RIO MADEIRA GROUPED REDD+ PROJECT

Document Prepared by FUTURE Carbon Group

Project Title	Rio Madeira Grouped REDD+ Project
Version	01.2
Date of Issue	21-March-2022
Prepared By	FUTURE Carbon Group
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1 PROJECT DETAILS

1.1 Summary Description of the Project

In Brazil, 58.39% of its entire 851,034,553.8 ha territory (IBGE, 2021[1]) is covered by forests, representing almost 497 million hectares of forest area (FAO, 2020[2]) 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 2020 (FAO, 2020[3]). 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 Rio Madeira Grouped REDD+ Project is located in the municipalities of Porto Velho, Rondônia state and Lábrea, south of Amazonas state, in the Northern region of Brazil. The region is surrounded by many rivers and its borders having direct contact with Rio Madeira. The Trans-Amazonian Highway BR-230, which is the third longest Brazilian highway, along its route, cattle raising can be found, which is one of the many drivers to deforestation in the region (WWF-Brasil, 2017[4]). In addition, Rondônia was the 3rd most deforested state in Brazil with 17,800 ha. Porto Velho was the 2nd municipality with the most deforestation rate in September 2021[5].

The main objective of the Rio Madeira Grouped REDD+ Project is to avoid unplanned deforestation (AUD) of a region within the municipalities of Porto Velho and Lábrea. The first three Project activity instances has 53,640 ha project area, which is within two private properties in Porto Velho owned by Grupo Rovema and Grupo Leite (hereafter, PAI 1 and PAI 2, respectively) and one private property in Lábrea owned by Grupo Tupã (hereafter, PAI 3) consisting of 100% Amazon rainforest. The contract signing between Grupo Leite and the security company responsible for monitoring the properties of invasions and deforestation, on 23-October-2019, was the first action in terms of initiating the present REDD project and has thus designated this date as its project start date. The project's crediting period start is 23-October-2019. However,

[1] IBGE – Instituto Brasileiro de Geografia e Estatística. Brasil. 2021. 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>.

[5] G1 – Globo. Available at: < https://g1.globo.com/ro/Rondônia/noticia/2021/11/03/Rondônia-e-o-3o-estado-que-mais-desmatou-em-setembro-de-2021-segundo-dados-do-imazon.ghtml>

other REDD project instances could be inserted into this grouped project activity in the future, as long as they comply with the eligibility criteria defined in sections below.

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 contributing to environmental education and other social activities. The contribution to sustainability is being monitored applying the SOCIALCARBON® Standard, which is based in six key indicators: Biodiversity; Natural; Financial; Human; Social and Carbon Resources.

This Grouped REDD project is expected to avoid a predicted 17,722 ha of deforestation, equating to around 5,344,693 tCO2e in emissions reductions over the 30-year project lifetime (01-November-2019 to 31-October-2049).

1.2 Sectoral Scope and Project Type

14. Agriculture, Forestry, Land Use

Reducing Emissions from Deforestation and Degradation (REDD) through Avoided Unplanned Deforestation.

This is a grouped project.

1.3 Project Eligibility

The project is eligible under the scopes of the VCS Program Version 4.0:

- The project meets all applicable rules and requirements set out under the VCS Program.
- The project applies a methodology eligible under the VCS Program
- The implementation of this project activity does not lead to the violation of any applicable law.
- This is an eligible AFOLU project category under the VCS Program: reduced emissions from deforestation and degradation (REDD).
- This project is not located within a jurisdiction covered by a jurisdictional REDD+ program.
- Implementation partners are identified in the project activity.
- 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[6].

[6] 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.fao.org/3/x6896e/x6896e0e.htm >. As per methodology requirements, and detailed in section 3.3, Project Area must include areas that contains native forested land for a minimum of 10 years. This will be evidenced through the historic land use and land change analysis (part of section 3.4).

- This project does not occur on wetlands and does not drain native ecosystems or degrade hydrological functions.
- Non-permanence risk will be analyzed in accordance with the VCS Program document AFOLU Non-Permanence Risk Tool.

1.4 Project Design

This project is being designed as a Grouped Project Activity. The expansion of the project scope is allowed by the inclusion of new project activity instanced (PAIs) after its validation. The inclusion of new PAIs takes place by the time of each verification event.

Eligibility Criteria

A set of eligibility criteria for the inclusion of any new areas as instances willing to participate within the grouped project are described below.

As Rio Madeira Grouped REDD+ is a Grouped Project, all instances implemented after validation shall meet the elements mentioned in Sections 3.5.15 and 3.5.16 of VCS Standard v4.0. In additions, 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.

VCS Standard Eligibility criteria for the inclusion of new project activity instances	Rio Madeira Grouped Project	Instance 1 – Grupo Rovema Project Activity	Instance 2 – Grupo Leite Project Activity	Instance 3 – Grupo Tupã Project Activity
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.	The Instance 1 – Grupo Rovema Project Activity complies with this requirement because it adopts the Methodology VM0015: Methodology for Avoided Unplanned Deforestation, version 1.1, published on 03-December-2012.	The Instance 2 – Grupo Leite Project Activity complies with this requirement because it adopts the Methodology VM0015: Methodology for Avoided Unplanned Deforestation, version 1.1, published on 03-December-2012.	The Instance 3 – Grupo Tupã Project Activity 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 Grupo Rovema Project Activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Rio Madeira Grouped REDD+ Project Also, this instance is in the same reference region described in the VCS PD. Therefore, it applies the same technologies or measures specified in the Project description: forest conservation by avoiding unplanned deforestation, without forest management in project scenario.	The Grupo Leite Project Activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Rio Madeira Grouped REDD+ Project. Also, this instance is in the same reference region described in the VCS PD. Therefore, it applies the same technologies or measures specified in the Project description: forest conservation by avoiding unplanned deforestation, without forest management in project scenario.	The Grupo Tupã Project Activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Rio Madeira Grouped REDD+ Project. Also, this instance is in the same reference region described in the VCS PD. Therefore, it applies the same technologies or measures specified in the Project description: forest conservation by avoiding unplanned deforestation, without forest management in project scenario.
Projects are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	All project instances shall be in accordance with the 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." In case any project instance includes Sustainable Forest	The Grupo Rovema Project Activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Rio Madeira Grouped Project. Therefore, this instance is in accordance with the same baseline scenario determined in Section 3.4 of the VCS PD.	The Grupo Leite Project Activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Rio Madeira Grouped Project. Therefore, this instance is in accordance with the same baseline scenario determined in Section 3.4 of the VCS PD.	The Grupo Tupã Project Activity complies with this criterion because it was the instance that originated the baseline scenario and the development of the Rio Madeira Grouped Project. Therefore, this instance is in accordance with the same baseline scenario determined in Section 3.4 of the VCS PD.

	Management Plan (SFMP), it should be demonstrated that the baseline scenario is the same in comparison to a project without SFMP, i.e., the project area with SFMP is also susceptible to the same agents and drivers of deforestation identified in the baseline scenario (such as cattle ranching, mainly for producing beef cattle; and timber harvesters, acting both legally and illegally). The region where this grouped project is located has a very high unplanned deforestation risk and therefore, the existence of a SFMP does not ensure the complete conservation of the area. Usually, the instances that will be included within this project present high expenses with forest surveillance to control illegal invasions within the project areas, which will be an evidence to demonstrate the			

	similarity of the baseline scenario in both cases (with or without SFMP).			
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.	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. 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. 1) Instances may or may not include Sustainable Forest Management Plan. 2) In case the project activity does not involve Sustainable Forest	it is emphasized that this project has a management plan, and this kind of activity is included in the grouped project. Furthermore, the additionality analysis for this instance were made according to STEP 2 of VCS VT001 v 3.0. Since the PD was developed based on the characteristics, reference region and activity of the initial instance, the Grupo Rovena, as instance 1, complies with this additionality criterion.	it is emphasized that this project has a management plan, and this kind of activity is included in the grouped project. Furthermore, the additionality analysis for this instance were made according to STEP 2 of VCS VT001 v 3.0. Since the PD was developed based on the characteristics, reference region and activity of the initial instance, the Grupo Leite, as instance 2, complies with this additionality criterion.	it is emphasized that this project has a management plan, and this kind of activity is included in the grouped project. Furthermore, the additionality analysis for this instance were made according to STEP 2 of VCS VT001 v 3.0. Since the PD was developed based on the characteristics, reference region and activity of the initial instance, the Grupo Tupã, as instance 3, complies with this additionality criterion.

	Management Plan: - 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. - A new AFOLU non-permanence risk analysis shall be provided. 3) In case the project activity includes a Sustainable Forest Management Plan: - 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.			
New Project Activity Instances shall occur within one of the designated	Projects must be located within the Reference Region	The area referring to instance 1 - Grupo Rovema Project Activity is within the	The area referring to instance 2 - Grupo Leite Project Activity is within the	The area referring to instance 3 - Grupo Tupã Project Activity is within the

geographic areas specified in the project description.	described in Section 3.4 of the VCS PD.	project's reference region as described in section 3.4 of the VCS PD.	project's reference region as described in section 3.4 of the VCS PD.	project's reference region as described in section 3.4 of the VCS PD.
Instances shall comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient.	All instances must comply with the complete set of eligibility criteria for the inclusion of new project activities instances.	The Grupo Rovema Project Activity - Instance 1 - complies with all eligibility criteria for the inclusion of new project activity.	The Grupo Leite Project Activity - Instance 2 - complies with all eligibility criteria for the inclusion of new project activity.	The Grupo Tupã Project Activity - Instance 3 - complies with all eligibility criteria for the inclusion of new project activity.
Instances must be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verificati on 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/verificati on body.	Grupo Rovema properties comply with this criterion, as it is included in this PD as the first project activity instance.	Grupo Leite properties comply with this criterion, as it is included in this PD as the first project activity instance.	Grupo Tupã properties comply with this criterion, as it is included in this PD as the first project activity instance.
New Project Activity Instances must be validated at the time of verification against the applicable set of eligibility criteria	The addition of new Project activity instances shall be made in the monitoring report for the Grouped Project, being validated at the time of verification.	Grupo Rovema Project Activity complies with this criterion, as it is included in this Joint PD as the first project activity instance.	Grupo Leite Project Activity complies with this criterion, as it is included in this Joint PD as the first project activity instance.	Grupo Tupã Project Activity 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	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	The Grupo Rovema Project Activity instance is in accordance with this criterion. The evidence of Project ownership and Project start date were provided, as described in	The Grupo Leite Project Activity instance is in accordance with this criterion. The evidence of Project ownership and Project start date were provided, as described in	The Grupo Tupã Project Activity instance is in accordance with this criterion. The evidence of Project ownership and Project start date were provided, as described in

date upon which the project activity instance began reducing or removing GHG emissions).	applicable VCS Standard definitions).	sections 1.7 and 1.8 of the VCS PD.	sections 1.7 and 1.8 of the VCS PD.	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.	This instance 1 – Grupo Rovema Project Activity has the same start date of the grouped Project, as described in section 1.8 of the VCS PD.	This instance 2 – Grupo Leite Project Activity has the same start date of the grouped Project, as described in section 1.8 of the VCS PD.	This instance 3 – Grupo Tupã 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.	This instance 1 – Grupo Rovema Project Activity has the same start and end date of the grouped Project, as described in section 1.8 of the VCS PD	This instance 2 – Grupo Leite Project Activity has the same start and end date of the grouped Project, as described in section 1.8 of the VCS PD	This instance 3 – Grupo Tupã Project Activity 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	Carbon Asset (Carbon Asset Management Projetos Ambientais LTDA)
Contact person	Thiago de Avila Othero Guilherme Lucas Medeiros Prado Cintia Donato
Title	Thiago de Avila Othero - COO Guilherme Lucas Medeiros Prado – Technical Coordinator Cintia Donato – Legal Coordinator
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1.6 Other Entities Involved in the Project

