



MONITORING REPORT: EVERGREEN REDD+ PROJECT



Document Prepared by Carbonext

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Project Title	Evergreen REDD+ Project
Version	1.2
Report ID	01
Date of Issue	08-Apr-2022
Project ID	2539
Monitoring Period	25-Nov-2020 to 31-Jul-2021
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1. PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The Evergreen REDD+ Project is a 130,554.81 hectare forest area located in Apuí Municipality, Amazonas, which is currently the municipality with the 10th highest deforestation rate in Brazil¹.

Provided that the present REDD+ project is approved, the landowner intends to improve the mechanisms of surveillance inside the Project Area, abandon planned deforestation activities, as well as implement activities that will result in climate, community, and biodiversity benefits. One of the project properties has plans for sustainable forest management activities scheduled for 2027, which will permit further reinforcement of monitoring of the areas by staff.

- In July 2021 a hybrid model aircraft was purchased. Thus, the project now has two aircraft (one purchased before the start date of the project) to carry out aerial monitoring.
- Between July 12th and 16th, 2021, the surveillance base located at the Boa Lembrança farm was renovated, structural repairs were made, and the paintwork was renewed.
- Between July 15 and 17, 2021, project representatives visited neighbors and communities in person to explain the characteristics of the Evergreen REDD+ project.
- On July 17, 2021, first aid training was offered to residents close to the project area.
- In July 2021, a ferry was installed on the Roosevelt River that passes between the Boa Lembrança and São Damião properties, to facilitate access to the innermost part of the project area to inhibit invasions.
- The project proponents will discontinue their plans to deforest 20% of the Project Area.

Thus, the total net GHG emission reductions generated in this monitoring period are estimated at 852,920 tCO₂, while the verified volume of VCU's eligible for issuance is 766,330 VCU's

1.2 Sectoral Scope and Project Type

Sectoral Scope: 14 - Agriculture, Forestry, Land Use

¹ Source PRODES: http://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/legal_amazon/rates

Project Category: Avoided Unplanned Deforestation (AUD project activity) and Avoided Planned Deforestation (APD project activity)

This is a grouped project.

1.3 Project Proponent

Organization name	Ituxi Administração e Participação Ltda.
Contact person	Ricardo Stoppe Junior
Title	Project Proponent (Landowner)
Address	Av. Calama N. 5040 Sala 01, Porto Velho, Rondônia
Telephone	55 (92) 3634-7521
Email	aamericardo@ig.com.br

Organization name	Milenio Empreendimentos
Contact person	Renan Vitoriano Bohem
Title	Project Proponent (Landowner)
Address	Av Lauro Sodré, 2300 AP 1205 – Torre Plants – São Joao Bosco, Porto Velho-RO
Telephone	55 (69) 99310-7061
Email	empreendimentos.milenio@gmail.com

Organization name	Carbonext Consultoria Ltda.
Contact person	Janaína Dallan, Luiz Fernando de Moura & David Swallow
Title	Project Developer

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1.4 Other Entities Involved in the Project

Organization name	Avix Engenharia e Estudos Técnicos
Role in the project	Satellite imagery analysis for baseline assessment
Contact person	Mateus Trez
Title	Technology, Remote Sensing and Geoprocessing Coordinator
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Telephone	+55 (19) 3427-2438
Email	mateus@avix.com.br

1.5 Project Start Date

25th November 2020 is defined as the project start date for both APD and AUD components of the Evergreen REDD+ Project.

Regarding APD activities, 25/11/20 was the date that the project owner submitted a request to the official organ IPAAM, to obtain permission to deforest a legal proportion of the Alvorada property in the Project Area (PA), which was approved. This planned deforestation activity was necessary because, as of that time, maintaining forests without carbon credits within the PA was no longer financially viable for the project owner. It is clarified that the approved avoided planned deforestation request is the most advanced documentation that the project owner was able to obtain without in fact deforesting the property. If a deforestation permit had been obtained, the project owner would then have been obliged to carry out the planned deforestation, or face complications in the IPAAM organ.

Regarding the AUD activities, all of the project properties already had contractual intentions of conserving forests and REDD+ projects prior to 25/11/20, as evidenced by:

- The contract between Carbonext and the project proponent (regarding the Alvorada, Buiucu and Aroeira properties)
- And the partnership contract between the project proponents Milênio and Ituxi Administração companies (regarding the São Damião and Boa Ventura II properties)

To substantiate the intention to conserve forest properties, an amendment was made with effect as of 25/11/20 to the contract with a private security company, which had been hired originally on 01 December 2019 to monitor all the REDD+ projects led by Ituxi Administração (being the Unitor and Ituxi REDD+ projects), which clearly states that security and vigilance services in the field will be provided to the five project properties, which are mentioned by name. In this sense, the amendment serves to make explicit that the private security services were effective in the Evergreen REDD+ area as of 25/11/20.

All the contracts and further evidence relating to the above were made available at audit.

1.6 Project Crediting Period

Start date: 25th November 2020

End date: 24th November 2050

30 years.

1.7 Project Location

The Evergreen REDD+ Project (hereafter “the project”) is situated in Apuí municipality in the State of Amazonas, in the Southern Amazon. The municipality is located around 1,000 km from Manaus, Amazonas State capital. The Project Area belongs to Ituxi Administração e Participação Ltda (represented by Ricardo Stoppe Junior), and Renan Vitoriano Bohem, and is covered 100% by native vegetation, totaling 130,554.8 ha. The northern project boundary lies approximately 20 km from the city of Apuí, the western boundary is close to, or at points touching, the Aripuanã River, and the eastern boundary is flanked by the unofficial local road, the Estrada da Coruja, and is within some 20 km of the Acari river. The full contour coordinates of the project area are available upon request

