

CCB & VCS Monitoring Report Template

This template is for monitoring the implementation of projects that are both validated to the third edition of the Climate, Community & Biodiversity Standards and using the VCS Program. Projects not validated to the third edition of the Climate, Community & Biodiversity Standards must use the template for the edition to which it is validated. Projects not using the VCS Program must use the CCB Monitoring Report Template. Projects not seeking CCB verification must use the VCS Monitoring Report Template.

Instructions for completing the monitoring report:

TITLE PAGE: All items in the box on the title page must be completed using Arial 10pt, black, regular (non-italic) font. This box must appear on the title page of the final document. Monitoring reports may also feature the project title and preparers' name, logo and contact information more prominently on the title page, using the format below (Arial 24pt and Arial 11pt, black, regular font).

MONITORING REPORT: Instructions for completing this template can be found under each section heading in grey or blue italicized text. The grey text represents guidance for the general, climate, community and biodiversity components of the monitoring report that must follow CCB and VCS Program rules and requirements. The blue text represents guidance for the carbon component of the monitoring report that must follow VCS project-level requirements and the applied VCS methodology. Green text at the end of section headings is reference to specific sections of CCB Program documents from which the template heading corresponds and must not be removed from the document; unless otherwise noted, the references correspond to sections of the Climate, Community & Biodiversity Standards. References that begin with 'Rules' correspond to sections of the CCB Program Rules.

This template must be completed in accordance with both standards, and the preparer will need to refer to the relevant CCB and VCS Program documents and the methodology in order to complete the template. It is also expected that relevant guidance, as it relates to the project and methodology, is followed. Note that the instructions in this template are intended to serve as a guide and do not necessarily represent an exhaustive list of the information the preparer must provide under each section of the template.

The monitoring report does not need to include information on indicators for which the conditions assessed have not changed from the validated project description, but shall include relevant information about project implementation and impacts, and any changes to project design. Unless otherwise noted in the template instructions, project implementation and impacts data must relate only to the monitoring period to be verified.

All sections must be completed using Arial 10pt, black, regular (non-italic) font, unless deviations are merited. Where a section is not applicable, same must be stated under the section (the section must not be deleted from the final document unless instructions specifically state so).

All instructions, including this introductory text, must be deleted from the final document.

RIO ANAPU-PACAJA REDD PROJECT MONITORING REPORT

Document Prepared By Michael Greene

Contact Information Michael@brazilagfor.com

Project Title	Rio Anapu-Pacaja REDD Project
Project ID	Not provided
Version	3.4
Report ID	MR 2016-2020
Date of Issue	21, June 2017
Project Location	Brazil
Project Proponent(s)	Brazil Agfor LLC Michael Greene Michael@brazilagfor.com +55-11-3042-7805
Prepared By	Michael Greene Brazil Agfor LLC Michael@brazilagfor.com +55-11-3042-7805
Validation/Verification Body	Dr. M.P Kanal / 4K Earth Science Pvt Ltda. kanal@4kearthscience.com / +91 80 4336 5728
GHG Accounting/ Crediting Period	1 January 2016 – 31 December 2055; 40 years
Monitoring Period of this Report	1 January 2016 – 30 April 2020; 4 years 4 months
History of CCB Status	First Verification
Gold Level Criteria	<i>List which Gold Level criteria are being used and provide a brief description of the activities implemented and results achieved that enable the project to qualify for each relevant Gold Level</i>

Table of Contents

The page numbers of the table of contents below shall be updated upon completion of the report.

1	Summary of Project Benefits	4
1.1	Unique Project Benefits.....	4
1.2	Standardized Benefit Metrics	5
2	General	9
2.1	Project Description	9
2.2	Project Implementation Status	23
2.3	Stakeholder Engagement.....	29
2.4	Management Capacity	37
2.5	Legal Status and Property Rights	39
3	Climate.....	45
3.1	Monitoring GHG Emission Reductions and Removals	45
3.2	Quantification of GHG Emission Reductions and Removals	90
3.3	Optional Criterion: Climate Change Adaptation Benefits	94
4	Community	96
4.1	Net Positive Community Impacts	96
4.2	Other Stakeholder Impacts	98
4.3	Community Impact Monitoring	98
4.4	Optional Criterion: Exceptional Community Benefits	101
5	Biodiversity	106
5.1	Net Positive Biodiversity Impacts	106
5.2	Offsite Biodiversity Impacts.....	110
5.3	Biodiversity Impact Monitoring	111
5.4	Optional Criterion: Exceptional Biodiversity Benefits	113
6	Additional Project Implementation Information.....	114
7	Additonal project Impact Information.....	114
	Appendicies	115
	Appendix 1: New Project Areas and Stakeholders	115
	Appendix 2: Project Risks Table	117
	Appendix 3: Additional Information	138

1 SUMMARY OF PROJECT BENEFITS

The project protects over 165,707 ha in Portel, Para one of the most highly threatened regions of the Amazon. The project has clear benefits in the reduction of GHG emissions. The project has a strong social goal and that is to provide full land tenure including title to all the riverine people (traditional people) that live around the project area. As well as improve the economy of the riverine people. In addition to this the project has delivered eco-cook stoves to everyone that wants one. The project has already been successful in bringing stability to the area and targeting the drivers of deforestation and destruction.

This section highlights some of this project's important benefits. Section 1.1 (Unique Project Benefits) should be aligned with a project's causal model and is specific to this project. Section 1.2 (Standardized Benefit Metrics) is the same quantifiable information for all CCB projects. This section does not replace the development of a project-specific causal model or the monitoring and reporting of all associated project-specific impacts (positive and negative) in Sections 2-5 of this document.

1.1 Unique Project Benefits

Insert the brief summaries of two to five benefits of the project not captured by the standardized benefit metrics in Section 1.2 (these may be the same as those listed in Section 1.1 of the project description). For each outcome or impact, assess the net benefit the project has achieved during the monitoring period covered by this report and in the time since the beginning of the project lifetime (if this is the project's first verification report, the two columns the same). Achievements included in the monitoring period column shall be substantiated in this document as denoted by the corresponding section reference.

Additional project benefits not anticipated in the project description or captured in Section 1.2 (Standardized Benefit Metrics), below, may be added, keeping in mind that these benefits may be reported on in subsequent monitoring reports.

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
1) Cook stove distributed to community people	50 people benefitted	2.1.1	Same as Monitoring Period
2) Land Demarcation to prevent dislocation and eviction : land tenure related issues solved	127 people (Over 8,000 hectares) registered in the program to obtain the use from land that was titled as private property as par to the project and is shifted over to the riverine people to be their land. The CAR documents can be found in the government website for the Environmental Ministry for the state	2.1.1	Same as Monitoring Period

	of Para – all 50 are there.		
3) Sustainable Agro-forestry Technics	50 people benefitted in learning about alternative cash crops which will improve the economy once they use this training and implement projects. This helps the local population and transitions them away from nearly solely relying on Cassava production which has very little economic benefit.	2.1.1	Same as Monitoring
4) Bio-diversity Monitoring	50 people were trained to monitor the fauna that would enter the area in the vicinity of their hmes. They were guided to use their cell phone cameras to take pictures and record the animals that they saw..	2.1.1	Same as monitoring.

1.2 Standardized Benefit Metrics

For each metric, quantify the net benefit the project has achieved during the monitoring period covered by this report and since the project start date (if this is the project's first verification report, the two columns the same). Insert "not applicable" where the metric does not apply and "data not available" where the metric does apply but there are no means of quantification. Data included in the monitoring period column shall be substantiated in this document as denoted by the corresponding section reference.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	Net estimated emission removals in the project area, measured against the without-project scenario	0		0
	Net estimated emission reductions in the project area, measured against the without-project scenario	4,359,748	3.2.4	40,154,304
For est ¹ cover	For REDD ² projects: Number of hectares of reduced forest loss in the			

¹ Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	project area measured against the without-project scenario			
	For ARR ³ projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario	NA		-
Improved land management	Number of hectares of existing production forest land in which IFM ⁴ practices have occurred as a result of the project's activities, measured against the without-project scenario	NA		-
	Number of hectares of non-forest land in which improved land management has occurred as a result of the project's activities, measured against the without-project scenario	5,000 hectares	4.3.1	Sam as Monitoring Period
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	50	2.2.6	Same as Monitoring Period
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities of project activities	50	2.2.6	Same as Monitoring Period
Employment	Total number of people employed in of project activities, ⁵ expressed as number of full time employees ⁶	11	2.3.8	Same as Monitoring Period

² Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (*VCS Program Definitions*)

³ Afforestation, reforestation and revegetation (ARR) - Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (*VCS Program Definitions*)

⁴ Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood and fuelwood (*VCS Program Definitions*)

⁵ Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers and community members that are paid to carry out project-related work.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	Number of women employed in project activities, expressed as number of full time employees	3	2.3.8	Same as Monitoring Period
Livelihoods	Total number of people with improved livelihoods ⁷ or income generated as a result of project activities	193	2.1.4	Same as Monitoring Period
	Number of women with improved livelihoods or income generated as a result of project activities	50	2.1.4	Same as Monitoring Period
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	22	2.1.7	Same as Monitoring Period
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	11	2.1.7	Same as Monitoring Period
Education	Total number of people for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	43	4.4	Same as Monitoring Period
	Number of women and girls for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	22	4.4	Same as Monitoring Period
Water	Total number of people who experienced increased water quality and/or improved access to drinking water as a result of project activities,	50	2.2.1	Same as Monitoring Period

⁶ Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region or economic territory (adapted from UN System of National Accounts (1993) paragraphs 17.14[15.102];[17.28])

⁷ Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. *The Sustainable Livelihood Approach to Poverty Reduction*. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	measured against the without-project scenario			
	Number of women who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	50	2.2.1	Same as Monitoring Period
Well-being	Total number of community members whose well-being ⁸ was improved as a result of project activities	193	2.2.1	Same as Monitoring Period
	Number of women whose well-being was improved as a result of project activities	93	2.2.1	Same as Monitoring Period
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation, ⁹ measured against the without-project scenario	N/A		Same as Monitoring Period
	Number of globally Critically Endangered or Endangered species ¹⁰ benefiting from reduced threats as a result of project activities, ¹¹ measured against the without-project scenario	N/A		Same as Monitoring Period

⁸ Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Health, Education, Water, etc.), but could also include other benefits such as empowerment of community groups, strengthened legal rights to resources, conservation of access to areas of cultural significance, etc.

⁹ Biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation.

¹⁰ Per IUCN's Red List of Threatened Species

¹¹ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

2 GENERAL

2.1 Project Description

2.1.1 Implementation Description

Provide a description of the implementation status of the project, including the following (no more than one page): A summary description of the implementation status of the technologies/measures (e.g., plant, equipment, process, or management or conservation measure) included in the project. The operation of the project activity(s) during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring. Describe how leakage and non-permanence risk factors are being monitored and managed. The total GHG emission reductions or removals generated in this monitoring period. Any other changes (e.g., to project proponent or other entities).

Date	Milestone(s) in the project's development and implementation
June 5, 2012	The Rio Anapu-Pacaja REDD Project contract was signed to place the land into a REDD carbon credit project.
2016	The community groups were contacted and one-on-one meetings took place to gain support for the project signature goal of inserting into the government database the necessary documentation to allow each family to gain land tenure documents.
2017	Eco-Stoves were delivered for 17 families The first land tenure documents were inserted into the government database
2018	Eco-Stoves were delivered to 17 families in the project area
2019	Eco-Stoves were delivered to 17 families. Some land survey work was completed for each family.
2020	Additional land survey work for each family parcel is being completed so that the data can be submitted to the government for the final step in a long process to gain land title deeds for each Riverine family.

The project has given out 50 cook stoves in 2017, 2018 and 2019 period. These cook stoves have a tremendous benefit in the region for several regions.

The unique cook stove benefits are as follows:

Improved health by having a fuel efficient cook stove that is not going to create as much smoke and use as much fuel. Reduction of indoor pollution.

Improved time to cook as it is two burner stove

Controlled fire, so less risk burning down the house.

Smaller so for those who cook outside they can now cook inside, due to common rain in the region the woman get wet, and then can get sick,

Improved environment so that large fires and trees don't need to cut to make fire wood for cooking.

Improved water quality when it is necessary to boil water for drinking.

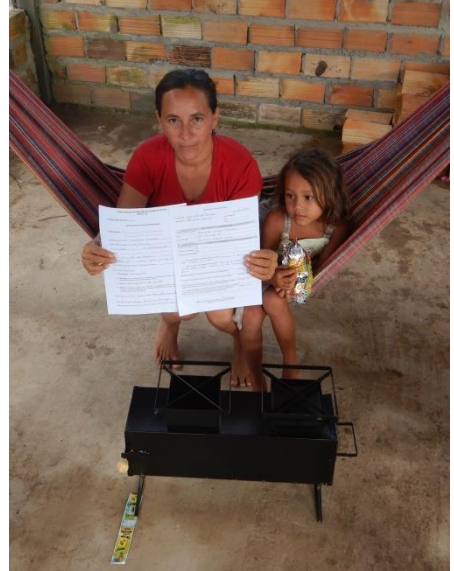
Improved cleanliness as easier to start the stove, easier to clean the ash, and easier to use in general.

Primary benefactors are woman as it is not customary for men to cook in the region. Far easier for the woman. Less time to cook means women spend more time in agroforestry activities which are traditionally the domain of men.

The pictures were taken of a few people who have received cook stoves during the monitoring period. The paper they are holding is the receipt of the cook stove.

Picture, 1, 2 3, 4, 5: Riverine people with Cook stoves and Reciepts





Land Tenure for the Community Groups

In the project area the main focus is to help with land tenure related issues. The project has been assessing the needs of the riverine with the goal to help them gain land tenure rights, including the final goal of title. The locals faced serious risks and serious prejudice as they held no real land related title document. Without proper documentation the local community groups faced dislocation by the drivers of deforestation and if not dislocation, they faced altered traditional life.

The risks to the locals:

- 1.) Physical removal and displacement by illegal loggers, land grabbers, rural syndicates that use their power to extort the locals.
- 2.) Lack of ability to get loans for planting crops without title.
- 3.) Lost real estate value due to a lack of, if they want to move, they get up and leave and lose everything behind, which results in a lack of mobility, but if they have an ability to sell their real estate title and land, they have higher mobility, they can sell the land for a large capital gain and move as they want.
- 4.) Lack of “want” to invest back into land that is not theirs, so they result in an underperforming personal economy. Why invest if they lose it all from day to night, there is no reason.
- 5.) Overall instability in the region is exacerbated when hundreds of families are living with precarious or non-existent land tenure rights. The drivers of deforestation utilize this instability to claim the region is a conflict region, and in conflict regions they then claim law and order is restricted, thus the drivers of deforestation can invade at will. By bringing stability to the riverine people, it restricts the deforestation in the adjacent project area.

The goal of the project was to use the following steps to gain the ultimate goal of title for each family:

Step 1: Cadastrol Ambiental Rural – this is a government program launched in 2008 that was paid for by the Norwegian government via the Amazon Fund that is overseen by the Brazilian development bank BNDES.

In order for us to gain the Cadastrol Ambiental Rural for a family we must physically go to each family's house and conduct one on one meetings. In these meetings we are able to gain the location of where their house is, the approximate land boundaries for where the community person believes his land is. We also are able to gain the ID numbers for that person so the data can be submitted to the government.

During these meetings the team of technicians explained what the carbon credit project was, how it works and gained Free and Prior Consent for this.

Step 2: A formal survey of the land, which has been conducted on over 25 of the 50 plots so far, which the remaining 25 being completed in January of 2020.

Step 3: A request of donation from the government land agency of ITERPA of up to 100 hectares per family.

By April 30, 2020 a total of 127 families that are adjacent to the project area.

Figure 1, 2: Picture of an example Cadastrol Ambiental done for one of the families


RECIBO DE INSCRIÇÃO DO IMÓVEL RURAL NO CAR

Registro no CAR: PA-1505809-058B.CSFA.B22D.4C9F.B96C.EDB2.EFCF.D4CC Data de Cadastro: 26/11/2018 19:46:07

RECIBO DE INSCRIÇÃO DO IMÓVEL RURAL NO CAR

Nome do Imóvel Rural: SÍTIO TEREZA SANTOS	
Município: Porel	UF: Para
Coordenadas Geográficas do Centro do Imóvel Rural: Latitude: 02°17'28.06" S	Longitude: 51°27'23.1" O
Área Total (ha) do Imóvel Rural: 99.2431	Módulos Fiscais: 1.4178
Código do Protocolo: PA-1505809-3ASE.BB67.FA85.72F5.1522.1FC8.BDE6.8F6D	

INFORMAÇÕES GERAIS

1. Este documento garante o cumprimento do disposto nos § 2º do art. 14 e § 3º do art. 29 da Lei nº 12.651, de 2012, e se constitui em instrumento suficiente para atender ao disposto no art. 75-A da referida lei;
2. O presente documento representa a confirmação de que foi realizada a declaração do imóvel rural no Cadastro Ambiental Rural-CAR e que está sujeito à validação pelo órgão competente;
3. As informações prestadas no CAR são de caráter declaratório;
4. Os documentos, especialmente os de caráter pessoal ou domínial, são de responsabilidade do proprietário ou possuidor rural declarante, que ficam sujeitos às penas previstas no art. 299, do Código Penal (Decreto-Lei nº 2.848, de 7 de setembro de 1940) e no art. 59-A da Lei nº 9.805, de 12 de fevereiro de 1996;
5. O demonstrativo da situação das informações declaradas no CAR, relativas às áreas de Preservação Permanente, de uso restrito e de Reserva Legal poderá ser acompanhado no site eletrônico car.gov.br;
6. Esta inscrição do Imóvel Rural no CAR poderá ser suspensa ou cancelada, a qualquer tempo, em função do não atendimento de notificações de pendência ou inconsistências detectadas pelo órgão competente nos prazos estabelecidos ou por motivo de irregularidades constatadas;
7. Este documento não substitui qualquer licença ou autorização ambiental para exploração florestal ou supressão de vegetação, como também não dispensa as autorizações necessárias ao exercício da atividade econômica no imóvel rural;
8. A inscrição do Imóvel Rural no CAR não será considerada título para fins de reconhecimento de direito de propriedade ou posse;
9. O declarante assume plena responsabilidade ambiental sobre o Imóvel Rural declarado em seu nome, sem prejuízo de responsabilização por danos ambientais em área contígua, posteriormente comprovada como de sua propriedade ou posse.

CAR - Cadastro Ambiental Rural

Página 1/2




RECIBO DE INSCRIÇÃO DO IMÓVEL RURAL NO CAR

Registro no CAR: PA-1505809-058B.CSFA.B22D.4C9F.B96C.EDB2.EFCF.D4CC Data de Cadastro: 26/11/2018 19:46:07

INFORMAÇÕES ADICIONAIS

Não foi detectada diferença entre a área do imóvel rural declarada conforme documentação comprobatória de propriedade ou posse e a área do imóvel identificada em representação gráfica.

REPRESENTAÇÃO GRÁFICA



IDENTIFICAÇÃO DO PROPRIETÁRIO/POSSUIDOR

CPF: 048.052.192/11 Nome: TEREZA ARAUJO DOS SANTOS

ÁREAS DECLARADAS (em hectares)

Imóvel	Imóvel
Área Total do Imóvel	Área Consolidada
99.2431	6.1621
Área de Serviço Administrativa	Remanescente de Vegetação Nativa
0.0000	0.0000
Área Líquida do Imóvel	Reserva Legal
99.2431	0.0000
APP / Uso Restrito	Área de Reserva Legal
0.8779	0.0000
Área de Preservação Permanente	
0.0000	
Área de Uso Restrito	

CAR - Cadastro Ambiental Rural

Página 2/2



All 127 Cadastrol Ambiental Rural in the evidence folder for the project.

Picture 6 and 7: shows the Survey Team with equipment, prior to departure to the Project LMA to complete land tenure surveys until everything in the region is completed.



Figure 3: In the screen shot below there are numerous polygons in the map below show the Cadastrol Ambiental Rural certificates that have been completed. The red rectangle has been inserted to show the CAR that was done in regards to the Rio Anapu-Pacaja REDD project. The Project area is directly above these polyoygons.



The positive impacts of land tenure for the poor are the following:

- Security – having security of your home, your location your plot in this region is crucial. There has been over 25 land conflict related murders in the last 10 years in this region.
- Improved economy – Everyone was investing the bare minimum into their property because at any time they could face eviction. Now with rights to the land, and security to have the land, they can invest into more complicated crops such as black pepper, which have a long term pay out.
- Stability & health – The community groups main preoccupation is displacement. By no longer fearing a situation of dislocation the families are able to focus on improving their life, improving their health, the education of their children

- Environment – 100 hectares is what each family gains, this helps reduce a major risk to the project area, as the community groups both protect the forest and prevent further invasion into the region which causes deforestation.

Improved Economy:

The project has had one-on-one discussions with 127 families in the project area. Mostly the woman, and have discussed alternative sources of income such as black pepper, Acai, Cocoa, Cupuacu, and Honey production.

The goal of these one-on-one discussions is to work to convince the community groups to focus on new and better projects for land usage that brings in a much stronger return on investment over time.

2.1.2 Project Category and Activity Type

Project Scope: Agriculture, Forestry and Other Land Use (AFOLU)

Project Category: Reducing Emissions from Deforestation and Degradation (REDD)

Type of Activity: Avoided Unplanned Deforestation & Degradation (AUDD)

Reference of Methodology: Approved VCS Methodology for Avoided Unplanned Deforestation (VM0015) V1.1

Indicate the AFOLU project category (e.g., ALM, IFM, WRC) and activity type, if applicable (e.g. ICM, RIL, RWE). Also indicate whether the project is a grouped project.

2.1.3 Project Proponent(s)

Provide contact information for the project proponent(s). Copy and paste the table as needed.

Organization name	Brazil Agfor L.L.C
Contact person	Michael Greene
Title	Landowner and Director
Address	Rua Cabo Joao Teruel Fregoni 307 apt 124 Ponte Grande, Guarulhos, Sao Paulo CEP 07.032-000
Telephone	+55-11-3042-7805
Email	Michael@brazilagfor.com

2.1.4 Other Entities Involved in the Project

Provide contact information and roles/responsibilities for any project participant(s) for which information was not provided in the cover page of this document. Copy and paste the table as needed.

Organization name	Brazil Agfor L.L.C.
Role in the project	Project Manager, Project Coordinator, Landowner
Contact person	Michael Greene
Title	Project Manager
Address	Rua Cabo Joao Teruel Fregoni 307 apt 124 Ponte Grande, Guarulhos, Sao Paulo CEP 07.032-000
Telephone	+55-11-9-7020-3200
Email	Michael@brazilagfor.com

2.1.5 Project Start Date (G1.9)

The project started on January 1, 2016

Although, forest protection initiatives and activities were developed prior, setting a 2016 project start date was a conservative approach to make sure the project had enough monitoring and enforcement experience to start producing conservation results.

No actual help to the riverine people occurred prior to 2016, besides informal conversations.

2.1.6 Project Crediting Period (G1.9)

The crediting period for the project is for a period of 40 years starting from May.

Indicate the project crediting period, specifying the day, month and year for the start and end dates and the total number of years.

2.1.7 Project Location

The project is located in northwest of Brazil, in the State of Para, micro region of Portel, municipality of Portel (Map 1). The regular main transport to arrive in Portel is by boat, the trip takes approximately, 8 hours from Belem. Some parts of the area are also accessible by car, as the network of roads of the Transamazonica highway (BR-230) has already connected to logging (pioneer) roads that keep developing in the project area.

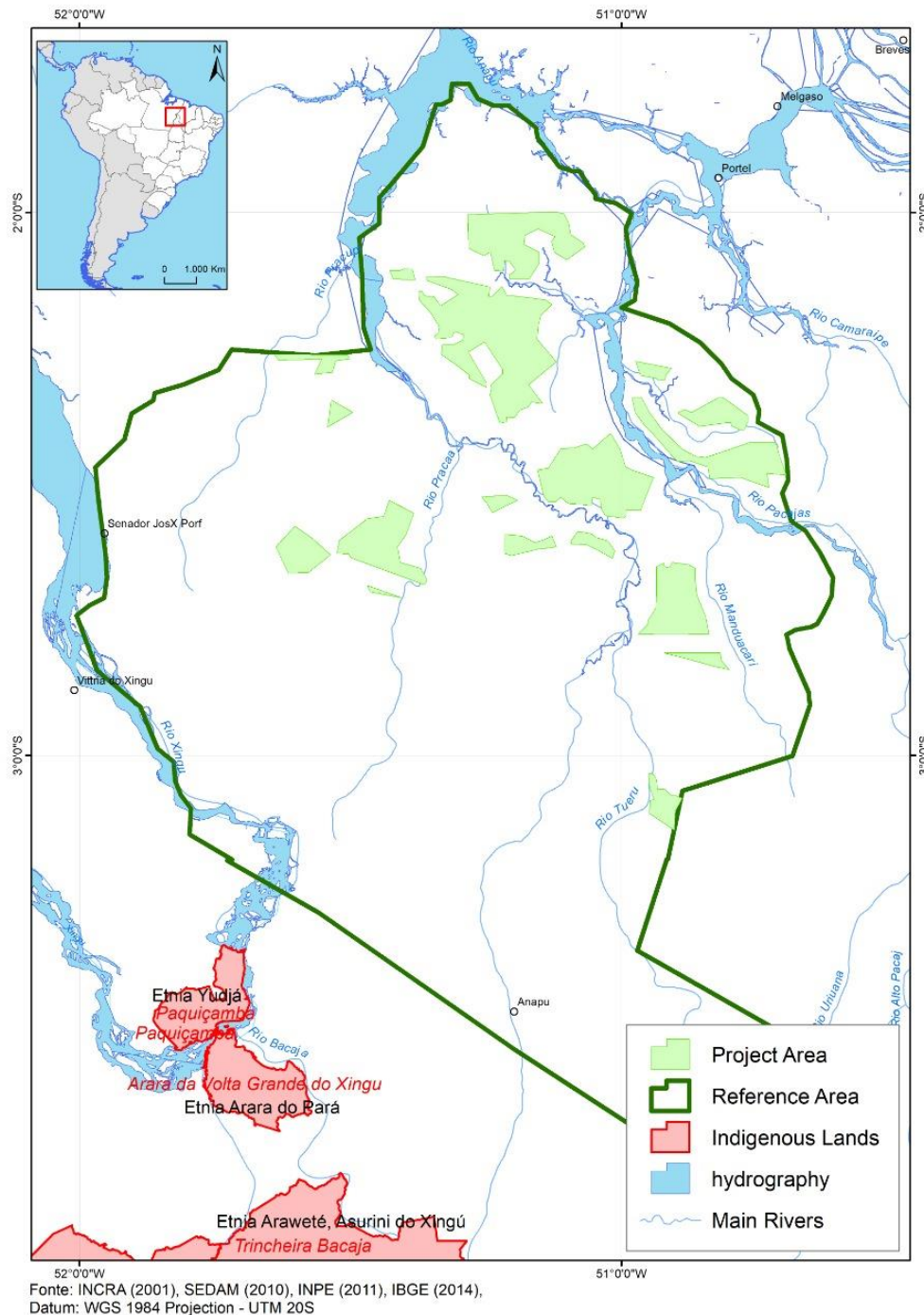
The land of the Project (LP) has 182,210 ha and the Project Area (PA) has 165,707 ha.