Organization name	FUTURE Carbon Group (FUTURE Carbon Holding S.A.)
Role in the project	Holding company, Carbon credits trader and Registry Manager
Contact person	Thiago de Avila Othero Guilherme Lucas Medeiros Prado Cintia Donato
Title	Thiago de Avila Othero - COO Guilherme Lucas Medeiros Prado – Technical Coordinator Cintia Donato – Legal Coordinator
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Organization name	FUTURE Forest (FUTURE Carbon Consultoria e Projetos Florestais e Biodiversidade LTDA)
Role in the project	Project Developer
Contact person	Thiago de Avila Othero Guilherme Lucas Medeiros Prado Cintia Donato
Title	Thiago de Avila Othero - COO Guilherme Lucas Medeiros Prado – Technical Coordinator Cintia Donato – Legal Coordinator
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Organization name	Grupo Rovema
Role in the project	Project Activity Instance 1 owner
Contact person	Lediana Ghedin
Title	Lediana Ghedin – CEO
Address	Av. Calama, 1383 – São João Bosco – Porto Velho RO Postal Code – 76803-705
Telephone	+55 69 3216-9600
Email	lediana@ceo.gruporovema.com.br

Organization name	Grupo Leite
Role in the project	Project Activity Instance 2 owner
Contact person	José Marcos Leite Junior
Title	José Marcos Leite Junior - CEO

Address	BR-364 Porto Velho - RO Postal Code – 78900-000
Telephone	+55 68 9218-9393
Email	joseleitejunior@gmail.com

Organization name	Grupo Tupã
Role in the project	Project Activity Instance 3 owner
Contact person	Túlio Lemos
Title	Túlio Lemos - CEO
Address	BR 364 KM 135 Postal Code – 69830-000
Telephone	+ 55 68 8111-1000
Email	ciatupa@uol.com.br

1.7 Ownership

The Grouped Project covers a region in the municipalities of Porto Velho in the state of Rondônia and Lábrea, in the state of Amazonas, Brazil. The initial areas are located within three main private properties named:

Grupo Rovema: “Fazendas Agropecúaria RJR, Rio Madeira and Central (Serra Verde)” are owned by Lediana Ghedin.

Grupo Leite: “Fazendas Santa Carmem, Santa Carmem 2 and Nova Esperança” are owned by José Marcos Leite Junior.

Grupo Tupã: “Fazendas Fronteira, Iracema, Iracema II, Seringal Novo A, Seringal Novo B, Beleza and Santo Antônio III” are owned by Túlio Lemos.

The legal documents providing the land title and ownership of each property will be made available to the auditors during the validation process.

1.8 Project Start Date

According to the rules established by the “VCS Standard V4.0” 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).

Therefore, the project start date is 23-October-2019, and it was defined taking into consideration the date on which the Grupo Rovema created a digital account through Uzzipay Company, a Rovema´s group company, as an action to help in forest conservation due to the numerous invasions that the properties had been suffering. Evidence will be presented during the audit period, however, there is a page on Grupo Rovema's blog that ensure the start date of conservation activities[7]. Along with the creation of the digital account, Grupo Rovema also signed a contract with a monitoring team to increase surveillance activities and to guarantee the conservation of the area.

The other two Project Activity Instances are neighbouring properties and suffer from the same invasion risks, thus, the Grupo Leite, on 19-May-2021 signed a contract with the security company "Impactual Vigilance and Security Ltda", which was responsible for making the rounds on the borders of the Grupo Leite properties, preventing invasions.

Finally, Grupo Tupã signed a contract with a service provider, on 22-January-2020, to carry out the same security and patrol activity, to prevent invasions.

Thus, briefly, below is the project start date of the 3 instances:

Ownership	Project Start Date
Grupo Rovema	23-October-2019
Grupo Leite	19-May-2021
Grupo Tupã	22-January-2020

These actions were the first step to demonstrate the intention and commitment to the conservation of the project area due to the increase of invasions within the properties.

1.9 Project Crediting Period

The project has a crediting period of 30 years, starting from 01-November-2019 until 31-October-2049.

This version of VCS PD covers the first baseline period of the Rio Madeira Grouped REDD+ Project, from 01-November-2019 to 31-October-2025.

According to VCS requirements[8], the baseline must be reassessed every 6 years for ongoing unplanned deforestation because projections for deforestation are difficult to predict over the long term.

[7] Website available to monitor the conservation in Rovema´s properties. This action defined the Project Start Date of the Rio Madeira Grouped REDD+ Project. Available at: < https://uzzipay.com/blog/1a-area-de-preservacao-selecionada> Last visited on 07/07/2022

[8] Available at <https://verra.org/wp-content/uploads/2022/02/VCS-Standard_v4.2.pdf>

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	X
Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
2019	26,715
2020	163,530
2021	166,660
2022	169,812
2023	172,984
2024	176,176
2025	179,390
2026	182,623
2027	185,879
2028	189,156
2029	167,286
2030	171,713
2031	174,840
2032	177,986
2033	181,154
2034	184,342
2035	187,551
2036	190,782
2037	194,031
2038	197,305
2039	161,616

2040	166,646
2041	169,650
2042	172,673
2043	175,715
2044	178,777
2045	181,858
2046	184,960
2047	188,081
2048	191,222
2049	123,579
Total estimated ERs	**5,344,693**
Total number of crediting years	**30**
Average annual ERs	**178,157**

1.11 Description of the Project Activity

The principal objective of the present grouped REDD project is the conservation of a region within the municipalities of Porto Velho in the Rondônia States and Lábrea, in the south of Amazonas state. This will be achieved through avoidance of unplanned deforestation. The three first instance of this Grouped Project presents a 53,640 ha of forest area within the Grupo Rovema, Grupo Leite and Grupo Tupã properties. In the future, new instances may be added to the project, expanding the conservation of the forest.

The main mitigation action of the project is to avoid unplanned deforestation through the expansion of monitoring of 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.

It is important to note that this grouped project is not located within a jurisdiction covered by a jurisdictional REDD+ program.

The ex-ante estimate for the predicted avoided deforestation within the first instance project area over the 30-year project lifetime would be 17,722 ha. The avoided emissions are expected to 5,344,693 tCO_2e across the project crediting period (01-November-2019 to 31-October-2039), including buffer (RF), leakage (DLF) and project efficiency (EI) reductions.

In recent years, the project region has been deforested for the expansion of agricultural and livestock activities, mainly due to the advancement of the so-called arc of deforestation from the south of the Amazon biome. This pressure is expected to continue, given the globalization of markets in the Amazon region and international development policies planned for the region[9].

Therefore, besides forest conservation, the present project aims to improve and quantify its social and environmental benefits through application of the SOCIALCARBON® Methodology. This methodology is an innovative concept developed by the Ecológica Institute to measure the contribution of carbon projects to sustainability. The SOCIALCARBON® Methodology is based on six main resources: Biodiversity; Natural; Financial; Human; Social and Carbon Resources and aims to deliver high-integrity benefits in each.

The area's conservation plan involves increasing satellite monitoring, overflight and/or in person, with monitoring posts in the area, as well as socio-environmental education and community insertion in the project activity through the generation of jobs, such as monitoring agents, as the main way to mitigate illegal actions in the area. This plan will be based on the monitoring parameters, in addition to being verified in every SocialCarbon Report. The SocialCarbon methodology drives continuous improvement in the local community through prospects (at least one per resource, totalling 6 improvement actions), in which the project owner undertakes to implement them until the next monitoring period.

To guarantee the evolution of the socioenvironmental scenario in the region, SocialCarbon Standard requires that at least 50% of the actions suggested in the previous Ponit must be implemented, under the risk of losing the Standard. The monitoring period for SocialCarbon should be the same as the monitoring period for the Carbon Accounting Standard.

1.12 Project Location

The Rio Madeira Grouped REDD+ Project is situated in the municipalities of Porto Velho in Rondônia states and Lábrea, in Amazonas state in the north of Brazil, a region known as Southern Amazon. Belonging to the South-Amazonian Mesoregion and Microregion of Madeira, Porto Velho and Lábrea's population, according to the Brazilian Institute of Geography and Statistics (IBGE) in 2021, had about 596,000 inhabitants. Their territorial areas sum up to around 102,352 km², which makes them among the largest municipalities in Brazil in the territorial area.[10]

The area of the first project activity instance comprehensively belongs to Grupo Rovema, the second project activity instance belongs to Grupo Leite and the third belongs to Grupo Tupã[11]

[9] 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.

[10] Brazilian Institute of Geography and Statistics (IBGE) < https://www.ibge.gov.br/cidades-e-estados/ro/porto-velho.html>

[11] More information about the split properties, see section "1.7 - Ownership"

(Figure below). In accordance with VCS requirements, stipulated in Approved VCS Methodology VM0015, version 1.1, they are areas which include only "forest"[12] for a minimum of ten years prior to the project start date'. To define the project area, areas within the three properties that were defined as forest for ten years prior to the project start date were identified and utilized to compose the project area.

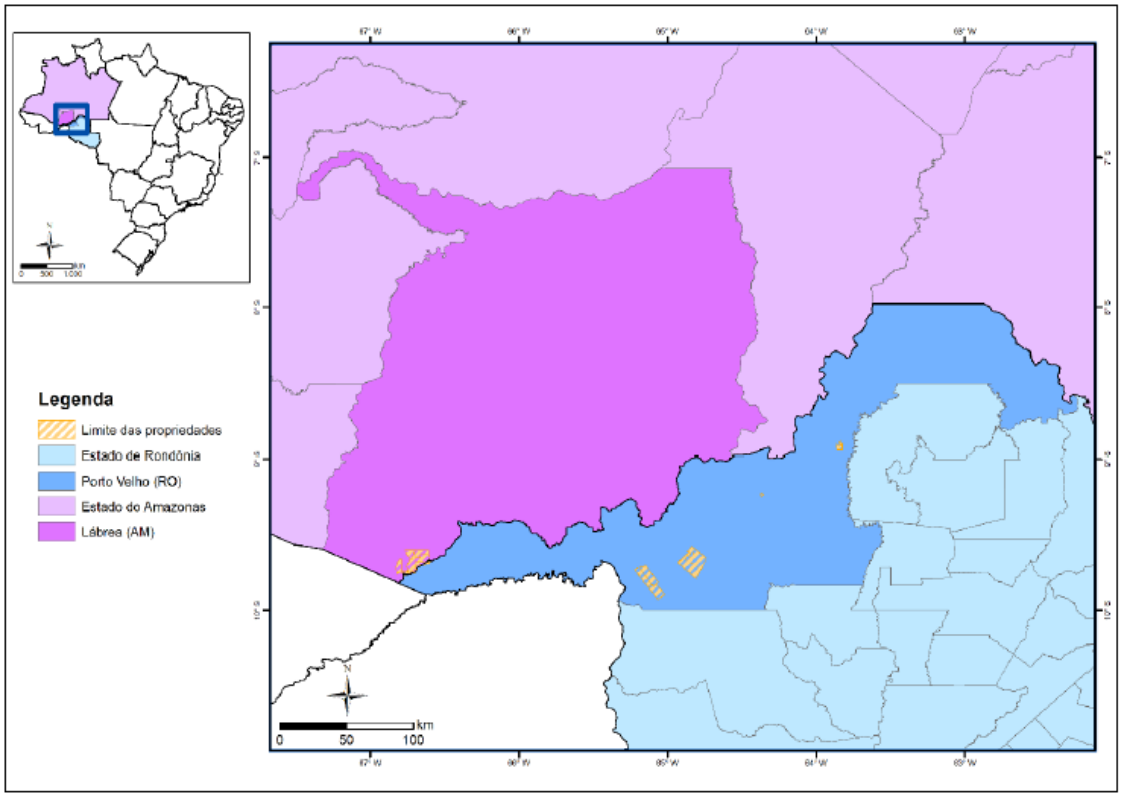
Table and figure below show the location of the project area (detailed coordinates are described in Appendix I):

Table 1 - Centroid location coordinates by property

Ownership	Properties	Centroid location coordinates
Grupo Rovema	Agropecuária RJR	8°54'40.51"S ; 63°50'39.01"W
	Fazenda Rio Madeira	9°40'41.22"S ; 64°49'40.57"W
	Central (Serra Verde)	9°07'33.76"S ; 64°03'21.22"W
Grupo Leite	Fazenda Santa Carmem	9°46'01.89"S ; 65°07'25.50"W
	Fazenda Santa Carmem I	9°52'20.83"S ; 65°04'24.96"W
	Fazenda Santa Carmem II	9°46'39.08"S ; 65°09'42.32"W
Grupo Tupã	Fazenda Beleza	9°41'38.45"S ; 66°43'15.96"W
	Fazenda Fronteira	9°43'04.65"S ; 66°41'39.67"W
	Fazenda Iracema I	9°39'33.69"S ; 66°38'49.99"W
	Fazenda Iracema II	9°37'16.84"S ; 66°39'45.12"W
	Fazenda Santo Antonio III	9°44'40.60"S ; 66°46'05.71"W
	Fazenda Seringal Novo A	9°37'25.59"S ; 66°43'54.66"W
	Fazenda Seringal Novo B	9°42'43.80"S ; 66°48'33.02"W

[12] The applied definition of forest is from the FAO: "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

Figure 1 - Project Activity Instances location



1.13 Conditions Prior to Project Initiation

The present project activity has not been implemented to generate GHG emissions for the purpose of their subsequent reduction, removal, or destruction. On the other hand, the project aims to combine REDD and socioenvironmental activities, which will promote forest conservation combined with alternative income generation from sustainable practices, associated with a greater surveillance against deforestation agents.