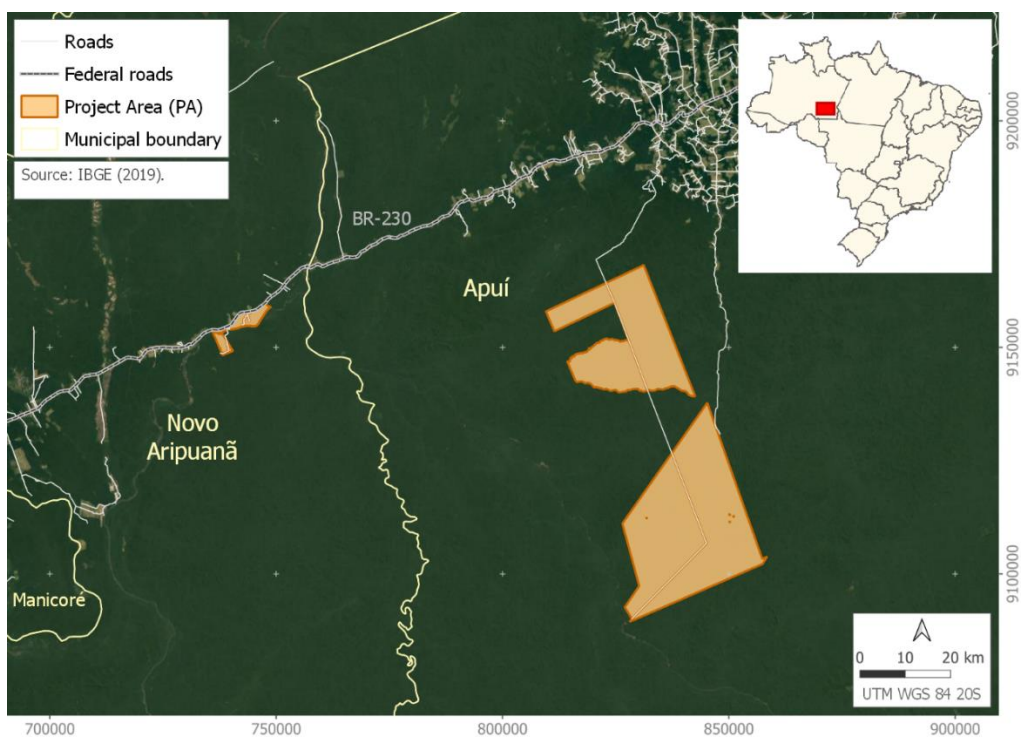


Figure 1. The Evergreen REDD+ Project Area

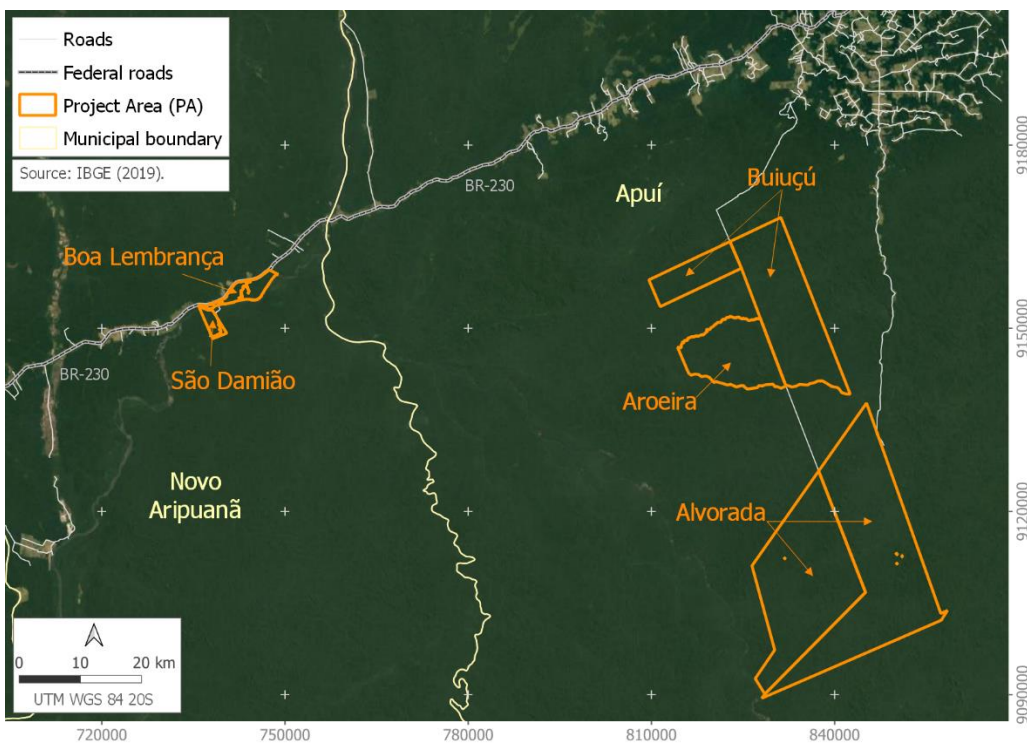


Figure 2. Location of each of the properties within the Project Area

The latitude and longitude coordinates of the project areas, along with Figures to identify the coordinates in each of the properties, are presented below.

Table 1. Latitude and Longitude of Project Zones 1 – 5

Property Name	Id	Latitude	Longitude
Alvorada	1	-8.0311	-60.0385
Alvorada	2	-8.2270	-60.0226
Alvorada	3	-8.0949	-59.7479
Alvorada	4	-7.7891	-59.8703
Buiuçu	5	-7.6090	-60.1945
Buiuçu	6	-7.5154	-59.9994
Buiuçu	7	-7.7761	-59.8946
Aroeira	8	-7.7464	-60.1348
Boa Lembrança	9	-7.5971	-60.7585
Boa Lembrança	10	-7.6043	-60.7440
Sao Damião	11	-7.6577	-60.8417
Sao Damião	12	-7.6917	-60.8202
Sao Damião	13	-7.6999	-60.8411
Boa Lembrança	14	-7.6504	-60.8630

Geographic coordinates Datum WGS 84

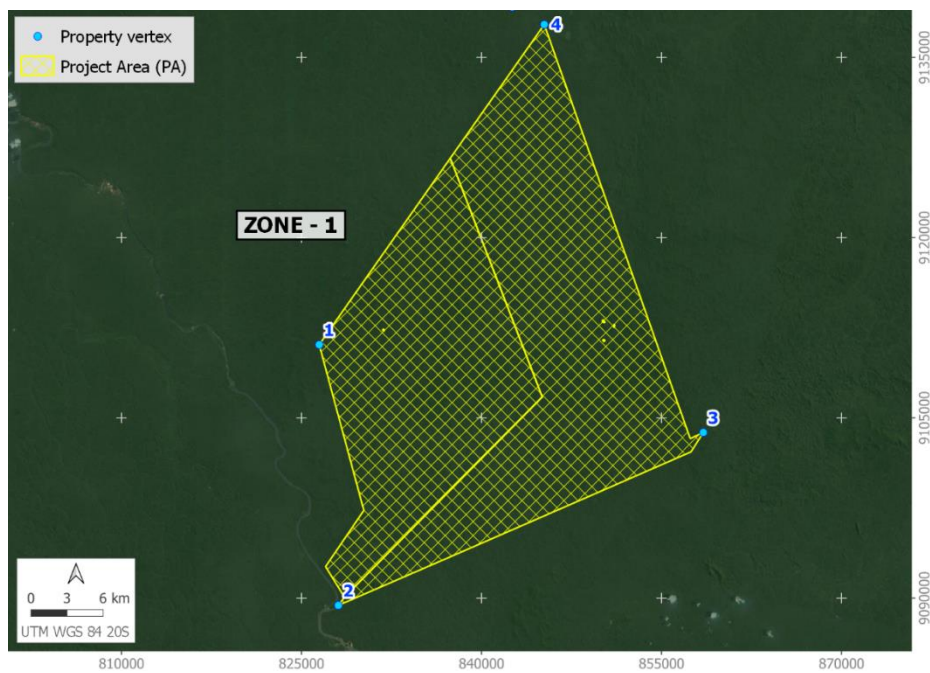


Figure 3. The Alvorada property and location of coordinates 1 – 5



Figure 4. The Buiçu and Aroeira properties and coordinates 5 – 8



Figure 5. The São Damião and Boa Lembrança properties and coordinates 9 – 14

1.8 Title and Reference of Methodology

Approved VCS Methodology VM0007 “REDD+ Methodology Framework (REDD+ MF)”, Version 1.6, 08 September 2020. At: https://verra.org/wp-content/uploads/2020/09/VM0007-REDDMF_v1.6.pdf (last visited 18/05/2021).

Approved VCS Module VMD0015 “Methods for monitoring of GHG emissions and removals in REDD and CIW projects (M-REDD)” Version 2.2, 08 September 2020. At: <https://verra.org/wp-content/uploads/2020/09/VMD0015-M-REDD-v2.2.pdf> (last visited 30/09/2021).

Carbon pool modules:

VMD0001 “Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools” (CP-AB), v1.1

VMD0005 “Estimation of carbon stocks in the long-term wood products pool” (CP-W), v1.1

Baseline module:

VMD0006 Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation/forest degradation and planned wetland degradation (BL-PL), v1.3

VMD0007 “Estimation of baseline carbon stock changes and greenhouse gas emissions from unplanned deforestation and unplanned wetland degradation” (BL-UP), v3.3

Leakage modules:

VMD0009 Estimation of emissions from activity shifting for avoided planned deforestation/forest degradation and avoided planned wetland degradation (LK-ASP), v1.3

VMD0010 Estimation of emissions from activity shifting for avoiding unplanned deforestation and avoiding unplanned wetland degradation (LK-ASU), v1.2

VMD0011 “Estimation of emissions from market-effects” (LK-ME), v1.1

Miscellaneous Modules:

VMD0013 Estimation of greenhouse gas emissions from biomass and peat burning (E-BPB), v1.2

VMD0016 Methods for stratification of the project area (X-STR), v1.2

VMD0017 Estimation of uncertainty for REDD project activities (X-UNC), v2.2

Tools:

Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (T-ADD), Version 01, 19 Oct 2007 At:

<https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-02-v1.pdf>
(last visited 15/07/21)

CDM – Executive Board “Tool for testing significance of GHG emissions in A/R CDM project activities (Version 01)” EB 31. At:

<https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-04-v1.pdf>
(last visited 14/09/2021).

AFOLU “Non-Permanence Risk Tool” VCS Version 4, Procedural Document, 19 September 2019, v4.0. At: <http://www.v-c-s.org/program-documents> (last visited 18/05/2021).

1.9 Participation under other GHG Programs

Not applicable: the project is not engaged in any other emissions trading program and the host country has no binding limits on GHG emissions as yet. The project has not been registered, or is seeking registration under any other GHG programs.

1.10 Other Forms of Credit

The project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates.

1.11 Sustainable Development

The Evergreen project is aligned with Brazil's commitments to the UN Sustainable Development Goals (SDGs). The table below presents the activities that will be implemented in project related to the SDGs.

Table 2: SDG implemented and to be implemented in the Evergreen REDD+ Project

SDG		Action	Status
1.1	By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than PPC\$3.20 a day	It is estimated that the project will create 20 temporary and permanent jobs in the coming years	Currently, the project has 6 employees in permanent positions.
1.2	By 2030, reduce proportion of men, women and children of all ages living in monetary and non-monetary poverty by at least half, in all its dimensions, according to national definitions	Gender equity in the jobs created by the project will be monitored	Of the current job positions, 33% (2 positions) is occupied by women.
3.4	By 2030, reduce premature mortality from non-communicable diseases by one third through prevention and treatment, and promote mental health and well-being	Workshops on health, well-being and nutrition will be given to employees and the community, aiming to raise awareness about non-communicable diseases and the importance of having healthy habits	So far, a first aid training has been conducted on July 17, 2021 for residents close to the project. There were 24 participants.
8.3	Promote development with the generation of decent work; formalization; the growth of micro, small and medium	Training events focusing on forest management and wild harvesting.	The training events will be conducted after the validation

	companies; entrepreneurship and innovation.		of the project and credit sales.
8.4	Increase the efficiency of the use of global resources in consumption and production, and strive to decouple economic growth from environmental degradation, in accordance with the Action Plan for Sustainable Production and Consumption (PPCS).		
13.3	Improve education, increase human and institutional awareness and capacity on climate change, its risks, mitigation, adaptation, impacts, and early warning systems	Increase the collective understanding of climate change and the importance of the forest through the project activities involving technical qualification, training in forest management, and community development in the form of participative workshops.	The trainings will be carried out after project validation and credit sale.