In total, the project area is constituted by 36 different individually titled properties registered in the registry office of Portel, Para.

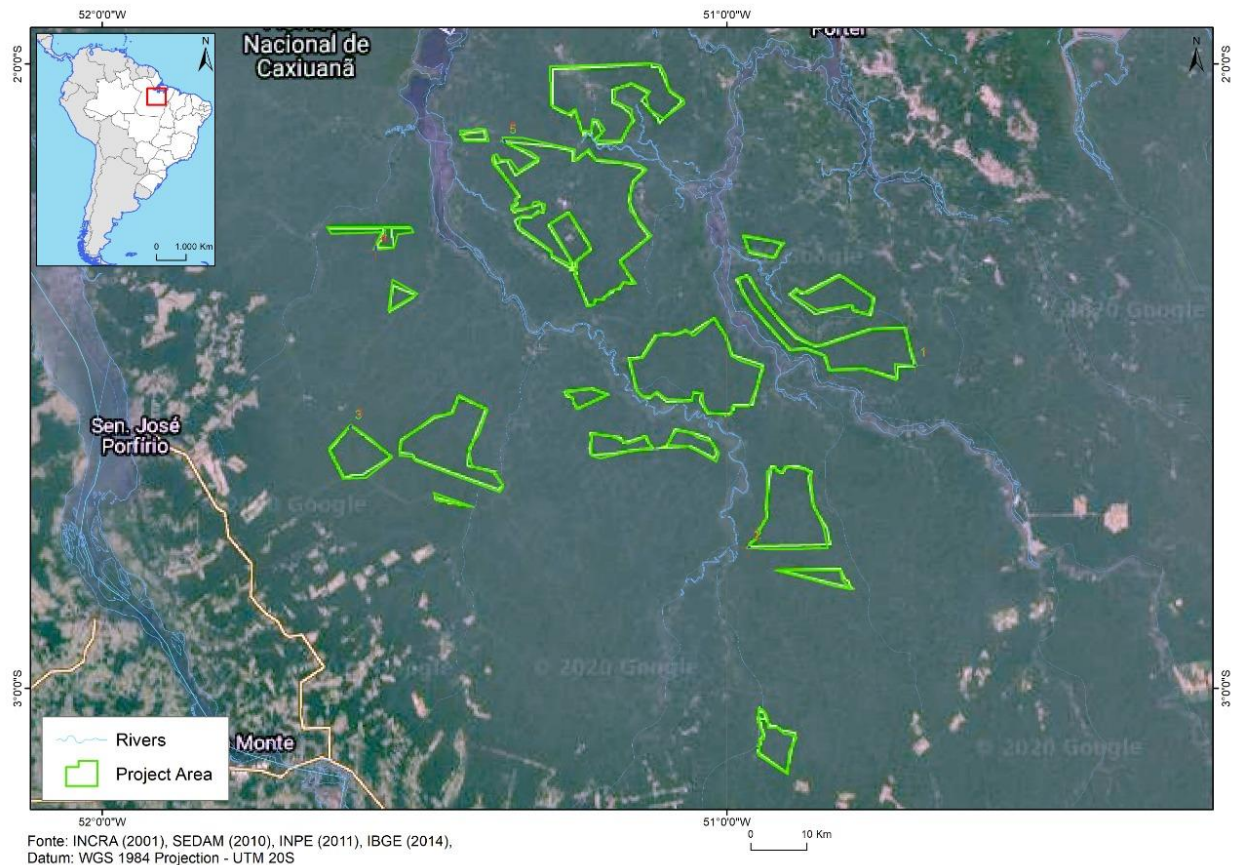
All properties have certified Maps with the Federal Land agency known as INCRA.

The Leakage Management Area is constituted as the Riverine communities that are without title, but are neighboring to the project area.

Map 1: Project area – 165,707 hectares

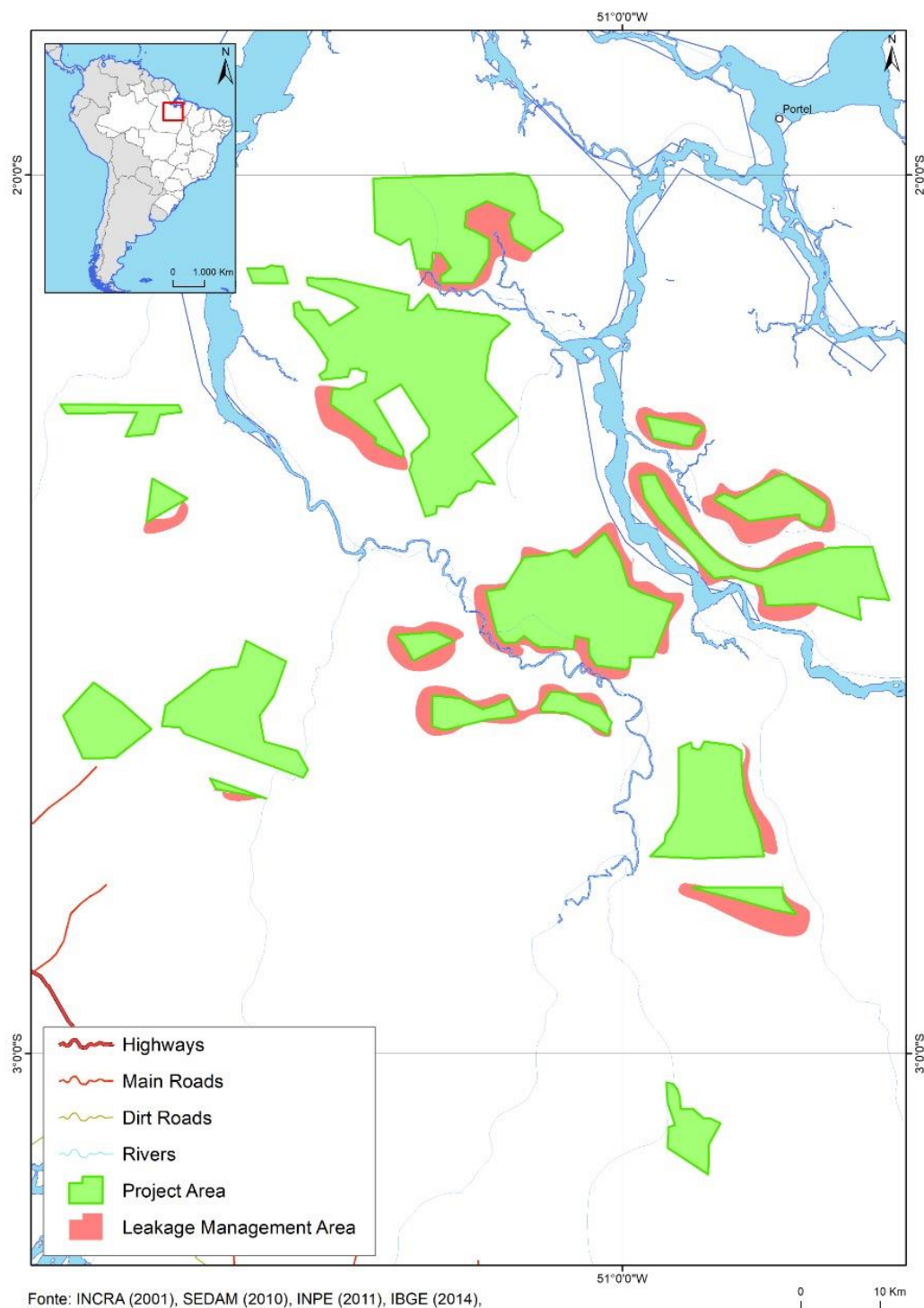


Map 2: Satellite Picture of Project Area



Map 2: Leakage Management Area – 16,503 hectares

Project Area in Green
Leakage Management Area in red



Indicate the project location and geographic boundaries (if applicable) including geodetic coordinates. Coordinates may be submitted separately as a KML file.

2.1.8 Title and Reference of Methodology

The project has been developed using the guidelines in VCS VM0015 REDD Methodology: Methodology for unplanned deforestation V1.1.

As part of the first verification the project has followed the following documents and tools:

VCS Program Guide 3.4
VCS Program Standard 3.4
VCS AFOLU Requirements Version 3.4
VCS Tool VT001 Version 3.0 – Tool for demonstration and Assessment of Additionally in AFOLU Project Activities.
VCS AFOLU Non-Permanence Risk Tool Version 3.4

As part of the second verification the project follows and uses the following documents and tools:

VCS Program Guide 3.4
VCS Program Standard 3.4
VCS AFOLU Requirements Version 3.4
VCS Tool VT001 Version 3.0 – Tool for demonstration and Assessment of Additionality in AFOLU Project Activities.

2.1.9 Other Programs (G5.9)

The project has not nor does it intend to create non-VCS/CCB GHG emissions reductions or any another form of environmental credits or social credits for this monitoring period and a declaration to this effect is submitted to VVB. The publication of Law No. 12,651/2012 and also Decree No. 7,830/2012 and No. 8,235/2014 brings important advances in land use planning and is essential both for conservation and/or environmental preservation and rural property regularization in Brazil. These advances can be evidenced by the adhesions to the Rural Environmental Registry (CAR) and the Environmental Regularization Program (PRA), which clearly demonstrate the percentage of areas in rural properties conserved with native vegetation, a condition that contributes to the maintenance of many ecosystem services, including those related to the maintenance of aquifers and water resources. This is because CAR and PRA bring, in a parallel and permanent way, strategies for the management of rural enterprise, since adhesion to the Registry establishes the areas that can be occupied, the Areas of Permanent Preservation (APP) and the percentages of Legal Reserve recovery, conservation and/or compensation, as indicated in legislation. It is the set of actions or initiatives that must be developed by rural landowners and/or squatters to adapt and promote the environmental regularization of their properties, as established in Federal Decree No. 7,830 from October 17, 2012 and Federal Decree No. 8,235 from May 5, 2014

Brazil does not have a cap-and trade related to forest land. Brazil does partake in the Clean Development Mechanism (CDM) – however CDM does not include REDD.

Include the following information, as applicable:

- Emission Trading Programs and Other Binding Limits: Where the project reduces GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading (as identified in the project description, or where such programs or mechanisms have subsequently emerged) demonstrate that net GHG emission reductions or removals generated during this monitoring period have not be used for compliance under such programs or mechanisms. Examples of appropriate evidence are provided in the VCS Standard.
- Other Forms of Environmental Credit: Indicate whether the project has sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period. Include all relevant information about the GHG-related environmental credits and the related program. Additionally, provide a list of all and any other programs under which the project is eligible to create another form of GHG-related environment credit.
- Participation under Other GHG Programs: Indicate whether the project is registered under any other GHG programs and, where this is the case, provide the registration number and details. Provide details of any GHG credits claimed under such programs.

2.1.10 Sustainable Development

Following the Warsaw Framework for REDD-plus adopted at the UN Climate Change Conference COP19, Brazil is the first country to voluntarily submit and have a forest reference emission level technically assessed and also the first country to submit REDD-plus results in a technical annex to the Biennial Update Report (BUR) for technical analysis. A key component of Brazil's National Climate Change Policy is the voluntary reduction in greenhouse gas emissions. The Project is in compliance with this voluntary target because the Project is a Reducing Emissions from Deforestation and Degradation (REDD+) project. Furthermore, this compliance is demonstrated via periodic verifications of the Project.

Describe how the project contributes to achieving any nationally stated sustainable development priorities, including any provisions for monitoring and reporting same.

2.2 Project Implementation Status

2.2.1 Implementation Schedule (G1.9)

Indicate the key dates and milestones in the project's development and implementation (e.g., dates of construction, commissioning, start of project activities, legal/community agreements and continued operation periods), making note of where these dates have changed since the last validation or verification. Add rows to the table below as necessary.

Activities	Indicator	Status	Monitored Impact
Patrolling activities	Control program	Implemented	Forest conservation / GHG emission reductions
Legal process to make evident the presence of the landowner and to demonstrate clear land tenure	Negotiation tables	Frequent dialogue with community members through workshops and capacity development activities	Forest conservation / GHG emission reductions
Provide training on forest and biodiversity monitoring and management, as well as opportunities to work as a monitoring/enforcement staff	One on One Meetings with each household	Annual trainings and awareness have been conducted for the entire monitoring period	Forest conservation / GHG emission reductions / strengthening community capacity
Providing capacity building on improved efficiency cook stoves and implement cook stove pilots	One on One meetings with each household	50 cook stoves have been deployed	Forest conservation / GHG emission reductions / strengthening community capacity

Summary:

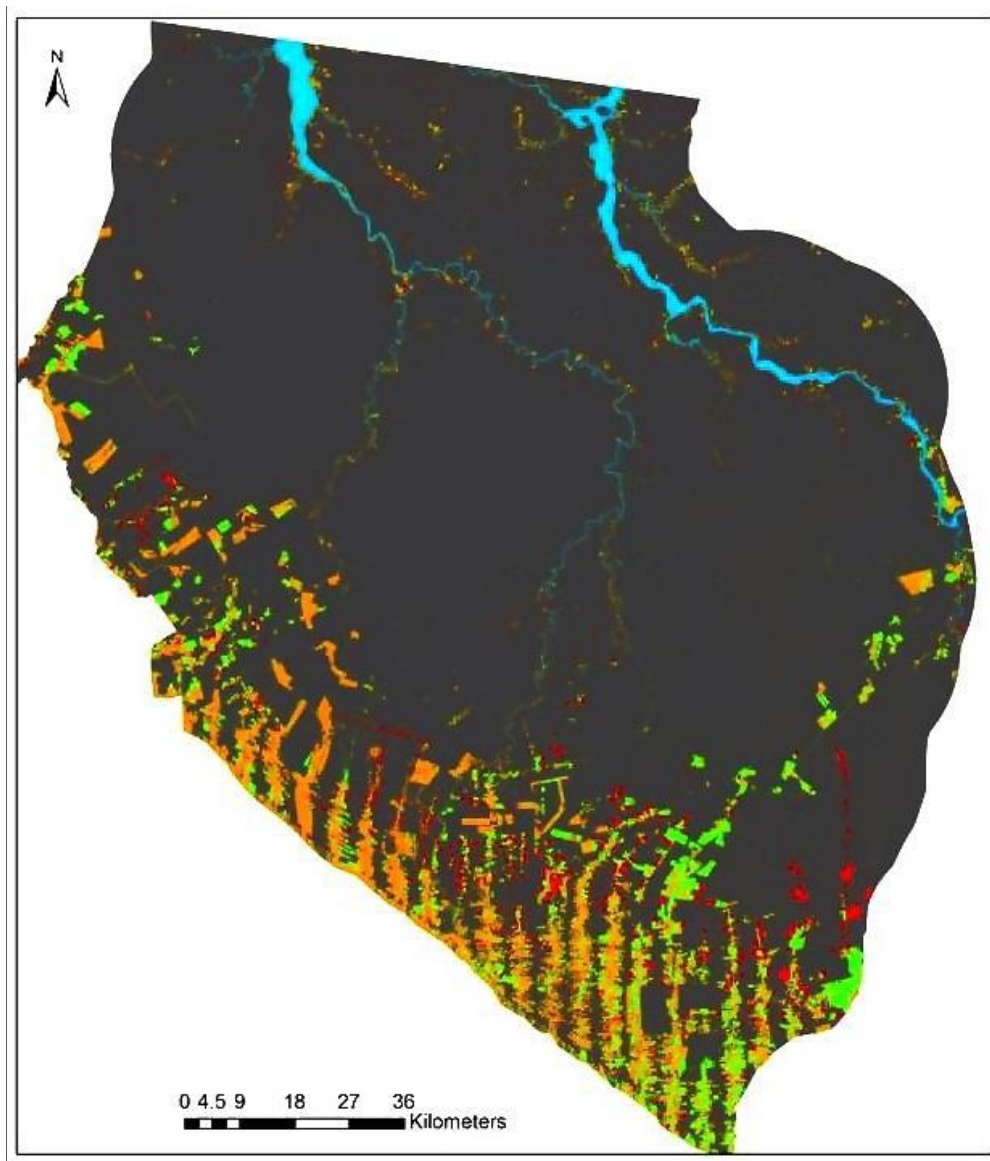
The project has been conducting on the ground monitoring and enforcement throughout the second monitoring period. The landowner has been sending teams during the dry season to patrol all his lands. The patrols would generate hand-written monitoring reports during the field trip and once in Portel they would report illegal activities. (i.e., loggers and / or squatters) through anonymous phone calls to IBAMA. Once back in Belem, the team would transcribe the

information and translate it to English. All reports (original and translations) are kept in electronic format.

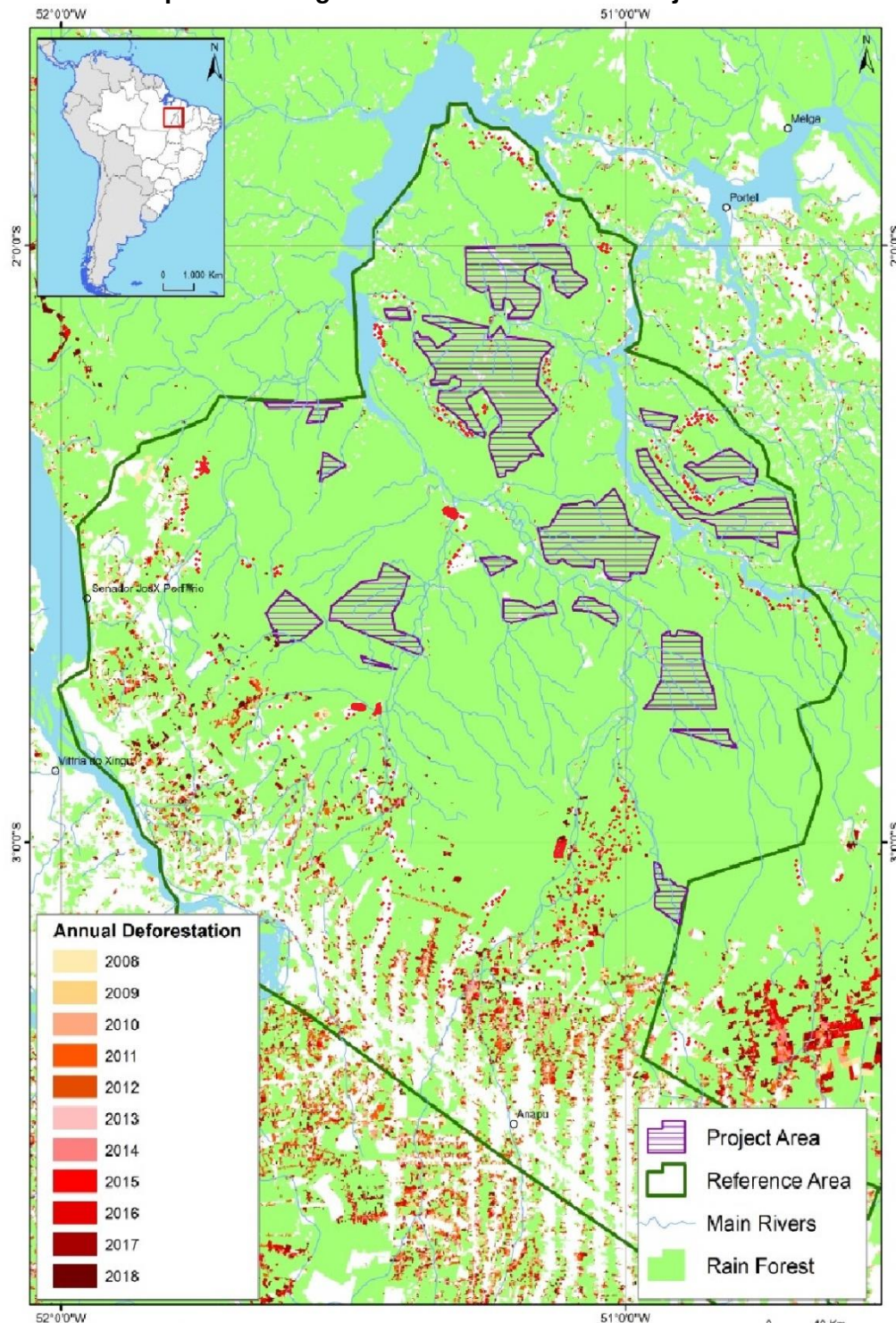
Further control and monitoring activity has taken place by making sure the land is registered into the INCRA database of the government, to allow potential land grabbers from seeing the land is already with an owner.

When land grabbing does take place the only remedy in Brazil is to target the land grabber in the horribly slow Brazilian legal system. However once in the legal system it restricts the land grabber from deforesting the area that the specific land grabber has targeted.

Figure 4: Leakage monitored using Landsat TM image



Map 04: Leakage Monitored around the Project Area



For this verification period, leakage has been monitored using a 2020 TERRA Brasil, INPA satellite data for deforestation.

2.2.2 Methodology Deviations

- No deviations.

2.2.3 Minor Changes to Project Description (*Rules 3.5.6*)

The whole project document is updated to VCS CCB Project Description Template CCBv3.0-VCS v3.4

Document any community or biodiversity changes to project design not requiring a project description deviation that occurred during the monitoring period compared with the validated project description. Include justification for the changes and demonstration that the changes are in conformance with the requirements of the Climate, Community & Biodiversity Standards criteria and indicators.

2.2.4 Project Description Deviations (*Rules 3.5.7 – 3.5.10*)

Not applicable – No deviations

Describe any project description deviations applied during this monitoring period, identify which section(s) of the project description have been updated and explain the reasons for the deviation. Identify whether the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario and provide an explanation of the outcome.

Describe and report on any project description deviations applied in previous monitoring reports.

2.2.5 Grouped Projects

Not applicable

2.2.6 Risks to the Project (*G1.10*)

Human induced risks

The greatest human induced risk to the Project's benefits is continued deforestation and government programs that support the invasion and subsequent deforestation of private properties, even if they are already owned by other people.

The Project Zone is undergoing large pressures for new agricultural land from both the expanding population and on-going immigration into the area.

Mitigation for this risk is through the Project Activities, mainly in the form of increased protection of the Project Area, creation of new income generating activities and through the promotion of improved agricultural methods as described in the Project Description Section.

The project is embarking on massive legal spending to halt the invasion of land in the project area that is being “virtually invaded” This is when a person uses a government program, registers a survey map in the government program and proceeds to try to gain title.

Land Grabbing takes place with similar steps that the project takes to help the Riverine community groups gain title. However in the case of land grabbers they pay multiple straw men money in order for them to use the persons ID number and they round up 40 or 50 people to land grab 40 or 50 plots, each plot about 1000 hectares. The program up until 2018 allowed up to 1500 hectares to be claimed.

The Project in this monitoring period has continued to reduce the risk of leakage, illegal logging and fire by building strong partnerships with villas in the Project Boundaries and its vicinity thus preventing deforestation activities to start.

The project is able to halt the land grabbing by employing attorneys to aggressively target when these virtual invasions take place.

Illegal logging risks was mitigated through a number of measures including demarcating boundaries and posting signage, and regular patrolling.

Natural Risks

The region in which the Project is located is not generally susceptible to severe or destructive natural events. Due to the fact it is a true rainforest and falls into the inter-tropical region, thus gains heavy rains year round. Other parts of the Amazon away from the equator have prolonged dry seasons which causes there to be higher risk to fire.

The primary types of natural events that could occur would be geologic events, pests or disease, flooding or a fire in the south side of the project area. The area is not prone to any geologic activity and poses little to no risk to the Project. As the Project Area is a native and bio diverse ecosystem the risk from pests or disease that result in significant emissions reversal is low. The primary mitigation for this risk is to maintain the forest, and ensure through monitoring that the trees and ecosystem remain healthy and intact. There can be minor seasonal flooding from the annual strong rain season. However, the species of this area are all adapted to the hydrological cycles and are not liable to flooding. The Project Area is not mountainous and there is a no risk of erosion or landslides.

The risk of human induced fire has the most potential to cause damage to the forests of the Project Area. However, the risk of significant emissions reversal is low. There have been no catastrophic fires in forests of this type in this region. Therefore, natural events have low risks to the Project’s benefits.

The VCS non-permanence risk report submitted identified such risks as minimal which is applicable for this monitoring period.

1. Communities lack of effectiveness to control the Conservation Forest area

The Project did provide permanent land use rights against results for conservation to those families living within the Project Boundary. Families were trained to monitor the area and to protect the forest.

With the completed census, and knowing who individually owns what, if a family breaks the Conservation Forest Area plan, it is easy to identify who they are and future benefits from the project will be curtailed if the behavior continues. The project has no way to revoke title that has been provided the riverine people. Around 220 CARs were registered for this monitoring period.

2. Population growth forces agricultural expansion in project area.

Although population is growing in the area, it is clear from the PRA and the LULC change analysis that small-scale agriculture is not a significant driver of deforestation in the area. Nevertheless, the Project includes capacity building on agroforestry techniques to help riverine people to develop more efficient crop systems that require less area and longer rotation times, thus reducing the need of clearing forest patches under regeneration. 50 members of the community benefited from such trainings during this monitoring period.

3. Loss of carbon stocks through fire, illegal felling, and land clearing

The Project has reduced the risk of leakage, illegal logging and fire by building strong partnerships with the households in the Project Boundaries and its vicinity thus preventing deforestation activities to start. This includes by giving out cook stoves and also paying for the riverine in these locations to gain title. Also, capacity building workshops were held to better monitor the forest, thus preventing further LULC change in the area.

Illegal logging risks were mitigated through a number of measures including demarcating boundaries and posting signage, blocking machinery access through trenching and other methods.

Describe actions needed and implemented to mitigate likely natural and human-induced risks to the expected climate, community, and biodiversity benefits during this monitoring period.

The Project Risks Table (see Appendix 2) may be used if appropriate. Delete if not used.

2.2.7 Benefit Permanence (G1.11)

Community activities are designed to transform local economies over the life of the Project. In this regard, the focus of the Anapu-Pacaja developed local business and income-generating activities that are critical components of a long-term low carbon economy. Project activities that met this overarching objective focus on education, sustainable agriculture, community-based ecotourism and sustainable management of natural resources. These activities reduced the necessity of community members to deforest and degrade the Project Area. During the Project Lifetime, this is achieved, for example, facilitating better education, through training farmers in sustainable agriculture.

The project focuses on three principal strategies to ensure the maintenance and enhancement of the project benefits beyond the project lifetime. For this monitoring period also the focus is the same.

1. Skill and capacity development.
2. Goal of permanent Land ownership
3. Health benefits

1. The skills are learnt by the communities throughout the projects lifetime. These relate to better land resource management. The project has initiated several awareness programmes for efficient use of land for agricultural practices and has also provided cook stoves which have the benefit of lessening the time for Farinha production and the overall cooking time. The protection of the forests itself ensure that due to lesser degradation there is greater potential to provide timber and non-timber forest products on a sustainable basis. The community has been made aware and trained in alternative crops of agroforestry such as black pepper, honey or andiroba oil. Around 200 community members have received training during this monitoring period.

2. The goal of permanent land ownership to the communities is one of the main initiatives of the project and this provides permanent ownership even beyond the project lifetime. This provides the community to implement the skills and learnings on their own land which is self-sustainable and provides benefits beyond the projects lifetime. Around 220 CARs have been distributed during this monitoring period.

