³⁶ Available at: < <https://www.socioambiental.org/pt-br/blog/blog-do-isa/a-anatomia-do-desmonte-das-politicas-socioambientais>

³⁷ Available at: <<https://www.economist.com/the-americas/2019/08/22/forest-fires-in-the-amazon-blacken-the-sun-in-sao-paulo>>

³⁸ Available at: <<https://www.theguardian.com/environment/2019/sep/09/amazon-fires-brazil-rainforest>>

³⁹ Available at: < <https://g1.globo.com/natureza/noticia/2020/09/12/em-um-ano-governo-bolsonaro-corta-verba-para-brigadistas-em-58.ghml>>

⁴⁰ Available at: < <https://g1.globo.com/natureza/noticia/2019/08/02/cronologia-reacao-do-governo-ao-uso-de-dados-sobre-desmatamento-leva-a-exoneracao-de-diretor-do-inpe.ghml>>

The quantity of national parks and conservation units in the country's forests was already questioned by the government, that intended to extinguish those by decree⁴¹, an unconstitutional action, after announcing the intention to review the conservation units law (SNUC) and the existing units⁴². In addition, the former Minister of the Environment speaks publicly, in a video released during investigations, of his intention to take advantage of the Covid-19 pandemic to approve several controversial changes to environmental protection and avoid critics and Justice processes.

There are also several threats to the national environmental license process, which has existed since 1981, including from the Minister of the Economy, who wants to loosen the process to favor mining companies, even with the several recent cases of environmental crimes of breaches of poorly executed and maintained mining dams from companies in the country⁴³.

Specialists affirm that, with the current pace of dismantling of the inspection structure and environmental legislation demonstrated since the first 6 months of the current government, the forest destruction can reach an irreversible limit in 4 to 8 years. Recent scientific researches show that if an area of 40% of the original forest gets deforested, the rest can't sustain the functioning of the tropical rainforest, and in this scenario, part of the forest may not be able to sustain itself. The Amazon has so far lost approximately 20% of its original coverage⁴⁴.

The development of REDD projects and a new culture of sustainable management and production, in addition to the profit from carbon credit sales, to encourage the maintenance of standing forest, goes against the non-environmental policy currently adopted by the country.

- **Analysis of chain of events leading to deforestation**

The analysis of chain events leading to deforestation within the reference region was based on the facts presented above, analyzing the relations between main deforestation agents, drivers and underlying causes that caused and most likely will lead to deforestation.

The project region is a region of high deforestation risk and rate. Agriculture and livestock are the main activities developed in the municipality, being the largest contributor to the region's economy. Furthermore, it is a region of intense and traditional livestock activity, followed by a growing market. The historical deforestation that has been occurring over the past 10 years within the reference region has followed this same pattern.

⁴¹ Available at: <<http://www.ihu.unisinos.br/78-noticias/589958-em-live-bolsonaro-reclama-que-nao-consegue-extinguir-parques-por-decreto>>

⁴² Available at: <<https://www.oeco.org.br/noticias/ricardo-salles-quer-rever-todas-as-unidades-de-conservacao-federais-do-pais-e-mudar-snuc/>>

⁴³ Available at: <https://brasil.elpais.com/brasil/2019/01/27/opinion/1548547908_087976.html>

⁴⁴ Available at: <<https://www.bbc.com/portuguese/brasil-48805675>>

Furthermore, location of deforestation usually occurs nearby already deforested areas, along rivers, and in low sloped areas. In addition, roads are an important driver explaining the location of future deforestation.

It is possible to relate the deforestation curve to the increase in livestock, agricultural and wood production in the region, all of which are growing. Those land-use changes are the main deforestation agents in the region. The profit from these products is also considerably higher than the production of other common products in the region, such as Brazil nuts and açaí.

The socioeconomic conditions of the population of the region, the fact that it is predominantly dominated by large properties landowners (with political and historical contributions that made the region an important livestock and agricultural center), and the demographic growth implies the need for new infrastructure projects and the arrival of new habitants coming from other regions of the country, attracted by the favorable conditions of production in low-cost forested areas. This increases the pressure on the forests in the project area.

The project area is vulnerable to invasions and illegal deforestation, with a settlement in the west boundary.

The recent history of polemics and anti-environmentalism of the Brazilian government, in addition to not tackling the direct causes, minimizing monitoring and restrictions in critical environmental areas and no investments in sustainable management and farming methods end up influencing and even motivating deforestation, illegal occupation and non-compliance with environmental laws. There is no strong environmental policy, and even with good advances, Brazilian laws have gaps that allows to be taken advantage of by landowners, or the inspection mechanisms suffer dismantling by the interest parties, making the conservation of the extensive Brazilian biomes even more difficult.