Regarding goal 13, the Evergreen REDD+ project involves the conservation of a predicted 58,073.54 hectares of forest over its lifespan and it is an essential activity for climate change mitigation.

Perhaps most importantly, the project is aligned with SDG 15 regarding Terrestrial Ecosystems, which was adopted into the Brazilian goals as follows: “15.1. By 2020, to conserve at least 30% of the Amazon, through systems of conservation units provided for in the Law on the National System of Conservation Units (SNUC), and other categories of officially protected areas such as Permanent Preservation Areas (APPs), Legal Reserves (RLs) and indigenous lands with native vegetation (...)”. The present project’s direct conservation of APPs and RLs, as well as synergistic actions with the surrounding Conservation Units are strongly aligned with this national goal.

Brazilian SDG goal 15.2, regarding sustainable forest management, tree plantation and restoration of forests, which stipulates to “eliminate illegal deforestation in all Brazilian biomes by 2030, expand the area of forests under sustainable environmental management and recover 12 million hectares of degraded forests and other forms of native vegetation, in all biomes and preferably in Permanent Preservation Areas (APPs) and Legal Reserves (RLs) and, in areas of alternative land use, expand the planted forest area by 1.4 million hectares”, is directly supported by the Evergreen project’s following activities:

- Monitoring of illegal land occupation, illegal logging, and illegal deforestation: Surveillance activities are being intensified to reduce illegal invasions and deforestation. There is a monitoring base at the Boa Lembrança farm, where an employee is housed and who makes daily rounds. Ground rounds can be done on foot, with a quad bike or pickup truck. The project has two aircraft for air monitoring, which is done monthly. River monitoring is done weekly. The monitoring frequency may be changed according to the season. However, the Carbonext team and the owners are together reviewing the operating procedures to standardize monitoring actions, determine responsibilities, how evidence should be recorded, how to prevent risks to forest integrity and how to combat in case of occurrences. This review aims to make actions more assertive and agile in combating and preventing deforestation, invasions and forest fires.
- Ultimate goal of avoiding deforestation of 44,818 hectares of Amazon rainforest over 30 years on private lands, preserving APPs and RLs.

The total net GHG emission reductions generated in this monitoring period are estimated at 852,920 tCO₂.

2. SAFEGUARDS

2.3 No Net Harm

The project activities do not cause any potential negative offsite stakeholder impacts. The project does not result in net negative impacts on the wellbeing of other stakeholder groups. A communication channel was established for stakeholders to express their concerns and to solve potential conflicts and grievances that arise during project planning and implementation. The main communication channel is the project's own email (reddevergreencarbonext@carbonext.com.br), which is managed by the Carbonext team. But the residents close to the project also have the Whatsapp contact for the owners and field managers and can send messages directly to them in case of conflicts, questions or suggestions. During the period of this monitoring report, no complaints or denunciations were made by the communities.

Complementary, monitoring of labour conditions will reduce several work safety risks, in addition to improving wellbeing of local workers: annually internal monitoring for health and security assessments, nutrition aspects, personal care and hygiene etc. All situations and occupations that might arise through the implementation of the project and pose a substantial risk to worker safety will be comprehensively assessed.

All relevant laws and regulations covering worker's rights will be periodically informed to workers, as part of community development sessions in the form of participative workshops. These

workshops and training sessions will also cover subjects related to health and security, in a manner to reduce risks during the field activities.

2.4 Local Stakeholder Consultation

The Evergreen REDD+ project determined three methods of communication and availability of materials related to the Project:

E-mail: preference was given to contact by email with all stakeholders who had an e-mail contact available. A summary of the project was sent and the email “reddevergreencarbonext@carbonext.com.br” was informed, to which they could send questions and suggestions about the Project. Questions will be answered within 10 working days.

Virtual: documents related to the Project are available through virtual means on the VCS website and, as soon as possible (given audits and VCS timeframes) will be available on the Carbonext website.

Oral: this communication method was the primary method used for communication with communities living around the project area. Information about the Project will be conveyed orally through meetings with communities, including a collective presentation, and individual questionnaire.

As preconized in VCS standard 4.1 (item 3.16.11), the project proponent conducted an assessment of the local stakeholders that are potentially impacted by the project. Local entities having some influence, activities and impact on the Reference Region were chosen through a process to identify them. Stakeholders chosen for local consultation also included potentially impacted communities and neighbours.

Institutional Public Consultation

The institutional public consultation began on June 18, 2021, and covered public agencies, institutions, associations and NGOs, with a total of 17 stakeholders being mapped:

- ADEMAP (Socioeconomic and Environmental Development Agency of the Municipality of Apuí)
- ADAF (Amazonas State Agricultural and Forestry Defense Agency)
- Aripuana-Guariba Agroextrativist Association
- Apuí Environment Secretary

- Apuí Administration Department
- Apuí City Hall
- CEUC - AM (State Center for Conservation Units)
- Department of Education, Culture and Sports of the Municipality of Apuí
- IDAM (Institute for Sustainable Agricultural and Forestry Development of the State of Amazonas)
- Idesam (Amazon Conservation and Sustainable Development Institute)
- IPAAM (Amazon Environmental Protection Institute)
- Jatuarana National Forest
- Secretary of Production of the Municipality of Apuí
- SEMA (State Secretariat for the Environment of Amazonas)
- Sucunduri State Forest
- RESEX Aripuanã (Aripuanã Extractive Reserves)
- UFAM (Federal University of The Amazon)

These stakeholders were contacted by email and received a project summary as described above for this method of communication.

So far, only Idesam has replied, raising certain issues about the Project's coordinates, the Project's integration with the REDD+ State System and the baseline deforestation projection. Carbonext responded promptly within 5 days and Idesam stated that the answers were satisfactory and enlightening. Questions received and their answers will be stored in a data room and will be available for audit.

Community Public Consultation

As stated in the methodology, local communities and families, neighbouring communities and workers were mapped for the community public consultation (Figure 6). For this survey, a sampling based on the Non-permanence analysis has been adopted, meeting the following criteria:

- i) minimum of 50% of stakeholders inside the Project Area, however there are no one living within the project area at the moment;
- ii) minimum of 20% of stakeholders relying on the Project Area have been consulted within a distance of 20 km of project boundaries;

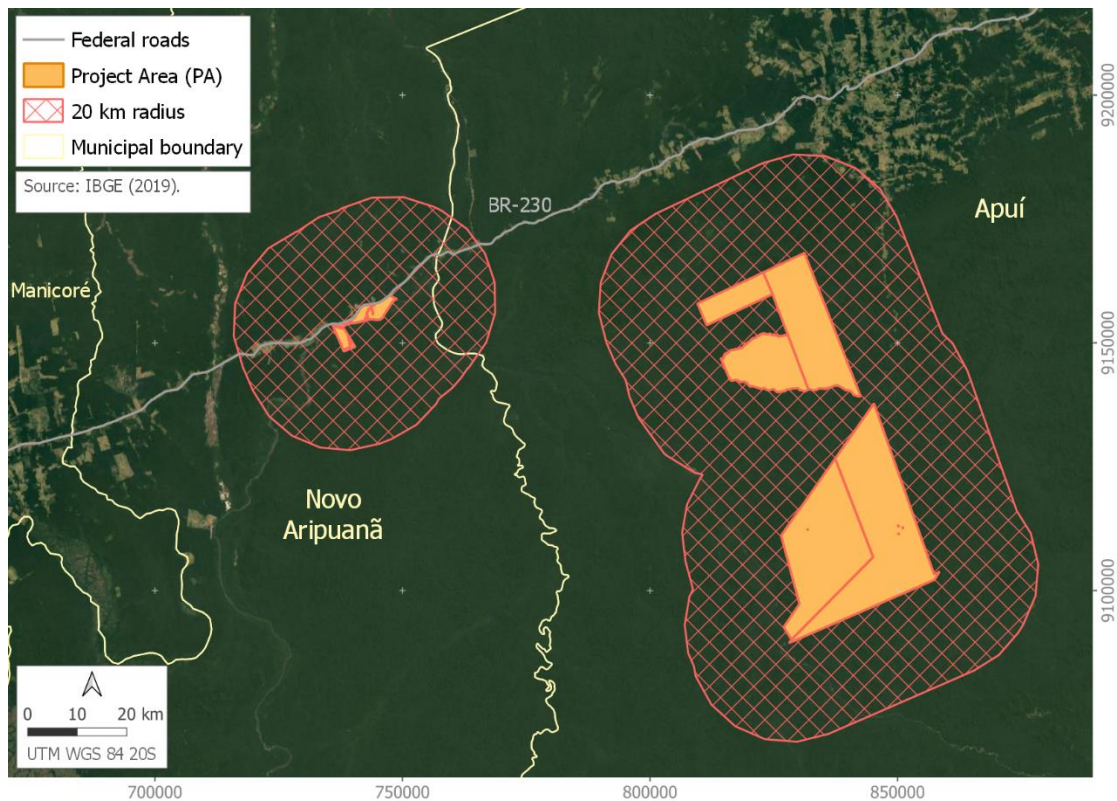


Figure 6. The Project Area and 20km radius within which the neighbors were mapped