3. The health benefits to the women and to the overall community is expected to continue beyond the projects lifetime. In a 2002 report, WHO listed indoor smoke from solid fuels among the top 10 risks to human health. "Day in and day out, and for hours at a time, women and their small children breathe in amounts of smoke equivalent to consuming two packs of cigarettes per day," WHO reported in the 2006 report Fuel for Life: Household Energy and Health. As greenhouse gas emissions have increased, the smoke from kitchens in the developing world has escalated from a local to a worldwide threat. The average cooking fire produces about as much carbon dioxide as a car, and produces more soot, also known as black carbon. Reducing these emissions may be among the fastest, cheapest ways to fight global climate change. Around 150 women have received cook stoves which translates to improved livelihood during this monitoring period.

The permanence of the benefits associated with the project are captured during the feedback from the community during the periodic community meetings in which around 78% of them prefer to continue the good practices.

Describe the measures needed and implemented since the last CCB validation or verification to maintain and enhance the climate, community, and biodiversity benefits beyond the project lifetime.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

All the documents/results are published in the project website and communicated in Portuguese in a simple language to the council of stakeholders for their awareness and free participation. The project CCB implementation from validation onwards is described in the relevant section in the MR.

Apart from the survey teams the main form of communication followed was one-to-one meetings with the community in which the feedback on the benefits provided were communicated which

are periodic. Further during this period, the benefits were mainly related to Skill and capacity development, Goal of permanent Land ownership and improved land management practices which were categorised as both long term and short term benefits in the relevant sections of the MR. sample of the survey forms and attendance records of one to one meetings have been submitted to the VVB.

Describe how full project documentation has been made accessible to communities and other stakeholders.

2.3.2 Dissemination of Summary Project Documents (G3.1)

All the documents/results are published in the project website and communicated in Portuguese in a simple language to the council of stakeholders for their awareness and free participation.

Apart from the survey teams the main form of communication followed was one-to-one meetings with the community in which the feedback on the benefits provided were communicated which are periodic. Further during this period, the benefits were mainly related to Skill and capacity development, Goal of permanent Land ownership and improved land management practices which were categorised as both long term and short term benefits in the relevant sections of the MR. sample of the survey forms and attendance records of one to one meetings have been submitted to the VVB

Describe how summary project documentation and summary information on monitoring results, has been actively disseminated to communities.

2.3.3 Informational Meetings with Stakeholders (G3.1)

Good amount of information about the characteristics of the population in the Project zone was collected through PRA. The surveys applied to the local householders have allowed the project to know the main social and economic characteristics of the population, and the interviews held with the local leaders have brought information about the characteristics regarding their organization, production, relation with state authorities and other institutions, mains needs and concerns, among other.

Describe informational meetings with communities and local stakeholders and how they have been publicized.

2.3.4 Community Costs, Risks, and Benefits (G3.2)

Information about Community Costs, Risks, and Benefits was exchanged and discussed during consultative meetings. The project has no costs to the communities, the team of technicians have always based the modus operandi as go-to-the point, thus the project team goes to the community, we don't request the community to come to the project team. The travel cost is the greatest burden for the community. It was discussed and explained during all meetings that the carbon credit project costs the community nothing, it was explained that the project is 100% there to benefit the locals in a business-as-usual situation.

As explained in the community meetings and one-on-one discussions there is no risk to the community.

The benefits are explained to be cook stoves, land tenure documentation and survey work and training for a better sustainable living and improved livelihoods.

Demonstrate how relevant and adequate information about potential costs, risks and benefits to communities – identified using a participatory and transparent process – has been provided to communities in an understandable form and in a timely manner prior to any decision they may have been asked to make with respect to participation in the project.

2.3.5 Information to Stakeholder on Verification Process (G3.3)

The Project's executive summary, including project information and project benefits has been translated into Portuguese and is posted in public places in communities throughout the Project Zone.

During community meetings held by project staff as part of the project outreach process the monitoring and verification process was described.

A poster/notice in Portuguese advertising the Project's public comment period and the validation /verification field visit was posted in communities throughout the Project Zone.

Describe how communities and other stakeholders were informed of the process for CCB verification by an independent validation/verification body. Specifically, address:

Activities and/or processes implemented.

Communication methods used.

2.3.6 Site Visit Information and Opportunities to Communicate with Auditor (G3.3)

The Project Proponent has actively communicated to community members and stakeholders about the start of the Public Comment Period and the methods with which they can submit comments on the Project as well as how to view full project documentation. This was accomplished by communicating the Project - Public Comment Period and Verification field visit dates to previously identified stakeholders, community leaders, leaders of the faith communities and public officials. They were then requested to pass that information onto their communities.

Six weeks prior to the site visit in June 2020, verbal communication was done, and it was requested that up to 1 person from all 50 families will be prepared to answer questions of the auditor. One-on-one interviews were arranged.

Describe how communities and other stakeholders or have been informed of the validation/verification body's site visit in a timely manner before the site visit occurs, and how direct and independent communication between communities and other stakeholders or their representatives and the validation/verification body or has been facilitated.

2.3.7 Stakeholder Consultation (G3.4)

The Project designed its activities based on the results of the PRA. It was intended since the beginning to develop activities that were tuned with local livelihoods and the best way to do so was by first consulting with local stakeholders.

All Project activities are based fundamentally on local customs and needs. Such activities do not constitute dramatic changes on local ways of life or customs but only provide knowledge and finance to improve and make more efficient what is already happening on the ground.

The team was able to consult with the community originally prior to July 2016.

The technicians who go to the land stay in the houses of the riverine people while doing survey work, eat at their table and greatly support the project, this has greatly help build trust with the stakeholders. 50 houses holds are involved.

Apart from the survey teams the main form of communication followed was one-to-one meetings with the community.

Describe how communities, including all community groups and other stakeholders, have influenced project implementation. Document consultations and indicate if and how project design has been affected by stakeholder input.

2.3.8 Continued Consultation and Adaptive Management (G3.4)

Two of the project team Sergio and Camerao live in Portel and have been with the project since the beginning. They were hired as they know each family in the project area their local knowledge facilitated the warm reception for the project. They are both the project guides and pilots for the technicians and team. They know first-hand everyone in the community and this knowledge allows there to be seamless communication between the project team and the local communities. It may require a cell phone call to Camerao, who then calls on the radio to the specific river to reach the family.

Throughout the lifetime of the project, we maintain a direct line of communication with community members, and relevant stakeholders. This establishes a commitment to communication and consultation to keep stakeholders informed of project activities including restoration, maintenance, monitoring and the CCB validation and verification process.

With-project scenario there is an increase to the socio-ecological resilience, reduce the vulnerability and improve the adaptation capacity through a better management of the natural resources, including adaptive management. In addition to this, forest protection in the project area does provide a healthy ecosystem with much greater adaptation potential to climate change, with a higher resistance and recovery capability to extreme meteorological phenomena and a wide range of benefits to the neighboring people.

Hence there is no change in the consultative and adaptive management system during this monitoring period.

Describe how communication and consultation about the project has continued between the project proponent(s) and communities and other stakeholders. Explain the processes the project

proponent has used to consider this input and how this communication and consultation has influenced the project through adaptive management.

2.3.9 Stakeholder Consultation Channels (G3.5)

The technicians who go to the land stay in the houses of the riverine people while doing survey work, eat at their table and greatly support the project, this has greatly help build trust with the stakeholders.

Apart from the survey teams the main form of communication followed was one-to-one meetings with the community.

Demonstrate that all consultations and participatory processes have been undertaken directly with communities and other stakeholders or through their legitimate representatives. Provide justification that adequate levels of information sharing have occurred.

2.3.10 Stakeholder Participation in Decision-Making and Implementation (G3.6)

During this monitoring period, consultations have ensured to engage with both men and women, and more marginal stakeholder groups in culturally appropriate ways to ensure that the project can hear a wide range of perspectives. Apart from the survey teams the main form of communication followed was one-to-one meetings with the community.

Describe the activities and/or processes implemented to enable the effective participation, as appropriate, of all communities. Demonstrate the culture- and gender-sensitivity of implementation of such actions.

2.3.11 Anti-Discrimination Assurance (G3.7)

Anapu-Pacaja has company policies to prevent discrimination and outline a course of action, should it occur, the human resource (HR) policy provides a clear statement on discrimination relating to gender, religion or sexual discrimination. Discrimination is considered a level A misconduct under the HR policy. Where discrimination occurs within the company, partner organisations or within project areas (project participants), actions are outlined in the grievance policy to ensure that any discrimination is dealt with by the senior management. All company employees and field partners sign a code of conduct with ES that includes anti-discrimination. No such related incidents have been reported for this monitoring period.

Describe the activities and/or processes implemented to ensure that all entities involved in project design and implementation are not involved in or complicit in any form of discrimination (e.g., discrimination based on gender, race, religion, sexual orientation or other habits) or sexual harassment with respect to the project.

2.3.12 Grievances (G3.8)

The conflict resolution approach sequentially adopted and responds to the conformity or inconformity of the complainer to the proposed solution. The evaluator may also propose a

specific approach for the resolution depending on the complexity of the case and the assessment of the same.

The present mechanism does not exclude the right of local people to present the case to any public entities.. Actually, during the census, the Project's management team informs local people of the creation of such committee and be informed of their right to present grievances directly to the team on the ground, making a clear point that all claims and/or complaints are addressed equally *notwithstanding the line of grievance*. No such related incidents have been reported for this monitoring period.

Document any grievance(s) received and how they were resolved using the project's grievance redress procedure, as set out in the project description.

2.3.13 Worker Training (G3.9)

Project's activity #1 is designed to provide training to local community groups that generates the required capabilities to undertake forest monitoring as well as monitoring for social and biodiversity variables.

The Project ensures that all members of the community groups have the same opportunity to attend capacity building workshops and participate in demonstrational activities, regardless of race, religion, sexual orientation, or gender. Although the opportunity to actively participate in all the activities of the Project, it is finally a decision of each stakeholder to participate with no pressure.

Special attention was given to under-represented groups (elder people, woman and children) are aware of the on-going training workshops and activities. The content and language of capacity training and demonstrational activities were adapted accordingly to each participating group. The Project considers developing and implementing workshops specifically designed for age classes groups to better transmit the information.

Capacity building is a relevant aspect in the implementation and operation of the project. In order to achieve the goals successfully the member of the community must be trained to have the skills and knowledge to effectively carry out the work.

50 community people have benefited from the training programs during this monitoring period.

Describe activities and/or processes implemented to provide orientation and training for the project's workers and a wide range of people from the communities. Identify how, once it is built, local capacity is not lost.

2.3.14 Community Employment Opportunities (G3.10)

The Project designed employment opportunities to make sure underrepresented groups of local community have equal opportunities of finding employment in within the Project management and demonstrative activities.

Employment positions that require demanding physical work and a higher risk (i.e. on the ground monitoring of former logging trails, sampling biomass in forest plots, monitoring of Project Boundaries by boat to detect illegal logging activities, setting and revisiting biodiversity

camera traps) are filled by persons between the age of 18 and 60 years and/or according to the experience and physical strength of a person, assessed on an individual basis.

Other employment opportunities that require less physical effort and by their nature are less risky are for the elderly people or less physically apt people. Such activities can be but not limited to: social assessment surveying and monitoring, running demonstrative activities to other members of the local communities and to neighbor communities, actively participating in setting up demonstrative activities (i.e. home gardens, forest gardens, improved fallows, energy efficient cook stoves, etc.).

Around 11 people have been employed of which 3 are women for this monitoring period.

Demonstrate that people from the communities have been given an equal opportunity to fill all work positions (including management) if the job requirements are met. Where relevant, describe the activities and/or processes implemented to ensure community members, including women and vulnerable and/or marginalized people, are given a fair chance to fill positions for which they can be trained.

2.3.15 Relevant Laws and Regulations Related to Worker's Rights (G3.11)

The local community received clear and adequate information about the requirements of national and international regulations on worker's rights before entering in a contract agreement with Anapu-Pacaja.

Anapu-Pacaja made sure to comply with the applicable national regulations on worker's rights. This is assured by yearly audits held by a third party that was identified when the census was done. Such audits were announced to local authorities and community and they were encouraged to meet with audit entity. This way, local people can rest assure that all their complaints about workers' rights are known in a straightforward and clear way.

The following is a list of Brazil's all relevant laws and regulations covering worker's rights:

The Brazilian Constitution, Chapter II-Social Rights, Articles 7- 11 which addressed: o Minimum wage o Normal working hours on Guidance on vacation and weekly leave on Guidance on maternity and paternity leave o Recognition of collective bargaining o Prohibition of discrimination.

In addition to the Constitution, there are two additional decrees related to Brazilian labor laws. Consolidação das Leis do Trabalho (CLT): DECRETO-LEI N.º 5.452, DE 1º DE MAIO DE 1943 (Consolidate of Working Laws)³⁵. This decree gives more clarification on: o Hourly, daily, weekly and monthly work hours of Employment of minors and women o Establishes a minimum wage of Worker safety and safe working environments of Defines penalties for non-compliance by employers Establishes a judicial work-related process for addressing all worker related issues.

Estatui normas reguladoras do trabalho rural: LEI No 5.889, DE 8 DE JUNHO DE 1973 (Establishes Regular Norms for Rural Workers)³⁶. This is a complimentary law to the aforementioned 1943 decree because prior to 1973, rural workers did not have the same rights as urban workers. In 1973, this law was established to specify the equality between urban and rural workers, along with compensation for overtime.

Hence it is stated that the project complies with relevant host country rules for this monitoring period as there have been no reported incidents to the contrary.

List all relevant laws and regulations covering worker's rights in the host country and provide assurance that the project has met or exceeded each. Where relevant, demonstrate how compliance was achieved and describe activities and/or processes implemented to inform workers about their rights.

2.3.16 Occupational Safety Assessment (G3.12)

Project's activities do not hold risk besides those inherent to the day-to-day life in the forest. Project's activities do not require the use of heavy machinery or dangerous substances. Nevertheless, the Project management team has been provided adequate protection equipment to employees working in forest monitoring activities. Also, monitoring staff were equipped with first aid kits. Protection equipment included but was not be limited to:

- Hard hat
- Cap with the company's logo
- Reflective/fluorescent security vest with the company's logo
- Rubber boots
- Gloves
- Two-way radios
- GPS
- Camera
- Field backpack
- Camel pack
- LED Flashlight
- Whistle
- Machete
- First aid kit

Risks for each type of work was assessed and safety guidelines were developed helping identifying and reducing such risks. Guidelines were written in clear and adequate language and distributed among workers. Additionally, workers have received safety instructions to make sure any doubts and suggestions are taken care of.

During this period such training was provided to 20 people who have been employed of which 3 are women.

Provide an assessment of substantial risks to worker safety that have arisen due to project implementation. Describe activities and/or processes implemented to inform workers of risks and how to minimize such risks. Show how risks have been minimized.

2.4 Management Capacity

2.4.1 Required Technical Skills (G4.2)

Project Participants			
Key Function	Organization Involved	Type of Group/ Organization	Brief Description of Activities
Project administration	ANAPU-PACAJA	Project Participant	- Administrative
	Brazil Agfor	Technical Partner	- Reinvestment - Financial planning - Market research - Project prospecting - Administer funds - Review field data, track project developments - Serve as key actor in dispute resolution
	Vale Geographer Services	Survey Partner	- De-conflict land disputes - Provide CAR land tenure document and all work involved in this - Provide Technical Staff - Provide Team that made the Carbon Inventory in the forest.

Document the maintenance of the key technical skills required to impleme

nt the project successfully, including community engagement, biodiversity assessment and carbon measurement and monitoring skills.

2.4.2 Management Team Experience (G4.2)

Michael Greene – Project Coordinator and landowner. Is currently responsible for the general coordination of the project. He has a Bachelor's degree in Industrial Engineering from Kettering University in Michigan. He has lived in Brazil for 10 years, consulting related to complex real estate situations. Michael's specialty is the coordination of the program plots for the poor. This is a program to help each family gain title. He oversees an engineer and geomancer team of 4 people in the field and 2 people in front of computers, categorizing each family a and there their plots of land are located. He also directs the security boat patrols and is taking quotations from companies to build 30 security houses within the project area.

Professor David Vale - Technical Director, is currently responsible for coordinating, managing and implementing the social aspects of the project. David is professor of Geography at the Federal University in the state of Para. He has worked over the last 20 years in numerous projects involving land survey work, making him suitable for helping the Riverine people gain

survey and land tenure documents. While this work is taking place, a huge amount of face-time occurs between the riverine people and the technicians, allowing for strong relationships to be built and making these moments ideal for agroforestry lessons and eco-cook stove distribution.

Document the management team's expertise and prior experience implementing land management and carbon projects at the scale of this project.

2.4.3 Project Management Partnerships/Team Development (G4.2)

Dr. Evelise da Cruz Pires Greene – Project Coordinator and is responsible for writing the social and technical aspects of the project.

Demonstrate how other organizations were partnered with to support the project, if relevant experience was or is lacking. Provide evidence that gaps identified in the previous CCB validation or verification have been satisfactorily filled, or include a recruitment strategy by which the management team plans to fill any remaining gaps.

2.4.4 Financial Health of Implementing Organization(s) (G4.3)

The project is funded by the landowners. No outside investors are involved in the Anapu-Pacaja project.

For a detailed financial analysis refer to the attached Financial Evidence of this Project's VCS PDD.

Document the financial health of the implementing organization(s). For grouped projects, document the ability of the implementing organization(s) to provide adequate financial support to new project areas included in the project at this verification event.

2.4.5 Avoidance of Corruption and Other Unethical Behavior (G4.3)

As a collaborative effort, the team is committed to upholding a high level of integrity and professionalism throughout all aspects of project design and implementation. We have a zero-tolerance attitude towards corruption and unethical behavior, and are not involved in, or complicit in, any form of corruption such as bribery, embezzlement, fraud, extortion, and collusion.

Demonstrate that the project proponent and any other entities involved in the project implementation are not involved in or complicit in any form of corruption such as bribery, embezzlement, fraud, favoritism, cronyism, nepotism, extortion, and collusion. Describe any activities and/or processes implemented to be able to provide this assurance.

2.4.6 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

There is no commercially sensitive information in this monitoring report document, itself. Supporting documents which include commercially sensitive information that are not made publicly available include: the MOU; Contracts with Buyers and Service Providers; and documents related to project financials.

Indicate whether any commercially sensitive information has been excluded from the public version of the monitoring report and briefly describe the items to which such information pertains.

Note - Information related to the determination of the baseline scenario, demonstration of additionality, and estimation and monitoring of GHG emission reductions and removals (including operational and capital expenditures) cannot be considered to be commercially sensitive and must be provided in the public versions of the project documents.

2.5 Legal Status and Property Rights

2.5.1 Recognition of Property Rights (G5.1)

Name of the Law	Description	Project Compliance
Law number 4771, September 15th 1965 (D.O.U of September 16th 1965)	The Brazilian forest code of 1965 – Brazilian Forest Code –provides for example: II – area of permanent preservation: protected area in the terms of article 20 and 30 of this law, covered or not by native vegetation, with the role of protecting the water resources, landscape, geological stability, biodiversity, flux of genes of plants and animals, protect de soil and secure a good environment for the human population; III – Legal Reserve Areas: Area located in the property or “posse rural” excluding the areas of permanent preservation, for the sustainable use of the natural resources, conservation and restoration of the ecological process, biodiversity conservation and refugee and protection of native animals and plants; Art. 150 – It is prohibited under empirical form the exploration of primitive forest of the Amazon watershed, but only can be explored in accordance of technical management plans approved by act of Public authorities, to be issued in one year term.	All properties have legal reserve areas and APPs defined. In accordance with the CARs (Environment Rural Registry) at SEMA (Environment State Institute)
Normative Instruction number 003 of May 23th 2007 – Executive office of environment , science and technology - SECTAM	Regulatory of the Environmental Rural Registry -CAR in the state of Pará and providence of other requirements. Art 1 – establish criteria and procedures for implementation of the CAR – PA as an instrument for identification of the rural properties in the state of Pará that must be issued by SECTAM-PA in accordance with this Normative Instruction. Art 2 – It is necessary for all rural properties in the state of Pará to be registered in the CAR-PA, even the properties that have no production activity. Art 3 – The issuance of the CAR-PA, as toll for identification of the property was done only once for each property. It has a registry number with a sequential number. This number is in all licenses, authorizations, and other documents issued for the environmental regularization of the rural property. This registry number is linked to the land, independent if the land is sold, transferred or taken possession by other person. Single paragraph – There are no concessions of any	Development of CAR in all lands in the Project Area

	license for the land that has no registry at CAR-PA. Art 4 – In the CAR-PA it is mentioned all the basic data of the rural property, Total area- AT, Area of permanent preservation – APP, legal reserve areas – ARL, and area of alternative use of the soil – AUAS , in addition the name and profession of the land owner, geographic coordinates and other information required by complementary laws	
Federal Decree number 5.975/2006	Art. 10 – Forest exploration and succession formations that require shallow harvest of the forest only are permitted under specific authorization for alternative land uses issued by SISNAMA. # 1o By alternative land use is understood any conversion of the forest to other land cover, such as settlements, agriculture, pasture, industry, energy generation, mining and transportation.	All properties have legal reserve areas and APPs defined. In accordance with the CARs (Environment Rural Registry) at SEMA (Environment State Institute)

Demonstrate that all property rights are recognized, respected, and supported. If applicable, describe activities and/or processes implemented by the project to help to secure statutory rights.

2.5.2 Free, Prior and Informed Consent (G5.2)

Free prior and informed consent (FPIC), is the principle that a community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use.

The project proposes conduct a process of FPIC to continue the informative process initiated with the PRA in order to promote a reasonable understanding about the project is and their activities, an equitable participation in decision-making processes and the involvement of the population in the implementation of the proposed project.

In this regard, we considered the following elements conductors for this process
Avoiding the exercise of coercion, intimidation or manipulation (FREE);

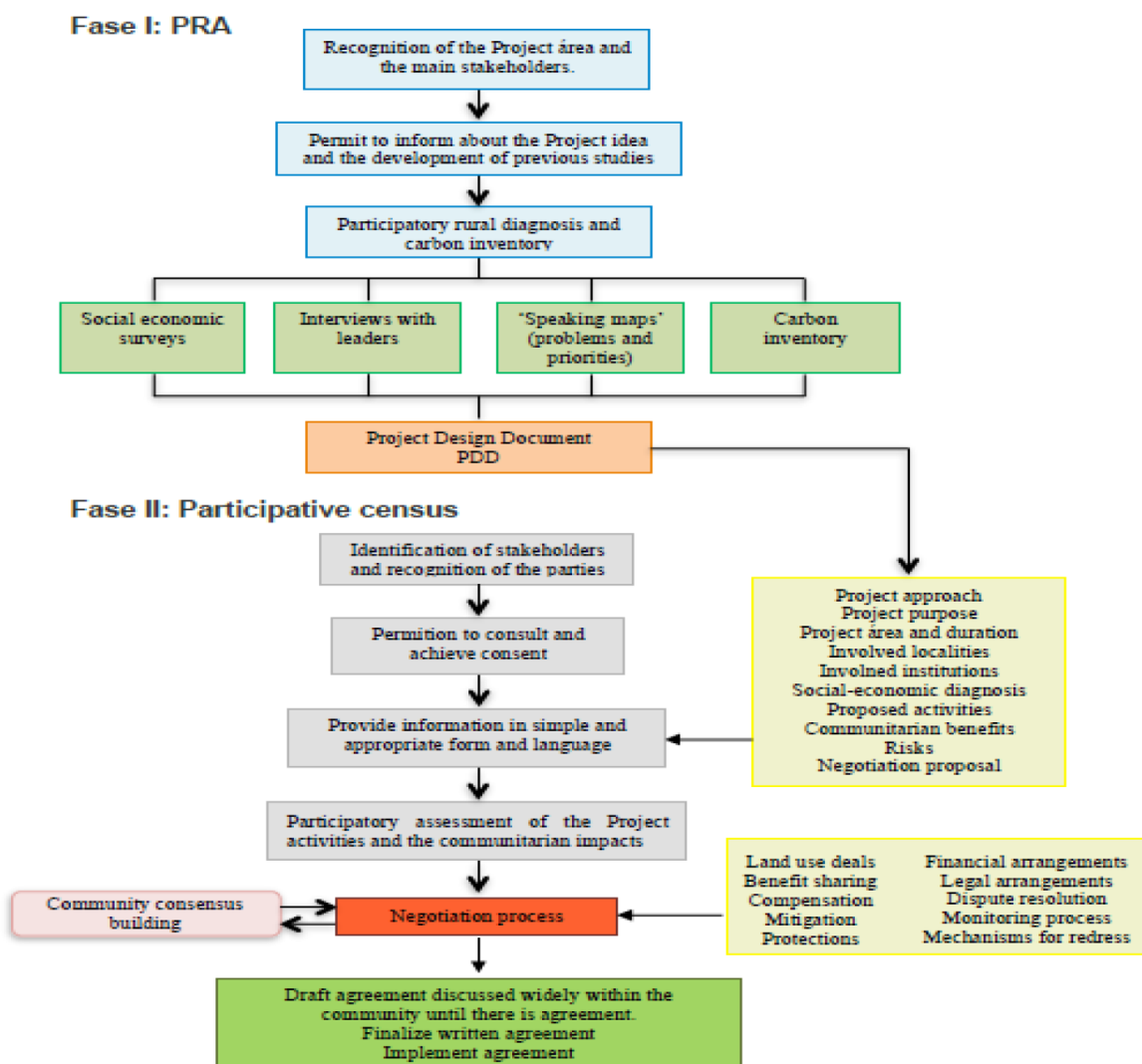
- Consent is required in advance to any authorization or beginning of the activities (PRIOR);
- Providing information that covers the following information:
 - a. The nature, importance, rhythm, reversibility and approach of the project and the proposed activities;
 - b. The purpose of the project and its activities;
 - c. The duration of the project;

- d. The area where the project and its activities are developed, as well as the localities involved;
- e. The results of the initial diagnosis of the economic, social, cultural and environmental situation, including possible risks and benefits;
- f. The institutions and staff that intervene in the implementation of the project, and
- g. The procedures the project may include (claims resolution mechanism);
 - The consultation must be carried out through the establishment of a frank dialogue within an atmosphere of mutual respect, good faith and full and equitable participation (CONSENT);
 - The process must include genre perspective. Women participation is essential, as well as the involvement of children, young people and vulnerable groups.

It is important to mention that the definite protocol for FPIC is produced after the validation of the project and includes a detailed development of each one of the activities, protocols, annexes, formats and tools that are utilized.

The following flowchart intends to represent the protocol to be followed in order to comply and ensure the FPIC standards and criteria are implemented.

Figure 5: Flowchart for FPIC



Demonstrate with documented consultations and agreements that:

The project has not encroached uninvited on private property, community property, or government property.

The free, prior, and informed consent has been obtained of those whose property rights or are affected by the project.

Appropriate restitution or compensation has been allocated to any parties whose lands have been or affected by the project.

2.5.3 Property Right Protection (G5.3)

Our project activities do not lead to involuntary removal or relocation of property rights holders from their lands or territories and does not force rights holders to relocate activities important to their culture or livelihood.

There will never be a relocation of anyone, unless they decide to relocate. If in the future any relocation of activities needs to be undertaken, it will take place with a written agreement that demonstrates that the agreement was made with the free, prior, and informed consent of those concerned and includes provisions for just and fair compensation.

All residents even land grabbers are permitted to keep the land they have taken up to 100 hectares.