The draft with general characteristics of the project area are described below. It is important to mention the information regarding the reference region will be available in the full Project Design version.

Climate

The project region is classified as Tropical rainforest climate type – category Am – in the Köppen climate classification[13]. This means that it has no dry season, and the average annual rainfall is

[13] KÖPPEN, W.; GEIGER, R. Klimate der Erde. Gotha: Verlag Justus Perthes. 1928. Available at: <https://www.britannica.com/science/Koppen-climate-classification> Access on 29/12/2021.

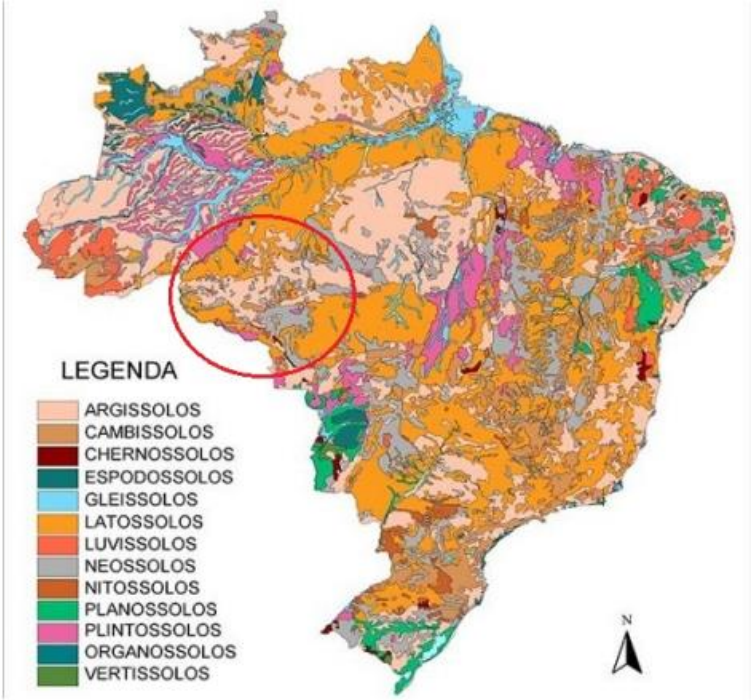
high, averaging between 2,000mm and 2,500mm year^{-1} in the project area. The relative humidity average in the region is 85%[14].

These conditions combined make excellent conditions for biomass to thrive, leading to the high levels of biomass described below. The Am climate type is defined as Humid or sub-humid tropical climate. It is a transition between the Af and Aw climate type. It is characterized by having an average temperature of the coldest month always above 18ºC, presenting a dry season of short duration which is compensated by high total rainfall.[15]

Geology, Topography and Soils

The predominant soils in Rondônia are Latosols, which occupy an area around 58%, 26% of which are Yellow Red Latosol, 16% Red Latosol and 16% of Yellow Oxisol. The Ultisols and Neosols occupy 11% of the territory each 6 of them, Cambisols occupy 10% and Gleissolos occupy 9%, the other classes of soils occupy the remaining 1%.

Figure 2 - Soils in Brazil (red circle in Rondônia)



Regarding the suitability of land use in Rondônia, studies show that 59% of the territory has soils suitable for farming at different levels of use. The aptitude of uses with cultivated pastures add up to 16% of the territory, as the native pastures have potential suitability for use, make up 5%

[14] CLIMATE DATE.ORG – Porto Velho Relative Humidity. Available at: https://pt.climate-data.org/america-do-sul/brasil/Rondônia/porto-velho-3120/ Access on 29/12/2021

[15] EMBRAPA – Am climate definitons. Available at: <https://www.cnpf.embrapa.br/pesquisa/efb/clima.htm>

of the territorial area. The areas destined for preservation remain corresponding to 20% of the territorial área.

Most of the soils in the State of Rondônia were originally covered by the Amazon Forest that kept them protected. despite low fertility natural, had high relative productivity, mainly due to recycling of nutrients and the preservation of organic matter, which provides good soil quality, due to its physical, chemical and biological characteristics, thus forming a balanced and efficient system.

The relief of the State of Rondônia is basically composed of plains and plateaus low, these have on average, altitudes ranging from 90 to 1000 meters in relation to sea level. Thus, the type of relief that predominates in the territory varies. From 100 to 600 meters, this in approximately 94% of the entire state area, the rest reach elevations in excess of 600 meters. However, the relief shown is constituted by four geomorphological units: Amazonian Plain, North of the Brazilian Plateau, Chapada dos Parecis and Paacás Novos and Guaporé-Mamoré Valley.

Socio-economic conditions

Currently, the state of Rondônia presents a scenario of expansion of the cultivation of soybean and corn, which directly benefits the regional livestock system, with lower prices for these inputs and the opportunity to implement integrated crop-livestock systems.

In a trend scenario, it is estimated that in 2031 the state would have a herd of 17.6 million head, which represents a variation of 43.4% compared to 2012. The projection under this scenario indicates a growth of approximately 48% in the production of arrobas in 2031 (9.34 @/ha), with a stocking of 1.95 AU/ha and slaughtering of 270 thousand heads finished in intensive systems and 450,000 heads in semi-intensive systems. Therefore, the intensification of production systems ensures a greater participation of animals finished in more intensified systems, with approximately 23.5 and 14% of animals coming from intensive and semi-intensive systems, respectively, in the total number of animals slaughtered in the state.

In an innovative scenario, the state would have a large supply of inputs close to areas destined for beef cattle, in addition to the use of integrated ILP systems. This would make it possible to increase the production of arrobas per hectare by 100% by the year 2031, with a herd of only 15.0 million heads 26% lower than estimated in the trend scenario. Thus, there is a 471% growth in the number of males slaughtered from intensive systems, which would represent approximately 38% of the total males slaughtered in the state in 2031.

In this scenario, there is a strong reduction in the age at slaughter, characteristic of intensified systems, eliminating the participation of animals over 4 years old in 2026. In turn, the total production of arrobas reaches 33.7 million in 2031

The municipalities of Boca do Acre, Lábrea, Apuí and Manicoré concentrate almost 90% of the region's production, and account for livestock production on properties small, medium and large. There is significant divergence between the data presented by the state of the Amazonas and the IBGE Agricultural Census regarding the quantity of the bovine herd in each municipality.

The socio-economic and climate conditions described are integrated into the Rio Madeira Grouped REDD+ Project's goals, as the application of SOCIALCARBON® Standard and the planned collaboration with a government environmental body[16] aims to deliver appropriate, integrated, and quantifiable ecological and socio-economic benefits to the population of the project area.

Biodiversity

The Brazilian Government Ministry for the environment (Ministério do Meio Ambiente) included the project region in its 2018 survey of Brazil's 900 priority areas for conservation[17]. The Project Area is classed within the ministry's "extremely high" and "high" classes, as demonstrated in the Figure 6 below. The report classified the priority actions in the area as "inspection and control of illegal activities" and "regularization of degrading activity".

The Southern Amazon Mosaic is located in a well-preserved region within the Legal Amazon, noting its high biological importance. However, this is also one of the least scientifically known regions of Brazil and therefore considered a priority area for wildlife inventories[18].

In the regional context, the Southern Amazon Mosaic is within areas of high richness of birds, mammals and amphibian species, according to Figure below. Although scientific research is scarce in the region, it is very likely that the existing biodiversity assessments underestimate the reality. A recent example was a new primate species found in the region, named Zogue-zogue fire tail (Callicebus miltoni)[19].

[16] Currently under negotiation

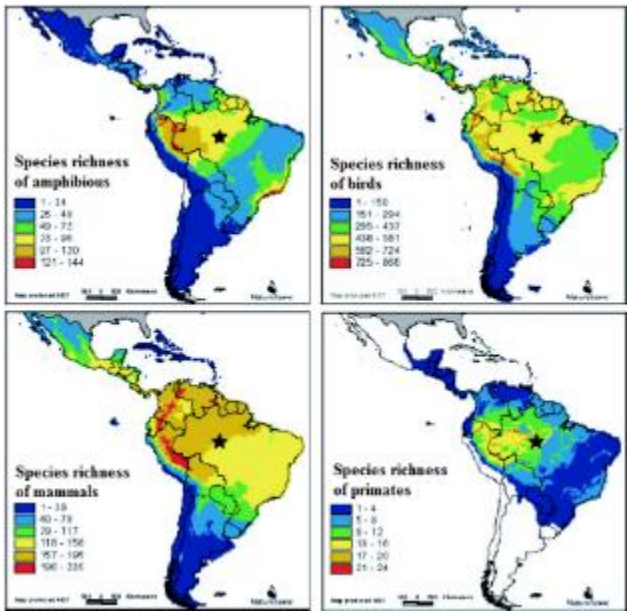
[17] MMA (2018): <http://areasprioritarias.mma.gov.br/2-atualizacao-das-areas-prioritarias> Access on 29/12/2020.

[18] WWF (Brasil). **Mosaico da Amazônia Meridional:** Vencendo limites geográficos e integrando gestão. Brasília-DF: WWF, 2014. 136 p. Available at:

<http://d3nehc6yl9qzo4.cloudfront.net/downloads/mam_livro_vencendo_limites_geograficos_final.pdf>. Access on 29/12/2020

[19] O ESTADO DE SÃO PAULO. Sustentabilidade. Nova espécie de primata é descoberta na Amazônia. March 11th, 2015. Available at: <http://sustentabilidade.estadao.com.br/noticias/geral,nova-especie-de-primata-e-descoberta-na-amazonia,1648925>. Last visit on: July 09th, 2020.

Figure 3 - Space richness of amphibians, birds, mammals, and primates within the project region



In addition, it is estimated that there are at least 13 threatened species of fauna, ten of these being mammals. Among those of great conservation interest are the Golden-White Tassel-ear Marmoset (Mico chrysoleucus), the Giant Armadillo (Priodontes maximus), the Brazilian Tapir (Tapirus terrestris), the Red Brocket (Mazama americana), and the Azara's Agouti (Dasyprocta azarae). Furthermore, there are several other species expected to be at some grade of risk, such as the Golden Parakeet (Guaruba guarouba) and the Hyacinth Macaw (Anodorhynchus hyacinthinus), both within the vulnerable category, according to the International Union for Conservation of Nature - IUCN. In addition, the present project contributes to the preservation of species that require large areas, such as the Jaguar (Panthera onca)[20]. Table 4 below shows the fauna species within the following IUCN categories: vulnerable and endangered. It can be observed that the present project helps to preserve at least 2% of the Brazilian threatened species, most of them being mammals.

Regarding flora biodiversity, the presence of the Amazon and Cerrado (Savannah) biomes makes the region a complex environment with a great diversity of species and vegetation types. Three forest inventories have been carried out in protected areas within the region, revealing a great flora biodiversity[21]:

[20] IUCN 2014. The IUCN Red List of Threatened Species. Version 2014. Available at: <http://www.iucnredlist.org>. Last visit on: July 09th, 2020.