As described in sub-item “Community Public Consultation” below, the survey allowed the project proponent to assess the following stakeholders’ characteristics (required in VCS standard 4.1, item 3.16.11): i) legal or customary tenure/access rights to territories and resources, including collective and/or conflicting rights, held by local stakeholders; ii) a description of the social, economic and cultural diversity within local stakeholder groups and the differences and interactions between the stakeholder groups; iii) potential changes in the makeup of local stakeholders over time; iv) the expected changes in well-being and other stakeholder characteristics under the baseline scenario, including changes to ecosystem services identified as important to local stakeholders (i.e., generally associated with the conservation of non-timber products species vs deforestation); v) the location of communities, local stakeholders and areas outside the project area that are predicted to be impacted by the project; vi) the location of territories and resources which local stakeholders own or to which they have customary access; vii) identify likely natural and human-induced risks to local stakeholder well-being expected during the project lifetime and outline measures needed to mitigate these risks (required in VCS standard 4.1, item 3.16.12); viii) identify the risks for local stakeholders to participate in the project (required in VCS standard 4.1, item 3.16.13); and ix) identify any allegations or complaints on discrimination or sexual harassment (required in VCS standard 4.1, item 3.16.14).

As required in VCS standard 4.1, item 3.16.17, for the “Local stakeholder consultation”, a comprehensive project summary was actively presented to the communities and other stakeholders in Portuguese in the field, by two project agents. For the “Institutional Consultation”, in turn, the government organs and other institutions were contacted by e-mail. In both consultation modalities, the project proponent communicated in a didactic way: i) the project design and implementation, including the results of monitoring; ii) the risks, costs and benefits the project may bring to local stakeholders; iii) all relevant laws and regulations covering workers’ rights in the host country; iv) the process of VCS Program validation and verification and the validation/verification body’s site visit.

Between July 15 and 17, 2021, project representatives visited neighbors and communities in person to explain the characteristics of the Evergreen REDD+ project. During the visits, three documents were collected:

- i. Declaration of Consent with the Project:** those consulted declare that they received a visit from a project representative, that they are aware of the objectives and which properties belong to the project area. They also declare that they agree with the realization of the Evergreen REDD+ Project and gave their free consent.
- ii. Customary Resource Use Survey:** Questionnaire applied to neighbors and communities to fully understand community natural resource use and management activities within the Project Area.
- iii. Awareness of Communication Channels:** respondents declare that they have received information about the communication channels, to be used for complaints and questions regarding the Project.

All statements are duly stored and available during the audit.

During the public consultation, 50 residents within the 20km radius of the project were interviewed, corresponding to 20,2% of local residents, considering the adults that live on the rural area and depends on forest resources as a source of income (IBGE 2010a)² (IBGE 2010b)³ (DataSUS 2012)⁴.

² IBGE (2010a) Census of forest workers in the municipality of Apuí
<https://cidades.ibge.gov.br/brasil/am/apui/pesquisa/23/22957?detalhes=true>

³ IBGE (2010b) Census of rural residents: <https://censo2010.ibge.gov.br/sinopse/index.php?uf=13&dados=12>

⁴ DataSus (2012): Census of adult population in the municipality of Apuí TabNet Win32 3.0: População Residente - Amazonas (datasus.gov.br)

The interviews are essentially wild harvesters that relies on forest areas to collect oils, fruits (açaí) and nuts. Those groups were positive about the Evergreen REDD+ project, because the proponents of the project will register them and help to found an association. The creation of this association is important because it allows families in the community to benefit from public policies accessible only to associated and legally registered producers. These are programs promoted, for example, through the Fund for Social Promotion and Poverty Eradication (FPS) and the federal policies of minimum prices for nuts and açaí by the National Supply Company (Conab). Establishing an association strengthens the community and makes them less dependent on middlemen who retain most of the profits by having logistical dominance and more access to local traders and buyers of products⁵.

The wild harvesters reported that due to the growing deforestation in the Apuí region, they need to travel greater distances into the forest to be able to collect non-timber forest products. Therefore, they expect that with the conservation of the Evergreen area and increased monitoring, it will contribute to the preservation of the forest resources they exploit.

Through the interview and the Customary Resource Use Survey, it was possible to analyze some social and economic characteristics of these communities:

- 54% were residents of Apuí and 46% of Novo Aripuanã.
- All residents interviewed work harvesting non-timber forest products close to the project area. The most explored products are Nuts (32%), Açaí (28%), Copaiba Oil (21%) and Andiroba Oil (18%). None claimed to exploit wood or own
- close to the project area.
- In relation to gender distribution of the participants, 60% identified as male and 40% as female.
- Regarding the main needs of the region, the most mentioned topics were: Roads (23%), Health Access (21%), Internet (20%), Education (19%) and Energy distribution (17%),

This information is relevant so that the activities that will be developed within the property can benefit them in a way that contributes to the social and economic development of the region. Furthermore, it is important to point out that wild harvesters will continue to have access to the project area to collect non-forest products. The wild harvesters are known to the proponents and they will be registered, in order to differentiate them from illegal invaders.

⁵ IDESAM (2019) <https://idesam.org/conteudo/noticias/familias-produtoras-de-oleos-vegetais-reativam-associacao-em-busca-de-novos-mercados-e-preco-justo/>



Figure 7. Public consultation with wild-harvesters about the implementation of the Evergreen REDD+ Project

Communication channel

The project proponent understands that stakeholders want and need to be involved in project design, implementation, monitoring and evaluation throughout the project lifetime. Therefore, in compliance with VCS Standard 4.1 (item 3.16.18), a communication channel was established for stakeholders to continually express their concerns and to solve eventual conflicts and grievances that arise during project planning, implementation, and monitoring. The main communication channel is the project's own email (reddevergreencarbonext@carbonext.com.br), which is managed by the Carbonext team.

Besides that, there are communities leaders who are responsible for collecting doubts and complaints from the communities and passing them on to the project's proponents. This communication can be done via phone call or face-to-face visits, as the proponents are often in the areas and make themselves accessible for conversations.

During the period of this monitoring report, no complaints or denunciations were made by the communities or any other stakeholder.

2.3 AFOLU-Specific Safeguards

During the monitoring period, the project developer and proponents have communicated and consulted neighbour landowners and wild-harvesters about the development of the Evergreen REDD+ Project. Despite the project being carried out on private property, during the public consultation, the neighbors and surrounding communities were informed about the project's objectives, the benefits for forest conservation and the activities that will be carried out in the future with the communities. In addition, the participants spontaneously signed a term giving their free consent and agreement with the implementation of the project⁶. None of them reported any conflicts or concerns about the project and they were positive with the implementation of the project, as an association with the wild harvesters will be formed and they will be registered (activity still to be performed), which will strengthen and allow them access to credit lines for investments. Besides that, the wild harvesters will continue to have access to the project area to collect non-forest products. Thus, no stakeholder risk was detected, and they did not express any perception of risk to them.

During the public consultation held on July 17, 2021, they were informed about the communication channels for any doubts and complaints. The means of communication are the project email (reddevergreencarbonext@carbonext.com.br) and telephone contact with the proponents. Community leaders have direct contact with the proponents (via phone or face to face visits), and they are constantly visiting the area and are available for conversations.

The process for receiving, hearing, responding to and attempting to resolve Grievances will be performed within a reasonable time period. It is expected that each grievance is responded in a delay of 7 days, proposing and/or taking corrective actions.

1. The Project Proponent shall attempt to amicably resolve all grievances and provide a written response to the grievances in a manner that is culturally appropriate. (Action must be taken in 7 days);

⁶ File in PDF named "Declaração de Consentimento com o Projeto" (Declaration of consent with the project) available for audit.

2. Any grievances that are not resolved by amicable negotiations shall be referred to mediation by a neutral third party. (Action must be taken in 30 days);
3. Any grievances that are not resolved through mediation shall be referred either to a) arbitration, to the extent allowed by the laws of the relevant jurisdiction or b) competent courts in the relevant jurisdiction, without prejudice to a party's ability to submit the grievance to a competent supranational adjudicatory body, if any. (The time to accomplish this stage is dependent on local jurisdiction delays.)

During the period of elaboration of this Monitoring Report, no complaints, suggestions or accusations were received through any of the communication channels. Thus, we can conclude that so far, the project has not caused any negative impact on stakeholders.

3. IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The approximate implementation schedule for the Evergreen REDD+ project's first monitoring report, along with current accomplishments, is as follows:

Table 3. Implementation schedule

Date	Event
July,2021	A hybrid model aircraft was purchased. Thus, the project now has two aircraft (one purchased before the start date of the project) to carry out aerial monitoring.
July,2021	A ferry was installed on the Roosevelt River that passes between the Boa Lembrança and São Damião properties, to facilitate access to the innermost part of the project area to inhibit invasions.
July 12th to 16th, 2021	Before the Boa Lembrança property was bought by Renan Boehm, the base was abandoned. The owner carried out repairs to the structure and painting to revitalize the building.