However land grabbing are not be tolerated and when it occurs the project landowner has already and will aggressively pursue these threats within the legal system of Brazil.

Demonstrate that project activities have not led to involuntary removal or relocation of property rights holders from their lands or territories, and has not forced rights holders to relocate activities important to their culture or livelihood.

If any relocation of habitation or activities is undertaken within the terms of an agreement, demonstrate that the agreement was made with the free, prior, and informed consent of those concerned and includes provisions for just and fair compensation.

2.5.4 Identification of Illegal Activity (G5.4)

Illegal activities in the area are constituted by unplanned timber extraction. Such logging operations are evidenced by the proliferation of pioneer roads as presented. It is known from literature that extractive operations take advantage from the fact that local farmers don't have land titles to displace them or to gain access to the forest resources nearby villages (Araujo, Bonjean et al. 2009). At the same time, illegal logging operations thrive whenever there are forested areas that seem to be under no-use and where the presence of the landowner is not made evident (Margulis 2004).

The Project has trained local community members to work as monitoring staff in the Project Area and the LMA. This is the main activity to identify, prevent and avoid illegal activities from taking place in the Project Area.

As support measures against illegal activities, the Project did provide land titles against conservation results to households living within the Project LMA Boundaries and did provide support to neighboring communities to achieve land tenure on unused public lands.

Stakeholders in neighboring communities were encouraged to report encroachers and illegal loggers trying to get into nearby forests. The Project did proceed to make the respective denounce to local authorities as just like the situation is occurring in the Project Area. Through this mechanism the project were generating positive leakage.

No identification of illegal activities were reported for this monitoring period.

Identify any illegal activities that could affect the project's impacts. Describe activities and/or processes implemented to reduce these activities so that project benefits are not derived from illegal activities.

2.5.5 Ongoing Disputes (G5.5)

There is an ongoing dispute in the project area.

Dispute:

15,936 hectares with title, and CAR, but in a settlement area.

The government of President Bolsonaro has blocked all Settlement Areas in the Amazon. These typically were done by legal or government actions to expropriate land. In this case the previous government in 2010 placed a settlement area on part of the property. However the actually settling of this area is on hold at the moment, the land is not invaded by land grabbers either, at least for the time being there is no conflict. However if a different president in the future is in favor of settlement areas then the land is in further risk of deforestation.

Reports by international ONGs have blamed settlement areas in the Amazon for 2/3rds of all deforestation.

However currently the Amazon has no more land that is not already taken. Thus to do a settlement area, one needs to take private property.

15,936 hectares are affected by the settlement area. The land has the Cadastrol Ambiental Rural, however the land does not have a Certified INCRA Survey. The land does have title, as all the land for the project area have title deeds.

The project plan is to use the next 3 years during the President of Bolsonaro to start a negotiation with the Federal Government to cancel the settlement area on these 15,936 hectares.

A meeting was originally schedule with Carlos Luiz Nabhan for March 12th in Brasilia, however the team postponed it due to the Coronavirus issues. Mr. Nabhan is in charge of resolving the Foundation issues with land in Brazil, his department is "Assuntos Fundiaria"

The titles that are affected are: Title Matricula 278 and INCRA CCIR number 045.071.051.829-2 as well as Matricula 166 a total of 4,356 hectares for this property is affected by this dispute. The other land affected is Title Matricula 166 which has 045.071.051-900-00 a total of 11,580 hectares is affected from these titles which have a total of 21,780 hectares.

Demonstrate that no activity has been undertaken by the project that could prejudice the outcome of an unresolved dispute relevant to the project.

If applicable, describe activities and/or processes implemented to resolve conflicts or disputes.

2.5.6 National and Local Laws (G5.6)

Even though there aren't any national law or regulations regarding REDD policies, there are some local initiatives to encourage REDD projects. The majority of these initiatives are at the municipality level. For example: Paragominas, a municipality located at about 400 km from the project area, has approved (July 26th 2011) a municipality environmental policy (Law number 765/2011) that includes REDD. With this it was created a municipal-level system for reduction of emissions from degradation and deforestation that will be linked to a potential national or state REDD system.

List any national and local laws and regulations in the host country that have gone into effect, changed, or been eliminated since the project's last validation or verification that are relevant to the project activities. Provide assurance that the project is in compliance with all national and local laws and regulations in the host country that are relevant to the project activities and, where relevant, demonstrate how compliance is achieved.

3 CLIMATE

Note that Section 3 relates exclusively to data and parameters for monitoring GHG emission reductions and removals. No community or biodiversity parameter should be entered here with the exception of any relevant information for fulfilling the optional Gold Level criteria.

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation

Complete the table below for all data and parameters that are determined or are available at validation, and remain fixed throughout the project crediting period (copy the table as necessary for each data unit/parameter). Data and parameters monitored during the operation of the project are included in Section 3.1.2 (Data and Parameters Monitored) below.

Data / Parameter	RRD Forest / Non-Forest Cover Benchmark Map
Data unit	Ha
Description	Map showing LULC class forest and non-forest at Project start date
Source of data	Landsat imagery from 1996, 2004, 2008 and 2012 obtained from INPES website
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB
Purpose of the data	<i>Indicate one of the following:</i> <i>Determination of baseline scenario (AFOLU projects only)</i>

	• Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage
Comments	N/A

Data / Parameter	Project Area Forest Cover Benchmark Map
Data unit	Ha
Description	Map that shows the stratification and location of LULC class forest in the project area at the project start date (100% forest cover)
Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> • Determination of baseline scenario (AFOLU projects only) • Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage
Comments	N/A

Data / Parameter	Leakage Belt Forest Cover Benchmark Map
Data unit	Ha
Description	Map that shows the stratification and location of LULC class forest in the Leakage belt at the project start date (100% forest cover)
Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Value applied	<i>Provide the value applied</i>

Justification of choice of data or description of measurement methods and procedures applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	ABSLRR_t
Data unit	Ha
Description	Annual area of baseline deforestation in the reference region at year t
Source of data	Calculated based on results from future deforestation model using peer-reviewed software IDRISI Selva
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	Variables and procedures to calculate baseline deforestation are thoroughly explained in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	ABSLPAT
Data unit	Ha
Description	Annual area of baseline deforestation in the reference region at year t
Source of data	Calculated based on results from future deforestation model

	using peer-reviewed software IDRISI Selva
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	Variables and procedures to calculate baseline deforestation are thoroughly explained in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	ABSLKt
Data unit	Ha
Description	Annual area of baseline deforestation in the reference region at year t
Source of data	Calculated based on results from future deforestation model using peer-reviewed software IDRISI Selva
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	Variables and procedures to calculate baseline deforestation are thoroughly explained in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	C_{tot}_{fcl}
Data unit	tCO ₂ -e ha-1
Description	Average carbon stock of all accounted carbon pools in forest

	class <i>fc/</i>
Source of data	IPCC 2003 Good Practice Guidance for Land Use – Table 3.3.8
Value applied	51.65
Justification of choice of data or description of measurement methods and procedures applied	Data is a default value for land converted to grassland in Tropical-Moist & Wet Climate Zones.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	CF
Data unit	tCt-1d.m
Description	Carbon fraction of dry matter
Source of data	IPCC 2003 Good Practice Guidance for Land Use, Chapter 3.2 Forest Land, page 3.25
Value applied	0.5
Justification of choice of data or description of measurement methods and procedures applied	The value chosen is an IPCC default value as recommended by VM0015 methodology
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	CFj
Data unit	tCt-1d.m

Description	Carbon fraction for tree specie j
Source of data	IPCC Good Practice Guidance for Land Use, Chapter 3.2, Forest Land, page 3.25
Value applied	0.5
Justification of choice of data or description of measurement methods and procedures applied	The value chosen is an IPCC default value as recommended by the VM0015 methodology
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	$f_j(\text{DBH})_{ab}$
Data unit	t.d.m. tree-1
Description	Allometric equation for species j linking DBH to aboveground biomass of living trees, expressed as t.d.m. tree-1
Source of data	Overman's 1994 equation Overman, Witte, et al (1994) corrected for biomass moisture content (Araujo, Higuchi, et al. 1999)
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	Above-ground biomass for a $\text{DBH} \geq 10$ cm was calculated using Overman's equation (Overman, Witte, et al. 1994) corrected for biomass moisture content (Araujo, Higuchi, et al. 1999). Araujo tested Overman's equation in a location 250 kms from Belem in Para (close to the project area under the same forest type), obtaining predicted results within $\pm 0.6\%$ of the weight determined in the field through destructive sampling.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	LULC Change
Data unit	%
Description	Percentage of forest that change to non-forest final classes during the historical reference period
Source of data	Landsat imagery from 1996, 2004 and 2008 obtained from INPES website. SEMA (2010) Economic ecological zoning information for the northern area of Para.
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	Landsat imagery is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB. SEMA's data is available to the public and is the most up to date and scale adequate official data for the Project Area.
Purpose of the data	<i>Indicate one of the following:</i> <i>Determination of baseline scenario (AFOLU projects only)</i> <i>Calculation of baseline emissions</i> <i>Calculation of project emissions</i> <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	F_{burnt}^{icl}
Data unit	%
Description	Proportion of forest area burned during the historical reference period in the forest class <i>icl</i>
Source of data	Percentage of biomass that is left to burn after timber for wood products is extracted
Value applied	96%
Justification of choice of data or description of measurement methods and procedures applied	Data is derived from the assessment of durable wood products
Purpose of the data	<i>Indicate one of the following:</i> <i>Determination of baseline scenario (AFOLU projects only)</i> <i>Calculation of baseline emissions</i> <i>Calculation of project emissions</i>

	• Calculation of leakage
Comments	N/A

Data / Parameter	ERCH4
Data unit	Dimensionless
Description	Emission ratio for CH ₄ (IPCC default value = 0.012)
Source of data	VM0015 methodology
Value applied	Provide the value applied
Justification of choice of data or description of measurement methods and procedures applied	Default value indicated by VM0015 methodology
Purpose of the 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	N/A

Data / Parameter	P_{burnt,p,icl}
Data unit	%
Description	Average proportion of mass burnt in carbon pool <i>p</i> in the forest class <i>icl</i>
Source of data	Percentage of biomass that is left to burn after timber for wood products is extracted
Value applied	96%
Justification of choice of data or description of measurement methods and procedures applied	Data is derived from the assessment of durable wood products
Purpose of the 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	N/A

Data / Parameter	C_{p,icl,t}
Data unit	tCO ₂ -e ha-1
Description	Average carbon stock per hectare in the carbon pool p burnt at year t in the forest class icl
Source of data	Determined by using data from carbon inventory developed by Vale Survey Company Data from IPCC Good Practice Guidance for Land Use Table 3.3.8
Value applied	Provide the value applied
Justification of choice of data or description of measurement methods and procedures applied	The inventory was carried out in 79 plots of forest comprising two classes namely dense forest and degraded forest, within an area that encompasses the project area and leakage belt. A detailed report can be found in Annex but as a summary the following are the highlights of the report: - Sampling plots were randomly located in forest stratum - DBH (Diameter at Breast Height) was measured for all the trees in a plot - Tree biomass was determined using Overman et al. 1994 equation, which was successfully tested nearby the project area by a different study. Data is a default value for land converted to grassland in Tropical-Moist & Wet Climate zones.
Purpose of the 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	N/A

Data / Parameter	CE_{p,icl}
Data unit	Dimensionless
Description	Average combustion efficiency of the carbon pool p in the forest class icl
Source of data	VM0015 methodology
Value applied	0.5

Justification of choice of data or description of measurement methods and procedures applied	Presented by VM0015 methodology
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	GWP_{CH4}
Data unit	Dimensionless
Description	Global warming potential for CH4 (IPCC default value = 21 for the first commitment period)
Source of data	VM0015 methodology
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	Presented by the VM0015 methodology
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	DLF
Data unit	%
Description	Displacement leakage factor
Source of data	VM0015 Methodology
Value applied	0

Justification of choice of data or description of measurement methods and procedures applied	Presented in the VM0015 methodology. The value is an ex-ante estimation.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	LKB
Data unit	%
Description	Percentage of the overlapping leakage belts area to be assigned to project, A,B,...N
Source of data	Map of distance to selective logging from tertiary roads Map of distance to rivers Project area forest cover benchmark map
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	The data was generated using Landsat Imagery that is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB. Relevance of the variable is recognized in the literature
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	RF_t
Data unit	%
Description	Risk factor used to calculate VCS buffer credits
Source of data	AFOLU Non-Permanence Risk Tool V3.1
Value applied	<i>Provide the value applied</i>

Justification of choice of data or description of measurement methods and procedures applied	The value was calculated as a result of applying the guidelines in the aforementioned tool
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	R_j
Data unit	Dimensionless
Description	Root-shoot ratio appropriate for species, group of species of forest type j
Source of data	IPCC Good Practice Guidance for Land Use Table 3.3.8
Value applied	0.22
Justification of choice of data or description of measurement methods and procedures applied	Is the lowest value presented in the document for Tropical Wet forests in the IPCC's tables.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	Cwp
Data unit	tCO ₂ -e ha ⁻¹
Description	Average carbon stock per hectare in the harvested wood products carbon pool
Source of data	Logging intensity Co-efficient of Volumetric efficiency Carbon Stock Change Factor Carbon Fraction for tree specie j

	Basic Wood density in specie j
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	Logging intensity was used as a default for Para as presented by Putz et al. 2008 Coefficient of Volumetric equation is an official default from CONOMA Wood density is a default value from IPCC 2003 Carbon Stock change factor was calculated using the lowest boundary of the 90% CI
Purpose of the data	<i>Indicate one of the following:</i> <i>Determination of baseline scenario (AFOLU projects only)</i> <i>Calculation of baseline emissions</i> <i>Calculation of project emissions</i> <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	$\Delta C_{tot,ct,t}$
Data unit	tCO ₂ -e ha ⁻¹
Description	Carbon stock change factor (also called emission factor) for all accounted carbon pools in category <i>ct</i> at time <i>t</i>
Source of data	Calculated
Value applied	798.02
Justification of choice of data or description of measurement methods and procedures applied	Value calculated based on the corrected values of carbon density for each pool at the lowest boundary of the 90% CI
Purpose of the data	<i>Indicate one of the following:</i> <i>Determination of baseline scenario (AFOLU projects only)</i> <i>Calculation of baseline emissions</i> <i>Calculation of project emissions</i> <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	Map of distance to selective logging from tertiary roads
Data unit	Kms
Description	Average distance from tertiary roads to areas presenting selective logging

Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	The data is available to the public free of charge. Details about data pre and post-processing can be found in the excel sheet submitted to VVB. Relevance of the variable is recognized in the literature
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	Map of distance to rivers
Data unit	Kms
Description	Raster map of distances from navigable rivers in the RRD
Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	Map of distance to roads
Data unit	Kms
Description	Raster map of distances from navigable rivers in the RRD

Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Determination of baseline scenario (AFOLU projects only)</i> <i>Calculation of baseline emissions</i> <i>Calculation of project emissions</i> <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	Map of distance to non-forest
Data unit	Kms
Description	Raster map of distances from all roads in the RRD
Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Value applied	<i>Provide the value applied</i>
Justification of choice of data or description of measurement methods and procedures applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Determination of baseline scenario (AFOLU projects only)</i> <i>Calculation of baseline emissions</i> <i>Calculation of project emissions</i> <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	Logging intensity
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Data unit	m3/ha
Description	Volume of commercial timber extracted per hectare in Para
Source of data	Putz et al. 2008
Value applied	30
Justification of choice of data or description of measurement methods and procedures applied	Data comes a peer reviewed publication
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	Coefficient of Volumetric Efficiency
Data unit	NA
Description	Proportion of wood that actually makes it all the way to durable wood products
Source of data	CONAMA 2009
Value applied	0.45
Justification of choice of data or description of measurement methods and procedures applied	Data comes from an official source
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Data / Parameter	EI
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Data unit	%
Description	Ex-ante estimated effectiveness index
Source of data	Calculated
Value applied	??
Justification of choice of data or description of measurement methods and procedures applied	Based on results from ongoing on-site monitoring activities since 2008
Purpose of the data	<i>Indicate one of the following:</i> • <i>Determination of baseline scenario (AFOLU projects only)</i> • <i>Calculation of baseline emissions</i> • <i>Calculation of project emissions</i> • <i>Calculation of leakage</i>
Comments	N/A

Table: Notations

Notation	Description	Unit	Equation	Observation
A	Area of error due to observed change predicted as persistence	Ha	13	Was not used / Does not apply
Average _i	Area of “average” forest land suitable for conversion to non-forest land within stratum	Ha	5.b, 6.b, 10	Was not used / Does not apply
Average _{i,t1}	Area with forest cover in stratum <i>i</i> on “average” areas at time <i>t1</i>	Ha	6.b	Was not used / Does not apply
Average _{i,t2}	Area with forest cover in stratum <i>i</i> on “average” areas at time <i>t2</i>	Ha	6.b	Was not used / Does not apply
ABSL _{Lfcl,t}	Area of final (post-deforestation) non-forest class <i>fcl</i> deforested at time <i>t</i> within the leakage belt in the baseline case	Ha	14	Was not used / Does not apply
ABSL _{LKct,t}	Area of category <i>ct</i> deforested at time <i>t</i> within the leakage belt in the baseline case	Ha	15	Was not used / Does not apply
ABSL _{LKicl,t}	Area of initial (pre-deforestation) forest class <i>icl</i> deforested at time <i>t</i> within the leakage belt in the baseline case	Ha	14	Was not used / Does not apply
ABSL _{PAct,t}	Area of category <i>ct</i> forest deforested at time <i>t</i> within the project area in the baseline	Ha	15	Was not used / Does not apply

	case			
ABSLPA $f_{ct,t}$	Area of final (post-deforestation) non-forest class f_{cl} deforested at time t within the project area in the baseline case	Ha	14	Was not used / Does not apply
ABSLP $i_{cl,t}$	Area of initial (pre-deforestation) forest class i_{cl} deforested at time t within the project area in the baseline case	Ha	14	Was not used / Does not apply
ABSLRRopt_hrpi	Average area deforested in Average i during the historical reference period	Ha	5.a	Was not used / Does not apply
ABSLRR $f_{cl,t}$	Area of final (post-deforestation) non-forest class f_{cl} deforested at time t within the reference region in the baseline case	Ha	14	Was not used / Does not apply
ABSLRR i,t	Annual area of baseline deforestation in stratum i with the reference region at year t	Ha	2, 3, 4, 5, 6, 7, 8, 9, 10, 11,12	Was not used / Does not apply
ABSLRR $i,t_{average}$	Annual area of baseline deforestation in stratum i with the reference region at year $t_{average}$	Ha	11	Was not used / Does not apply
ABSLRR $i_{cl,t}$	Area of initial (pre-deforestation) forest class i_{cl} deforested at time t within the reference region in the baseline case	Ha	14	Was not used / Does not apply
ABSLRRopt_hrpi	Average area deforested in $A_{optimal}$ during the historical reference period	Ha	5.b	Was not used / Does not apply
ABSLRRopt_hrpi	Average area deforested in $A_{suboptimal}$ during the historical reference period	Ha	5.c	Was not used / Does not apply
ABSLRR $i,t_{average}$	Annual area of baseline deforestation in stratum i with the reference region at a year $t_{average}$	Ha yr-1	11	Was not used / Does not apply
$A_{optimal}$	Area of "optimal" forest land suitable for conversion to non-forest land within stratum i	Ha	3, 7	Was not used / Does not apply
$A_{optimal,t1}$	Area of forest cover in stratum i on optimal areas at time $t1$	Ha	6.a	Was not used / Does not apply
$A_{optimal,t2}$	Area of forest cover in stratum i on optimal areas at time $t2$	Ha	6.a	Was not used / Does not apply
AP	Plot Area	m2	A3-13	Was not used / Does not apply

APDPAicl,t	Areas of planned deforestation in forest class <i>icl</i> at year <i>t</i> in the project area	Ha		Was not used / Does not apply
APFicl,t	Annual area of planned fuel-wood and charcoal activities in forest-class <i>icl</i> at year <i>t</i> in the project area	Ha		Was not used / Does not apply
APLPAicl,t	Areas of planned logging activities in forest class <i>icl</i> at year <i>t</i> in the project area	Ha		Was not used / Does not apply
APNiPAicl,t	Annual area of forest class <i>icl</i> with increasing carbon stock without harvest at year <i>t</i> in the project area	Ha		Was not used / Does not apply
ARRaveragei,t1	Area with forest cover in stratum <i>i</i> on average and sub-optimal areas at time <i>t1</i>	Ha	4.b	Was not used / Does not apply
ARRaveragei,t2	Area with forest cover in stratum <i>i</i> on average and sub-optimal areas at time <i>t2</i>	Ha	4.b	Was not used / Does not apply
ARRi	Total forest area in stratum <i>i</i> within the reference region at the project start date	Ha	6, 11	Was not used / Does not apply
ARRi,t-1	Area with forest cover in stratum <i>i</i> within the reference region a year <i>t-1</i>	Ha	3	Was not used / Does not apply
ARRoptimali,t1	Area with forest cover in stratum <i>i</i> on optimal areas at time <i>t1</i>	Ha	4.a	Was not used / Does not apply
ARRoptimali,t2	Area with forest cover in stratum <i>i</i> on optimal areas at time <i>t2</i>	Ha	4.a	Was not used / Does not apply
ARRsub-optimali,t1	Area with forest cover in stratum <i>i</i> on sub-optimal areas at time <i>t1</i>	Ha	4.c	Was not used / Does not apply
ARRsub-optimali,t2	Area with forest cover in stratum <i>i</i> on sub-optimal areas at time <i>t2</i>	Ha	4.c	Was not used / Does not apply
Asub-optimali,t1	Area with forest cover in stratum <i>i</i> on "sub-optimal" areas at time <i>t1</i>	Ha	6.c	Was not used / Does not apply
Asub-optimali,t2	Area with forest cover in stratum <i>i</i> on "sub-optimal" areas at time <i>t2</i>	Ha	6.c	Was not used / Does not apply
B	Area correct due to observed change predicted as change	Ha	13	Was not used / Does not apply
BCEF	Biomass conversion and expansion factor for conversion of merchantable volume of total aboveground tree biomass	Dimensionless	A3-9, A3-36	Was not used / Does not apply
BEFpl	Biomass expansion factor for converting volumes of extracted round	Dimensionless	A3-21	Was not used / Does not apply

	wood to total above-ground biomass (including bark), applicable to tree tr, in plot pl			
<i>Cabcl</i>	Average carbon stock per hectare in above-ground biomass carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-6, A3-14, A3-36	Was not used / Does not apply
<i>Cabntcl</i>	Average carbon stock per hectare in the above-ground non-tree biomass carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-7, A3-24	Was not used / Does not apply
<i>Cabtcl</i>	Average carbon stock per hectare in the above-ground tree biomass carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-7	Was not used / Does not apply
<i>Cbbcl</i>	Average carbon stock per hectare below-ground biomass carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-6, A3-17	Was not used / Does not apply
<i>Cbbntcl</i>	Average carbon stock per hectare below-ground non-tree biomass carbon pool of LU/LC Class <i>cl</i>	tCO ₂ -e ha-1	A3-8	Was not used / Does not apply
<i>Cbbtcl</i>	Average carbon stock per hectare below-ground tree biomass carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-8	Was not used / Does not apply
<i>Cdwcl</i>	Average carbon stock per hectare in the dead wood biomass carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-6, A3-25	Was not used / Does not apply
<i>CFdc</i>	Carbon fraction of the density class <i>dc</i>	Tonnes C (tonne d.m)-1	A3-30	Was not used / Does not apply
<i>cl</i>	1,2,3,...cl LU/LC Classes	Dimensionless	A3-3	Was not used / Does not apply
<i>Clcl</i>	Average carbon stock per hectare in the litter carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-6	Was not used / Does not apply
<i>Cldwcl</i>	Average carbon stock per hectare in lying dead wood carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-25, A3-30	Was not used / Does not apply
<i>Csdwcl</i>	Average carbon stock per hectare in standing dead wood carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-25	Was not used / Does not apply
<i>Csoccl</i>	Average carbon stock per hectare in soil organic carbon pool of LU/LC class <i>cl</i>	tCO ₂ -e ha-1	A3-6, A3-33	Was not used / Does not apply
<i>Csocpl</i>	Carbon stock per hectare in the soil organic carbon pool estimated for the plot <i>pl</i>	tCO ₂ -e ha-1	A3-33	Was not used / Does not apply
<i>ct</i>	1,2,3,... CT categories of LU/LC change	Dimensionless	15	Was not used / Does not apply
<i>CXBw,icl,t</i>	Mean carbon stock per hectare of extracted biomass	tCO ₂ -e ha-1	A3-35, A3-37	Was not used / Does not apply

	carbon by class of wood product w for forest class ic at time t			
$d1, d2, \dots, dn$	Diameters of intersecting pieces of dead wood	cm	A3-29	Was not used / Does not apply
DBI	Daily biomass intake	kg d.m. head-1 day-1	A4-2	Was not used / Does not apply
dc	1,2,3, dead wood density classes	Dimensionless	A3-30	Was not used / Does not apply
DC	Total number of density classes (3)	Dimensionless	A3-30	Was not used / Does not apply
☐ CBSLPat	Total baseline carbon stock change within the project area at year t	t CO ₂ -e	14, 25	Was not used / Does not apply
☐ Cdwct	Average carbon stock change factor in the dead wood biomass carbon pool of category ct	tCO ₂ -e ha-1		Was not used / Does not apply
☐ CFCdPat	Total decrease in carbon stock due to forest fires and catastrophic events at year t in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CFCiPat	Total increase in carbon stock due to forest fires and catastrophic events at year t in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CLKt	Total decrease in carbon stocks within the leakage belt at year t	tCO ₂ -e		Was not used / Does not apply
☐ CPAdPat	Total decrease in carbon stock due to planned activities at year t in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CPAiPat	Total increase in carbon stock due to planned activities at year t in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CPDdPat	Total decrease in carbon stock due to planned deforestation at year t in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CPFdPat	Total decrease in carbon stock due to planned fuel-wood and charcoal activities at year t in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CPFiPat	Total increase in carbon stock due to planned fuel-wood and charcoal activities at year t in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CPLdPat	Total decrease in carbon stock due to planned logging activities at year t in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CPLiPat	Total increase in carbon stock due to planned logging activities at year t in the project area	tCO ₂ -e		Was not used / Does not apply