[21] Government of the State of Amazonas. Plano de gestão do mosaico de unidades de conservação do Apuí. Manaus: WWF - Brasil, 2010. 246 p.

Therefore, the current situation indicates that the rainforests of the Southern Amazon are critically endangered, as well as their great biological diversity and presence in several environment types, in addition to the presence of endemic species of extreme importance to the conservation of Amazon biodiversity. Amazonas state has one of the largest priority areas in Brazil, with most of the extremely high priority areas of the country[22].

Vegetation Cover

The Project Area has a general forest cover characterized as Open ombrophylous forest (As, according to Brazilian Vegetation Map, IBGE).

Open Ombrophilous Forest: it is considered a transitional type of dense rainforest, characterized by climatic gradients with more than 60 dry days. It has four floristic facades: with vine, in the areas of circular depressions of the Precambrian basement; with palm trees, in sandstone terrain that occurs throughout the Amazon and even beyond; with bamboo, it occurs from the western part of the Amazon to the southern plateau of the State of Paraná (usually occupying the areas where noble species were explored); with sororoca (Phenakosperma guyanensis) in the south of the Amazon basin, in the middle Xingu river, occurring in depressions that are temporarily flooded and in small areas where soils of the Red Latosol type predominate.

During the full version of this Project Design all vegetation cover categories will be detailed within the Project Area, Reference Region and Leakage Belt.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

According to the Brazilian Forest Code (Law Nº 12.651, 25/05/2012[23]), all rural estates located in forest zones should have:

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

II – Legal Reserve (LR): an area located within a rural property or possession, except for the permanent preservation, necessary for the sustainable use of natural resources, conservation and rehabilitation of ecological processes, biodiversity conservation and shelter, and protection

[22] WWF, MMA, 2015.. Áreas Prioritárias para Uso Sustentável e Repartição dois Benefícios da Biodiversidade da Amazônia.

[23] BRASIL. Law nº. 12.651, of 25 May 2012. Forest Code. Diário Oficial [da] República Federativa do Brasil, Brasília, DF, 25 May 2012.

of native flora and fauna. In the Brazilian Legal Amazon[24], eighty percent (80%) of a rural property should be preserved as LR.

One of the main ways to combat deforestation in Brazil are the command-and-control mechanisms, such as effective monitoring, requiring compliance with environmental legislation along with a greater state presence. However, this does not seem effective in most regions of the country, because the failure of the government to fulfil these responsibilities in comparison with other social goals and economic interests has put Brazil among the world's largest deforesters[25].

In spite of the legal provisions intended to preserve at least 80% of the Amazon Forest coverage, 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 complete disregard of the mandatory provisions of the Forest Code. In addition to that, to cover vast distances of areas with low demographic density makes tracking of illegal activities and land surveillance very difficult for the authorities[26].

Therefore, all calculations were made assuming that the reference region has a general non-compliance with the Brazilian Forest Code. Thus, the baseline scenario considers the potential of unplanned deforestation in the project area to surpass the limits stipulated by the Law.

Although no overlap with indigenous lands has yet been identified, it is important composing the legislative scope of this document, it is worth mentioning decree No. 10,088, of November 5, 2019, which aims to create a binding international instrument dealing specifically with the rights of culturally traditional people. The basic concepts, which guide the interpretation of the provisions of the Convention, are the consultation and participation of the people concerned and their right to decide on their own development priorities as it affects their lives, beliefs, institutions, values spiritual and the land they occupy or use.

Annex LXXII to the decree provides for ILO Convention No. 169 on Indigenous and Tribal Peoples, recognizing the right to possession and property and provides measures to be taken to safeguard the rights related to the land and territory that traditional communities inhabit or use collectively.

Recognizing, thus, the aspirations of these communities to take control of their own institutions and habits and their economic development, and to maintain and strengthen their identities, languages and religions, within the scope of the States where they live;

[24] 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.

[25] Food And Agriculture Organization Of The United Nations (FAO) (2011), “State of the World's Forests 2011.” FAO Forestry Paper. Rome, Italy.

[26] MOUTINHO, 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.

According to PART II - Lands, Article 13, item 2, “The use of the term" lands "in Articles 15 and 16 should include the concept of territories, which covers the entire habitat of the regions that the people concerned occupy or use.

According to Article 14, item 1: “The people concerned should be given the property and possession rights over the lands they traditionally occupy. In addition, in appropriate cases, measures should be taken to safeguard the right of interested people to use land that is not exclusively occupied by them, but which they have traditionally had access to for their traditional and subsistence activities. In this regard, special attention should be paid to the situation of nomadic peoples and itinerant farmers”.

It is also worth mentioning decree No. 6,040, of February 7, 2007, which institutes the National Policy for the Sustainable Development of Traditional Peoples and Communities. According to Art. 2 “The PNPCT's main objective is to promote the sustainable development of the Traditional Communities, with an emphasis on recognizing, strengthening and guaranteeing their territorial, social, environmental, economic and cultural rights, with respect and appreciation for their identity, their forms of organization and their institutions.

With that said, it is worth mentioning that the project respects the provisions of the law and does not interfere with the rights of indigenous peoples.

1.15 Participation under Other GHG Programs

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

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

1.15.2 Projects Rejected by Other GHG Programs

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

1.16.1

1.16 Other Forms of Credit

1.16.2 Emissions Trading Programs and Other Binding Limits

The project activity is not included in an emission trading program or any other mechanism that includes GHG allowance trading.

Other Forms of Environmental Credit

The project activity has not created any other form of environmental credit. This project has not been registered in any other credited activity.

The project does not intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under this VCS project.

1.17 Additional Information Relevant to the Project

Leakage Management

The leakage management plan and maps of the leakage management area will be located in section Baseline Scenario, of the present VCS PD.

Commercially Sensitive Information

None of the information exposed to the Validation and Verification Body was withheld from the public version of the report.

Sustainable Development

The primary objective of the Rio Madeira Grouped REDD+ Project is to avoid the unplanned deforestation (AUD) of the project area, consisting of 100% Amazon rainforest at the project start date.

These measures contribute to several nationally stated sustainable development priorities, such as the following objectives and targets from the Brazilian Government related to the UN Sustainable Development Goals (SDG)[27]:

- SDG 1: No poverty.

  Part of the funds from the sale of carbon credits will go to the education and sustainable development of the riverside communities present inside and outside the project area. Thus, the project collaborates with targets such as:

- 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 4: Quality education.

[27] UN’s Sustainable Development Goals and targets available at: <https://sdgs.un.org/goals> Last visited on 04/01/2021.

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:

- 4.3 "By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university";
- 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";
- 4.7 "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 8: Decent work and economic growth.

  The project may offer professional training and job creation, as well as other alternative sources of income, aiming to minimize illegal extraction in the 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";
- 8.4 "Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead";
- 8.8 "Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment";
- 8.9 "By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products".
- SDG 12: Ensure sustainable production and consumption patterns.

  The project is based on encouraging sustainable development and maintaining the standing forest, optimizing access to non-timber forest products and the consumption of local inputs.

In case of wood extraction, the Sustainable Forest Management Plan will be required, in encouraging the emission of certifications of good practices. One of the main objectives is to reduce illegal deforestation and profit from this activity, offering alternatives for income and extraction. The Rio Madeira Grouped 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 resources[28].

The following components of the Brazilian commitments under the Convention are reinforced by the development of the Rio Madeira Grouped 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.

In summary, the project plans to expand the extraction of NTFPs and other alternative income for the community, encouraging handicrafts and local traditions. In addition, the project activities will enable the creation of jobs to monitor the area, prioritizing the hiring of local residents for monitoring of the area, with professional training. Income from the sale of credits will make it possible to invest in the educational and professional training of children and adults in the Community.

In addition, beyond the project's ecological and carbon benefits, the implementation of REDD and SOCIALCARBON mechanisms promotes benefit sharing: a proportion of the carbon credits generated will be dedicated to improving the social and environmental conditions in the project region, specifically contributing to improving deforestation control, and developing environmental education and other social activities.

SOCIALCARBON methodology will serve as a plan and guideline for carrying out activities and achieving goals, in addition to assessing progress in each monitoring period. In this way, the owners are committed and add value to the carbon project with each action taken, encouraging long-term sustainable development.

[28] Brazil's Nationally Determined Contribution towards achieving the objective of the United Nations Framework Convention on Climate Change can be accessed in full at: <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Brazil/1/BRAZIL%20iNDC%20english%20FINAL.pdf>. Last visited on December 10th, 2019.

SOCIALCARBON is based on the monitoring of indicators of six aspects of the project's sustainability: carbon, social, biodiversity, financial, natural and human. The result is a hexagon that shows the evolution of the project's contributions over time.

Further Information

Not applicable.

2 SAFEGUARDS

2.1 No Net Harm

Summarize any potential negative environmental and socio-economic impacts and the steps taken to mitigate them.

2.2 Local Stakeholder Consultation

Describe the process for, and the outcomes from, the local stakeholder consultation conducted prior to validation. Include details on the following:

- *The procedures or methods used for engaging local stakeholders (e.g., dates of announcements or meetings, periods during which input was sought).*
- *The procedures or methods used for documenting the outcomes of the local stakeholder consultation.*
- *The mechanism for on-going communication with local stakeholders.*
- *How due account of all and any input received during the consultation has been taken. Include details on any updates to the project design or justify why updates are not appropriate.*
- *The project design and implementation, including the results of monitoring.*
- *The risks, costs and benefits the project may bring to local stakeholders.*

For AFOLU projects, also demonstrate how the project has or will communicate the following:

- *All relevant laws and regulations covering workers' rights in the host country.*
- *The process of VCS Program validation and verification and the validation/verification body's site visit.*

2.3 Environmental Impact

Summarize any environmental impact assessments carried out with respect to the project, where applicable.

2.4 Public Comments

Demonstrate how due account of all and any comments received during the public comment period has been taken. Include details on any updates to the project design or demonstrate the insignificance or irrelevance of comments.

2.5 AFOLU-Specific Safeguards

For AFOLU projects, provide details on the following:

- *Local stakeholder identification process and a description of results.*
- *Risks to local stakeholders due to project implementation and how the project will mitigate such risks.*
- *Risks to local stakeholder resources due to project implementation and how the project will mitigate such risks, including the plans to ensure the project will not impact local stakeholder's property rights without the free, prior and informed consent.*
- *Processes to ensure ongoing communication and consultation with local stakeholders, including a grievance redress procedure to resolve any conflicts which may arise between the project proponent and local stakeholders.*

For AFOLU projects with no impacts on local stakeholders, provide evidence of such.

For non-AFOLU projects, this section is not required.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

This Grouped project utilizes the approved VCS Methodology VM0015: Methodology for Avoided Unplanned Deforestation, version 1.1, published on 03-December-2012.

Furthermore, the following tools were used:

- VT0001 – Tool for demonstration and assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities, v3.0, published on 01-February-2012.
- AFOLU Non-Permanence Risk Tool v4.0, published on 19-September-2019.