- **Conclusion**

The conduction of the Step 3 and available evidence allows to analyze that the most likely future deforestation trend within the reference region and project area is conclusive.

The increasing deforestation rate, added to the region's cattle ranching and agricultural advancement, population increase, lack of effective governmental control and environmental planning are clear evidence that the overall trend in future baseline deforestation rates will be increasing, and this demonstrates the need for conservation measures that encourage a change in the business and production model in the region.

3.5 Additionality

The last version of the VT0001 VCS Tool for the demonstration and assessment of additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) must be applied for all project activities instances.

In additionality assessment, each instance shall determine the appropriate analysis method, whether to apply simple cost, investment comparison or benchmark analysis, according to STEP 2 of VCS VT001 v 3.0.

Instances may or may not include Sustainable Forest Management Plan, as described in Grouped Project Eligibility Criteria in section 1.4.

In case the project activity does not involve Sustainable Forest Management Plan:

- The instance should have financial, technical and scale consistent with the described in this PD, facing similar investments, technological and/or other barriers as the initial instance. As the VCS AFOLU project generates no financial or economic benefits other than VCS related income, the simple cost analysis (Option I) shall be applied.

In case the project activity includes a Sustainable Forest Management Plan:

- A new additionality and AFOLU non-permanence risk analyses shall be provided. In this case, the investment comparison analysis (Option II) or the benchmark analysis (Option III) of the Tool shall be used.

For the purpose of the present analysis, the VT0001 VCS Tool for the demonstration and assessment of additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) project activities, version 3.0 was applied below for the first project instance. This instance does not have a Sustainable Forest Management Plan.

Other instances shall perform the additionality analysis at the time of their inclusion in the monitoring report.

STEP 1. Identification of alternative land use scenarios to the AFOLU project activity

Sub-step 1a. Identify credible alternative land use scenarios to the proposed VCS AFOLU project activity.

As described in section above of the present VCS PD, and according to the applied methodological tool, the considered alternatives to the project activity are:

- Timber production
- Cattle raising
- Continuation of pre-project land use
- Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project

These activities are considered credible alternatives, as shown by official data. Cattle raising and is important economic activity in Brazil, being an expressive deforestation agent. Meanwhile,

timber production represents an important value of production from the municipalities in which the reference region is located.

The pre-project land use is the maintenance of the area as it is, without any activity and actions for conservation. Although no economic activities are carried out in the pre-project scenario, the area is exposed to invasions and illegal deforestation, as detailed in section 3.4.

The application of the project activity could be carried out on the land within the project boundary, nevertheless performed without being registered as the VCS REDD project. This scenario would include avoiding deforestation through security and monitoring installation. Additionally, complementary activities to improve the monitoring of deforestation caused by the agents (identified in section 3.4 above) would have to be carried out, such as: increased surveillance, monitoring and control by satellite images, REDD+ technical studies, social and environmental activities promoted by the SOCIALCARBON or CCB Standards, among others. These investments are usually not made by the Brazilian Government, nor are part of sustainable forest management plans, as they are financially unattractive and not necessary to legally perform the timber harvest. Therefore, the economic feasibility of this scenario would be reduced without additional revenues from the sale of VCUs.

Sub-step 1b. Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations

Timber production:

Timber production may be authorized in the Amazon as long as the property has an approved Sustainable Forest Management Plan and an Exploration Authorization (AUTEX) issued by the Brazilian Environmental Agency. Furthermore, the land shall follow the Brazilian Federal Law 12,651/2012, that classifies at least 80% of the property located in the Amazon biome as Legal Reserve, which restricts the activities that could be developed in the area. In addition, there are other mandatory restriction regulations that limits the legal exploring area, such as the Permanent Preservation Areas.

The landowner of the project area has no timber production in the area but demonstrated interest in issuing an authorization in the absence of the present project activity.

However, Brazilian legislation and other legal restrictions are not enough to prevent the illegal deforestation of the Brazilian Amazon Rainforest, which is a common practice in the country. According to INPE, the estimated deforestation rate (complete removal of primary forest cover by clear cutting, regardless of the future use of these areas) between August 2018 and July 2021 were at the highest rates since 2008, a significant increase over the rate calculated during the previous annual period. The State of Amazonas was the fourth State with the highest deforestation rate within the biome between 1988 and 2020⁴⁵.

⁴⁵ Available at: <http://www.inpe.br/noticias/noticia.php?Cod_Noticia=5811>

Thus, the Project area is exposed to legal and illegal timber activity, which is a common practice in the region; moreover, the related environmental legislation are systematically not enforced.