☐ CPNiPat	Total increase in carbon stock due to planned protection of growing forest classes in the project area at year <i>t</i>	tCO ₂ -e		Was not used / Does not apply
☐ CPSPat	Total project carbon stock change within the project area at year <i>t</i>	tCO ₂ -e	25	Was not used / Does not apply
☐ Csocct	Average carbon stock change factor in the soil organic carbon pool of category <i>ct</i>	tCO ₂ -e ha ⁻¹		Was not used / Does not apply
☐ CUCdPat	Total decrease in carbon stock due to catastrophic events at year <i>t</i> in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CUCiPat	Total increase in carbon stock due to catastrophic events at year <i>t</i> in the project area	tCO ₂ -e		Was not used / Does not apply
yiuyerers	Total actual carbon stock change due to unavoided unplanned deforestation at year <i>t</i> in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CUFdPat	Total decrease in carbon stock due to unplanned (and planned – where applicable) forest fires at year <i>t</i> in the project area	tCO ₂ -e		Was not used / Does not apply
☐ CUFiPat	Total increase in carbon stock in areas affected by forest fires (after such events) at year <i>t</i> in the project area	tCO ₂ -e		Was not used / Does not apply
☐ Cwpct	Average carbon stock change factor in harvested wood products carbon pool (stock remaining in wood products after 100 years) of category <i>ct</i>	tCO ₂ -e ha ⁻¹		Was not used / Does not apply
<i>Ddc</i>	Dead wood density of class <i>dc</i>	tonnes d.m. m ⁻³	A3-30	Was not used / Does not apply
<i>Dm</i>	Deadwood density	g cm ⁻³	A3-28	Was not used / Does not apply
<i>DMpl</i>	Dry mass of sample <i>pl</i>	tonnes of d.m.	A3-24	Was not used / Does not apply
<i>EBBBSLPat</i>	Sum of (or total) baseline non-CO ₂ emissions from forest fire at year <i>t</i> in the project area	tCO ₂ -e		Was not used / Does not apply
<i>EBBCO₂icl</i>	Per hectare CO ₂ emissions from biomass burning in slash and burn in forest class <i>icl</i>	tCO ₂ -e ha ⁻¹	17, 18, 19	Was not used / Does not apply
<i>EBBN₂Oicl</i>	N ₂ O emissions from biomass burning in forest class <i>icl</i>	tCO ₂ -e	16, 17	Was not used / Does not apply
<i>EBBPSPat</i>	Sum of (or total) actual non-CO ₂ emissions from forest fire at year <i>t</i> in the project area	tCO ₂ -e		Was not used / Does not apply
<i>EBBtoticl</i>	Total GHG emissions from	tCO ₂ -e	16	Was not used /

	biomass burning in forest class <i>icl</i>			Does not apply
<i>ECH4fermt</i>	CH4 emissions from enteric fermentation at year <i>t</i>	tCO2-e	A4-1	Was not used / Does not apply
<i>ECH4mant</i>	CH4 emissions from manure management at year <i>t</i>	tCO2-e	A4-3	Was not used / Does not apply
<i>EdirN2Omant</i>	Direct N2O emissions from manure management at year <i>t</i>	tCO2-e	A4-4, A4-5	Was not used / Does not apply
<i>EF1</i>	Enteric CH4 emission factor for the livestock group	Kg CH4 head-1 yr-1	A4-1	Was not used / Does not apply
<i>EF1</i>	Emission factor for emissions from N inputs	tN2O tN-1		Was not used / Does not apply
<i>EF2</i>	Manure management CH4 emission factor for the livestock group	Kg CH4 head-1 yr-1	A4-3	Was not used / Does not apply
<i>EF3</i>	Emission factor for N2O emissions from manure management for the livestock group	Kg N2O-N (kg N-1) head-1 yr-1	A4-5	Was not used / Does not apply
<i>EF4</i>	Emission factor for N2O emissions from atmospheric deposition of forage-sourced nitrogen on soils and water surfaces	Kg N2O-N (kg NH3-N and NOx-N emitted)-1 head-1 yr-1	A4-6	Was not used / Does not apply
<i>EgLKt</i>	Emissions from grazing animals in leakage management areas at year <i>t</i>	t CO2-e	23	Was not used / Does not apply
<i>EindNOmant</i>	Indirect N2O emissions from manure management at year <i>t</i>	t CO2-e	A4-4, A4-5	Was not used / Does not apply
<i>ELKt</i>	Sum of ex-ante estimated leakage emission at year <i>t</i>	t CO2-e	23	Was not used / Does not apply
<i>EN2Omant</i>	N2O emissions from manure management at year <i>t</i>	t CO2-e	A4-4	Was not used / Does not apply
<i>ERN2O</i>	Emission factor for N2O (IPCC default value = 0.007)	Dimensionless	17	Was not used / Does not apply
<i>fcl</i>	1,2,3,...fcl final (post-deforestation) non-forest classes	Dimensionless	14	Was not used / Does not apply
<i>GWPN2O</i>	Global warming potential for N2O (IPCC default value = 310 for the first commitment period)	Dimensionless	17	Was not used / Does not apply
<i>H</i>	Height of the tree	Meters	A3-27	Was not used / Does not apply
<i>i</i>	1,2,3,...IRRA Stratum within the reference region	Dimensionless	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	Was not used / Does not apply
<i>icl</i>	1,2,3,...icl initial (pre-deforestation) forest classes	Dimensionless	14	Was not used / Does not apply
<i>j</i>	Number of organic fertilizer classes	Dimensionless		Was not used / Does not apply
<i>L</i>	Length of the line	m	A3-29	Was not used / Does not apply
<i>NCR</i>	Nitrogen/Carbon ratio (IPCC	Dimensionless	17	Was not used /

	default value = 0.01)	ess		Does not apply
<i>Nex</i>	Annual average N excretion per livestock head	kg N head-1 yr-1	A4-6	Was not used / Does not apply
<i>OFW</i>	Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest	Dimensionless	A3-35, A3-37	Was not used / Does not apply
<i>p</i>	Carbon pool that could burn (above-ground biomass, deadwood and litter)	Dimensionless	19	Was not used / Does not apply
<i>PCabpl</i>	Carbon stock in above-ground biomass in plot <i>p</i>	tC ha-1	A3-13	Was not used / Does not apply
<i>PCbbpl</i>	Carbon stock in below-ground biomass in plot <i>p</i>	tC ha-1	A3-16	Was not used / Does not apply
<i>Pcomicl</i>	Commercial volume as a percent of total aboveground volume in initial forest class <i>icl</i>	Dimensionless	A3-36	Was not used / Does not apply
<i>PCxi</i>	Average in situ production costs for one ton of product <i>Px</i> in stratum <i>i</i>	\$/t	1	Was not used / Does not apply
<i>Pforaget</i>	Production of forage at year <i>t</i>	kg d. m. yr-1	A4-2	Was not used / Does not apply
<i>pl</i>	1,2,3,... <i>PLcl</i> plots in LU/LC class <i>cl</i>	Dimensionless	A3-14, A3-17, A3-24, A3-33	Was not used / Does not apply
<i>PLcl</i>	Total number of plots in LU/LC class <i>cl</i>	Dimensionless	A3-14, A3-17, A3-24, A3-34	Was not used / Does not apply
<i>Po</i>	Anhydrous weight of sample	g	A3-28	Was not used / Does not apply
<i>Populationt</i>	Equivalent number of forage-fed livestock at year <i>t</i>	number of heads	A4-1	Was not used / Does not apply
<i>PPi,t</i>	Proportion of stratum <i>i</i> that is within the project area at time <i>t</i>	%	12	Was not used / Does not apply
<i>PPxi</i>	Potential profitability of product <i>Px</i> at the location <i>i</i> (pixel or polygon)	\$/t	1	Was not used / Does not apply
<i>Ps</i>	Saturated weight of sample	g	A3-28	Was not used / Does not apply
<i>Px</i>	Product <i>x</i> produced in the reference region	Dimensionless	1	Was not used / Does not apply
<i>r1</i>	Radius at the base of the tree	meters	A3-27	Was not used / Does not apply
<i>r2</i>	Radius at the top of the tree	meters	A3-27	Was not used / Does not apply
<i>RBSLRR_avgi,t</i>	Deforestation rate applicable to stratum <i>i</i> within the reference region at year <i>t</i> after <i>Toptimali</i> years and during <i>Taveragei</i> years	%	4.b	Was not used / Does not apply
<i>RBSLRR_opti,t</i>	Deforestation rate applicable to stratum <i>i</i> within the reference region at year <i>t</i> during the first <i>Toptimali</i> years	%	4.a	Was not used / Does not apply
<i>RBSLRR_sopti,t</i>	Deforestation rate applicable	%	4.c	Was not used /

	to stratum i within the reference region at year t after $T_{optimali} + T_{averagei}$ and during $T_{sub-optimali}$ years			Does not apply
$RBSLRRI,t$	Percentage of remaining forest area at year $t-1$ in stratum i to be deforested at year t	%	11	Was not used / Does not apply
$R_{j,pl,tr}$	Root-shoot ratio, applicable to tree tr of species j in plot pl	Dimensionless	A3-22	Was not used / Does not apply
$S\$x$	Selling price of product Px	\$/t	1	Was not used / Does not apply
$SLFw$	Fraction of wood products that will be emitted to the atmosphere within 5 years of timber harvest	Dimensionless	A3-35, A3-37	Was not used / Does not apply
$SPxI$	Selling point I of product Px	map	1	Was not used / Does not apply
t	1,2,3,... T a year of the proposed crediting period	Dimensionless	Almost all equations	Was not used / Does not apply
t^*	The year at which the area $ABSLPA_{fcl,t}$ is deforested in the baseline scenario	Dimensionless	A3-34	Was not used / Does not apply
$T_{averagei}$	Number of years in which $A_{averagei}$ is deforested in the baseline case	yr	5	Was not used / Does not apply
$t_{averagei}$	Year at which $T_{averagei}$ ends	yr	9, 11	Was not used / Does not apply
T_{Babj}	Above-ground biomass of a tree of species, or species group, or forest type j	kg tree ⁻¹ or t tree ⁻¹	A3-10	Was not used / Does not apply
T_{Babtr}	Above-ground biomass of tree tr	kg tree ⁻¹ or t tree ⁻¹	A3-11, A3-13, A3-21	Was not used / Does not apply
T_{Cabtr}	Carbon stock in above-ground biomass of tree tr	kg tree ⁻¹ or t tree ⁻¹	A3-11, A3-21	Was not used / Does not apply
T_{Cbbtr}	Carbon stock in below-ground biomass of tree tr	kg C tree ⁻¹	A3-16, A3-22	Was not used / Does not apply
TCv	Average transport cost per kilometer for one ton of product Px on land, river or road of type v	\$/t/km	1	Was not used / Does not apply
TDv	Transport distance on land, river or road of type v	\$/t/km	1	Was not used / Does not apply
$Thrp$	Duration of the historical reference period	yr	2	Was not used / Does not apply
$T_{optimali}$	Number of years since the start of the AUF project activity in which $A_{optimali}$ in stratum i is deforested in the baseline case	yr	5	Was not used / Does not apply
$t_{optimali}$	Year at which $T_{optimali}$ ends	yr	7, 8, 9	Was not used / Does not apply
tr	1,2,3,... TR_{pl} number of trees in plot pl	Dimensionless	A3-13	Was not used / Does not apply
$T_{sub-optimali}$	Number of years in which $A_{sub-optimali}$ is deforested in	yr	5	Was not used / Does not apply

	the baseline case			
v	1,2,3,... V type of surface on which transport occurs	Dimensionless	1	Was not used / Does not apply
$V1i,t; V2i,t; \dots; Vni,t$	Variables included in a deforestation model		11	Was not used / Does not apply
$VBCt$	Number of Voluntary Buffer Credits deposited in the VCS Buffer at time t	t CO ₂ -e	24, 25	Was not used / Does not apply
$VCUt$	Number of Voluntary Carbon Units (VCUs) to be made available for trade at time t	t CO ₂ -e	24	Was not used / Does not apply
VEF	Volume Expansion Factor	Dimensionless	A3-9	Was not used / Does not apply
$VEXw,j,fcl,t$	Volume of timber for product class w , of species j , extracted from within forest class fcl , at time t	m ³	A3-34	Was not used / Does not apply
$VOB10$	Volume over bark above 10cm DBH	m ³	A3-9	Was not used / Does not apply
$VOB30$	Volume over bark above 30cm DBH	m ³	A3-9	Was not used / Does not apply
$Volumedc$	Volume of lying dead wood in the density class dc	m ³	A3-30	Was not used / Does not apply
Vpl	Commercial volume of plot pl	m ³ plot-1	A3-19	Was not used / Does not apply
Vtr	Commercial volume of tree tr	m ³	A3-18, A3-21	Was not used / Does not apply
w	1,2,3,... W wood product class (sawn-wood, wood-based panels, other industrial round-wood, paper and paper board, and other)	Dimensionless	A3-34	Was not used / Does not apply
WWw	Wood waste for wood product class w . the fraction immediately emitted through mill inefficiency	Dimensionless	A3-35, A3-37	Was not used / Does not apply
XF	Plot expansion factor form per plot values to per hectare values	Dimensionless	A3-12, A3-13, A3-16, A3-19, A3-20, A3-24	Was not used / Does not apply

3.1.2 Data and Parameters Monitored

Complete the table below for all data and parameters monitored during the project crediting period (copy the table as necessary for each data unit/parameter). Data and parameters determined or available at validation are included in Section 3.1.1 (Data and Parameters Available at Validation) above.

Data / Parameter	RRD Forest / Non-Forest cover benchmark Map
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Data unit	Ha
Description	Map showing LULC class forest and non-forest at project start date
Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Description of measurement methods and procedures to be applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB.
Frequency of monitoring/recording	At the start of every fixed baseline period
Value monitored	<i>Provide an estimated value for the data/parameter</i>
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i> <i>Calculation of project emissions.</i> <i>Calculation of leakage.</i>
Calculation method	<i>Where relevant, provide the calculation method, including any equations, used to establish the data/parameter.</i>
Comments	N/A

Data / Parameter	Project area forest cover benchmark map
Data unit	Ha
Description	Map that shows the stratification and location of LULC class forest in the project area at the project start date (100% forest cover)
Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Description of measurement methods and procedures to be applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB.
Frequency of monitoring/recording	At the start of every fixed baseline period

Value monitored	<i>Provide an estimated value for the data/parameter</i>
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i> <i>Calculation of project emissions.</i> <i>Calculation of leakage.</i>
Calculation method	<i>Where relevant, provide the calculation method, including any equations, used to establish the data/parameter.</i>
Comments	N/A

Data / Parameter	Leakage belt forest cover benchmark map
Data unit	Ha
Description	Map that shows the stratification and location of LULC class forest in the leakage belt at the project start date (100% forest cover)
Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website
Description of measurement methods and procedures to be applied	The data is available to the public free of charge. Details about data pre and post processing can be found in the excel sheet submitted to VVB.
Frequency of monitoring/recording	At the start of every fixed baseline period
Value monitored	<i>Provide an estimated value for the data/parameter</i>
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i> <i>Calculation of project emissions.</i> <i>Calculation of leakage.</i>
Calculation method	<i>Where relevant, provide the calculation method,</i>

	<i>including any equations, used to establish the data/parameter.</i>
Comments	N/A

Data / Parameter	ABSLRRt
Data unit	Ha
Description	Annual area of baseline deforestation in the reference region at year <i>t</i>
Source of data	Calculated based on the results from future deforestation model using peer-reviewed software IDRISI Selva
Description of measurement methods and procedures to be applied	Variables and procedures to calculate baseline deforestation are thoroughly explained in the excel sheet submitted to VVB.
Frequency of monitoring/recording	Each renewal of fixed baseline period
Value monitored	<i>Provide an estimated value for the data/parameter</i>
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i> <i>Calculation of project emissions.</i> <i>Calculation of leakage.</i>
Calculation method	<i>Where relevant, provide the calculation method, including any equations, used to establish the data/parameter.</i>
Comments	N/A

Data / Parameter	ABSLPAt
Data unit	Ha
Description	Annual area of baseline deforestation in the project area at year <i>t</i>
Source of data	Calculated based on the results from future deforestation model using peer-reviewed software IDRISI Selva
Description of measurement methods and procedures to be applied	Variables and procedures to calculate baseline deforestation are thoroughly explained in the excel sheet submitted to VVB.

applied	.
Frequency of monitoring/recording	Each renewal of fixed baseline period
Value monitored	<i>Provide an estimated value for the data/parameter</i>
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i> <i>Calculation of project emissions.</i> <i>Calculation of leakage.</i>
Calculation method	<i>Where relevant, provide the calculation method, including any equations, used to establish the data/parameter.</i>
Comments	N/A

Data / Parameter	ABSLLKt
Data unit	Ha
Description	Annual area of baseline deforestation in the leakage belt at year t
Source of data	Calculated based on the results from future deforestation model using peer-reviewed software IDRISI Selva
Description of measurement methods and procedures to be applied	Variables and procedures to calculate baseline deforestation are thoroughly explained in the excel sheet submitted to VVB.
Frequency of monitoring/recording	Each renewal of fixed baseline period
Value monitored	<i>Provide an estimated value for the data/parameter</i>
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i>

	• 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	N/A

Data / Parameter	LULC Change
Data unit	%
Description	Percentage of forest that change to non-forest final classes during the historical reference period
Source of data	Landsat imagery from 1996, 2004, 2008, 2012, 2015, and 2020 obtained from INPES website. SEMA (2010) Economic-ecological zoning information for the northern area of Para
Description of measurement methods and procedures to be applied	Landsat imagery is available to the public free of charge. Details about data pre and post-processing can be found in the excel sheet submitted to VVB. SEMA's data is available to the public and is the most up to date and scale adequate official data for the project area
Frequency of monitoring/recording	At project start
Value monitored	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	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the 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	N/A

Data / Parameter	DLF
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Data unit	%
Description	Displacement Leakage factor
Source of data	VM0015 methodology
Description of measurement methods and procedures to be applied	Presented in the VM0015 methodology. The value is an ex-ante estimation
Frequency of monitoring/recording	Each renewal of fixed baseline period
Value monitored	0
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	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the 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	N/A

Data / Parameter	%LKB
Data unit	%
Description	Percentage of the overlapping leakage belts area to be assigned to project A,B,...N
Source of data	Map of distance to selective logging from tertiary roads Map of distance to rivers Project area forest cover benchmark map
Description of measurement methods and procedures to be applied	The data was generated using Landsat imagery that is available to the public free of charge. Details about pre and post-processing can be found in the excel sheet submitted to VVB. Relevance of the variable is recognized in the literature
Frequency of monitoring/recording	At project start and at each verification

Value monitored	<i>Provide an estimated value for the data/parameter</i>
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i> <i>Calculation of project emissions.</i> <i>Calculation of leakage.</i>
Calculation method	<i>Where relevant, provide the calculation method, including any equations, used to establish the data/parameter.</i>
Comments	N/A

Data / Parameter	RFt
Data unit	%
Description	Risk factor used to calculate VCS buffer credits
Source of data	A
Description of measurement methods and procedures to be applied	The value was calculated as a result of applying the guidelines in the aforementioned tool
Frequency of monitoring/recording	Each renewal of fixed baseline period
Value monitored	
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i> <i>Calculation of project emissions.</i> <i>Calculation of leakage.</i>
Calculation method	<i>Where relevant, provide the calculation method, including any equations, used to establish the data/parameter.</i>

Comments	N/A
Data / Parameter	EI
Data unit	%
Description	Ex ante estimated effectiveness index
Source of data	Calculated
Description of measurement methods and procedures to be applied	Based on results from ongoing on-site monitoring activities since 2008
Frequency of monitoring/recording	At project start and annually
Value monitored	<i>Provide an estimated value for the data/parameter</i>
Monitoring equipment	<i>Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate.</i>
QA/QC procedures to be applied	Through accuracy assessment in the excel sheet submitted to VVB.
Purpose of the data	<i>Indicate one of the following:</i> <i>Calculation of baseline emissions.</i> <i>Calculation of project emissions.</i> <i>Calculation of leakage.</i>
Calculation method	<i>Where relevant, provide the calculation method, including any equations, used to establish the data/parameter.</i>
Comments	N/A

3.1.3 Monitoring Plan

The justification for the selection of the carbon pools is presented below (see Table 20). Selection of carbon pools followed the guidelines of VCS VM0015 methodology. *Refer to validated VCS PD for details*

Carbon pools	Included / TBD/Excluded	Justification / Explanation of choice
Above-ground	Included	Carbon stock change in this pool is always significant
Below-ground	Included	Included to account for all the Trees biomass.

Dead wood	Excluded	This pool is less present in the Baseline scenario than in the Project scenario, thus is conservatively excluded.
Harvested wood products	Excluded	This pool didn't pass 5% significance test.
Litter	Included	This pool should be excluded according to VCS vm0015 methodology.
Soil organic carbon	Excluded	Not to be measure when forest is Converted to pastures according To VCS vm0015 methodology.

Quality control and quality assurance procedures:

As monitoring was conducted mainly by using remote sensing imagery in a GIS environment, quality management procedures are related with GIS data quality. When working with geographical information, positional accuracy is often synonymous with data quality. Data compilation from several different sources often requires very good data quality. Quality procedures must be employed to ensure that data are properly collected, handled, processed, used and maintained throughout the data lifecycle while performing monitoring activities.

For Satellite Images, GIS and GPS data:

Quality Management Procedures before data collection:

- Monitoring was done by trained project personnel, understanding the importance of accurate data collecting.
- Format: Satellite Images were collected in TIFF raster digital format. Vector files were collected in shape file GIS format. GPS was also collected in digital format.
- Spatial Reference: Data was always use the Projected UTM System, South 22 Zone, Datum WGS84.
- Imagery: Landsat LCDM (Landsat 8) is the type of image selected for permanent monitoring.
- Source: Imagery were downloaded from the US Geologic Survey website (currently <http://glovis.usgs.gov/>).
- Responsibility for quality assurance was assigned to a person with adequate background suitable to the task.
- References on GPS and satellite images calibration are described in this document in the section "Equipment calibration".

- Metadata: Metadata was created for the data to be collected.
- GPS accuracy: To obtain accuracies such as those reported, the GPS Receiver must be located in an area that is free from overhead obstructions and reflective surfaces and have a good field of view to the horizon (for example, they do not work very well under a heavy forest canopy). Data coordinates were collected in meters using the spatial reference units noted above.
- The staff member for monitoring evaluates the data gathering team to identify errors in field techniques, verify measurements processes and correct any identified problems before measurements are carried out.

Quality Management Procedures during data entry:

- Protocols and Guides: Data in digital formats must be treated according to protocols on data management. Methodology to process and classify satellite images must be carried out according to the annexed section on "Classification and Accuracy Assessment".

- Design an efficient storage system for the data: Data was stored in a computerized database for use with specialized software (GPS, GIS, Remote sensing) for processing it. One person was in charge of managing this dataset.

- All modifications to the dataset shall be documented.

Quality Management Procedures after data entry:

- Regular backup of data helps ensure consistent quality levels.
- Data integrity: Data was not altered or destroyed in an unauthorized manner, or accidentally or maliciously modified.
- Data integration: Geographical datasets are difficult to integrate when there are inconsistencies between them, which may involve both the spatial and attributes characteristics of the data.
- Given the timeframe of the project, and the pace of production of updated versions of software and new hardware for storing data, electronic copies of data and reports were periodically updated or converted to a format that can be assessed by any future software applications.

All activities included in the Monitoring Plan are documented, as guides or protocols to be used permanently. It is required a data quality testing in each phase of data capture, including validation of GPS coordinates measured in the field (at a level community scale), choice of relevant data from a relevant source, positional accuracy of satellite images and GIS data, using automated GIS software tools and accuracy assessment of classified images.

Positional accuracy in satellite images

It is very important to ensure that remote sensing images in a time series overlay properly to each other and to other GIS maps used in the analysis. To geometrically correct the acquired images, it is necessary to have at least one orthorectified image to use as a reference image, and to undertake a process called georeferencing.

Images were geometrically corrected to the projection UTM Zone 22 South datum WGS 1984 using an orthorectified image by collecting manually selected control points in both images.

Among the features to be identified as control point locations we have road or stream intersections, the mouth of a stream, the corner of an established plot, or roads corners. The second-order polynomial transformation and the nearest neighbor resampling technique could be used to correct images. RMS errors of less than one pixel obtained from the geometric correction process was acceptable.

Accuracy of the baseline deforestation

Accuracy assessment follows the guidelines of the document „Methodology Procedures Used in Processing, Classification, and Accuracy Assessment of Remotely Sensed Data“ included the excel sheet submitted to VVB.

GHG emissions calculations

The tables to calculate GHG emission benefits from the project have been reviewed during the verification process and errors have been corrected. A cell by cell review was performed to follow the formulas and values to make sure all were correct.

TASK 1: Monitoring changes in carbon stocks and GHG emissions for periodic verification

1.1 Monitoring actual changes in carbon stocks and GHG emissions in the project area;

1.2 Monitoring leakage;

1.3 Ex-post calculation of GHG emission reductions.

1.4 Monitoring the impacts of natural disturbances and other catastrophic events.

1.1 Monitoring actual changes in carbon stocks and GHG emissions in the project area

1.1.1 Monitor the Implementation of the project

This task of developing the monitoring report was the responsibility of the landowners. The landowner was in charge of sending patrol to the project area to identify loggers and squatters. The monitoring activities are done by STA solutions located in Belem.

Monitoring waste conducted mainly by using remote sensing imagery. Remotely sensed data have been widely used as a cost effective tool in the mapping and monitoring of large areas (e.g. Danaher et al. 1998; Gould 2000; Mayaux et al. 2000; Freeman et al. 2002). Satellite optical or radar images could be used depending on the availability of the scenes, cloud cover and related acquisition and processing costs. Satellite images need be calibrated (pre-processing procedures) before performing the principal analysis. These preprocessing operations could include (1) radiometric preprocessing to adjust digital values for effects of a hazy atmosphere and/or (2) geometric preprocessing to bring an image into registration with a map or another image (Campbell and Wynne, 2011).

At the same time, monitoring patrols composed by local people that patrol the Project Area to dissuade any invasion or illegal logging attempt. Fieldwork was done using a ground-based GPS approach to register the geographical position of any activity that need to be reported.

The Project Area was divided in patrols to better manage the extent of the Project Area and LMA and assure an effective on the ground monitoring. Patrol leaders oversee the activities, compile, and analyze the results from monitoring patrols³ (Figure 2). Patrol leaders report to the office in Belem. These two offices were responsible of informing local authorities about illegal

activities happening in the Project Area and to follow up the enforcement of the required measures to remove invaders (Figure 3).

EQUIPMENT CALIBRATION

GPS

Besides any operational considerations when using a GPS receiver in the field, this equipment need not be calibrated for this monitoring. Average positional accuracy of most GPS receivers (15 meters) is enough to register monitoring activities in the field (i.e. location of loggers or squatters in the Project Area). GPS coordinates were used 'for information only' and its accuracy is considered appropriate to clearly show in maps where any feature or activity in the Project Area is located.

Satellite Images

Monitoring was conducted mainly by using remote sensing imagery. Before processing the image data to produce land cover maps, satellite imagery need be calibrated, this is, some preprocessing procedures must be applied to the imagery. These procedures enhance the quality of the image data by reducing or eliminating various radiometric and geometric errors caused by internal and external conditions.