July 15 to 17, 2021	Project representatives visited neighbors and communities in person to conduct a public consultation about the Evergreen REDD+ Project. The public consultation was carried at the surveillance base in the Fazenda Boa Lembrança and at the homes of neighbors who were unable to travel to the project area.
July 17, 2021	First aid training was held at the Boa Lembrança base for residents and employees, totaling 24 participants.



Figure 8. Aircraft purchased for air monitoring



Figure 9. Ferry installed on the Roosevelt River, between Boa Lembrança and São Damião properties

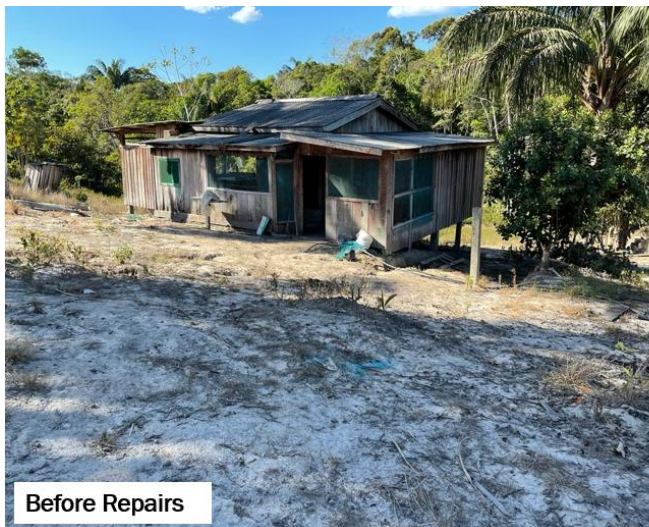


Figure 10. Before and after repairs performed at the Boa Lembrança surveillance post



Figure 11. Public consultation held at the surveillance post of the Boa Lembrança farm

Regarding the following requirement of the MR template:

- *Where applicable, describe how leakage and non-permanence risk factors are being monitored and managed for AFOLU projects.*

Since the beginning of the project, actions have been intensified to strengthen monitoring and make it more efficient, such as the purchase of new aircraft for aerial monitoring, restoration of the monitoring base and construction of the ferry to facilitate access to the project area. These activities inhibit invaders that may cause fires or reduce forest cover, thus reducing the emission of GHG. In addition, the Carbonext team together with the owners is reformulating the operational procedures of the monitoring activities, to identify opportunities for process improvements, standardize activities, define responsibilities and determine the process of evidence collection, in order to make the monitoring more effective.

The remote monitoring mechanism is also being improved to increase its effectiveness. It will provide increased monitoring frequency and forward automated alerts so that enforcement actions and contingency measures take place as soon as possible.

Besides that, there were no changes in owners and other entities involved during this monitoring report period.

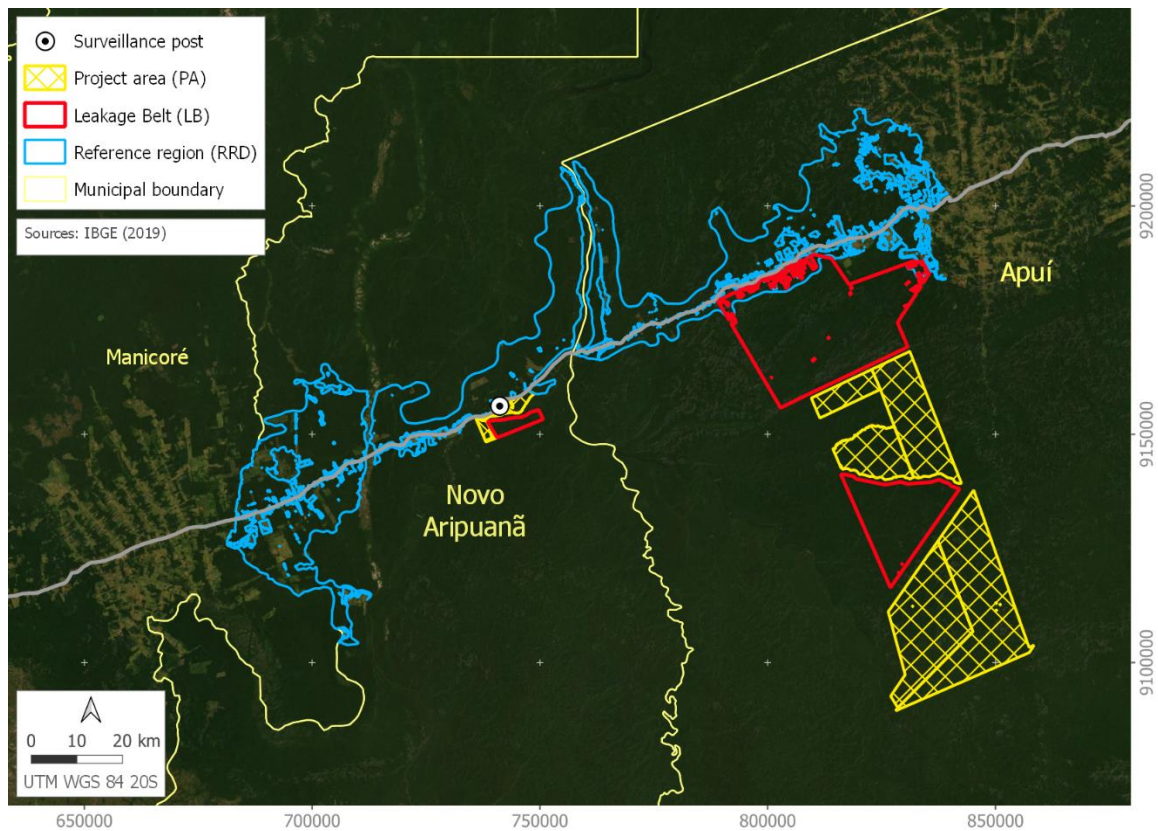


Figure 12. Boa Lembrança Surveillance Post location.

3.2 Deviations

3.2.1 Methodology Deviations

The Evergreen REDD+ Project has no methodology deviations during this monitoring period.

3.2.2 Project Description Deviations

The Evergreen REDD+ Project has no project deviations during this monitoring period.

3.3 Grouped Projects

No new instances were added to the project within this monitoring period.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	CF
Data unit	tC _t /td.m ⁻¹
Description	Carbon fraction of dry matter in t C t ⁻¹ d.m
Source of data	Values from the literature (e.g. IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.3) shall be used if available, otherwise default value of 0.47 t C t ⁻¹ d.m. can be used
Value applied	0.47
Justification of choice of data or description of measurement methods and procedures applied	The default value was used for conservativeness purposes.
Purpose of Data	• Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage
Comments	If new and more accurate carbon fraction data become available, these can be used to estimate the net anthropogenic GHG emission reduction of the subsequent fixed baseline period.

Data / Parameter	44/12
Data unit	Dimensionless
Description	Carbon mass to CO ₂ e mass conversion factor
Source of data	From scientific literature: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 AFOLU
Value applied	44/12
Justification of choice of data or description of measurement methods and procedures applied	Conversion from C to CO ₂ based on molecular weights
Purpose of Data	• Calculation of baseline emissions • Calculation of project emissions

	Calculation of leakage
Comments	IPCC standard value

Data / Parameter	R
Data unit	t root d.m.t ⁻¹ shoot d.m.
Description	Root to shoot ratio appropriate to species or forest type / biome; note that as defined here, root to shoot ratio is applied as belowground biomass per unit area: aboveground biomass per unit area (not on a per stem basis)
Source of data	VM0007 module CP-AB, average from page 17.
Value applied	0.37
Justification of choice of data or description of measurement methods and procedures applied	Local values are not known, and the IPCC is a conservative value.
Purpose of Data	- Calculation of baseline emissions - Calculation of project emissions - Calculation of leakage
Comments	Peer-reviewed work performed in the region of the Project Area, with a similar vegetation typology. The statistical quality of model is in accordance with methodology requirements

Data / Parameter	WW_{ty}
Data unit	Dimensionless
Description	Fraction of extracted biomass effectively emitted to the atmosphere during production by class of wood product ty
Source of data	Default value for developing countries: CP-W - page 14.
Value applied	0.24
Justification of choice of data or description of measurement methods and procedures applied	As per CP-W.

Purpose of Data	Calculation of baseline emissions
Comments	Parameter values to be updated if new empirically based peer-reviewed findings become available.