3.2 Applicability of Methodology

Applicability Conditions	Rio Madeira Grouped Project Justification of Applicability	Instance 1 – Grupo Rovema Project Activity Justification of Applicability	Instance 2 – Grupo Leite Project Activity Justification of Applicability	Instance 3 – Grupo Tupã 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.	All instances may have baseline activity that includes 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.	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 v4.0. The primary land uses in the baseline scenario consists of two activities: illegal logging for timber collection, clearing of the area and subsequent cattle ranching, as mentioned on section 3.2 of the PD. Therefore, the present criteria are fulfilled.	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 v4.0. The primary land uses in the baseline scenario consists of two activities: illegal logging for timber collection, clearing of the area and subsequent cattle ranching, as mentioned on section 3.2 of the PD. Therefore, the present criteria are fulfilled.	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 v4.0. The primary land uses in the baseline scenario consists of two activities: illegal logging for timber collection, clearing of the area and subsequent cattle ranching, as mentioned on section 3.2 of the PD. Therefore, the present criteria are fulfilled.
b) Project activities may include one or a combination of the	Within the categories of Table 1 and Figure 2 of the	The first project instance contains forest and	The first project instance contains forest and	The first project instance contains forest and

eligible categories defined in the description of the scope of the methodology (table 1 and figure 2).	methodology, the present grouped project falls within category A, "Avoided Deforestation without Logging" or B, "Avoided Deforestation with Logging in the Project Case".	degradation is not included in either the baseline or project scenario. This instance presents a Sustainable Forest Management Plan.	degradation is not included in either the baseline or project scenario. This instance presents a Sustainable Forest Management Plan.	degradation is not included in either the baseline or project scenario. This instance presents a Sustainable Forest Management Plan.
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".	All instances that compose the Rio Madeira Grouped REDD+ Project could include different types of forest, such as, but not limited to, old growth forest, degraded forest, among others since meeting the definition of "forest".	The REDD project instance area is 100% made up of forest, as described in the section Conditions Prior to Project Initiation of the present VCS PD. No deforested, degraded or areas otherwise modified by humans were included in the project area at Project Start Date.	The REDD project instance area is 100% made up of forest, as described in the section Conditions Prior to Project Initiation of the present VCS PD. No deforested, degraded or areas otherwise modified by humans were included in the project area at Project Start Date.	The REDD project instance area is 100% made up of forest, as described in the section Conditions Prior to Project Initiation of the present VCS PD. No deforested, degraded or areas otherwise modified by humans were included in the project area at Project Start Date.
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.	For all instances of this grouped project is a requirement that the project area shall include only land qualifying as "forest" for a minimum of 10 years prior to the project start date.	The project instance area consisted of 100% tropical rainforest in 2010 – 10 years prior to project start date – all of which conformed to the Brazilian definition of forest[29]. This was ascertained using	The project instance area consisted of 100% tropical rainforest in 2010 – 10 years prior to project start date – all of which conformed to the Brazilian definition	The project instance area consisted of 100% tropical rainforest in 2010 – 10 years prior to project start date – all of which conformed to the Brazilian definition

[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>.

		satellite images, as described in the section Project Location of the present VCS PD.	of forest[30]. This was ascertained using satellite images, as described in the section Project Location of the present VCS PD.	of forest[31]. This was ascertained using satellite images, as described in the section Project Location of the present VCS PD.
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.	As a criteria for this item, none of the instances of this grouped project will be aloud to maintain regions grows on peat. Apart of the exception above the project area can include forested wetlands (such as bottomland forests, flood plain forests, mangrove forests)	As described in the section 1.13 of the present VCS PD, all soil types are oxisoils, thus, mineral. Therefore, none of the project region grows on peat, satisfying this applicability criterion.		

[30] 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>.

[31] 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>.

VT001	
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 landowners must present 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 sum of the three properties comprising the three first project instance area – defined in accordance with the methodology's rules governing the latter – as well as the size of the reference region and leakage belt that will be available in the full version of this project design, including details of its definition.

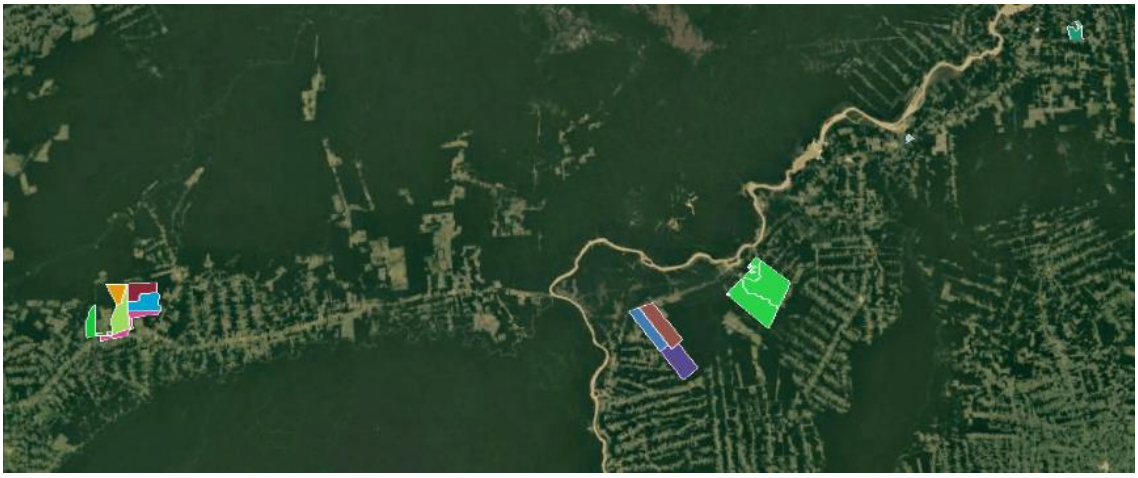
- **Project Area**

The three first project activity instances areas are composed of three main properties as described in the section "1.12 Project Location". Given that the coordinates represented by these properties are extensive, the area contour coordinates of the properties composing the Rio Madeira Grouped REDD+ Project are presented in the Appendix I.

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"[32] for a minimum of ten years prior to the project start date. Therefore, satellite images between 2009 and 2019 will be analyzed and classified. The areas within the properties that were defined as forest in 2009 and in 2019 will be identified and utilized to compose the project area. In addition, some non-forest areas will also be excluded, such as rivers, rocks, and non-forest vegetation.

Therefore, the estimated Project Area, including the three initial instances, is located within the properties' boundaries, totaling 53,640 ha, as displayed below:

Figure 4. Rio Madeira Grouped REDD+ Project Instances areas



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.

According to the applied methodology, as no applicable sub-national or national baseline is available, and the country or subnational region has not been divided in spatial units for which deforestation baselines will be developed, a baseline must be developed for a Reference Region.

The Reference Region must encompass the project area, the leakage belt and any other geographic area that is relevant to determine the baseline of the Project Area.

[32] 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.

A geographic area with agents, drivers and overall deforestation patterns observed during the 10-year period preceding the first instance's start date, i.e. 2009 to 2019, was determined, representing a credible proxy for possible future deforestation patterns in the project area.

The RR will be defined in accordance with two criteria:

- The methodology recommends that projects under 100,000 ha in size should have RRs 20 - 40 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). The latter condition was the most important for adjusting the RR in order for it to more accurately represent the land-use dynamics. Specifically, this was based on the waterways (watersheds) and infrastructure (roads), which are the principal means of human and product transportation in the region. As such, from the areas directly surrounding the project, the RR was expanded to meet the nearest main waterways and roads.

It is possible to assume that the deforestation in the Project Area is likely to occur in a similar way to the observed in the Reference Region. The RR is yet to be defined.

Leakage Belt

The Leakage Belt (LB) is the land area or land areas surrounding or adjacent to the Project Area in which baseline activities could be displaced due to the project activities implemented in the project area. To define the boundary of the Leakage Belt, Opportunity cost analysis (Option I) will be applied, in accordance with Approved VCS Methodology VM0015 "Methodology for Avoided Unplanned Deforestation", Version 1.1, 3 December 2012, Sectoral Scope 14.

The boundary of the Leakage Belt will be revisited at the end of each fixed baseline period, as opportunity costs are likely to change over time. In addition, this boundary of the Leakage Belt may have to be revisited if other VCS AFOLU projects are registered nearby the Project Area.

Opportunity cost analysis (Option I) is applicable where economic profit is an important driver of deforestation. In this context, literature studies, surveys and other credible and verifiable sources of information were used to demonstrate profitability of the main products of deforestation in the region: wood and cattle.

The LB is yet to be defined.

Forest

According to the Brazilian Forests at a Glance 2019[33], the Brazilian Forest Service considers as forests the lands that correspond to the vegetation typologies according to the Classification System of the Brazilian Institute of Geography and Statistics (IBGE), updated by the SIVAM project[34]. Brazil endorses the definition of forest adopted by FAO: 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. It does not include land that is predominantly under agricultural or urban land use. The compliance of the Project Area with these definitions is further explained in section 1.13.

In addition, as per VM0015 methodology, the Minimum Mapping Unit (MMU) size of the LULC maps created using RS imagery shall not be more than one hectare irrespective of forest definition. Thus, the 30 m resolution LANDSAT images used for mapping have the minimum mapping unit defined at 30x30 m (0.09 ha), therefore falling easily to the methodology requirement. Details on data and image processing will be available at Appendix II.

Temporal Boundaries

As this is a grouped project, it is important to consider the Project Start Date of all the included project activity instances (detailed in section 1.8):

Ownership	Project Start Date
Grupo Rovema	23-October-2019
Grupo Leite	19-May-2021
Grupo Tupã	22-January-2020

- **Starting date and end date of the historical reference period**

The adopted historical reference period is November 2009 to October 2019;

- **Starting date of the project crediting period the AUD project activity**

The project has a crediting period of 30 years, starting from 01-November-2019 until 31-October-2049.

- **Starting date and end date of the first fixed baseline period**

The first baseline period is from 01-November-2019 to 30-October-2025.

- **Monitoring period**

[33] Available at <https://www.florestal.gov.br/documentos/publicacoes/4262-brazilian-forests-at-a-glance-2019/file>. Last visited on August 3rd, 2021

[34] As of 1996, through a contract signed between the Implementation Commission of the Airspace Control System - Ciscea, and its Amazon's Surveillance System Project - Sivam, and IBGE, updated the information that make up the Legal Amazon, attending, at the same time, the Systematization of Information on Natural Resources project. Information available at https://www.terrabrasilis.org.br/ecotecadigital/pdf/manual-tecnico-da-vegetacao-brasileira.pdf; SIVAM Project: https://www.camara.leg.br/noticias/55929-o-que-e-o-sivam/

The next monitoring periods will comply with the criteria established in the applied methodology, which states that the minimum time-frame of the monitoring period is one year, and the maximum time-frame is one fixed baseline period.

Carbon Pools

The applied methodology considers six carbon pools 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.

Table 2 - 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: Excluded	No existence of perennial crops as final class
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.

Table 3 - Sources and GHG included or excluded within the boundary of the proposed AUD project activity

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_2O	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.
		N_2O	Excluded	Excluded for simplification. This is conservative.
		Other	Excluded	No other GHG gases were considered in this project activity.
Project	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 project scenario, according to the methodology.
		N_2O	Included	Included as non-CO2 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_2O	Excluded	As above.
		Other	Excluded	No other GHG gases were considered in this project activity.

The map of the project boundary including the locations of project area, reference region and leakage belt will be available in the full version of this project design.

3.4 Baseline Scenario

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 of the Project (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 historical land use and land cover change, as well as definition of classes and categories of LU/LC and the analysis of historical changes will be conducted as per VM0015 methodology.

ANALYSIS OF AGENTS, DRIVERS, AND UNDERLYING CAUSES OF DEFORESTATION

- Identification of agents of deforestation

As previously mentioned in "1.13 Conditions Prior to Project Initiation" of this VCS-PD, pasture accounts for virtually all the deforested land occupation in the project region.

The following information is provided for the identified agent of deforestation:

a) Cattle Ranchers

Description of the main features of the main agent of deforestation: Cattle ranching (pasture) is usually financed by means of initial capital obtained in wood logging. Deforestation is considered to occur through clear-cutting of forests for logging followed by pasture installation. This deforestation pattern may be caused by private landowners themselves and also by professional land-grabbers, by means of invasions in unguarded areas. The final use of virtually all occupied lands would be cattle ranching (pasture). Thus, it can be affirmed that the deforestation agent group is composed by large and small-scale cattle ranchers supported by land-grabbers and loggers in the initial stage of deforestation. This group is composed by private owners and itinerant land-grabbers. It can also be affirmed that this group of deforestation agents is culturally and economically adapted to this "business cycle" of deforestation, whose results are clearly demonstrated in the Reference Region during the reference period.

b) Timber harvesting

Timber harvesting can be regarded as the initial approach in a series of activities by deforestation agents, as it is the precursor of cattle ranching implementation. Official registration of formally documented logging for sale to sawmills has been volatile over the last 10 years, according to official IBGE data.