Cattle raising

Cattle raising in the Amazon Forest is legal as long as the owner follows the 80% Legal Reserve and Permanent Preservation Areas restriction described in the Brazilian legislation, as explained above. The landowner must also provide a deforestation authorization for clearing the area for pasture. Therefore, livestock in the region is legalized.

According to IPAM, rural credit is the main funding for the Brazilian livestock production and is essential in the transition to sustainable land use, but in the Amazon area, it is used for conventional practices and activities, associated with deforestation. Despite the fact that, since 2014, the Brazilian Central Bank demands an assessment of socio-environmental risks from banks to approve public financing, and the existence of credit and financing opportunities for sustainable practices and producers in compliance with environmental laws, conventional livestock still represents 20% of the conversion of forest coverage to pasture and other agricultural crops. These practices are still used mainly due to its low implementation costs and maintenance, along with non-intensive use of labor, and as long as it's held in areas with legal authorization, are legal, although inefficient, with low productivity and high environmental impact.

Continuation of pre-project activity:

The pre-project activity consists of no activities to be developed within the area, which is in compliance with the Brazilian environmental laws.

Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project

The conservation of the forest, monitoring and surveillance are in compliance with the Brazilian environmental laws.

Thus, all the land uses listed under sub-step 1a are retained in 1b, being either in accordance with the law or a widespread illegal practice in respect to which the law is not enforced.

Outcome of substep 1b:

List of plausible alternative land use scenarios to the VCS AFOLU activity that are in compliance with mandatory legislation and regulations taking into account their enforcement:

- Timber extraction;
- Cattle raising;
- No activities;
- Project activity without VCS registration.

Sub-step 1c. Selection of the baseline scenario

The project area held no activity in the baseline scenario. There are no economic activities implemented in the area, nor exploration of non-timber forest products (NTFPs) or other land use activities.

Therefore, the lack of presence and monitoring of the area makes it exposed to invasions and illegal deforestation, without any control of the activities carried out within the area.

The identified agents and drivers, combined with underlying causes present in the region, will most likely continue to cause deforestation in the future, and therefore the continuation of the current (pre-project) land use scenario was defined as the most plausible baseline scenario. The future trend for baseline scenario is that deforestation rate in the reference region will probably increase, as verified during the historical reference period.

STEP 2. Investment analysis

Sub-step 2a. Determine appropriate analysis method

Sub-step 2b. Simple Cost Analysis

The simple cost analysis was determined as the appropriate analysis method once the Project instance does not generate any financial or economic benefits other than VCU related income. There is no for-profit sale of any products and there is no NTFPs or timber production in the area.

According to the additionality tool applied: If it is concluded that the proposed VCS AFOLU project produces no financial benefits other than VCS related income then proceed to Step 4 (Common practice analysis).

STEP 4. Common practice analysis

Given that no financial benefits were found in the results of the simple cost analysis, the following step according to the VCS additionality tool is the common practice analysis.

The practice of conservation of privately-owned forest areas in the Amazonas State as a whole, is extremely rare. Conservation activities are usually made in public areas, such as Conservation Units, federal and state protected areas.

In the Verra Registry, there are around 24 REDD projects registered in Brazil, the majority being located in the State of Amazon, but there is no project in the Presidente Figueiredo region.

In conclusion, the development of a carbon project is not a common practice in the area, and those that exist have essential distinctions between them and the present VCS AFOLU activity.

In addition to REDD projects, other forms of conservation of private areas are promoted in the country:

- **Private Reserve of Natural Heritage (RPPN):** it is a category of conservation unit created voluntarily by the landowner. When the area is categorized as RPPN, the owner is committed to nature conservation, without land expropriation. The benefits

of the private reserve are preference in the analysis of applications to acquire rural credit, tax benefits and the possibility of cooperation with private and public entities in the protection, and management of the land. There are no RPPNs close to the project area, and other RPPNs in the State are much smaller properties compared to the project area.

- **Payment for Environmental Services (PSA):** PSA is a voluntary transaction, with the main objective of providing economic incentives to owners of rural or urban properties that have natural areas capable of providing environmental services. Many law projects are in discussion in Brazil's National Congress, and some federal laws mention the service, but currently there is no valid regulation in the entire country. However, there are few programs that benefit landowners. The search for investment and payment for these areas is up to the owners, usually being agreed with banks or private companies, without government participation.

For the aforementioned reasons of the essential difference between the present project instance and similar projects in the area, the proposed VCS AFOLU project activity is not the baseline scenario, and hence it is additional.

3.6 Methodology Deviations

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5 MONITORING

APPENDIX