Data / Parameter	SLF_{ty}
Data unit	Dimensionless
Description	Fraction of wood products that will be emitted to the atmosphere within 5 years of production by class of wood product ty
Source of data	As per CP-W: Sawnwood, page 13.
Value applied	0.20
Justification of choice of data or description of measurement methods and procedures applied	Default conservative value prescribed by CP-W.
Purpose of Data	Calculation of baseline emissions
Comments	Parameter values to be updated if new empirically based peer-reviewed findings become available

Data / Parameter	OF_{ty}
Data unit	Dimensionless
Description	Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest by class of wood product ty
Source of data	The OF_{ty} is the complementary number of SLF_{ty} : the sum of both parameters must equal 1 (i.e., 100%).
Value applied	0.80
Justification of choice of data or description of measurement methods and procedures applied	As per CP-W.
Purpose of Data	Calculation of baseline emissions

Comments	Parameter values to be updated if new empirically based peer-reviewed findings become available.
Data / Parameter	P_{COMI}
Data unit	Dimensionless
Description	Commercial volume as a percent of total aboveground volume in stratum i .
Source of data	For calculation of this parameter, the volume of merchantable wood in exploitation (in m^3/ha) has been based on "Florestal Santa Maria Project" ($35.08 m^3/ha$), whose Project Area is located about 120 km South of this Project Area and forest typologies are very similar ⁷ . In fact, "Florestal Santa Maria Project" aboveground biomass ranges from 224 to 268 t/ha, while the average aboveground biomass in this project is estimated as 253 t/ha. Thus, as prescribed in CP-W, a forest inventory from a proxy area in the same region, representing the same forest type and age class was chosen for calculation of this parameter.
Value applied	Submontane dense: 0.08235 Submontane open: 0.08155
Justification of choice of data or description of measurement methods and procedures applied	As prescribed in CP-W, a forest inventory from a proxy area in the same region, representing the same forest type and age class was chosen for calculation of this parameter. This parameter is updated at baseline renewal when aboveground biomass is re-inventoried as per module CP-AB (at least every 10 years).
Purpose of Data	Calculation of baseline emissions
Comments	Updated at the time of baseline revision (at least every 10 years). Application of the commercial percentage of total volume introduces the simplifying assumption (and conservative, as it is only used in the ex-ante baseline calculations) that all commercial stocks are extracted (i.e., perfect efficiency).
Data / Parameter	$C_{WP,I}$

7

https://registry.verra.org/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=52137&IDKEY=9lksoiuwqowrnoiuomnckjashoufifmln902309ksdfiku098l71896923 (last visited in 10/09/2021)

Data unit	t CO ₂ e ha ⁻¹
Description	Mean carbon stock entering the wood products pool from stratum <i>i</i>
Source of data	VCS Module VMD0005 REDD Methodological Module: Estimation of Carbon Stocks in The Long-Term Wood Products Pool (CP-W) ⁸ . This parameter has been calculated using default values prescribed in CP-W.
Value applied	2.61
Justification of choice of data or description of measurement methods and procedures applied	As per CP-W.
Purpose of Data	Calculation of baseline emissions
Comments	N/A.

Data / Parameter	C _{XB}
Data unit	t CO ₂ -e ha ⁻¹
Description	Mean stock of extracted biomass carbon from stratum <i>i</i>
Source of data	Calculated as in Table 36 of the project VCS-PD
Value applied	27.03
Justification of choice of data or description of measurement methods and procedures applied	Calculated according to Module CP-W
Purpose of Data	Calculation of baseline emissions
Comments	N/A.

Data / Parameter	Pasture carbon pool
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⁸ <https://verra.org/wp-content/uploads/2018/03/VMD0005-CP-W-v1.1.pdf> (last visited in 28/09/2021)

Data unit	t CO ₂ e
Description	Pasture carbon pool in the baseline scenario
Source of data	<i>Terceiro Inventário Brasileiro de Emissões e Remoções Antrópicas de Gases de Efeito Estufa Relatórios de Referência Setor Uso da Terra, Mudança do Uso da Terra e Florestas</i> (Third Brazilian Inventory of Greenhouse Gas Emissions and Removals Reference Reports Land Use, Land Use Change and Forestry Sector). Ministry of Science, Technology and Innovation, 2015 ⁹ . Deforestation measured through data from Mapbiomas project.
Value applied	As in Table 37 of the project VCS-PD
Justification of choice of data or description of measurement methods and procedures applied	The post-deforestation biomass (pasture) according to the National GHG Inventory has been multiplied by the deforestation measured through data from Mapbiomas.
Purpose of Data	Calculation of baseline emissions
Comments	Calculation based on country-specific values.

Data / Parameter	BCEF
Data unit	Dimensionless
Description	Biomass conversion and expansion factor for conversion of commercial wood volume per unit area to total aboveground tree biomass per unit area
Source of data	According to CP-AB - page 14, being the average of the three proposed factors.
Value applied	1.32
Justification of choice of data or description of measurement methods and procedures applied	BCEF was applied for conversion of merchantable volume to total aboveground tree biomass
Purpose of Data	• Calculation of baseline emissions • Calculation of project emissions

⁹ http://redd.mma.gov.br/images/FREL/RR_LULUCF_Mudana-de-Uso-e-Floresta.pdf (last visited in 17/09/2021)

	Calculation of leakage
Comments	N/A.

Data / Parameter	$C_{bb_{icl}}$
Data unit	tCO ₂ /ha
Description	Average carbon stock per hectare in the below-ground biomass carbon pool of initial forest class icl
Source of data	Average of public literature data from the project region. Further details are provided in “1.13 Conditions Prior to Project Initiation” of this VCS-PD.
Value applied	Submontane dense tropical rainforest: 254.5 Submontane open tropical forest: 257.0
Justification of choice of data or description of measurement methods and procedures applied	0.24 root-shoot ratio (R) was applied, according to VM0007 module CP-AB, average from page 17.
Purpose of Data	Calculation of baseline emissions
Comments	Literature studies used for this assessment, as well as respective calculations, are available for consultation by the audit team.

Data / Parameter	$C_{ABnon-tree,post,i}$; $C_{BBnon-tree,post,i}$
Data unit	tCO ₂ /ha
Description	Post-deforestation carbon stock in aboveground non-tree vegetation in stratum i; t CO ₂ -e ha ⁻¹ ; Post-deforestation carbon stock in belowground non-tree biomass in stratum i; t CO ₂ -e ha ⁻¹
Source of data	<i>Terceiro Inventário Brasileiro de Emissões e Remoções Antrópicas de Gases de Efeito Estufa Relatórios de Referência Setor Uso da Terra, Mudança do Uso da Terra e Florestas</i> (Third Brazilian Inventory of Greenhouse Gas Emissions and Removals Reference Reports Land Use, Land Use Change and Forestry Sector). Ministry of Science, Technology and Innovation, 2015 ¹⁰ .

¹⁰ http://redd.mma.gov.br/images/FREL/RR_LULUCF_Mudana-de-Uso-e-Floresta.pdf (last visited in 17/09/2021)

Value applied	27.8 (sum of above and belowground biomass)
Justification of choice of data or description of measurement methods and procedures applied	Value used in the National GHG inventory.
Purpose of Data	Calculation of baseline emissions
Comments	Country-specific value provided for above and belowground biomass of pasture.

Data / Parameter	COMF
Data unit	Dimensionless
Description	Combustion factor for stratum i (vegetation type)
Source of data	E-BPB refers to Table 2.6 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4 Agriculture, Forestry and Other Land Use, Chapter 2, "Primary tropical moist forest" ¹¹
Value applied	0.50
Justification of choice of data or description of measurement methods and procedures applied	Value was applied according to E-BPB: Table 2.6 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4 Agriculture, Forestry and Other Land Use, Chapter 2, "Primary tropical moist forest"
Purpose of Data	Calculation of baseline emissions Calculation of project emissions
Comments	N/A.

Data / Parameter	G _{gi}
Data unit	g kg ⁻¹ dry matter burnt
Description	Emission factor for stratum i for gas g

¹¹ https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_02_Ch2_Generic.pdf (last visited in 20/09/2021)

Source of data	Defaults can be found in Volume 4, Chapter 2, of the IPCC 2006 Inventory Guidelines in table 2.5 (see Annex 2: emission factors for various types of burning for CH ₄ and N ₂ O).
Value applied	G _{CH₄} = 4.8 G _{N₂O} = 0.2
Justification of choice of data or description of measurement methods and procedures applied	Conservative default values from IPCC 2006.
Purpose of Data	• Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage emissions
Comments	N/A.

Data / Parameter	Dmm
Data unit	t d.m.m ⁻³
Description	Mean wood density of commercially harvested species
Source of data	Source: Brown, S., A. J. R. Gillespie, and A. E. Lugo, 1989. Biomass estimation methods for tropical forests with applications to forest inventory data. Forest Science, 35:881-902. See pg. 890, Table 4, Moist
Value applied	0.59
Justification of choice of data or description of measurement methods and procedures applied	Country-specific data obtained from the same biome.
Purpose of Data	• Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage emissions
Comments	N/A.

Data / Parameter	LDF
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Data unit	t C m ⁻³
Description	Factor for calculating the biomass of dead wood created during logging operations per cubic meter extracted (i.e. Logging Damage Factor)
Source of data	VMD0001 LK-ME ¹²
Value applied	0.53
Justification of choice of data or description of measurement methods and procedures applied	It is the default value for broadleaf and mixed forests, according to module VMD0001 LK-ME. Default value for broadleaf and mixed forests of 0.53 t C m ⁻³ from 774 logging gaps measured by Winrock International in Bolivia, Belize, the Republic of Congo, Brazil and Indonesia may be used for tropical broadleaf forests
Purpose of Data	• Calculation of leakage emissions • Calculation of project emissions
Comments	N/A.