An unprecedented survey showed that 42% of logging in Rondônia between August 2019 and July 2020 took place in the capital, Porto Velho. In addition, the illegally exploited area in the state in the period reached at least 5,000 soccer fields, just in strict protection conservation units and indigenous lands. Due to the lack of access to complete public data, it was not possible to analyze the legality of logging in the entire territory of Rondônia.

The study was carried out by Rede Simex, made up of four environmental organizations: Imazon, Idesam, Imaflora and ICV. According to the research, which is based on satellite images, a total of 69,794 hectares were identified with logging in Rondônia, with 29,646 of them in Porto Velho alone. The capital is followed by Machadinho d'Oeste, with 8,129 hectares (12%), and Candeias do Jamari, with 6,317 hectares (9%). The three municipalities account for more than half of the entire area with identified wood extraction in the state.[35]

- Identification of drivers of deforestation

In this step, the factors that drive the land-use decisions of the agent group are analyzed to identify the immediate causes of deforestation. For this analysis, two sets of driver variables are distinguished:

For this analysis, two sets of driver variables are distinguished:

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

Cattle prices:

According to CEPEA (2021)[36], the price of cattle increased 245% over the 2010 (R$ 88.51 per arroba) to 2021 (R$ 305.46 per arroba) period. This economic phenomenon can be observed throughout the country. Young (1998) as cited in Rivero et al. (2009)[37], evaluating the mechanisms that cause deforestation in the Legal Amazon, found a positive relation between the expansion of agricultural areas and the variation of prices of agricultural products. For Margulis (2001) as cited in Rivero et al. (2009), the higher the agricultural prices, the higher is the migration to rural lands, which results in deforestation.

This key driver variable is likely to have a major impact on cattle ranchers' decision to deforest. Considering that the higher is the cattle price, the higher are the profits obtained with pasture for cattle ranching, instead of maintaining standing forests. This driver also plays an important role on the definition of economic radius for cattle activities, which also influences the distances of deforestation from consumption poles.

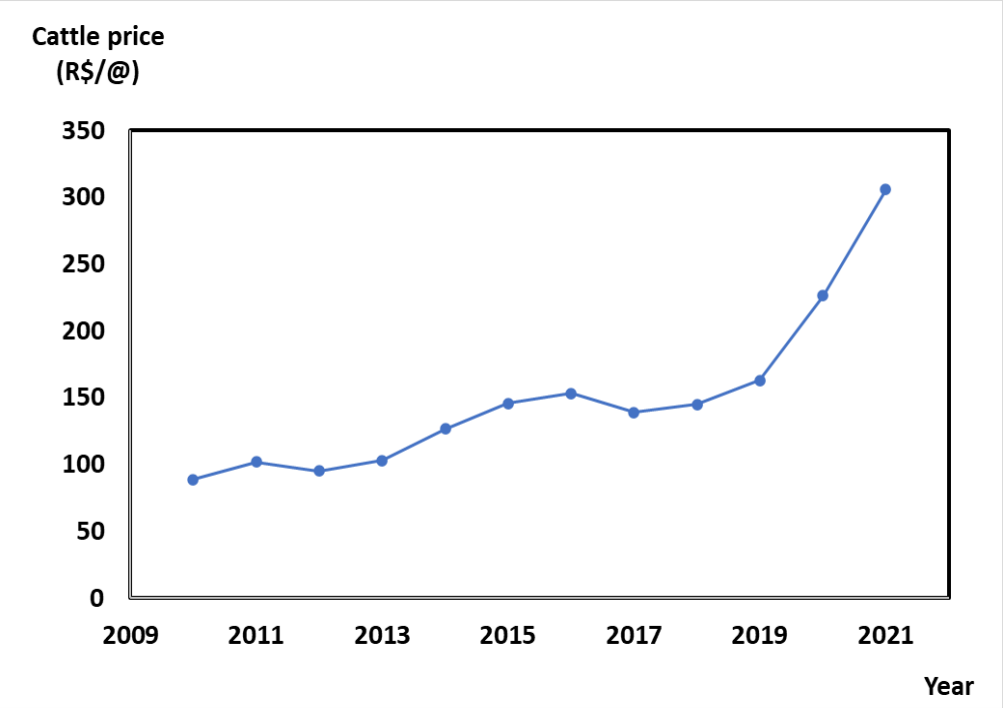
[35] IMAZON – Timber Harvesting in Porto Velho. Available at: < https://imazon.org.br/imprensa/porto-velho-concentra-42-da-exploracao-madeireira-de-Rondônia/>

[36] https://www.cepea.esalq.usp.br/br/consultas-ao-banco-de-dados-do-site.aspx (accessed in 31/05/2021)

[37] https://www.scielo.br/j/neco/a/jZHjd9B8ZghY7tG9G7qchTk/?format=pdf&lang=pt (accessed in 31/05/2021)

In a trend scenario, it is estimated that in 2031 the state would have a herd of 17.6 million head, which represents a variation of 43.4% compared to 2012 (see table) (see figure). The projection under this scenario indicates a growth of approximately 48% in the production of arrobas in 2031 (9.34 @/ha), with a stocking of 1.95 AU/ha and slaughtering of 270 thousand heads finished in intensive systems and 450,000 heads in semi-intensive systems. Therefore, the intensification of production systems ensures a greater participation of animals finished in more intensified systems, with approximately 23.5 and 14% of animals coming from intensive and semi-intensive systems, respectively, in the total number of animals slaughtered in the state.

Figure 5. Cattle prices in Brazil (CEPEA, 2021)



Population density:

This deforestation driver is associated with the dynamics of the local cattle market, as well as with the increase of potential deforestation agents working in the region. Several authors include population density as a prediction variable in deforestation models, which demonstrates that this driver has important impact on deforestation trends (Reis and Margulis, 1991; Reis, 1996; Andersen and Reis, 1997 as cited in Rivero et al. 2009);

This key driver variable provides an increasing pressure of deforestation by cattle ranchers, avid for mitigating poverty by means of a profitable business.

Considering that the project activity cannot regulate the population density, there will be no project measures to address this driver.

a) **Driver variables explaining the location of deforestation:**

These driver variables will be used in deforestation projection modelling, the results of which show that such variables can predict the location of deforestation variables explaining the quantity (hectares) of deforestation:

Access to forests (existing roads and navigable rivers):

Studies on historical location of deforestation can evidence that this factor has been a driver for deforestation during the historical reference period. It is broadly recognized that deforestation is accelerated in regions that have denser road networks (IMAZON, 2021[38]);

The presence of roads and navigable rivers is a logical deforestation driver, since it facilitates the flow of wood and other products harvested from the forest. The capacity to transport wood logs, rapidly clear the land for pasture and place wood logs in sawmills, quickly obtaining revenues, certainly has a major impact on cattle ranchers' decision to deforest the most accessible forest areas.

The project measures that will be implemented to address this driver are the same measures that are being adopted to manage leakage in this project. These measures are described in detail in "1.17 Additional Information Relevant to the Project", subtopic "Leakage Management", of this PD, and involve Sustainable Forest Management practices, increased surveillance, replication of project concepts to other areas (divulgation), engagement of local communities in inhibiting illegal occupation, and others.

- Identification of underlying causes of deforestation

According to literature surveys, it is concluded that the underlying causes of deforestation are as follows:

Land-use policies and their enforcement:

As previously mentioned in this PD, in spite of the legal provisions intended to preserve at least 80% of the Amazon's Forest cover, the lack of law enforcement by local authorities along with the increase in production and prices of cattle has 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 makes tracking of illegal activities and land surveillance very difficult for the authorities. Accordingly, policies implemented to address illegal deforestation only by means of command-and-control approaches have proven to be ineffective so far.

This key underlying cause has a strong effect on the decisions of the main deforestation agents, as they are at liberty to continue their illegal business activities with very low probability of being

[38] https://imazongeo.org.br/ (accessed in 31/05/2021)

detained by authorities. There are several indications of loosening of environmental legislation in recent years, with emphasis on the following subfactors:

Greater conveniences for obtaining “forest clearing authorization”: An example of this fact can be observed in the state of Goiás, which reported a 1,100% increase in the number of permits for deforestation in 2020[39]. The new environmental licensing in Goiás, plus technologies that facilitate the inspection work of the Secretariat of Environment and Sustainable Development (Semad), in addition to effort in the analysis of applications, are responsible for increasing the number of deforestations permits in the State. According to data from Semad's Environmental Licensing Superintendence, there was an increase of area suppressed by 673%: 6.5 km² in 2019, to 43.8 km² in 2020. Thus, as occurred in the State of Goiás, the facilitation of the issuance of authorization for the suppression of native vegetation can occur at any time in the Amazon Biome. In fact, attempts at facilitation have been sought recently (in 2020), as indicated in the next topic.

Granting of tacit (or automatic) environmental licensing, in case of delay of the environmental agency: The controversial automatic release of environmental permits and permits by maturity of term, that is, after a period stipulated for the government agency to manifest (120 days), was voted on 29/04/2020, by a virtual plenary. Provisional Measure 915 originally referred to the so-called "Economic Freedom Law" edited by the government, but ended up bringing, within the texts, changes that directly affect the rite of environmental licensing throughout the country. The change could lead to the automatic authorization of forest suppression in the Amazon and Atlantic Forest enforced by delay, and without analysis of the environmental agency. This means that, once the 120-day period is expired, the request would be automatically granted with a tacit license[40]. Fortunately, environmentalists have reedited the Provisional Measure 915, to prevent deforestation licensing for term expiration[41].

Loosening legislation for timber exports: As reported by Reuters, during 2019 Brazil exported "thousands of cargoes of wood from an Amazonian port without authorization from the federal environmental agency, increasing the risk that they have been extracted from illegally deforested land". The rule change scrapping IBAMA's authorizations for most timber exports came after five cargoes of wood arrived in US and European ports without these mandatory documents. Foreign authorities contacted Brazil to ask about the missing authorizations, with the head of Ibama in Pará then retroactively granting the authorizations. The problem, however, is much more widespread than just the five shipments. In Pará state, more than half of the roughly 3,000 officially registered shipments in the past year, containing an estimated 54,000 m³ of wood that

[39] https://www.meioambiente.go.gov.br/noticias/2089-emiss%C3%A3o-de-licen%C3%A7as-para-supress%C3%A3o-de-vegeta%C3%A7%C3%A3o-tem-aumento-de-1-100-in-a-year-in-goi%C3%A1s.html (accessed in 01/06/2021)

[40] https://www.correiobraziliense.com.br/app/noticia/brasil/2020/04/29/interna-brasil,849652/camara-pode-aprovar-hoje-licenciamento-ambiental-automatico.shtml (accessed in 01/06/2021)

[41] https://epbr.com.br/ambientalistas-alteram-mp-915-para-prevent-licensing-environmental-by-course-of-time/ (accessed in 01/06/2021)

left one port, did not have authorization. Companies had requested authorizations from Ibama for those shipments but exported them before the agency had time to respond. Beyond that, many shipments were exported without seeking approval from Ibama. Shipments went to the US, the Netherlands, France, Germany, Belgium, and possibly other countries. Before the rules changed, Ibama was required to give authorization to all wood exports before they leave port. Even though, most of the shipments needed only the proper paperwork to be given the green light, but only certain cargoes would be randomly selected for physical inspection[42]. Arbitrarily, the president of Ibama ensured that all future unauthorized exports of wood, previously classified as illegal, became legal: he took advantage of the inattention of the press to the theme during Carnival, at the end of February 2020, to quietly revoke a 2011 Ibama policy that required an authorization from the agency before forest products could receive export licenses. From that date on, such permits would be required only for endangered tree species or in other special circumstances. With the repeal, the way was opened for large shipments of illegal timber from the Brazilian Amazon to go abroad[43]. It was also revealed that in February 2020, loggers from Pará asked Ibama to change that rule: the companies wanted to sell wood abroad presenting only the Document of Forest Origin (DFO, "DOF – Documento de Origem Florestal" in Portuguese), made by the companies themselves and that originally only serves to allow the transport of the goods to the port. This change has been immediately accepted by the president of Ibama[44].