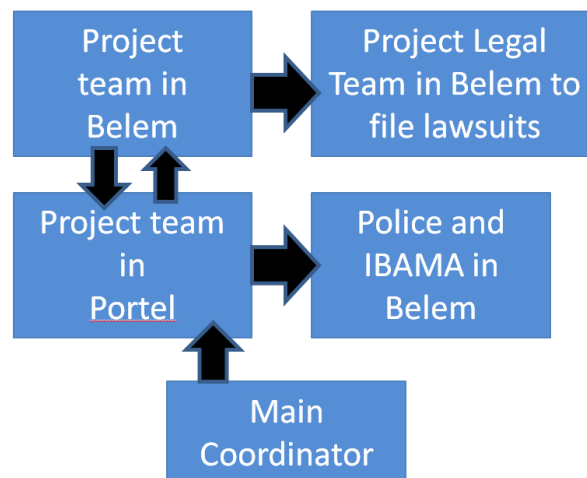
a. Geometric correction procedures address errors in the relative position of pixels due to factors such as variation in altitude, attitude and velocity of the sensor platform, Earth curvature, panoramic distortion, relief displacement and non-linearities in the sweep of a sensor (Lillesand and Kiefer 1994). It is very important to ensure that images in a time series overlay properly to each other and to other GIS maps used in the analysis. To geometrically correct the images, it is necessary to have a spread of Ground Control Points (GCPs) located either on a 1:100,000 official topography or another rectified image, to undertake a process called geo-referencing. For all resampling operations, we use the Nearest Neighbor algorithm to maintain radiometric integrity of the image.

b. Radiometric correction procedures account for errors that affect the brightness value of pixels due to both a sensor system detector error and an environmental attenuation error (e.g. changes in scene illumination, atmospheric conditions and viewing geometry [Lillesand and Kiefer 1994]). One of these procedures involved conversion of the measured multi-espectral brightness values to top of atmosphere reflectance units. This normalization procedure is crucial when creating multi-temporal and/or multi-spatial mosaics as it largely removes variations between these images due to sensor differences, Earth-sun distance and solar zenith angle (caused by different scene dates, overpass time and latitude differences)(Bruce and Hilbert, 2004).

Figure 6: Activities management in the Project area



Figure 7: Activities to inform local authorities about illegal activities in the Project area



The activities of the Project and their monitoring can be grouped as follows:

1. Forest monitoring:

Monitoring of forest cover was done mainly by remote sensing imagery. The choice of imagery depend on the availability of scenes, cloud cover, and related acquisition and processing costs.

Remote sensing imagery could be either satellite (i.e Landsat) or radar (i.e Alos Palsar) or a combination of both.

LULC-change analysis using remote sensing imagery could be conducted annually or by periods depending on the availability of scenes. Therefore, verification event could occur annually or by periods.

The fixed degradation frontier map was updated at each verification event to account for areas that may have changed their carbon stocks due to unavoided illegal logging activities. The fixed degradation frontier was assessed based on the availability of scenes, cloud cover, and related acquisition and processing costs. Remote sensing imagery could be either satellite (i.e Landsat) or radar (i.e Alos Palsar) or a combination of both.

The landowners did limited patrols from 2012 to 2016. These patrols would generate a hand-written report in Portuguese and then a law firm hired by the landowner would clean the reports and translate these to English. During this period no GPS points were taken to identify the exact location of deforestation activities. All original hand-written reports and the official translations are available in digital formats.

Prior to July 2016, patrolling activities were scaled-up by hiring local people as forest monitoring patrols. They were responsible for each monitoring patrol who generate monthly reports unless illegal activities are spotted, in which case a report was submitted immediately as described in the next section.

Of particular importance is the implementation of the surveillance system that allows continuous monitoring of the Project Area to prevent the entry of squatters and illegal loggers. The objective of forest patrolling is to make evident the presence of the landowner and dissuade pioneer agents (i.e loggers, squatters) from encroaching the Project Area. This activity functions as a complement of remote sensing-based monitoring but does not replace it. Furthermore, the generation of carbon credits for avoided emissions does not rely on the results of patrolling,

The Project Area was divided in patrols (based on river affluents) to facilitate monitoring such a large area. Each Patrol leader compiles the information from patrolling reports into adequate digital formats all the information from the reports to keep track of the areas that are being patrolled each week and what are the findings of each patrol. Digital reports were sent to the office in Belem to be organized and stored.

The actual size of a patrol and the numbers of community members to be hired depends on the results from the census that were conducted after validation. The area of a patrol is reasonable to allow for

an effective surveillance given available staff. If not enough local community members are willing to work as monitoring staff; Anapu-Pacaja has hired people from Portel, Para urban area.

Patrols did identify illegal activities (invasions and timber extraction) and reported them the patrol leader. When illegal activities are spotted, patrols geo-reference the finding and make a short description of what was found. Patrols approach squatters or loggers to let them know –in good terms- that this is private land, they cannot undertake such activities there and they must leave immediately. (virtual squatters are handled in the Brazilian legal system)

With the information supplied by each patrol, patrol leaders complete a monitoring report that include at least the coordinates where the illegal activities are taking place, the date and a brief

report of what was identified. Finally, each patrol leader did submit this information to the local police in Portel and to IBAMA in Portel and in Belem.

Monitoring reports are numbered, filed appropriately, and be scanned to have digital copies in an archive as backup.

Once every two months, patrol leaders perform random site visits to verify that monitoring patrols are covering the assigned area and that each patrol is wearing the adequate field equipment. Patrol leaders complete a report that was submitted to office in Belem. A monitoring patrol that does not wear adequate field equipment or does not cover the designed monitoring route, did receive a warning. If a patrol is a reoffender, the patrol leader has a meeting with the offender to attempt to correct the issues.

Maps, reports and records are available to validators at each verification event.

2. **Biodiversity monitoring:** monitoring will follow the guidelines described in section “B3. Biodiversity Impact Monitoring” of the associate CCB PDD.

Biodiversity activities and their indicators will be:

1. Biodiversity protection is directly related with ecosystem health, which is in turn linked to forest cover. Positive impacts on biodiversity will be estimated indirectly through remote analysis of forest cover. Preserving forest cover through avoided deforestation and degradation will allow implying that net positive impacts on biodiversity are being generated.

2. Biodiversity spotting by local people. Local people participating in the biodiversity component of the project will be in charge of reporting animal spotting at the boundaries of the LMA and the PA. Spotting frequency and animal species identified will indirectly assess net positive impacts on ecosystem health.

3. Active biodiversity monitoring. Local people will be hired to monitor ants, bats and bryophytes. Results are a good indirect indicator of ecosystem health.

All information should be properly reported following the protocols developed by Anapu-Pacaja after the fieldwork . Reports should provide geo-referenced information about biodiversity spotting and data as determined by the protocols. All data from the reports should be input into electronic format prior to the analysis. Maps, reports and records will be available to validators at each verification event.

3. Social Monitoring: will be undertaken by social monitoring squads. There will be a responsible for each monitoring squad who will generate monthly activities reports. Each squad will be in charge of specific villages and will use approved questionnaires to gather socio-economic data about the impacts of the activities of the Project. Questionnaires will also include a section for comments to include information that is not contained in the template.

Monthly reports will be submitted to the brigade leader who will input the information into electronic format to analyze it. The results from this analysis will be used to assess the impact of each activity and to identify villages that require particular attention.

The Project management teams in Protel and Belem will held bimonthly meetings to assess the effectiveness of the activities in local villages. Based on the information supplied by the brigade leaders, the management teams will improve the proposed activities. Maps, reports and records will be available to validators at each verification event.

1.1.2 Monitoring change and land use within the project area.

This task will be the responsibility of Anapu-Pacaja. According to the categories presented in Table 35 of the VM0015 methodology (Table 2), the Project will implement MRV to identify and assess LULC-changes within the Project Area.

Table 2: Categories that require MRV (refer to Table 35 – VM0015 methodology)

ID	Type	Conditions under which monitoring is mandatory	Explanations	Applicability to the Project
I	Area of forest land converted to non-forest land	Mandatory in all AUD project activities		Applicable
II	Area of forest land undergoing carbon stock decrease	Mandatory only for AUD project activities having planned logging, fuel-wood collection and charcoal production activities above the baseline	Change in carbon stock must be significant according to ex-ante assessment, otherwise monitoring is not required	Does not apply because none of the Project"s activities involve planned logging, fuel-wood collection and charcoal production
III	Area of forest land undergoing carbon stock increase	Mandatory only for AUD project activities wishing to claim carbon credits for carbon stock increase	Increase must be significant according to ex-ante assessment and can only be accounted on areas that will be deforested in the baseline case	Does not apply because the project will not claim carbon credits from carbon stock increase.

Monitoring of forest cover will be done mainly by remote sensing imagery. The choice of imagery will depend on the availability of scenes, cloud cover, and related acquisition and processing costs.

Remote sensing imagery could be either satellite (i.e Landsat) or radar (i.e Alos Palsar) or a combination of both.

LULC-change analysis using remote sensing imagery could be conducted annually of by periods depending on the availability of scenes. Therefore, verification event could occur annually of by periods.

LULC-change analysis will be done for the the Reference Region, Project Area and Leakage Belt using the protocol described in detail in the excel sheet submitted to VVB.. This imagery classification analysis will result in forest and non-forest classes that should be compared with the results from the deforestation model for the date of a specific verification event. The results from such analysis will be reported using the appropriate VCS" tables and formats.

1.1.3 Monitoring of carbon stock changes and non-CO2 emissions from forest fires

None of the cases presented in Section 1.1.3 of the VM0015 methodology apply to the Project (Table 3). So, the Project is not required to set sampling plots to measure carbon stocks in either the project area or leakage belt.

Table 3: Applicability criteria for monitoring non-CO2 gasses

	ID	Type	Applicability to the Project
	Within the Project Area		
Mandatory monitoring of the carbon stocks	I	Areas subject to significant carbon stock decrease in the project scenario according to ex-ante assessment	Does not apply
	II	Areas subject to unplanned and significant carbon stock decrease e.g., due to uncontrolled forest fires and other catastrophic events	Does not apply
	III	Area of forest land undergoing carbon stock increase	Does not apply
	Within Leakage Management Area		
	IV	Areas subject to planned and significant carbon stock decrease in the project scenario according to ex-ante assessment	Does not apply
Option monitoring of carbon stocks	Within the Project Area		
	V	Areas subject to carbon stock increase after planned harvest activities	Does not apply

		Areas recovering after disturbances	Does not apply
VI	Within Leakage Management Areas		
VII		Areas subject to carbon stock increase due to leakage prevention measures	Does not apply
	Within Leakage Belt		
VIII		Areas undergoing significant changes in carbon stock	Does not apply

1.1.4 Monitoring of the impacts of natural disturbances and other catastrophic events

Catastrophic events are not expected in the Project Area or Leakage Belt. Nevertheless, if by any chance a catastrophic event presents during the Project's lifetime, such events will be evaluated and reported if significant. Monitoring will follow VM0015 Tables 20.f, 20.g, 21.f and 21.g to report reductions by catastrophic events.

1.1.5 Total ex post estimated actual net carbon stock changes and GHG emissions in the project area

All ex post estimations in the Project Area will be summarized using the format of Table 24 of the VM0015 methodology.

1. 2 Monitoring of leakage

The Project is not expected to generate any type of leakage. Even so, as mentioned in item 1.1.2 of this Monitoring Plan, monitoring of forest cover will be done mainly by remote sensing imagery. The choice of imagery will depend on the availability of scenes, cloud cover, and related acquisition and processing costs. Remote sensing imagery could be either satellite (i.e. Landsat) or radar (i.e. Alos Palsar) or a combination of both.

LULC-change analysis using remote sensing imagery could be conducted annually of by periods depending on the availability of scenes. Therefore, verification event could occur annually of by periods.

Any deforestation above the deforestation baseline found outside the Project's Boundaries will be considered to be leakage as described in the VCS' vm0015 methodology.

Carbon stocks in pre and post-deforestation classes are assumed to remain constant, as there are not significant decreases or increases of carbon stocks in the leakage belt.

1.2.1 Monitoring of carbon stock changes and GHG emissions associated to leakage prevention activities

The activities of the project won't generate GHG emissions.

1.2.2 Monitoring of carbon stock decreases and increases in GHG emissions due to activity shifting leakage.

It is not expected for the Project to generate any kind of leakage. Even so, LULC-change will be monitored periodically (annual or multi-annual depending on the frequency of the verification events) using the protocol described in detail in Annex submitted as part of the monitoring activities described in Section 1.1.2 of this monitoring plan.

For the case of the leakage belt, LULC-change analysis will be focused on assessing deforestation above baseline levels. If such deforestation is identified results will be reported in Tables 29.a, 29.b and 29.c.

If deforestation above the baseline levels occurs in the leakage belt during the project lifetime, the exceeding carbon stock loss will be accounted for, and will be deducted from the non-permanence buffer.

Monitoring of increases in GHG emissions

The parameter values used to estimate emissions will be the same used for estimating forest fires in the baseline (table 18 of VM0015 methodology), except for the initial carbon stocks (Cab, Cdw) which shall be those of the initial forest classes burned in the leakage belt area.

The results will be reported using the same table formats (Table 18 and 19 of the VM0015 methodology) used in the ex ante assessment of baseline GHG emissions from forest fires in the project area.

TASK 2 - Revisiting the projected baseline at fixed periods.

2.1 Update information on agents, drivers and underlying causes of deforestation.

Anapu-Pacaja will be responsible for monitoring these variables. The biophysical variables, agents, vectors, and the underlying causes of deforestation (Step 3). used to project future deforestation from the Reference Region will be reviewed at least every 10 years (fixed baseline period) but they can also be reviewed earlier depending on the requirements of the Project.

2.2 Adjust the component of use and land-use change of the baseline.

Anapu-Pacaja will be responsible for carrying out this part of the monitoring.

Step 4 of Part 2 of the methodology VM0015 will be repeated to consider at least the following 10-year period in the Reference Region (2018-2028). However, the baseline can be modified to consider earlier 10-year periods. Such changes in the baseline must be approved by Anapu-Pacaja and will require undergoing a verification process before they can be implemented.

Updating the baseline scenario will take place both in the modeling component of the system dynamics (which defines the amount of change) and the spatial component that defines the distribution of deforestation. Key variables that will be used to recalculate the baseline in the second 10-year period of the project are:

- Socio-economic information retrieved from the Project's monitoring activities

- Distance to new roads
- Average distance to selective logging activities from pioneer roads
- Distance to non-forest
- Planned infrastructure in the region

To collect this information, field visits, surveys and workshops will be held and forest cover dynamics will be assessed using available satellite and/or radar imagery.

2.3 Adjusting the carbon component of the baseline.

According to Section **1.1.3** of this monitoring plan, it will not be necessary to adjust the carbon component of the baseline.

Describe the process and schedule followed for monitoring the data and parameters set out in Section 3.1.2 (Data and Parameters Monitored) above during this monitoring period, including details on the following:

- The organizational structure, responsibilities and competencies of the personnel that carried out the monitoring activities.
- The methods used for generating/measuring, recording, storing, aggregating, collating and reporting the data on monitored parameters.
- The procedures used for handling any internal auditing performed and any non-conformities identified.
- The implementation of sampling approaches, including target precision levels, sample sizes, sample site locations, stratification, frequency of measurement and QA/QC procedures. Where applicable, demonstrate whether the required confidence level or precision has been met.

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

3.1.4 Dissemination of Monitoring Plan and Results (CL4.2)

A monitoring plan for climate benefits along with the monitoring plan and results were communicated to the communities and other stakeholders via the website for the project where the Monitoring plan is listed.

In addition to this the technicians who travel to the land are required to carry all the most up-to-date documents and go through them with the communities at their request.

The head of each household was shown a hard copy.

Describe how any results of monitoring undertaken in accordance with the monitoring plan, have been disseminated and made publicly available on the internet. Describe the means by which summaries (at least) of the results have been communicated to the communities and other stakeholders.

3.2 Quantification of GHG Emission Reductions and Removals

For this first verification event that is conducted for this period, the Anapu-Pacaja project will verify the emission reductions generated from the project area.

Based on the ex-post analysis, the project avoided the emission of **4,359,749** that after buffer reductions are equivalent to **3,847,478** tradable VCUs during 01/Jan/2016 to 30/April/2020.

3.2.1 Baseline Emissions

The List of all Land Use and Land Cover classes existing at the project start date within the reference region is provided in Annex A of the MR. (refer Table 6)

The Annual areas of baseline deforestation in the reference region is provided in Annex A of the MR. (refer Table 9 a)

Table 9.b: Annual areas of deforestation in the project area is provided in Annex A of the MR.

Table 9.c: Annual areas of deforestation in the leakage belt is provided in Annex A of the MR.

Table 11.a Annual areas deforested per forest class within the Reference region in the baseline case (activity data per forest class) is provided in Annex A of the MR.

Table 11.b: Annual areas deforested per forest class within the project area in the baseline case (activity data per forest class) is provided in Annex A of the MR.

Table 11.c: Annual areas deforested per forest class within the leakage belt in the baseline case (activity data per forest class) is provided in Annex A of the MR.

Table 12.a: Annual areas deforested in each zone within the reference region in the baseline case is provided in Annex A of the MR.

Table 12.b: Annual areas deforested in each zone within the project area in the baseline case is provided in Annex A of the MR.

Table 12.c: Annual areas deforested in each zone within the leakage belt in the baseline case is provided in Annex A of the MR.

Table 14. Average carbon stock per hectare of all land use and land cover classes present in the leakage belt and project area is provided in Annex A of the MR.

Table 17.b: Total net baseline carbon stock change in the project area is provided in Annex A of the MR.

Table 18. Parameters used to calculate non-CO2 emissions from forest fires is provided in Annex A of the MR.

Table 19. Baseline non-CO2 emissions from forest fires in the project area is provided in Annex A of the MR.

Quantify the baseline emissions and/or removals, providing sufficient information to allow the reader to reproduce the calculation. Attach electronic spreadsheets as an appendix or separate file to facilitate the verification of the results.

3.2.2 Project Emissions

Table 9.b: Ex-post annual areas of unavoided deforestation in the project area is provided in Annex A of the MR.

Table 9.c: Ex-post annual areas of baseline deforestation in leakage belt is provided in Annex A of the MR.

Table 11.b: Ex-post annual areas deforested per forest class within the project area (activity data per forest class) is provided in Annex A of the MR.

Table 11.c: Ex-post annual areas deforested per forest class within the leakage belt (activity data per forest class) is provided in Annex A of the MR.

Table 12.b: Ex-post annual deforestation areas within the project area is provided in Annex A of the MR.

Table 12.c: Ex-post annual deforestation within the leakage belt is provided in Annex A of the MR.

Table 17.b Ex-post carbon stock change in the project area (above-ground, below-ground and litter biomass) is provided in Annex A of the MR.

Table 19: Ex-post non-CO2 emissions from forest fires from the project area is provided in Annex A of the MR.

Table 22. Ex-ante estimated net carbon stock change in the project area is provided in Annex A of the MR. is provided in Annex A of the MR.

Table 24. Total ex-post estimated actual net carbon stock changes and emissions from non-CO2 gasses in the project area is provided in Annex A of the MR.

Quantify project emissions and/or removals providing sufficient information to allow the reader to reproduce the calculation. Attach electronic spreadsheets as an appendix or separate file to facilitate the verification of the results.

3.2.3 Leakage

Table 29.a: Baseline carbon stock change in pre-deforestation (forest) classes is provided in Annex A of the MR.

Table 29.b: Carbon stock change in post-deforestation (forest) classes is provided in Annex A of the MR.

Table 29.c: Total net carbon stock change in the leakage belt is provided in Annex A of the MR.

Quantify leakage emissions providing sufficient information to allow the reader to reproduce the calculation. Attach electronic spreadsheets as an appendix or separate file to facilitate the verification of the results.

3.2.4 Net GHG Emission Reductions and Removals

The project has generated a total of **3,847,478** Tradable VCUs for the period of 01-Jan-2016 to 30-April-2020. Project Lifetime reductions **35,436,173**VCUs.

Table 4. Ex-ante estimated net anthropogenic GHG emission reductions (DREDDt) and Voluntary Carbon Units (VCUs)

Project year	Baseline		Ex ante project		Ex ante leakage		Ex ante net anthropogenic GHG emission reductions	
	GHG emissions		GHG emissions		GHG emissions			
	annual	Cumulative	annual	cumulative	annual	cumulative	annual	cumulative
	$EBBBSLPA_t$	$EBBBSLPA$	$EBBPSPA_t$	$EBBPSPA$	ELK_t	ELK	$\square REDD_t$	$\square REDD$
	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e
1	825	825	660	660	132	132	1,009,025	1,009,025
2	825	1650	660	1320	132	264	1,009,025	2,018,049
3	825	2,475	413	1733	83	347	1,003,586	3,021,634
4	825	3300	413	2,146	83	430	1,003,586	4,025,220
5	137.5	3,437.5	68.7	2,214.7	13.83	443.83	334,528	4,359,748

Quantify the net GHG emission reductions and removals, summarizing the key results using the table below. Specify breakdown of GHG emission reductions and removals by vintages where the intent is to issue each vintage separately in the VCS registry system.

Include quantification of the net change in carbon stocks. Also, state the non-permanence risk rating (as determined in the AFOLU non-permanence risk report) and calculate the total number of buffer credits that need to be deposited into the AFOLU pooled buffer account. Attach the non-permanence risk report as either an appendix or a separate document.

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
Year 2016	825	660	132	1,009,025
Year 2017	825	660	132	1,009,025
Year 2018	825	413	83	1,003,586

Year 2019	825	413	83	1,003,586
Year 2020	275	137.6	27.7	334,529
Total	3,575	2,283.6	457.7	4,359,748

Table 5 a Summary of Ex-ante estimated tradable net anthropogenic GHG emission reductions (DREDDt) and Voluntary Carbon Units (VCUs) after application of buffer.

Project Year	Ex ante VCUs tradable	
	Annual	Buffer applied
2016	890,464	11.75%
2017	890,464	11.75%
2018	885,664	11.75%
2019	885,664	11.75%
2020**	295,222	11.75%

**2020 is the first four months of the year

3.3 Optional Criterion: Climate Change Adaptation Benefits

Please refer to Section 2.1.1 for a detailed description of the Project's implementation status. This section includes a brief overview of implemented project activities and how they specifically assist communities or biodiversity adapt to climate change.

Communities

The implemented activities to assist communities with the adaptation to probably impacts of climate change includes the direct employment by the Project and training on new income generating activities and training on new and improved agricultural methods. Both activities help mitigate for the communities the most probably impacts of climate change, notably reduction in agricultural yield due to climatic changes and loss of income and damage from flooding.

Biodiversity

The most primary and most vital project activity for assist biodiversity is the protection of the project area from deforestation and degradation. Through the maintenance of the native forest condition in a unfragmented state, it provides the forest ecosystem with the greatest resilience against the most probable impacts of climate change. This provides the biodiversity with continued food and water sources in a sustainable fashion, and a stable habitat.

This section (3.3) should be completed for projects validated at the Gold Level for climate change adaption benefits. If not applicable, state so and leave this section blank.

3.3.1 Activities and/or processes implemented for Adaptation (GL1.3)

Table below describes the expected climate changes in the project zone, their effect on the communities or biodiversity and the project's adaptive strategy. The Project is also employing adaptive management; therefore, as new climate change risks and/or effects are identified

during the Project's lifetime new adaptive strategies were developed and implemented. The project's casual model is shown in the PD Sections 2.1.11. These results chains demonstrate how the project activities achieve the Projects stated adaptation benefits

Table 7: Project climate change adaptation Benefits

Climate change risks	Potential effects	Potential mitigate /adaptive strategies
More intense and longer droughts	Low land productivity or complete crop failure, less pasture for livestock and wildlife, more severe fires	Reduce dependence on livestock and land through alternative promote cultivation of drought resistant crops, improve storage facilities and management of crops, water harvesting and water storage, raise awareness of danger of fires,
Increased flood risk	Destruction of agricultural crops and development	Conservation of the forest in the Project Area increase water, reducing flood risk. Improved agricultural techniques help crops survive flooding.
Low capacity of local populations to adapt to frequent natural disasters	Increase in periods of food insecurity, potential increase in disease and deaths with continuing very low health standards, potential for increasing inter-community conflict	Increase support of local institutional structures including the norms and rules of governance to help develop adaptive strategies, increase literacy levels, diversification of livelihood activities and income generation projects, involve women to a greater degree in decision making processes, increase general participation in decision making at the local level
Decreased biodiversity, loss of forest cover to drought, temperature change	Reduction in species, more species at risk	Help to maintain intact and interconnected ecosystems through protection of ecosystems, ensure landscape connectivity to allow migration, regeneration activities using indigenous, drought resistant trees

Based on the project's validated causal model, describe activities and/or processes implemented to assist communities and/or biodiversity to adapt to the probable impacts of climate change.

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CM2.1)

Complete the table below to describe all the impacts on each community group resulting from project activities under the with-project scenario. Impacts must include all those identified in the project description and any other unplanned impacts. Explain and justify key assumptions, rationale and methodological choices. Explain how the affected groups have participated in the evaluation of impacts. Provide all relevant references. Copy and paste the table as needed.

Community Group	- Riverine Community - The entire community is all the riverine in the project area. - The community is broken into households, these households are better described as families. Each household may have up to 13 houses each being houses of the children of the original settler. The project has targeted to have 5 people trained in diversity.
Impact	Number of riverine people participating in the monitoring - Improved livelihood - monitoring activities each month - One person in each river that is next to the project area, with a general awareness to all member in each community. - 5 People total, as 5 primary different rivers. - Team of technicians completing the survey work for each family are trained to biodiversity monitor and report back any unique events. - Over 50 people along 5 different river afluent. - 50 received land tenure document known as CAR
Type of Benefit/Cost/Risk	- Actual benefit. - Capacity building related to the monitoring and CCB management of the forest and biodiversity. - Very little cost, as the monitoring is done via cell phone camera when there is a unique event, such as a large carnivore enter the area in the vicinity of the houses.

	- Job Opportunities - Providing land ownership legal rights
Change in Well-being	- Improved livelihood – more aware of the fauna and flora. - Capacity building - Improved agricultural practices - Increase in safety and security

Community Group	Women of the community are seen as vulnerable group
Impact	- 50 women were trained on the efficient cook stoves. - 50 cook stoves have been provided to the riverine people. - Number of improved cooking stoves pilots implemented in local families - Capacity building related to efficient and improved cooking stoves - improvement in health
Type of Benefit/Cost/Risk	- Actual benefit - overall satisfaction and health of community
Change in Well-being	- Improvement in overall satisfaction and health of community

4.1.2 Negative Community Impact Mitigation (CM2.2)

There are no negative community impacts and hence there is no need for mitigation.

Describe activities and/or processes implemented to mitigate any negative well-being impacts on community groups and for maintenance or enhancement of high conservation value (HCV) attributes identified in the project description. Explain how such actions are consistent with the precautionary principle.

4.1.3 Net Positive Community Well-Being (CM2.3, GL1.4)

Net Positive community impacts for this monitoring period is summarised as:

- Secured land tenure
- Diversification of food through agroforestry practices thus an improvement in local nutrition
- More efficient technologies to produce farinha therefore less time is consume in this activity.
- Generation of income from monitoring activities.
- Better understanding of the importance of protecting the forest and how forest conservation benefits their livelihoods.

As shown in Section 4.1.1, most of the activities initiated during the reporting period have multiple positive impacts on a large segment of the communities under the Anapu-Pacaja. The potential costs or negative impacts from implementing the proposed project activities are nil/minimal and are being mitigated for to some extent through the community projects (e.g., for poachers). Consequently, the net well-being impacts for the reporting period are overwhelmingly positive given the proportion of the population potentially impacted, the magnitude of the impacts and their long-term nature

Demonstrate that the net well-being impacts of the project are positive for all identified community groups compared with their well-being conditions under the without-project land use scenario.

Projects validated at the Gold Level for climate change adaptation benefits: demonstrate how the project activities have assisted communities to adapt to the probable impacts of climate change.

4.1.4 Protection of High Conservation Values (CM2.4)

As shown under Section 4.1.1, the project activities undertaken during the reporting period were all geared towards reducing pressure on the forest by diversifying livelihoods away from direct natural resource exploitation and enhancing forest protection. No negative effects are observed because of the project activities.