Data / Parameter	LIF
Data unit	t C m ⁻³
Description	Factor for calculating the emissions arising from the creation of logging infrastructure (roads, skid trails and decks) during logging operations per cubic meter extracted
Source of data	LK-ME, pg 8
Value applied	0.29
Justification of choice of data or description of measurement methods and procedures applied	Conservative default value of 0.29 t CO ₂ -e m ⁻³ calculated from 1,839 hectares of logging concessions analysed by Winrock International in the Republic of Congo and Brazil, may be used for tropical broadleaf forests.
Purpose of Data	• Calculation of leakage emissions • Calculation of project emissions
Comments	N/A.

¹² Source: <https://verra.org/wp-content/uploads/2018/03/VMD0011-LK-ME-v1.0.pdf> (pg 8)

Data / Parameter	LF _{ME}
Data unit	dimensionless
Description	Leakage factor for market effects calculations
Source of data	VMD0011 (LK-ME)
Value applied	0.2
Justification of choice of data or description of measurement methods and procedures applied	When the mean biomass is more than 15% greater than the biomass within the project boundaries, the LF _{ME} shall be considered 0.2. In the Evergreen REDD+ Project, the biomass of total aboveground tree is considered to be 32,65% greater in the Amazon Biome than in the Project Area.
Purpose of Data	Calculation of leakage
Comments	N/A.

Data / Parameter	C _{LB}
Data unit	t CO _{2e} ha ⁻¹
Description	Area-weighted average aboveground tree carbon stock for forests available for unplanned deforestation inside the leakage belt
Source of data	Project Area data
Value applied	435.8
Justification of choice of data or description of measurement methods and procedures applied	Based on similarity analysis, data from the Project Area was applied to Leakage Belt area. It was taken a weighted average of aboveground biomass inside the Project Area.
Purpose of Data	Calculation of leakage emissions
Comments	N/A.

Data / Parameter	C _{OLB}
Data unit	t CO _{2e} ha ⁻¹

Description	Area-weighted average aboveground tree carbon stock for forests available for unplanned deforestation outside the leakage belt
Source of data	Saatchi, R.A. Houghton, R.C. dos Santos Alvalá, J.V. Soares, and Yifan Yu. Distribution of Aboveground Live Biomass in the Amazon Basin. 2007. As per LK-ASU, the number is derived from peer-reviewed literature that is appropriate, as it considers the same biome.
Value applied	578.1
Justification of choice of data or description of measurement methods and procedures applied	The value of 578,1 tCO ₂ /ha is the total mean biomass for floodplain forest in the Amazon basin of 157.66 tC/ha (according to Table 7 the study mentioned before), multiplied by 44/12, the conversion factor from tC to tCO ₂ .
Purpose of Data	Calculation of leakage emissions
Comments	N/A.

Data / Parameter	DLF
Data unit	%
Description	Displacement Leakage Factor
Source of data	Local assessment
Value applied	10
Justification of choice of data or description of measurement methods and procedures applied	Justification of choice of data or description of measurement methods and procedures applied: If deforestation agents do not participate in leakage prevention activities and project activities, the Displacement Factor shall be 100%. Where leakage prevention activities are implemented the factor shall be equal to the proportion of the baseline agents estimated to be given the opportunity to participate in leakage prevention activities and project activities. The project design team estimates that 100% of potential deforestation agents in the Reference Region will be given the opportunity to participate in leakage prevention activities. Thus, the "Displacement Leakage Factor" (DLF) was conservatively defined as 10%.
Purpose of Data	Calculation of leakage

Comments	This value is an ex-ante estimate. Accurate and actual values will be monitored and reported in verification periods
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Data / Parameter	Cab_tree
Data unit	t CO2-e ha-1
Description	Mean aboveground biomass carbon stock in stratum i
Source of data	The value is the result of the division of the total aboveground carbon pool per stratum by the area.
Value applied	433.3 for Submontane dense 437.6 for Submontane open
Justification of choice of data or description of measurement methods and procedures applied	As indicated in module CP-AB.
Purpose of Data	Calculation of baseline emissions
Comments	N/A

Data / Parameter	Cbb_tree
Data unit	t CO2-e ha-1
Description	Mean belowground biomass carbon stock in stratum i
Source of data	The value is the result of the division of the total aboveground carbon pool per stratum by the area.
Value applied	254.5 for Submontane dense 257.0 for Submontane open
Justification of choice of data or description of measurement methods and procedures applied	As indicated in module CP-AB.
Purpose of Data	Calculation of baseline emissions
Comments	N/A

4.2 Data and Parameters Monitored

Data / Parameter	Project Forest Cover Monitoring Map
Data unit	ha
Description	Map showing the location of forest land within the project area at the beginning of each monitoring period. If within the Project Area some forest land is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data	Remote sensing in combination with GPS data collected during ground truthing
Description of measurement methods and procedures to be applied	The minimum map accuracy must be 90% for the classification of forest/non-forest in the remote sensing imagery. If the classification accuracy is less than 90% then the map is not acceptable for further analysis. More remote sensing data and ground truthing data will be needed to produce a product that reaches the 90% minimum mapping accuracy
Frequency of monitoring/recording	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied	Figure 15
Monitoring equipment	Remote sensing and GIS
QA/QC procedures to be applied	The Mapbiomas project contributes to understand the land use dynamics in Brazil. The data generated by this program is used in this project. Mapbiomas data are applicable for use in this project, according to the criteria listed below (Methodology VM0007): i) Mapbiomas data covers the entire project area, leakage belt and reference region. ii) Mapbiomas data cover the entire reference period (beginning, middle and end) of the fixed baseline period. iii) Mapbiomas monitors conversion of forest land to non-forest land. iv) Monitoring occurred during the entire fixed baseline period. In case of unavailability of Mapbiomas data for monitoring period, other sources will be consulted such as PRODES or a classification of imagery (Landsat8) will be carried out to measure deforested area: 1. Land use and land cover mapping is assessed using images with spatial resolution superior to 30 meters. Image acquisition is performed during the period of low incidence of clouds and rainfall in the region, within July and September.

	- Images undergo geometric correction by means of geo-referencing, using topographic maps as reference or USG-NASA orthorectified images. - For analysis of areas with cloud cover, visual interpretation of radar image would be performed. Evaluation of classification accuracy is performed by analyzing the overall accuracy and kappa index obtained from a confusion matrix. The minimum accuracy of the mapping classification should be over 90%, considered very high.
Purpose of data	Project Emission
Calculation method	Remote sensing and GIS
Comments	N/A

Data / Parameter	Leakage Belt Forest Cover Monitoring Map
Data unit	ha
Description	Map showing the location of forest land within the leakage belt area at the beginning of each monitoring period. Only applicable where leakage is to be monitored in a leakage belt
Source of data	Remote sensing in combination with GPS data collected during ground truthing
Description of measurement methods and procedures to be applied	The minimum map accuracy must be 90% for the classification of forest/non-forest in the remote sensing imagery. If the classification accuracy is less than 90% then the map is not acceptable for further analysis. More remote sensing data and ground truthing data will be needed to produce a product that reaches the 90% minimum mapping accuracy.
Frequency of monitoring/recording	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied	Figure 16
Monitoring equipment	Remote sensing and GIS
QA/QC procedures to be applied	The Mapbiomas project contributes to understand the land use dynamics in Brazil. The data generated by this program is used in this project. Mapbiomas data are applicable for use in this

	project, according to the criteria listed below (Methodology VM0007): i) Mapbiomas data covers the entire project area, leakage belt and reference region. ii) Mapbiomas data cover the entire reference period (beginning, middle and end) of the fixed baseline period. iii) Mapbiomas monitors conversion of forest land to non-forest land. iv) Monitoring occurred during the entire fixed baseline period. In case of unavailability of Mapbiomas data for monitoring period, other sources will be consulted such as PRODES or a classification of imagery (Landsat8) will be carried out to measure deforested area: 1. Land use and land cover mapping is assessed using images with spatial resolution superior to 30 meters. Image acquisition is performed during the period of low incidence of clouds and rainfall in the region, within July and September. 2. Images undergo geometric correction by means of geo-referencing, using topographic maps as reference or USG-NASA orthorectified images. 3. For analysis of areas with cloud cover, visual interpretation of radar image would be performed. Evaluation of classification accuracy is performed by analyzing the overall accuracy and kappa index obtained from a confusion matrix. The minimum accuracy of the mapping classification should be over 90%, considered very high.
Purpose of data	• <i>Leakage emissions</i>
Calculation method	Remote sensing and GIS
Comments	N/A