Legislation favoring landgrabbers. An analysis conducted by IPAM (Environmental Research Institute of the Amazon) showed that 35% of deforestation occurred in the Amazon between August 2018 and July 2019 was recorded in non-designated areas without information. About land regularization, environmental NGOs warn about two ongoing projects. While, in the Senate is presented Bill 510/21, in the House of Representatives it is considered to vote the Bill 2633/20[45]. Commonly, both derive from the original text of Provisional Measure 910, known as "MP da Grilagem" (Landgrabbers' Provisional Measure), for changing the law to favor large occupants of recently invaded public lands. Bill 510/21 once again changes the deadline for public land invasions to be legalized (from 2011 to 2014) and allows large areas (up to 2500 hectares) to be titrated without the need for inspection. Indeed, given that the land grabbing of undesignated public lands is responsible for more than 1/3 of the deforestation in the country, it is to be expected that amnesty for landgrabbers and illegal deforesters will be an incentive to intensify this practice in the coming years. Bill 2633/20 has a loophole that would allow to legalize, via bidding, public areas invaded after the deadline for occupation provided for by law (i.e., 2014). Of the 49.8 million hectares of forests under state and federal responsibility, but not

42 https://www.businesslive.co.za/bd/world/americas/2020-03-04-brazil-may-be-exporting-illegally-deforested-wood/ (accessed in 01/06/2021)

43 https://brasil.mongabay.com/2020/04/ao-afrouxar-leis-de-exportacao-brasil-permite-saida-de-madeira-ilegal-da-amazonia/ (accessed in 01/06/2021)

44 https://g1.globo.com/natureza/noticia/2020/11/17/documentos-mostram-que-ibama-facilitou-exportacao-de-madeira-extraida-ilegalmente.ghtml (accessed in 01/06/2021)

45 https://ipam.org.br/35-do-desmatamento-na-amazonia-e-grilagem-indica-analise-do-ipam/ (accessed in 01/06/2021)

yet allocated to any category of use, 11.6 million hectares, or 23%, were irregularly declared as rural properties of particular use, in the National System of Rural Environmental Registration (CAR). If the entire area registered to date as private property was legalized, 2.2 to 5.5 million hectares could be deforested in the coming years, according to the deforestation limits defined by the Forest Code and considering that deforestation is often greater than allowed. In recent years, grabbing of non-destined public forests has increased: in 2019, it was the land category where the most forest felled in the Amazon, according to data from the deforestation alert system of INPE (National Institute of Space Research), Deter. The trend continued in 2020. Among the conditions defined by Provisional Measure 910, for appropriation of public lands by individuals, are: i) the area must be registered in the Rural Environmental Registry (CAR, "Cadastro Ambiental Rural"): as it is known, any information can be imputed in the "CAR" system until the current moment without any veracity checking, and ii) the claimant must be performing agricultural activities in the territory (i.e., should have preferably deforested the area)[46]. The Provisional Measure defines that for areas that meet the requirements and have up to 15 fiscal modules (areas with up to 1,650 hectares), the title will be granted without the need for inspection. Before the Provisional Measure, the exemption from inspection was granted to areas with up to four fiscal modules (maximum 440 hectares). The exemption from the inspection may allow large illegally deforested areas to be taken over by individuals. This is because the Provisional Measure only prohibits the regularization of areas that have been subject to fines or environmental embargoes, and not all environmental violations are known and fined by the government[47]. Given that the Project Area is surrounded by public lands and that cases of land-grabbing can be evidenced in the Reference Region, an abnormal increase in deforestation in that region is expected in the coming years, because Brazilian legislation increasingly gives all indications that it is very inviting to land-grabbing acts, granting amnesty to landgrabbers and agents of illegal deforestation.

The problem of lack of command-and-control measures to contain deforestation in the Amazon Biome is a widespread issue, which has been getting worse and worse every year, due to lack of personnel and infrastructure of legal authorities, in addition to schemes of corruption and violence established by illegal agents to maintain the status quo. In this context, the lack of law enforcement can be assumed to be a constant underlying cause of deforestation during the project lifetime.

Although the project activity cannot solve the problem of lack of enforcement in Brazil, it can serve as a case of success, to encourage neighbors to adopt sustainable practices as a profitable land-use alternative.

- Analysis of chain of events leading to deforestation

[46] https://ipam.org.br/cientistas-mapeiam-grilagem-em-florestas-publicas-na-amazonia/#:~:text=O%20impacto%20da%20grilagem%20se,main%20g%C3%A1s%20%20effect%20estufa (accessed in 01/06/2021)

[47] https://amazonia.org.br/como-a-mp-da-grilagem-pode-mudar-o-mapa-de-regioes-da-amazonia/ (accessed in 01/06/2021)

Based on the historical evidence collected in other REDD+ Projects, it is concluded that the implementation of the BAU activity (pasture) is usually financed by means of initial capital obtained through timber logging.

The lack of enforcement of policies and laws also affects land tenure and property rights. This aspect stimulates the action of land grabbers and squatters. Ineffective legal land registration and documentation is also a barrier to official registration of timber production from natural forests. In this scenario, a great portion of harvested wood logs can be regarded as illegal and official registration is not technically feasible.

All the above factors combine to result in uncontrolled land invasions and deforestation, followed by cattle ranching activities, a scenario which is substantiated by illegal trespassing events, and the fact that daily patrolling of the area is required by one or two employees on motorbikes, in order to combat the constant deforestation pressure.

- Conclusion

Available evidence about the most likely future deforestation trend within the Reference Region and Project Area is deemed to be "Conclusive". Meaning that the hypothesized relationships between agent groups, driver variables, underlying causes, and historical levels of deforestation have been verified via literature studies and other verifiable local sources of information.

The weight of the available evidence conservatively suggests that the overall trend in future baseline deforestation rates will be "Increasing". During the reference period, the deforestation rate in the Reference Region has consistently increased. In this context, the deforestation rate used in the projections was the Modelling ("c") approach (see step 4.1.1 of the VM0015 methodology: Selection of Baseline Approach).

PROJECTION OF FUTURE DEFORESTATION

This section refers to the following steps of the VM0015 Methodology: "4.1.1: Selection of the baseline approach"; and "Step 4.1.2: Quantitative projection of future deforestation".

3.5 Additionality

For the purpose of the present analysis, the VCS Tool for the Demonstration and Assessment of Additionality in VCS Agricultural, Forestry and Other Land Use (AFOLU) Project Activities - VT0001 version 3.0[48] will be applied.

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

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

Credible alternative land use scenarios to the present AFOLU project activity are:

[48] Available in <https://verra.org/wp-content/uploads/2017/11/VT0001v3.0.pdf>

I. **The continuation of the current (pre-project) land use scenario**: in this scenario, no REDD project is undertaken. The deforestation pattern identified in section 3.4 above, which describes the relationship among the agents, drivers and underlying causes present in the region during the historical period, will most likely continue to cause deforestation in the future.

This scenario involves the implementation of a sustainable forest management plan within the project boundaries of the proposed VCS REDD project, however without carrying out additional social and environmental activities, as well as activities to reduce unplanned deforestation. This scenario also complies with item iii of the methodological tool (activities similar to the proposed project activity on at least part of the land within the project boundary of the proposed VCS AFOLU project at a rate resulting from legal requirements).

Although this is a similar activity proposed by the present project, i.e. avoiding deforestation through conducting sustainable forest management activities, no other complementary activities to improve monitoring of deforestation would be carried out, such as: increased surveillance, monitoring and control by satellite images, REDD+ technical studies, social and environmental activities promoted by the SOCIALCARBON Standard, among others.

Many scientific articles conclude that sustainable forest management plans (SFMP), namely those certified, can be considered a tool for forest conservation, maintenance of forest carbon stocks, and decrease of deforestation rates in the region where they are implemented. This mainly occurs due to the use of reduced impact logging techniques, reduced social and environmental operational impacts, greater surveillance in the area, and generation of economic value for forests. On the other hand, there is a belief that forest is a non-productive natural resource and needs replacing with productive activities, such as livestock farming and agriculture, primarily in areas that require social and economic development[49],[50],[51],[52],[53].

However, the complexity and costs of a sustainable timber operation, added to factors such as bureaucratic constraints and fluctuation of certified timber prices, make SFMP less competitive than illegal logging. Thus, investment in additional practices to what is required by law is risky and may affect the survival of the operation. This includes activities that are complementary to

[49] BRASIL. Ministério do Meio Ambiente (MMA). Plano de ação para prevenção e controle do desmatamento na Amazônia. Brasília, 2012.

[50] SCHULZE, M., GROGAN, J., & VIDAL, E. 2008. O manejo florestal como estratégia de conservação e desenvolvimento socioeconômico na Amazônia: quanto separa os sistemas de exploração madeireira atuais do conceito de manejo florestal sustentável? In N. Bensusan & G. Armstrong (Eds.), O Manejo da Paisagem e a Paisagem do Manejo (1ª ed., pp. 161-213). Brasil: IEB

[51] VIEIRA, I. C. G.; SILVA, J. M. C.; TOLEDO, P. M. Estratégias para evitar a perda de biodiversidade na Amazônia. Estud. av., São Paulo , v. 19, n. 54, Aug. 2005 .

[52] HOLMES, T.P. el al. Custos e benefícios financeiros da exploração de impacto reduzido em comparação à exploração florestal convencional na Amazônia Oriental. Belém: Fundação Floresta Tropical, 2002, 66p, 2nd edition.

[53] VERWEIJ, P. *et al*. Keeping the Amazon Forests standing: a matter of values. Zeist: WWF, 2009. 72p.

the operation, specifically avoidance or reduction of unplanned deforestation/degradation and increase of monitoring of forest management areas.

Therefore, despite the contribution to forest preservation and carbon stock maintenance, SFMP areas are subject to unplanned deforestation and loss of carbon stock due to external agents, however expected to be in a lower intensity than in other areas without forest management. In addition, there are incentives for the local population to perform activities that result in unplanned deforestation, such as the expansion of low productivity agricultural activities, resulting in an ongoing necessity of cutting down the forest to maintain production.

There are many challenges to guarantee the consolidation of these areas and their effective social and environmental protection. Many conservation areas located in the Amazon still don't have an approved management plan, and a large amount does not have a management team. Furthermore, the number of Government agents assigned to these areas is greatly lacking and insufficient to carry out effective surveillance. The result is intense deforestation and pressure on protected areas in the legal Amazon, primarily because of wood harvesting activities, agriculture, road construction and mining[54],[55].

II. **Implementation of a sustainable forest management plan, combined with the implementation of additional activities:** In this scenario, the Project activity would 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 conducting sustainable forest management activities, with the addition of certifications such as CERFLOR or FSC.

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 Standard, 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.

III. **Cattle ranching:** In this scenario, Rio Madeira Grouped REDD+ Project and its first three instances would change its activity from forest management to cattle ranching. This is a plausible scenario since cattle is one of Brazil's main economic activities, as previously described in section above.

[54] VERÍSSIMO, A. *et al* (Org.). **Áreas Protegidas na Amazônia brasileira:** avanços e desafios. Belém : Imazon ; São Paulo : Instituto Socioambiental, 2011. 90 p.

[55] PORTAL AMAZONIA.COM. Unidades de Conservação do Amazonas ainda sofrem com crimes ambientais. 2013. Available at: <http://www.portalamazonia.com.br/editoria/meio-ambiente/unidades-de-conservacao-do-amazonas-ainda-sofrem-com-crimes-ambientais/>. Last visit on: March 12th, 2015

According to UFMGs report[56], the State of Rondônia In a trend scenario, it is estimated that in 2031 the state would have a herd of 17.6 million head, which represents a variation of 43.4% compared to 2012.

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

Scenario I and II - The application of a sustainable forest management plan is regulated in Brazil by the laws Nº 12,651[57], decree Nº 5,975[58]. Despite the requirement to mitigate social impacts, social and environmental activities for the communities surrounding the management plan area are not required by law. According to Ribeiro[59], the main obstacles related to the approval of the sustainable forest management plan in the Amazon are:

a) low investment capacity, financial and fiscal incentives,

b) bureaucracy and lack of control in the SFMP approval procedure and

c) lack of participation of traditional communities in the process of elaboration of the SFMP, when they are involved. Thus, it is common to see the exclusion of the surrounding community from management activities in private areas.