Demonstrate that none of the HCVs related to community well-being in the project zone identified in the project description are negatively affected by the project.

4.2 Other Stakeholder Impacts

4.2.1 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)

There are not expected negative offsite impacts thus no mitigation strategies are required.

Describe the activities and/or processes implemented to mitigate the negative well-being impacts on other stakeholders.

4.2.2 Net Impacts on Other Stakeholders (CM3.3)

Not Applicable

Demonstrate that the project activities have not resulted in net negative impacts on the well-being of other stakeholders.

4.3 Community Impact Monitoring

4.3.1 Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

The project proponents have designed a Social Impacts Monitoring Plan in accordance to the results obtained in the rural participatory diagnosis developed in the project area and initially

considering the indicators for the products of the proposed activities based on the identification of the necessities indicated by the population and the strategies foreseen to accomplish the project goals.

The following Table (Table 21) shows a non-comprehensive list of activities and indicators that were considered during monitoring. A full and detailed list is presented below:

Table 8: Some activities and indicators of the Social monitoring during this monitoring period.

Activity	Product Indicator
1. Capacity building related to the monitoring and management of the forest and biodiversity. Opportunities to work as control/supervision staff.	• 50 heads of households have been trained on monitoring. • They were taught to identify fauna that entered the vicinity to their home • Technicians completing survey work in the project area, and staying in the forest for long period of time are able to monitor biodiversity. Over the period 2016 to 2020 the project was focusing on a detailed census in each arm of each river, focusing on about 50 households per year for both census, training and delivering of cook stoves where needed.
2. Improving organizational Capacities of each community.	• 5 people one in each section of the project were trained on better organizational capacity. • Number of local associations/organizations strengthened by the project activities such as Association of Ribeirinhos e Moradores Portel Para Ltda. which was set up by the landowners to facility the social activities of the carbon credit project.
3. Providing land ownership legal rights versus conservation results	• 50 families living inside LMA and its proximities • 50 of people registered in the program to become legal land owners (inside and outside project area and LMA) • 50 of people that meet the forest conservation agreement.
4. Providing assistance to obtain land use rights over the forest owned by the private property landowners	• 50 people (Over 5,000 hectares) registered in the program to obtain the <i>use from land that was titled as private property as par to the project and is shifted over to the riverine people to be their land.</i> The CAR documents can be found in the government website for the Environmental Ministry for the state of Para – all 50 are there. This is the evidence The reason we know 50 were done is because

	the project did this, reviewing each CAR, one by one, as listed above the process is tedious with visit after visit to the same location, with locations very far from the town of Portel.
5. Providing assistance and training in agroforestry Techniques and implementing <i>pilot cases</i> .	• Around 50 people have been given lessons and training in alternative crops of agroforestry such as black pepper, Acai, Cocoa, Cupuacu, Honey
6. Capacity building related to efficient and improved cooking stoves and implementation of pilot <i>demonstrative cases</i>	• 50 cook stoves distributed 50 people trained in the use of efficient improved cooking stoves • 50 of improved cooking stoves pilots implemented <i>in local Families</i>
7. Capacity building on the development of small <i>communitarian enterprises</i> .	• 5 people from the community group, trained in the development and management of a small scale enterprise. Mostly focused on better marketing and advertising of the existing products such as cassava flour.

The Social Impacts Monitoring Plan aims at creating an association and mutual responsibility sense between the project and local communities in the management of social environmental impacts, as well as improving the perception of the social responsibility adopted by the project. ANAPU-PACAJA is committed to develop a complete Social Impacts Monitoring Plan with the summary of the activities is listed as above for this monitoring period.

Present the results of the community impact monitoring which should include:

All communities, community groups, other stakeholders, and HCVs related to community well-being identified in the monitoring plan.

Dates, frequency, sampling methods used, and other information regarding the monitoring process.

Results and evaluation of monitoring, including evaluations by the affected communities.

For projects validated to the Gold Level for exceptional community benefits, include all additional monitored data to demonstrate the project meets all required criteria.

4.3.2 Monitoring Plan Dissemination (CM4.3)

The plan was provided to local access via the project webpage and they have this.

In addition to this the technicians who travel to the land are required to carry all the most up-to-date documents and go through them with the communities at their request.

The head of each household were shown a hard copy of the results and a discussion took place to make sure that this person understood it.

Describe how any results of monitoring undertaken in accordance with the monitoring plan have been disseminated and made publicly available on the internet. Describe the means by which summaries (at least) of the monitoring results have been communicated to the communities and other stakeholders.

4.4 Optional Criterion: Exceptional Community Benefits

The project has implemented a number of long term and short term benefits over this monitoring period which qualifies under the gold level criteria of exceptional community benefits. The benefits are summarized in the sections below.

This section (4.4) should be completed for projects validated at the Gold Level for exceptional community benefits. If not applicable, state so and leave this section blank.

4.4.1 Short-term and Long-term Community Benefits (GL2.2)

Some of the short term benefits, which are estimated to occur during the project lifetime are summarised below:

1. Cook Stoves: The project has implemented distribution of energy efficient cook stoves for farinha production for the community members. A number of people have been trained in the use of efficient improved cooking stoves and the number of improved cooking stoves pilots implemented in local families is part of the monitoring plan and theory of change. This ensures capacity building related to efficient and improved cooking stoves, improvement in health and Improvement in overall satisfaction and health of community. Also this reduces the firewood consumption as cook stoves are more efficient compared to open stoves traditionally used. This results in long term community benefits. Around 150 cook stoves were distributed during this period.

2. Land Tenure: The 2016 to 2020 period worked as fast as possible to interview, meet, explain the process to gain title. It was a trust building exercise as the project was seeking to convince the locals to allow the project to pay for something. The community group is highly cautious as most people who promise them something are only present to steal their land or wood. All people interviewed are very eager to gain this data.

3. Better land resource management. The project has initiated several awareness programmes for efficient use of land for agricultural practices and has also provided cook stoves which have the benefit of lessening the time for Farinha (flour) production and the overall cooking time. The community has been made aware and trained in alternative crops of agroforestry such as black pepper, honey or andiroba oil. The increment of traditional Cassava plots pushes the agricultural frontier towards forest covered areas thus generating deforestation. Hence the alternative techniques of agroforestry help the community to make farming sustainable. This qualifies under both short term and long term benefits. 50 Community members trained in improved agroforestry techniques.

The project focuses on three principal strategies to ensure the maintenance and enhancement of the project benefits beyond the project lifetime which categorise as long term benefits.

1. Skill and capacity development.

2. Goal of permanent Land ownership

3. Health benefits

1. The skills are learnt by the communities throughout the projects lifetime. These relate to better land resource management. The project has initiated several awareness programmes for efficient use of land for agricultural practices and has also provided cook stoves which have the benefit of lessening the time for Farinha production and the overall cooking time. The protection of the forests itself ensure that due to lesser degradation there is greater potential to provide timber and non-timber forest products on a sustainable basis. The community has been made aware and trained in alternative crops of agroforestry such as black pepper, honey or andiroba oil. The increment of traditional Cassava plots pushes the agricultural frontier towards forest covered areas thus generating deforestation. Hence the alternative techniques of agroforestry help the community to make farming sustainable. 50 Community members have been trained in improved agroforestry techniques

2. The goal of permanent land ownership to the communities is one of the main initiatives of the project and this provides permanent ownership even beyond the project lifetime. This provides the community to implement the skills and learnings on their own land which is self-sustainable and provides benefits beyond the projects lifetime. 50 certificates of Cadastrol Ambiental Rural (CAR) were registered during this period

3. The health benefits to the women and to the overall community are expected to continue beyond the projects lifetime. In a 2002 report, WHO listed indoor smoke from solid fuels among the top 10 risks to human health? "Day in and day out, and for hours at a time, women and their small children breathe in amounts of smoke equivalent to consuming two packs of cigarettes per day," WHO reported in the 2006 report Fuel for Life: Household Energy and Health. As greenhouse gas emissions have increased, the smoke from kitchens in the developing world has escalated from a local to a worldwide threat. The average cooking fire produces about as much carbon dioxide as a car, and produces more soot, also known as black carbon. Reducing these emissions may be among the fastest, cheapest ways to fight global climate change. Around 50 cook stoves were distributed during this period.

The permanence of the overall short term and long term benefits associated with the project are captured during the feedback from the community during the periodic community meetings in which the majority of them prefer to continue the good practices. More than 87% of the community responded positively on these aspects in the one to one meetings.

Demonstrate that the project has or is on track to generate short-term and long-term net positive well-being benefits for smallholders/community members.

4.4.2 Marginalized and/or Vulnerable Community Groups (GL2.4)

Use the table below to identify each of the marginalized and/or vulnerable community groups that the project is engaging with and how the communities have or are on track to gain net positive benefits. Copy and paste the table as needed.

Community Group	Riverine community which are categorised as poor
Net positive impacts	Improved livelihood of the Riverine community for both short

	and long-term benefits.
Benefit access	The short term and long term benefits ensure a better safety, security and sustainable living. Also the door to door meetings ensure that the project calibrates itself to meet the expectations of the benefit programmes implemented. 220 people (Over 22,000 hectares) registered in the program to obtain the use from land that was titled as private property as par to the project and is shifted over to the riverine people to be their land. The CAR documents can be found in the government website for the Environmental Ministry for the state of Para – all 220 are there.
Negative impacts	The project has a role to facilitate feedback from the poorest members of the community. This process of regular interaction did prevent negative impacts on community members. Hence no negative effects are observed for this monitoring period.

Community Group	Women in riverine community
Net positive impacts	Improved livelihood of the women is expected to occur from the health benefits of using improved cook stoves for cooking. Also the lesser time it takes for farina productions means they can spend more time involving in other activities such as agroforestry which ensures overall better livelihood.
Benefit access	The short term and long term benefits for women ensure a better safety, security and sustainable living. Also the door to door meetings ensure that the project calibrates itself to meet the expectations of the benefit programmes implemented. Around 200 women have benefited from improved livelihood as indicated from the surveys conducted.
Negative impacts	The project has a role to facilitate feedback from the most vulnerable and marginalized members of the community. This process of regular interaction did prevent negative impacts on community members. Hence no negative effects are observed for this monitoring period.

4.4.3 Net Impacts on Women (GL2.5)

The net impacts on women observed during this monitoring period is summarised below:

1. Around 150 cook stoves have been distributed of which the main beneficiaries are women. Being a double burner cook stove, overall cooking time is reduced.
2. The extra time is being spent by women for agroforestry activities such as bee keeping. During the one to one meetings, more interest to use the bee boxes was observed. Around 05 bee boxes were distributed during this monitoring period as a trial.
3. The participation of women in meetings has been recorded to be of more than sufficient level given the historically existing gender imbalance in the region. The average representation in the one to one meetings is ensured as women are usually at the household and they are the main contributors for the survey inputs. More than 70% of the respondents interviewed were women.
4. Long term benefits such as improvement in indoor quality is also recorded by means of surveys. This has a direct impact of improving women"s overall health. Around 89% of women responded positively on this aspect.

Overall around 200 women have benefitted during the monitoring period.

Demonstrate that the project has generated net positive impacts on the well-being of women and that women participated in or influenced decision making.

4.4.4 Benefit Sharing Mechanisms (GL2.6)

The "Association of Ribeirinhos and Moradors of Portel, Para Ltda. provides the social benefits to the local population.

The focus of the project is to eventually give out a quarterly financial contribution to each family, but the project has not had the financial wherewithal to do that, as well as implementation of the social aspects. For this monitoring period, considering the low credit sales, has yet to be initiated.

It is to set up a governance structure operated by the locals throughout the community. The local associations have been active during this monitoring period.

To pay for the boat, the team, the survey work, and the work related to the land tenure has resulted in a cost of over USD 500,000 dollars for this monitoring period.

The 150 cook stoves cost about USD 50 dollars, each but delivery to the region is an additional USD 10 dollars including freight, staff salaries. So total cost of delivered cook stove is more.

The cost of anthropologist and the survey staff and security for patrolling has been a large overall factor taking up expenses. Their active participation during this monitoring period was observed.

Future benefit sharing mechanism is the following:

150 additional cook stoves

Additional survey work which will cost about USD 1 million dollars to finalize the full implementation of land tenure of all the land surrounding the project area. This is in relation to gaining the Final Title, completing the process for every family.

A future key project is, the first trial boxes of 200 boxes have already been ordered. The Bee boxes 150 families and 50 bee boxes per family are 7500 bee boxes. These bee boxes cost 30 dollars each and the additional equipment , freight, logistics is a USD 1 million dollar project to improve the economy. The goal is to produce 1 liter of Jatai Honey per bee box

Describe the implementation of the benefit sharing mechanisms described in the project description.

4.4.5 Governance and Implementation Structures (GL2.8)

The project has hired Anthropologists who specialize in traditional people to work as the liaisons for the project and interface with the locals. The project technicians are very good at interfacing, but the anthropologist and their ability to analyze the people helped improve on communication and implementation of the needs.

The association of Ribierinhos and Moradors of Portel, Para, Ltda. was set up to act as the governing body. Currently the boat pilot, guide and local manager for the project is in charge of the local activities of the association of Ribierinhos. They are employed as full time employees whereas survey personnel are contractual. Each time one on one meetings took place with the local households, 6 people were involved in the process.

Then over the period prior to July 2016 the project was focusing on a detailed census in each arm of each river, focusing on about 50 households per year for both census, training and delivering of cook stoves where needed. Hence a total of 2 surveys / year have been conducted during this monitoring period.

Describe how the project's governance and implementation structures have enabled full and effective participation of smallholders/community members in project decision-making and implementation.

4.4.6 Smallholders/Community Members Capacity Development (GL2.9)

During this period the project has been working with several academic institutes and associations as summarized below:

a) The project has been working with the Professor of Geography at the University of Para named David Vale. He has been advising and coordinating the aspect of land Tenure for the rural population within the project area. The University of Para is not directly affiliated with the project, but as Professor David brings a major expertise to the programs and procedures related to fulfilling the more complex land tenure questions within the project area. Professor David and

his team of interns and technicians have been successfully working to implement these land tenure aspects and explain to the local community that benefits from this.

b) The Association of Ribeirinhos and Moradores of Portel, Para Ltda. is working to become the representative body for the local population, by helping defending their rights against illegal loggers in the region, to help coordinate a formal security presence and to help represent them legally from illegal land invasion threats that are still ever present.

c) The Association of Ribeirinhos and Moradores of Portel, Para Ltda. is also acting as a custodian for those landowners who do not possess a Birth Certificate, tax ID number or ID number. For 50 people the distribution of these documents was done by the association for this monitoring period. Those people need to gain these documents before they are able to own the land the project is arranging for them. So the association holds the title as a custodian, where the title can only be transferred at the time that they possess the correct Brazilian ID.

Demonstrate how the project has developed the capacity of smallholders/community members, and relevant local organizations or institutions, to participate effectively and actively in project design, implementation and management.

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (B2.1)

The project focus exclusively on conservation measures within the project boundaries and its buffer, which makes negative offsite effects unlikely to happen. Besides, monitoring of flora and fauna this assures that any minimal offsite negative effect was taken care of immediately. Also, as mentioned on G3.2, the Project's activities do not involve the introduction of non-native species and the engagement of local community contributes for the socio-environmental safeguarding activities.

It is also very unlikely that the Project's activities within its boundaries (implementation of agroforestry techniques, energy efficient cook stoves for farinha production, and tenure rights) have any offsite impact. Therefore, considering these activities and "with project" scenario, the effects of the project on biodiversity is positive.

Complete the table below to describe all the changes in biodiversity resulting from project activities under the with-project scenario in the project zone during this monitoring period. Impacts must include all those identified in the project description and any other unplanned impacts. Explain and justify key assumptions, rationale and methodological choices. Provide all relevant references. Copy and paste the table as needed.

Change in Biodiversity	Vegetation cover /land use patterns
Monitored Change	Approximately 10 % Improvement of carbon stocks in the forest area was observed.

Justification of Change	Periodic analysis of satellite imagery and GIS analysis and assumptions used to estimate or document the change. Greatly reduced illegal logging in the project area, and this is mostly allowed old logging roads to fill with vegetation. This elimination of illegal wood activities has helped the flora replenish

Change in Biodiversity	Monitor area-limited species: species that require large patches to maintain viable populations, such as large carnivores. That indicates potential habitat losses and prey availability
Monitored Change	Increase in number of specific category species noted by sightings during regular patrolling for this monitoring period Puma concolor/ onca-parda- 5 Panthera onca/ onca-pintada - 6
Justification of Change	Increase in number of specific category species as the project area is not disturbed by agents of deforestation. This is noted by sightings during regular patrolling

Change in Biodiversity	Monitor resource-limited species: species requiring specific resources, such as frugivorous species, nectar species, snags etc. Bats can be great bio indicators as they have different feeding habits, such as insects, fruits, nectar/pollen, blood etc. They are also abundant through the region and its taxonomy has been well documented
Monitored Change	Increase in number of specific category species noted by sightings during regular patrolling for this monitoring period: araçari-de-pescoço-vermelho - 1 João-teneném-castanho - 2 jacupiranga - 1 mãe-de-taoca – 1
Justification of Change	Increase in number of specific category species as the project area is not disturbed by agents of deforestation. This is noted by sightings during regular patrolling

Change in Biodiversity	Monitor “special interest” species, critically endangered species, endangered species, and threatened species (IUCN, IBAMA)
Monitored Change	Increase in number of specific category species noted by sightings during regular patrolling for this monitoring period: Anta - 10 Queixada - 1 Graxaim - 4 macaco-da-noite - 1 Puma concolor/ onca-parda- 3 Panthera onca/ onca-pintada - 3
Justification of Change	Increase in number of specific category species as the project area is not disturbed by agents of deforestation. This is noted by sightings during regular patrolling

5.1.2 Mitigation Actions (B2.3)

The project during the monitoring period has sent teams of people, every year in two forms: Security and Monitoring, and the other team is training / implementing social projects (land tenure/cook stoves) and conservation education. The biodiversity monitoring is implemented as part of the regular patrolling conducted. The patrol guards note the sightings in the log book, which is reflected for this monitoring period. On an average 6 to 7 patrols have been conducted each year during this monitoring period. It is also informed that such patrols which have been on-going since project start date of 2009 onwards Security Patrols are coordinated by Silas, Camerao and Sergio. Further mitigation actions such as creating the awareness on conservation issues to the community and steps to prevent and remove land grabbers and illegal logging activities have ensured that the habitat is not fragmented.

Samples of the patrol logs have been submitted to the VVB.

Describe activities and/or processes implemented to mitigate negative impacts on biodiversity and any measures taken for maintenance or enhancement of the HCV attributes. Explain how such actions are consistent with the precautionary principle.

5.1.3 Net Positive Biodiversity Impacts (B2.2, GL1.4)

Net positive impacts on biodiversity have been demonstrated for this monitoring plan over time through periodic monitoring and reporting of biodiversity indicators as per the Biodiversity Monitoring Plan.

Demonstrate that the project's net impacts on biodiversity in the project zone are positive compared with conditions under the without-project land use scenario.

For projects validated at the Gold Level for climate change adaptation benefits: demonstrate how the project activities assist the biodiversity to adapt to the probable impacts of climate change.

5.1.4 High Conservation Values Protected (B2.4)

High Conservation Value	Caxiuna National Forest
Qualifying Attribute	The Caxiuna National Forest is considered the oldest in the Amazon region and the second in Brazil. It is amongst the most known conservation units in north of Brazil, and it has the presence of many important researchers from Brazil and abroad. There have been no changes to the HCV area for this monitoring period as analysed from GIS data. Further this serves as a biodiversity corridor resulting in the sightings of the endangered species in the project area.
Focal Area	On the northern border of the reference region there is a national conservation unit called National Forest Caxiuanã. It was created in 1961 and today it has an area of 322,694.34 hectares. The Conservation Units are types of conservation areas that were created to allow sustainable use of the forest and its natural resources

Demonstrate that no HCVs related to biodiversity in the project zone have been negatively affected by the project.

5.1.5 Invasive Species (B2.5)

None of the Project's activities introduce invasive species or genetically modified organisms. The Project's developer only approve agroforestry activities that use native species commonly known to occur in the Para region and are not in the Global Invasive Species Database before approving the utilization of particular species. Hence no invasive species were introduced for this monitoring period.

Demonstrate that no known invasive species have been introduced into any area affected by the project and that the population of any invasive species has not increased as a result of the project.

5.1.6 Impacts of Non-native Species (B2.6)

No non-native species was used in the Project Accounting Area.

Complete the table below to describe the use of any non-native species in the project zone.
Copy and paste the table as needed.

Species	Identify species.
Justification of Use	Justify use over use of native species.
Adverse Effect	Describe the adverse effects on the region's environment, including impacts on native species and disease introduction or facilitation due to the use of this species.

5.1.7 GMO Exclusion (B2.7)

No GMOs was used both within the Project Accounting Area and Project Zone.

Guarantee that no GMOs have been used to generate GHG emissions reductions or removals.

5.1.8 Inputs Justification (B2.8)

Not applicable

Complete the table below to describe the use of any fertilizers, chemical pesticides, biological control agents and other inputs used for the project. Copy and paste as needed.

Name	Identify input
Justification of Use	Justify use
Adverse Effect	Describe the potential and realized adverse effects on the region's environment and/or communities

5.2 Offsite Biodiversity Impacts

5.2.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Actions (B3.2)

The conservation itself as the aim of the project is already a mitigation strategy. The entire area has greatly benefited since there is no activity involving any kind of human disturbance. Furthermore, conservation of the project area increases landscape integrity and adaptation, avoiding edge effect, as described in the "with project" scenario, benefiting biodiversity (Wunder 2008).

A representative conservation area in which biodiversity can persist guarantees the maintenance of ecological processes and contributes to avoid fragmentation of the ecosystem, both through timber extraction and agricultural activities. The project helps landscapes enhancing its ecological health, including its adaptability to climate change and consequently reducing offsite greenhouse gas emissions (Wunder 2008). Moreover, the conservation of this area maintains microclimate, avoiding wildfires (Soares-Filho 2006).

Hence as there are no offsite negative biodiversity impacts observed during this monitoring period, there are no planned mitigation measures.

Complete the table below to describe any negative impacts on biodiversity outside of the project zone resulting from project activities. Add rows as needed.

Negative Offsite Impact	Mitigation Measure(s)
<i>There are no offsite negative biodiversity impacts</i>	<i>Not applicable.</i>

5.2.2 Net Offsite Biodiversity Benefits (B3.3)

The Project is expected to generate positive leakage on biodiversity by avoiding ecosystem fragmentation through voluntary engagement of neighbour communities in the Project's activities. As described above, the project focus exclusively on conservation measures within the project boundaries and its buffer, which makes negative offsite effects unlikely to happen. Besides, monitoring of flora and fauna assures that any minimal offsite negative effect was taken care of immediately. Also, as mentioned on G3.2, the Project's activities do not involve the introduction

Of non-native species. Therefore, considering these activities and "with project" scenario, the effects of the project on biodiversity is positive for this monitoring period.

Describe the evaluation of unmitigated negative impacts on biodiversity outside the project zone and compare them with the project's biodiversity benefits within the project zone. Justify and demonstrate that the net effect of the project on biodiversity is positive.

5.3 Biodiversity Impact Monitoring

5.3.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

Indicators are important in impact assessment because they respond to the basic question "what is measured to show that the claimed net social benefits are real and additional?" (Richards & Panfil 2011) An ideal indicator from the perspective of showing attribution is one that measures an „intermediate state" or assumption between an output and outcome or an outcome and an impact, clearly showing progress along a causal chain (Richards & Panfil, 2011). Thus, we used our theory of change logic as the basis for selecting indicators that factor in attribution. We then decided on the best sampling methods to use to collect these data to acceptable levels accuracy, precision and cost effectiveness whilst retaining transparency and simplicity. From this, a Monitoring Plan was implemented to guide data collection.

Further, the indicators were analysed based on the Pressure-State-Response framework, which also relies on a causal-chain logic, where threats negatively impact the status/condition of biodiversity, while responses or project interventions reduce pressure. Most Response indicators can be grouped under:

- a) Habitat improvement;
- b) Security enhancement; and

c) Improvement of community livelihoods efforts.

Pressure indicators fall under:

a) Human population size and dynamics;

b) Human-wildlife conflict (HWC); and

c) Incidences including poaching, grazing, encroachment, charcoal and firewood collection amongst others.

Wildlife: wildlife surveys and monitoring for all species was done by using information of sightings and recording evidence of species habitation.

Vegetation and land-use: carbon plot monitoring plots and remote sensing (based on LANDSAT imagery) and GIS techniques.

The riverine people were required to report all instances including human-wildlife conflict. This was reported to the local point of contact – Camerao. Camerao reported this back for verified first hand instances during this monitoring period. No significant incidents were recorded for poaching, grazing, encroachment, charcoal and firewood collection.

Present the results of the biodiversity impact monitoring, which should include:

All biodiversity variables identified in the monitoring plan.

Dates, frequency, locations, sampling methods used, and other information concerning the monitoring process.

Results and evaluation of monitoring.

Picture 8: A picture take by the team of a monkey in the project area next to a house of a Riberinho person.



For projects validated to the Gold Level for exceptional biodiversity benefits, include all additional monitored data to demonstrate the project meets all required criteria.

5.3.2 Biodiversity Monitoring Plan Dissemination (B4.3)

A summary of the monitoring plan was translated to local language and disseminated to the community groups and other stakeholders prior to validation. Monitoring results was also communicated through meetings and also uploaded on the project website.

Describe how any results of monitoring undertaken in accordance with the monitoring plan have been disseminated and made publicly available on the internet. Describe the means by which summaries (at least) of the monitoring results have been communicated to the communities and other stakeholders.

5.4 Optional Criterion: Exceptional Biodiversity Benefits

This project is not seeking Exceptional Biodiversity Benefits for the monitoring period.

This section (5.4) should be completed for projects validated at the Gold Level for exceptional biodiversity benefits. If not applicable, state so and leave this section blank.

5.4.1 Trigger Species Population Trends (GL3.3)

Complete the table below to describe population trends of each trigger species and actions taken to maintain or enhance the population status of each species in the project zone. Copy and paste the table as needed.

Trigger Species	Not applicable as this gold level biodiversity criteria is not claimed due to insufficient data
With-project Scenario	This criterion is not monitored for this monitoring period.

6 ADDITIONAL PROJECT IMPLEMENTATION INFORMATION

The monitoring process includes verification of the project against CCB criteria for the monitoring period from January 1, 2016 to April 30, 2020 verification has been conducted to demonstrate that it has produced net positive benefits over the project lifetime and has not caused harm to any community members.

Document any additional information that explains how the project has been implemented in accordance with the validated project description for all indicators that require implementation of an activity or process. Criteria and indicators shall be referenced for each statement made in this section.

7 ADDITIONAL PROJECT IMPACT INFORMATION

Not applicable

Document any additional information that provides the results of monitoring and shows how the project meets all indicators that require demonstration of impacts. Criteria and indicators of the Climate, Community & Biodiversity Standards or requirements of the VCS Standard shall be referenced for each statement made in this section.

APPENDICIES

The following appendices may be used if appropriate. Delete the instruction and heading if not used.

Appendix 1: New Project Areas and Stakeholders

Use this appendix, if necessary, to identify new project areas and stakeholders and fulfil the requirements of Sections 2.2.5 above. Modify the table, if necessary, to suit the project activities, or delete if not used.