As it does not contain social and environmental activities to control deforestation coming from communities surrounding the property, scenario I may contain activities that are illegal or of uncertain legal status, not being enforced namely due to the lack of control[60] and government capacity. This type of illegal deforestation, apart from planned deforestation, occurs mainly due to social pressure and low HDI in the Amazon regions. Although not being in compliance with applicable mandatory laws and regulations, this scenario results from systematic lack of enforcement of applicable laws and regulations. One of the goals of the present REDD project is to contribute to a solution to this problem by promoting the sustainable management of forest resources through increased monitoring and surveillance to avoid unplanned, illegal deforestation.

[56] Available at http://www.fapespa.pa.gov.br/upload/Arquivo/anexo/1383.pdf?id=1533567716 Last visit on: October 19th, 2021.

[57] Available at <https://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12651.htm> Last visit: 02/07/2021

[58] Available at <http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2006/decreto/d5975.htm> Last visit: 02/07/2021

[59] RIBEIRO, A.C.F. et al. O PLANO DE MANEJO FLORESTAL COMO INSTRUMENTO DE DESENVOLVIMENTO SUSTENTÁVEL NA AMAZÔNIA. Direito & Desenvolvimento, ISSN 2236-0859, 2020. Available at <https://periodicos.unipe.br/index.php/direitoedesenvolvimento/article/download/875/715/#:~:text=O%20Plano%20de%20Manejo%20Florestal%20Sustent%C3%A1vel%20%2D%20PMFS%20est%C3%A1%20intimamente%20relacionado,forma%20alcan%C3%A7armos%20um%20desenvolvimento%20ambiental>.

[60] MOUTINHO, 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.

For instance, Government conservation units such as parks and sustainable use areas (APAs) are also affected by advancing deforestation and increased accessibility of the region to economic activities due to creation or improvement of infrastructure. Between 2000 and 2008, 2.25 million hectares were deforested in protected areas in Legal Amazon, and illegal exploitation of wood (degradation) has occurred in many of them.

One way to avoid increased accessibility and illegal exploitation of protected areas would be to increase the effectiveness of sanctions in cases of environmental malpractice.

The creation of protected areas is proven to be one of the most effective tools in forest conservation and the fight against deforestation. However, without management and investment, these important reserves do not attain their sustainable development goals, leaving them vulnerable to criminal activity such as land squatting, illegal wood harvesting and deforestation. This underlines the importance of REDD+ projects for forest conservation, despite being located in protected areas, because they are capable of contributing to the improvement of deforestation monitoring and control, promoting social, economic and environmental benefits in the region.

As Scenario II is the implementation of the SFMP with the addition of social environmental activities, as presented above, it is also in compliance with all applicable legal and regulatory requirements. Thus, there are no restrictions for SFMP within the areas where the Rio Madeira Grouped REDD+ Project's property is located.

Scenario III - 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. The landowner must also provide a deforestation authorization for clearing the area for pasture. This authorization is provided by the State's government, in addition to the National Forest Code (Law 12,651) and Decree 5,975.

Sub-step 1c. Selection of the baseline scenario

Based on the scenarios presented and the scenario of the operations in the period, the damage caused by the poor administration and execution of the previous management plan and the accumulated loss, it is possible to conclude that the baseline scenario is Scenario III.

Cattle ranching is the most profitable alternative land use, and thus, the most plausible scenario at the time. However, in the full version of this Project Design will be conducted a review of all scenarios with information regarding project start date year.

After the complete study of all the scenarios described above, the most plausible scenario will be chosen.

STEP 2. Investment Analysis

Sub-step 2a. Determine appropriate analysis method

The Rio Madeira Grouped REDD+ Project generates financial benefits other than the revenue from the sale of VCUs, primarily through the commercialization of timber, as a result of the

sustainable forest management plan. Thus, two investment analysis comparison (Option II) will be carried out in order to determine the project's additionality, i.e, whether the proposed project activity, without the revenue from the sale of GHG credits, is economically or financially less attractive than the other land use scenarios.

Sub-step 2b. - Option II. Apply investment comparison analysis

An investment comparison analysis will be performed to demonstrate which of the scenarios identified above is more financially attractive. For such analysis, the Net Present Value will be considered the most appropriate financial indicator. Many articles on profitability of alternative land uses in areas under similar conditions to the project region applied the Net Present Value (NPV) for financial analysis, such as Amaral et al. (1998)[61], Barreto et al. (1998)[62], Schneider (2000)[63], Razera (2005)[64], Young et al. (2007)[65] and IDESAM (2014)[66].

Sub-step 2c. - Calculation and comparison of financial indicators

The following scenarios will be analyzed as part of the investment analysis:

1. The implementation of a sustainable forest management plan within the project boundaries of the proposed VCS REDD project, however without carrying out additional social and environmental activities, as well as activities to reduce unplanned deforestation.
2. Implementation of a sustainable forest management plan, combined with the implementation of additional activities to reduce deforestation.
3. Land use change to cattle ranching.

Sub-step 2d. - Sensitivity analysis

[61] AMARAL, P. et al. Floresta para Sempre: um Manual para Produção de Madeira na Amazônia. Belém: Imazon, 1998. p. 130

[62] BARRETO, P. et al. Custos e Benefícios do Manejo Florestal para Produção de Madeira na Amazônia Oriental. Série Amazônia N°10 - Belém: Imazon, 1998.

[63] SCHNEIDER, R. R. et al. Amazônia sustentável: limitantes e oportunidades para o desenvolvimento. Belém: Instituto do Homem e Meio Ambiente da Amazônia (IMAZON), 2000. 58 p.

[64] 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.

[65] ARIMA, E.; BARRETO, P.; BRITO, M. Pecuária na Amazônia: tendências e implicações para a conservação ambiental. Belém: Instituto do Homem e Meio Ambiente da Amazônia (IMAZON), 2005. 76 p.
173 YOUNG, C. E. F. et al. Rentabilidade da pecuária e custo de oportunidade privado da conservação no estado do Amazonas. 2007.

[66] INSTITUTO DE CONSERVAÇÃO E DESENVOLVIMENTO SUSTENTÁVEL DO AMAZONAS (IDESAM). Viabilidade econômica da pecuária semi-intensiva no sul do Amazonas: uma oportunidade para reduzir o avanço do desmatamento. Manaus: IDESAM, 2014. 48 p.

The objective of this sub-step is to demonstrate that the conclusion regarding the financial attractiveness of the project is robust to reasonable variations in the critical assumptions. The investment analysis provides a valid argument in favor of additionality only if it consistently supports the conclusion that the proposed VCS AFOLU project without the financial benefits from carbon credits is unlikely to be financially attractive.

To carry out the sensitivity analysis, the following variables will be subject to reasonable variation:

- Cost of SFM activities, including the SFM Plan, yearly operational Plan and other documents (Brazilian Reais/year);
- Cost for forest conservation measures and social and environmental activities required by the REDD Project (Brazilian Reais/year);

And, for the Scenario III, two analyses will be developed:

- Analysis 1 – Cattle Ranching
  - Arroba value (Brazilian Reais/year)
  - Production costs (Brazilian Reais/year)
- Analysis 2 – Timber harvesting
  - m^3 value (Brazilian Reais/year)
  - Production costs (Brazilian Reais/year)

STEP 4. Common practice analysis

The previous steps shall be complemented with an analysis of the extent to which similar activities have already diffused in the geographical area of the Rio Madeira Grouped REDD+ Project activity. Similar activities to the proposed REDD project, i.e., that are of similar scale, take place in a comparable environment, inter alia, with respect to the regulatory framework and are undertaken in the relevant geographical area, shall be analyzed. Other registered VCS AFOLU Project activities shall not be included in this analysis.

During the full version of this Project Design will be available a complete common practice analysis regarding the Rio Madeira Grouped REDD+ Project.

3.6 Methodology Deviations

This project activity does not apply any methodology deviations.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Describe the procedure for quantification of baseline emissions and/or removals in accordance with the applied methodology. Include all relevant equations, and explain and justify all relevant methodological choices (e.g., with respect to selection of emission factors and default values).

4.2 Project Emissions

Describe the procedure for quantification of project emissions and/or removals in accordance with the applied methodology. Include all relevant equations, and explain and justify all relevant methodological choices (e.g., with respect to selection of emission factors and default values).

4.3 Leakage

Describe the procedure for quantification of leakage emissions in accordance with the applied methodology. Include all relevant equations, and explain and justify all relevant methodological choices (e.g., with respect to selection of emission factors and default values).

4.4 Net GHG Emission Reductions and Removals

Describe the procedure for quantification of net GHG emission reductions and removals. Include all relevant equations. For AFOLU projects, include equations for the quantification of net change in carbon stocks.

Provide the ex-ante calculation (estimate) of baseline emissions/removals, project emissions/removals, leakage emissions and net GHG emission reductions and removals in the table below.

For data and parameters monitored, use estimates. Document how each equation is applied, in a manner that enables the reader to reproduce the calculation. Provide example calculations for all key equations, to allow the reader to reproduce the calculation of estimated net GHG emission reductions or removals.

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
Year A				
Year B				
Year C				
Year…				
Total				

5 MONITORING

5.1 Data and Parameters Available at Validation

Complete the table below for all data and parameters that are determined or available at validation, and remain fixed throughout the project crediting period (copy the table as necessary for each data/parameter). Data and parameters monitored during the operation of the project are included in Section 5.2 (Data and Parameters Monitored) below.

Data / Parameter	
Data unit	*Indicate the unit of measure*
Description	*Provide a brief description of the data/parameter*
Source of data	*Indicate the source(s) of data*
Value applied	*Provide the value applied*
Justification of choice of data or description of measurement methods and procedures applied	*Justify the choice of data source, providing references where applicable. Where values are based on measurement, include a description of the measurement methods and procedures applied (e.g., what standards or protocols have been followed), indicate the responsible person/entity that undertook the measurement, the date of the measurement and the measurement results. More detailed information may be provided in an appendix.*
Purpose of Data	*Indicate one of the following:* • *Determination of baseline scenario (AFOLU projects only)* • *Calculation of baseline emissions*

	• *Calculation of project emissions* • *Calculation of leakage*
Comments	*Provide any additional comments*

5.2 Data and Parameters Monitored

Complete the table below for all data and parameters that will be monitored during the project crediting period (copy the table as necessary for each data/parameter). Data and parameters determined or available at validation are included in Section 5.1 (Data and Parameters Available at Validation) above.

Data / Parameter	
Data unit	*Indicate the unit of measure*
Description	*Provide a brief description of the data/parameter*
Source of data	*Indicate the source(s) of data*
Description of measurement methods and procedures to be applied	*Specify the measurement methods and procedures, any standards or protocols to be followed, and the person/entity responsible for the measurement. Include any relevant information regarding the accuracy of the measurements (e.g., accuracy associated with meter equipment or laboratory tests).*
Frequency of monitoring/recording	*Specify measurement and recording frequency*
Value applied	*Provide an estimated value for the data/parameter*
Monitoring equipment	*Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.*
QA/QC procedures to be applied	*Describe the quality assurance and quality control (QA/QC) procedures to be applied, including the calibration procedures where applicable.*
Purpose of data	*Indicate one of the following:* • *Calculation of baseline emissions* • *Calculation of project emissions* • *Calculation of leakage*
Calculation method	*Where relevant, provide the calculation method, including any equations, used to establish the data/parameter.*
Comments	*Provide any additional comments*

5.3 Monitoring Plan

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

- *The methods for measuring, recording, storing, aggregating, collating and reporting data and parameters. Where relevant, include the procedures for calibrating monitoring equipment.*
- *The organizational structure, responsibilities and competencies of the personnel that will be carrying out monitoring activities.*
- *The policies for oversight and accountability of monitoring activities.*
- *The procedures for internal auditing and QA/QC.*
- *The procedures for handling non-conformances with the validated monitoring plan.*
- *Any sampling approaches used, including target precision levels, sample sizes, sample site locations, stratification, frequency of measurement, and QA/QC procedures.*

Where appropriate, include line diagrams to display the GHG data collection and management system.

APPENDIX

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