Stakeholder <i>Identify communities and any community groups within them, any cross-cutting community groups, and list other stakeholders</i>	Rights, Interest and Overall Relevance to the Project
Local Villages Individual houses outside of villages	Right to 100 hectares per family, limited by government regulations. These communities are old communities that are along the river. They complete small cassava plantations. They have an interest in direct benefits from the project, such as the cook stoves they have, the agro-education about black pepper plantations – which is a much better economic activity.
Four Private Property Landowners	Titled land of 165,707 hectares. Some land was divided out and set aside for the local villagers, so the area of land owned has transferred to the people who need it more.
Local villages outside of Project Area.	Right to 100 hectares per family. These families that live near the project area, and are not in the project area, but the project also sees it necessary to help them gain title to their land of 100 hectares per family. The reason is that all the local inhabitants inside and outside the project area that were able to gain title will also be able to bring stability because they were less reliant on the illegal loggers and operators in the region.

Appendix 2: Project Risks Table

Use this appendix, if necessary, to identify project risks and fulfill the requirements of Section 2.2.6 above. Modify the table, if necessary, to suit the project activities, or delete if not used.

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
Capacity building	Secured land tenure Better understanding of the importance of protecting the forest and how forest conservation benefits their livelihoods. Opportunity to develop local businesses through an external fund.	In own land illegal activity is minimized and protection is enhanced	Forest is protected Illegal activities are minimized	Improved forest management practices with community participation
Improve local livelihoods for households	Diversification of food through agroforestry practices thus an improvement in local nutrition More efficient technologies to produce farinha therefore less time is consume in this activity. Generation of income from monitoring activities.	Improvement in agricultural practices and promotion of income from other activities	Food security is increased Positive impact on average income	Improvement of livelihoods by capacity building

Participatory Rural Appraisal	Survey conducted in area constituted by the Project's Boundary and a 15km buffer to gather socio-economic information	Identification of deforestation drivers and agents by means of survey	Implementation of mitigation measures to reduce impact by drivers of deforestation	Positive effect on maintenance of carbon stocks
Improvement of health	Distribution of improve cook stoves to households	Better air quality is ensured in households	Longer life expectancy	Improvement of livelihoods

ANNEX A

Table 6. List of all land use and land cover classes existing at the project start date within the reference region

Class Identifier		Braod Class	Trend in Carbon stock ¹	Presence in ²	Baseline activity ³			Description (including criteria for unambiguous boundary definition)
<i>ID_{cl}</i>	Name				LG	FW	CP	
001	Dense Ombrofile Forest	Forest Land	constant	RR	yes	no	no	
002	Degraded Ombrofile Forest	Forest Land	constant	RR	yes	no	no	
003	Grassland	Grassland	constant	RR	no	no	no	
004	Cropland	Crop Land	constant	RR	no	no	no	
005	Dense Ombrofile Forest	Forest Land	constant	PA	yes	no	no	
006	Degraded Ombrofile Forest	Forest Land	constant	PA	yes	no	no	
007	Grassland	Grassland	constant	PA	no	no	no	
008	Cropland	Crop Land	constant	PA	no	no	no	
009	Dense Ombrofile Forest	Forest Land	constant	LK	yes	no	no	
010	Degraded Ombrofile Forest	Forest Land	constant	LK	yes	no	no	
011	Grassland	Grassland	constant	LK	no	no	no	
012	Cropland	Crop Land	constant	LK	no	no	no	

RR = Reference Region, LK = Leakage Belt, LM = Leakage Management Areas, PA =
2 Project Area

Table 9.a Annual areas of baseline deforestation in the reference region
using historical average approach with no

constraints

Project year	Stratum <i>i</i> in the reference region				Total	
	1	2	...	I_{RR}	annual	cumulative
	$ABSLRR_{i,t}$ ha	$ABSLRR_{i,t}$ ha	$ABSLRR_{i,t}$ ha	$ABSLRR_{i,t}$ Ha	$ABSLRR_t$ ha	$ABSLRR$ ha
1	18,788				18,788	18,788
2	18,788				18,788	37,576
3	18,788				18,788	56,364
4	18,788				18,788	75,152
5	18,788				18,788	93,940
6	18,788				18,788	112,728

Table 9.b Annual areas of baseline deforestation in the project area

Project year	Stratum <i>i</i> of the reference region in the project area				Total	
	Omrophile Dense	Omrophile Degraded	...	I_{RR}	annual	cumulative
	$ABSLPA_{i,t}$ ha	$ABSLPA_{i,t}$ ha	$ABSLPA_{i,t}$ ha	$ABSLPA_{i,t}$ Ha	$ABSLPA_t$ ha	$ABSLPA$ ha
1	40.0	0			40	40
2	40.0	0			40	80
3	40.0	0			40	120
4	40.0	0			40	160
5	40.0	0			40	200
6	40.0	0			40	240

Table 9.c Annual areas of baseline deforestation in the leakage belt

Project year	Stratum <i>i</i> of the reference region in the leakage belt				Total	
	Omrophile Dense	Omrophile Degraded	...	I_{RR}	annual	cumulative
	$ABSLLK_{i,t}$ ha	$ABSLLK_{i,t}$ ha	$ABSLLK_{i,t}$ ha	$ABSLLK_{i,t}$ Ha	$ABSLLK_t$ ha	$ABSLLK$ ha
1	10,809	0			10,809	10,809
2	10,809				10,809	21,618
3	10,809				10,809	32,427
4	10,809				10,809	43,236
5	10,809				10,809	54,045
6	10,809				10,809	64,854

Table 11.a: Annual areas deforested per forest class *icl* within the reference region in the baseline case (baseline activity data per forest class)
* Areas are areas of change since the project start date only. All changes are reported as positive values, yet changes are losses for the "for" class and gains for the "to" class.

Area deforested per forest class <i>fc</i> within the reference region					Total baseline deforestation in the project area
$ABSLRR_{icl,t}$ >	Omrophile Dense	Omrophile Degraded	...	<i>lcl</i>	

Name >	Forest				ABSLRR _t annual	ABSLRR cumulative
Project year <i>t</i>	ha	ha	ha	ha	ha	ha
1	18,788				18,788	18,788
2	18,788				18,788	37,576
3	18,788				18,788	56,364
4	18,788				18,788	75,152
5	18,788				18,788	93,940
6	18,788				18,788	112,728

Table
11.a:

Annual areas deforested per forest class *icl* within the reference region in the baseline case (baseline activity data per forest class)

* Areas are areas of change since the project start date only. All changes are reported as positive values, yet changes are losses for the "for" class and gains for the "to" class.

Area deforested per forest class <i>fc</i> within the reference region					Total baseline deforestation in the project area	
ABSLRR _{icl,t} >	Omrophile Dense	Omrophile Degraded	...	<i>icl</i>		
Name >	Forest				ABSLRR _t annual	ABSLRR cumulative
Project year <i>t</i>	ha	ha	ha	ha	ha	ha
1	18,788				18,788	18,788
2	18,788				18,788	37,576
3	18,788				18,788	56,364
4	18,788				18,788	75,152
5	18,788				18,788	93,940

6	18,788				18,788	112,728
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Table 11.b: Annual areas deforested per forest class icl within the project area in the baseline case (baseline activity data per forest class)

Area deforested per forest class fc/ within the project area					Total baseline deforestation in the project area	
$ABSLPA_{icl,t} >$	Omrophile Dense	Omrophile Degraded	...	icl		
Name >	Forest				$ABSLPA_t$ annual	$ABSLPA$ cumulative
Project year t	ha	ha	ha	ha	ha	ha
1	34.0	5.7			40	40
2	34.0	5.7			40	80
3	34.0	5.7			40	120
4	34.0	5.7			40	160
5	34.0	5.7			40	200
6	34.0	5.7			40	240

Table 11.c: Annual areas deforested per forest class icl within the leakage belt in the baseline case (baseline activity data per forest class)

Area deforested per forest class fc/ within the leakage belt					Total baseline deforestation in the project area	
$ABSLK_{icl,t} >$	Omrophile Dense	Omrophile Degraded	...	icl		
Name >	Forest				$ABSLK_t$ annual	$ABSLK$ cumulative

Project year t	ha	ha	ha	Ha	ha	ha
1	10,809				10,809	10,809
2	10,809				10,809	21,618
3	10,809				10,809	32,427
4	10,809				10,809	43,236
5	10,809				10,809	54,045
6	10,809				10,809	64,854

Table 12.a: Annual areas of post-deforestation classes fcl within the reference region in the baseline case (baseline activity data per non-forest class)

Area established after deforestation per class fcl within the reference region					Total baseline deforestation in the reference region	
$ABSLRR_{fcl,t}$	Omrophile Dense	Omrophile Degraded	...	Fcl	$ABSLRR_t$ annual ha	$ABSLRR$ cumulative ha
Name >	Non-forest					
Project year v	ha	ha	ha	ha	ha	ha
1	18,788				18,788	18,788
2	18,788				18,788	37,576
3	18,788				18,788	56,364
4	18,788				18,788	75,152
5	18,788				18,788	93,940
6	18,788				18,788	112,728

Table 12.b: Annual areas of post-deforestation classes fcl within the project area in the baseline case (baseline activity data per non-forest class)

Area established after deforestation per class fcl within the project area					Total baseline deforestation in the project area	
$ABSLPA_{fcl,t}$	Omrophile Dense	Omrophile Degraded	...	Fcl	ABSLPA _t annual	ABSLPA cumulative
Name >						
Project year v	ha	ha	Ha	ha	ha	ha
1	34.0	5.7			40	40
2	34.0	5.7			40	80
3	34.0	5.7			40	120
4	34.0	5.7			40	160
5	34.0	5.7			40	200
6	34.0	5.7			40	240

Table 12.c: Annual areas of post-deforestation classes fcl within the leakage belt in the baseline case (baseline activity data per non-forest class)

Area established after deforestation per class fcl within the leakage belt					Total baseline deforestation in the leakage belt	
$ABSLK_{fcl,t}$	Omrophile Dense	Omrophile Degraded	...	Fcl	ABSLK _t annual	ABSLK cumulative
Name >	Non-forest					
Project year v	ha	ha	Ha	ha	ha	ha
1	10,809				10,809	10,809
2	10,809				10,809	21,618
3	10,809				10,809	32,427
4	10,809				10,809	43,236

5	10,809				10,809	54,045
6	10,809				10,809	64,854

Table 14: Average carbon stock per hectare of all land use and land cover classes present in the leakage belt and project area

LU/LC class		Average carbon stock per hectare ± 90% CI													
		<i>Cab_{cl}</i>		<i>Cbb_{cl}</i>		<i>Cdw_{cl}</i>		<i>Cl_{cl}</i>		<i>Csoc_{cl}</i>		<i>Cwp_{cl}</i>		<i>Ctot_{cl}</i>	
		<i>average stock</i>	$\pm$ 90% CI	<i>average stock</i>	$\pm$ 90% CI	<i>average stock</i>	$\pm$ 90% CI	<i>average stock</i>	$\pm$ 90% CI	<i>average stock</i>	$\pm$ 90% CI	<i>average stock</i>	$\pm$ 90% CI	<i>average stock</i>	$\pm$ 90% CI
<i>ID_{cl}</i>	Name	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹
1	Omrophile Dense	469.6	46.7	105.2	10.5			8.68	0.8					583.5	58.0
2	Omrophile Degraded	461.2	95.5	103.4	21.3			8.96	1.36					573.6	118.1

Table 17.b Total net baseline carbon stock change in the project area

Project year	Activity data per category x Carbon stock change factor								Total baseline carbon stock change	
	$ID_{ct} = 1$		$ID_{ct} = 2$		$ID_{ct} = \dots$		$ID_{ct} = lct$		annual	cumulative
	$ABSLPA_{ct,t}$	$\square Ctot_{ct,t}$	$ABSLPA_{ct,t}$	$\square Ctot_{ct,t}$	$ABSLPA_{ct,t}$	$\square Ctot_{ct,t}$	$ABSLPA_{ct,t}$	$\square Ctot_{ct,t}$	$\square CBSLPA_t$	$\square CBSLPA$

	ha	tCO ₂ -e ha ⁻¹	ha	tCO ₂ -e ha ⁻¹	ha	tCO ₂ -e ha ⁻¹	ha	tCO ₂ -e ha ⁻¹	tCO ₂ -e	tCO ₂ -e
1	3,698	578							2,138,627	2,138,627
2	3,698	578							2,138,627	4,277,255
3	3,698	578							2,138,627	6,415,882
4	3,698	578							2,138,627	8,554,509
5	3,698	578							2,138,627	10,693,137
6	3,698	578							2,138,627	12,831,764

Table 18. Parameters used to calculate non-CO2 emissions from forest fires

Initial Forest Class	Parameters																
	$F_{burnt_{i,icl}}$	C_{ab}	C_{dw}	CI	$P_{burnt_{ab,icl}}$	$P_{burnt_{dw,icl}}$	$P_{burnt_{i,icl}}$	$CE_{ab,icl}$	$CE_{dw,icl}$	$CE_{i,icl}$	$ECO2_{-ab}$	$ECO2_{-dw}$	$ECO2_{-i}$	$EBBCO2_{-tot}$	$EBBnN2O_{i,icl}$	$EBBCH4_{i,icl}$	$EBBtot_{i,icl}$

$\frac{ID_c}{I}$	Name	%	$\frac{tCO_2e}{ha^{-1}}$	$\frac{tCO_2e}{ha^{-1}}$	$\frac{tCO_2e}{ha^{-1}}$	%	%	%	%	%	%	$\frac{tCO_2e}{ha^{-1}}$	$\frac{tCO_2e}{ha^{-1}}$	$\frac{tCO_2e}{ha^{-1}}$	$\frac{tCO_2e}{ha^{-1}}$	$\frac{tCO_2e}{ha^{-1}}$	$\frac{tCO_2e}{ha^{-1}}$	
1	Omrophile Dense	96	469.6	0.0	8.7	96	0	100	0.5	0.0	0.5	225.4	-	4.2	229.6	-0.0	21.0	21.0
2	Omrophile Degraded	96	461.2	0.0	9.0	96	0	100	0.5	0.0	0.5	221.4	-	4.3	225.7	-1.3	20.7	19.3

Table 19. Baseline non-CO2 emissions from forest fires in the project area

Project year	Emissions of non-CO ₂ gasses from baseline forest fires								Total baseline non-CO ₂ emissions from forest fires in the project area	
	$ID_{icl} = 1$		$ID_{icl} = 2$		$ID_{icl} = \dots$		$ID_{icl} = cl $		annual $EBBBSLPA_t$ tCO ₂ -e	cumulative $EBBBSLPA$ tCO ₂ -e
	$ABSLPA_{icl,t}$ ha	$EBBBSLto_{t_{icl}}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{icl,t}$ ha	$EBBBSLto_{t_{icl}}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{icl,t}$ ha	$EBBBSLto_{t_{icl}}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{icl,t}$ ha	$EBBBSLto_{t_{icl}}$ tCO ₂ -e ha ⁻¹		
1	34	21	6	19.3					825	825
2	34	21	6	19.3					825	1,650
3	34	21	6	19.3					825	2,475
4	34	21	6	19.3					825	3,300
5	34	21	6	19.3					825	4,125
6	34	21	6	19.3					825	4,950

Project Emissions

Table 9.b Ex-post annual areas of unavoided deforested in the project area.

Project year	Stratum <i>i</i> of the reference region in the project area				Total	
	Omrophile Dense	Omrophile Degraded	...	I_{RR}	annual	cumulative
	$ABSLPA_{i,t}$	$ABSLPA_{i,t}$	$ABSLPA_{i,t}$	$ABSLPA_{i,t}$	$ABSLPA_t$	$ABSLPA$
	ha	ha	ha	Ha	ha	ha
1	40.0	0.0			40.0	40
2	40.0	0.0			40.0	80
3	40.0	0.0			40.0	120
4	40.0	0.0			40.0	160
5	40.0	0.0			40.0	200
6	40.0	0.0			40.0	240

Table 9.c Ex-post annual areas of baseline deforestation in leakage belt.

Project year	Stratum <i>i</i> of the reference region in the project area				Total	
	Omrophile Dense	Omrophile Degraded	...	I_{RR}	annual	cumulative
	$ABSLLK_{i,t}$	$ABSLLK_{i,t}$	$ABSLLK_{i,t}$	$ABSLLK_{i,t}$	$ABSLLK_t$	$ABSLLK$
	ha	ha	ha	Ha	ha	ha
1	10,809	0.0			10,809	10,809
2	10,809	0.0			10,809	21,618
3	10,809	0.0			10,809	32,426
4	10,809	0.0			10,809	43,236

5	10,809	0.0			10,809	54,045
6	10,809	0.0			10,809	64,854

Table 11.b: Ex-post annual areas deforested per forest class within the project area (activity data per forest class)

Area deforested per forest class $fc/$ within the project area					Total baseline deforestation in the project area	
$ABSLPA_{icl,t}$ Name >	Omrophile Dense	Omrophile Degraded	...	$ic/$		
Forest					$ABSLPA_t$ annual ha	$ABSLPA$ cumulative ha
Project year t	ha	ha	ha	ha	ha	ha
1	34.0	5.7			40	40
2	34.0	5.7			40	79
3	34.0	5.7			40	119
4	34.0	5.7			40	159
5	34.0	5.7			40	199
6	34.0	5.7			40	238

Table 11.c: Ex-post annual areas deforested per forest class within the leakage belt (activity data per forest class)

Area deforested per forest class $fc/$ within the leakage belt					Total baseline deforestation in the project area	
$ABSLK_{icl,t}$ Name >	Omrophile Dense	Omrophile Degraded	...	$ic/$		
Forest					$ABSLK_t$ annual ha	$ABSLK$ cumulative ha
Project year t	ha	ha	ha	Ha	ha	ha
1	17,090				17,090	17,090

2	17,090				17,090	34,180
3	17,090				17,090	51,271
4	17,090				17,090	68,361
5	17,090				17,090	85,451
6	17,090				17,090	102,541

Table 12.b: Ex-post annual deforest areas within the project are)

Area established after deforestation per class fcl/ within the project area					Total baseline deforestation in the project area	
$ABSLPA_{fcl,t}$	Omrophile Dense	Omrophile Degraded	...	Fcl	$ABSLPA_t$ annual ha	$ABSLPA$ cumulative ha
Name >						
Project year v	ha	ha	ha	Ha	ha	ha
1	34.0	5.7			40	40
2	34.0	5.7			40	79
3	34.0	5.7			40	119
4	34.0	5.7			40	159
5	34.0	5.7			40	199
6	34.0	5.7			40	238

Table 12.c: Ex-post annual deforestation within the leakage belt.

Area established after deforestation per class fc_l within the leakage belt					Total baseline deforestation in the leakage belt	
$ABSLLK_{fc_l,t}$	Omrophile Dense	Omrophile Degraded	...	Fcl	$ABSLLK_t$ annual ha	$ABSLLK$ cumulative ha
Name >	Non-forest					
Project year v	ha	ha	ha	Ha	ha	ha
1	10,809	0.0			10,809	10,809
2	10,809	0.0			10,809	21,618
3	10,809	0.0			10,809	32,426
4	10,809	0.0			10,809	43,236
5	10,809	0.0			10,809	54,045
6	10,809	0.0			10,809	64,854

Table
17.b Total net baseline carbon stock change in the project area

Project year	Activity data per category x Carbon stock change factor								Total baseline carbon stock change	
	$ID_{ct} = 1$		$ID_{ct} = 2$		$ID_{ct} = \dots$		$ID_{ct} = lct$		annual	cumulative
	$ABSLPA_{ct,t}$ ha	$\square Ctot_{ct,t}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{ct,t}$ ha	$\square Ctot_{ct,t}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{ct,t}$ ha	$\square Ctot_{ct,t}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{ct,t}$ ha	$\square Ctot_{ct,t}$ tCO ₂ -e ha ⁻¹	$\square CBSLPA_t$ tCO ₂ -e	$\square CBSLPA$ tCO ₂ -e
1	40	578							22,959	22,959
2	40	578							22,959	44,919
3	40	578							22,959	68,878
4	40	578							22,959	91,837
5	40	578							22,959	114,797
6	40	578							22,959	137,756

Table 19. Ex-post non-CO₂ emissions from forest fires from the project area

Project year	Emissions of non-CO ₂ gasses from baseline forest fires								Total baseline non-CO ₂ emissions from forest fires in the project area	
	$ID_{icl} = 1$		$ID_{icl} = 2$		$ID_{icl} = \dots$		$ID_{icl} = Icl$		annual $EBBBSLPA_t$ tCO ₂ -e	cumulative $EBBBSLPA$ tCO ₂ -e
	$ABSLPA_{icl,t}$ ha	$EBBBSL_{to t_{icl}}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{icl,t}$ ha	$EBBBSL_{to t_{icl}}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{icl,t}$ ha	$EBBBSL_{to t_{icl}}$ tCO ₂ -e ha ⁻¹	$ABSLPA_{icl,t}$ ha	$EBBBSL_{to t_{icl}}$ tCO ₂ -e ha ⁻¹		
1	34	21.0	6	19.3					825	825
2	34	21.0	6	19.3					825	1,651
3	34	21.0	6	19.3					825	2,476
4	34	21.0	6	19.3					825	3,302
5	34	21.0	6	19.3					825	4,127
6	34	21.0	6	19.3					825	4,952

Table 22. Ex ante estimated net carbon stock change in the project area

Project year	Total carbon stock decrease due to planned activities		Total carbon stock increase due to planned activities		Total carbon stock decrease due to unavoided unplanned deforestation		Total carbon stock change in the project case	
	annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative
	$\square CPA_{dPA_t}$	$\square CPA_{dPA}$	$\square CPA_{iPA_t}$	$\square CPA_{iPA}$	$\square CUD_{dPA_t}$	$\square CUD_{dPA}$	$\square CPS_{PA_t}$	$\square CPS_{PA}$
	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e
1	0	0	0	0	-16,177	-16,177	-16,177	-16,177
2	0	0	0	0	-16,177	-32,353	-16,177	-32,353
3	0	0	0	0	-16,177	-48,530	-16,177	-48,530
4	0	0	0	0	-10,110	-58,640	-10,110	-58,640
5	0	0	0	0	-10,110	-68,750	-10,110	-68,750
6	0	0	0	0	-10,110	-78,861	-10,110	-78,861

Table 24. Total ex ante estimated actual net carbon stock changes and emissions of non-CO₂ gasses in the project area

Project year	Total ex ante carbon stock decrease due to planned activities		Total ex ante carbon stock increase due to planned activities		Total ex ante carbon stock decrease due to unavoided unplanned deforestation		Total ex ante net carbon stock change		Total ex ante estimated actual non-CO ₂ emissions from forest fires in the project area	
	annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative
	$\square CPA_{dPA_t}$	$\square CPA_{dPA}$	$\square CPA_{iPA_t}$	$\square CPA_{iPA}$	$\square CUD_{dPA_t}$	$\square CUD_{dPA}$	$\square CPS_{PA_t}$	$\square CPS_{PA}$	EBB_{PSPA_t}	EBB_{PSPA}
	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e
1	0	0	0	0	-16,177	-16,177	-16,177	-16,177	660	660
2	0	0	0	0	-16,177	-32,353	-16,177	-32,353	660	1,321
3	0	0	0	0	-16,177	-48,530	-16,177	-48,530	660	1,981
4	0	0	0	0	-10,110	-58,640	-10,110	-58,640	413	2,394

5	0	0	0	0	-10,110	-68,750	-10,110	-68,750	413	2,806
6	0	0	0	0	-10,110	-78,861	-10,110	-78,861	413	3,219

Leakage Emissions

Table
29.a Baseline carbon stock change in pre-deforestation (forest) classes

Project year	Carbon stock changes in initial (pre-deforestation) forest classes								Total C stock change in initial forest classes	
	$ID_{icl} = 1$		$ID_{icl} = 2$		$ID_{icl} = \dots$		$ID_{icl} = Icl$		annual	cumulative
	$ABSLLK_{icl,t}$	$Ctot_{icl,t}$	$ABSLLK_{icl,t}$	$Ctot_{icl,t}$	$ABSLLK_{icl,t}$	$Ctot_{icl,t}$	$ABSLLK_{icl,t}$	$Ctot_{icl,t}$	$\square CBSLLK_i$	$\square CBSLLK_i$
	ha	tCO ₂ -e ha ⁻¹	Ha	tCO ₂ -e ha ⁻¹	ha	tCO ₂ -e ha ⁻¹	ha	tCO ₂ -e ha ⁻¹	tCO ₂ -e	tCO ₂ -e
1	0	0							0	0
2	10,909	97							1,009,025	1,009,025
3	10,809	97							1,009,035	2,018,050
4	10,809	97							1,003,586	3,021,635
5	10,809	97							1,003,586	4,025,220
6	10,809	97							1,003,586	5,028,806

Table
29.b Baseline carbon stock change in post-deforestation (non-forest) classes

Project year	Carbon stock changes in final (post-deforestation) non-forest classes								Total C stock change in final non-forest classes	
	$ID_{fcl} = 1$		$ID_{fcl} = 2$		$ID_{fcl} = \dots$		$ID_{fcl} = Fcl$		annual	cumulative
	$ABSLLK_{fcl,t}$	$Ctot_{fcl,t}$	$ABSLLK_{fcl,t}$	$Ctot_{fcl,t}$	$ABSLLK_{fcl,t}$	$Ctot_{fcl,t}$	$ABSLLK_{fcl,t}$	$Ctot_{fcl,t}$	$\square CBSLLK_f$	$\square CBSLLK_f$
	ha	tCO ₂ -e ha ⁻¹	Ha	tCO ₂ -e ha ⁻¹	ha	tCO ₂ -e ha ⁻¹	ha	tCO ₂ -e ha ⁻¹	tCO ₂ -e	tCO ₂ -e
1	10,809	692							7,458,950	7,458,950
2	10,809	692							7,458,950	14,917,901
3	10,809	692							7,458,950	22,376,851
4	10,809	692							7,458,674	29,835,525
5	10,809	692							7,458,674	37,294,199
6	10,809	692							7,458,674	44,752,873

Table 29.c Total net baseline carbon stock change in the leakage belt

Project year	Total C stock change in initial forest classes		Total C stock change in final non-forest classes		Total baseline carbon stock change	
	annual	cumulative	Annual	cumulative	annual	cumulative
	$\square CBSLLK_i$ tCO ₂ -e	$\square CBSLLK_i$ tCO ₂ -e	$\square CBSLLK_f$ tCO ₂ -e	$\square CBSLLK_f$ tCO ₂ -e	$\square CBSLLK_i$ tCO ₂ -e	$\square CBSLLK_i$ tCO ₂ -e
1	0	0	7,458,950	7,458,950	-7,458,950	-7,458,950
2	1,009,025	1,009,025	7,458,950	14,917,901	-6,413,030	-13,908,876
3	1,009,025	2,018,050	7,458,950	22,376,851	-6,413,030	-20,358,801
4	1,003,586	3,021,636	7,458,674	29,835,525	-6,412,754	-26,813,889
5	1,003,586	4,025,221	7,458,674	37,294,199	-6,412,754	-33,268,978
6	1,003,586	5,028,807	7,458,674	44,752,873	-6,412,754	-39,724,006

Appendix 3: Additional Information

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