Data / Parameter	<i>Aburn,i,t</i>
Data unit	ha
Description	Area burnt in stratum <i>i</i> at time <i>t</i>
Source of data	Remote sensing data
Description of measurement methods and procedures to be applied	It is considered that burning is a common practice in the region, and that all deforested area undergoes burning in a given moment. The Amazon Biome comprises a great amount of biomass, and post-deforestation residuals are very abundant. There is no technology known and economically feasible to allow mechanical skidding or disposal of deforestation residual

	biomass. Selling of these residuals is not feasible, as transportation is more expensive than the residual material itself. In this context, the only feasible alternative for cattle ranchers for land clearing is setting fire in those residues, getting rid of them thoroughly, quickly, and cheaply. According to an article in the "Globo" newspaper: "Basically, whenever you deforest, you burn it. This is a viable way to get rid of all the weeds. Burning also helps prepare the soil for planting. It serves to reduce soil acidity, a problem in the Amazon, and deposits nutrients" - Philip Fearnside, American biologist and scientist ¹³ .
Frequency of monitoring/recording	Areas burnt will be monitored yearly, examination will occur prior to any verification event.
Value applied	PA: 2020: 0 ha 2021: 0 ha LB: 2020: 148.99 ha 2021: 853,67 ha
Monitoring equipment	Remote sensing and GIS tools
QA/QC procedures to be applied	Best practices in remote sensing Land use / land change map for monitoring period; Overlay land use / land change map with fire alerts location data from INPE-BDQUEIMADAS (http://www.inpe.br/queimadas/abasFogo.php) into the period; Quantify pixels of deforested areas over fire alerts.
Purpose of data	Monitor burned forest areas
Calculation method	Remote sensing and GIS techniques
Comments	As burning of biomass is common practice in the region, it was considered that all the deforested areas were burnt – deforestation cycle includes burning.
Data / Parameter	ABSLPAt
Data unit	ha

¹³ <https://g1.globo.com/natureza/noticia/2019/08/23/queimadas-e-desmatamento-estao-relacionados-na-amazonia-entenda.ghml> (last visited in 20/09/2021)

Description	Annual area of deforestation in the Project Area at year t
Source of data	Remote sensing data and GIS
Description of measurement methods and procedures to be applied	Forest cover change due to deforestation is monitored through periodic assessment of classified satellite imagery covering the project area provided by Mapbiomas project.
Frequency of monitoring/recording	Annually.
Value applied	2020: 0 ha 2021: 0 ha
Monitoring equipment	Remote sensing and GIS tools
QA/QC procedures to be applied	The Mapbiomas project contributes to understand the land use dynamics in Brazil. The data generated by this program is used in this project. Mapbiomas data are applicable for use in this project, according to the criteria listed below (Methodology VM0007): i) Mapbiomas data covers the entire project area, leakage belt and reference region. ii) Mapbiomas data cover the entire reference period (beginning, middle and end) of the fixed baseline period. iii) Mapbiomas monitors conversion of forest land to non-forest land. iv) Monitoring occurred during the entire fixed baseline period. In case of unavailability of Mapbiomas data for the monitoring period, other sources will be consulted such as PRODES, or a classification of Landsat8 images will be carried out to measure deforested area: 1) Land use and land cover mapping is assessed using images with spatial resolution superior to 30 meters. Image acquisition is performed during the period of low incidence of clouds and rainfall in the region, within July and September. 2) Images undergo geometric correction by means of geo-referencing, using topographic maps as reference or USG-NASA orthorectified images. 3) For analysis of areas with cloud cover, visual interpretation of radar image would be performed. 4) Evaluation of classification accuracy is performed by analyzing the overall accuracy and kappa index obtained from a confusion matrix. The minimum accuracy of the mapping classification should be over 90%, considered very high.
Purpose of data	Calculation of project emissions

Calculation method	Remote sensing and GIS techniques
Comments	N/A

Data / Parameter	$V_{EXTz t}$
Data unit	m ³
Description	Volume extracted from logging stratum z in stratum i in year t
Source of data	Records and reports documenting amount of wood extracted within project boundary. Official data of timber harvest reports from logging in sustainable forest management. Local field inventory.
Description of measurement methods and procedures to be applied	All logged trees are previously inventoried.
Frequency of monitoring/recording	To be determined, according to the decision listed in the 'Comments' section.
Value applied	The value will be calculated ex-post.
Monitoring equipment	The same equipment applied in forest inventory.
QA/QC procedures to be applied	Forest inventory data can be crosschecked with official data of timber harvest reports from logging in sustainable forest management.
Purpose of data	Calculation of project emissions
Calculation method	Official data of timber harvest reports from logging in sustainable forest management and timber inventory.
Comments	The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.

Data / Parameter	$C_{EXTz t}$
Data unit	tCO ₂ -e

Description	Biomass carbon stock of timber extracted within the project boundary for logging stratum z, in stratum i in year t;
Source of data	Official data of timber volume reports from logging in sustainable forest management
Description of measurement methods and procedures to be applied	Official data of timber volume reports from logging in sustainable forest management will be converted to tCO ₂ -e, considering wood basic density and carbon fraction, multiplied by 44/12. All logged trees are previously inventoried.
Frequency of monitoring/recording	To be determined, according to the decision listed in the 'Comments' section.
Value applied	Currently not applicable, value will be calculated ex-post as of the moment when SFMPs are implemented.
Monitoring equipment	The logged trees are previously inventoried.
QA/QC procedures to be applied	Forest inventory data can be crosschecked with official data of timber volume reports from logging in sustainable forest management.
Purpose of data	Calculation of project emissions
Calculation method	Official data of timber volume reports from logging in sustainable forest management ($V_{EXT\ z\ i\ t}$) will be converted to tCO ₂ -e, considering wood basic density and carbon fraction, multiplied by 44/12.
Comments	The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.

Data / Parameter	$C_{L\&I\ t}$
Data unit	tCO ₂ -e
Description	Actual net project emissions arising in the logging gap, in stratum i in year t
Source of data	Official data of timber volume reports from logging in sustainable forest management

Description of measurement methods and procedures to be applied	Biomass carbon stock of timber extracted within the project boundary ($C_{EXT\ z\ i\ t}$) is summed to volume of logs in sustainable forest management ($V_{EXT\ z\ i\ t}$) multiplied by LDF (Logging damage factor), to estimate both amounts of emissions of timber extracted and emissions caused for logging damage.
Frequency of monitoring/recording	To be determined, according to the decision listed in the 'Comments' section.
Value applied	Currently not applicable, value will be calculated ex-post as of the moment when SFMPs are implemented.
Monitoring equipment	The logged trees are previously inventoried.
QA/QC procedures to be applied	Forest inventory data can be crosschecked with official data of timber volume reports from logging in sustainable forest management.
Purpose of data	Calculation of project emissions
Calculation method	Biomass carbon stock of timber extracted within the project boundary ($C_{EXT\ z\ i\ t}$) is summed to volume of logs in sustainable forest management ($V_{EXT\ z\ i\ t}$) multiplied by LDF (Logging damage factor), to estimate both amounts of emissions of timber extracted and emissions caused for logging damage.
Comments	The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.

Data / Parameter	$A_{DECKS, i, t}$
Data unit	ha
Description	Area of logging decks in stratum i in year t
Source of data	Field measurements or reported measurements such as postharvest assessment reports and post-harvest maps that are based on field measurements. Remote sensing data and GIS.
Description of measurement methods	Systematic sampling must take place to ensure all decks within the area logged are identified and a conservative estimate of area produced.

and procedures to be applied	
Frequency of monitoring/recording	To be determined, according to the decision listed in the 'Comments' section.
Value applied	Currently not applicable, value will be calculated ex-post as of the moment when SFMPs are implemented.
Monitoring equipment	According to the Annual Operational Plans of the Sustainable Management Plan.
QA/QC procedures to be applied	The measured area of logging decks in current logging gaps will be compared with those of previous logging gaps.
Purpose of data	Calculation of project emissions
Calculation method	Data obtained from annual forest management.
Comments	The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.

Data / Parameter	$A_{ROAD,i,t}$
Data unit	ha
Description	Area of logging roads in stratum i in year t
Source of data	Reported measurements such as post-harvest assessment reports, post-harvest maps that are based on field measurements, or Annual Operational Plans of the Sustainable Management Plan. Remote sensing data and GIS.
Description of measurement methods and procedures to be applied	The area of roads created may be based on the length of roads multiplied by the average width of roads. The length of all roads created during selective logging within a stratum i in year t must be measured through systematically sampling the entire area logged to produce a conservative estimate of the length of roads created. The average width of the roads may be estimated through systematically sampling road width. Sufficient number of measurements of road width shall be measured to achieve a precision of equal or less than 15% of the mean at the 95%

	confidence interval. Where different categories of roads exist, different average road widths must be used.
Frequency of monitoring/recording	To be determined, according to the decision listed in the 'Comments' section.
Value applied	Currently not applicable, value will be calculated ex-post as of the moment when SFMPs are implemented.
Monitoring equipment	According to the Annual Operational Plans of the Sustainable Management Plan.
QA/QC procedures to be applied	The measured area of roads will be crosschecked with GIS analysis.
Purpose of data	Calculation of project emissions
Calculation method	Estimations of emissions from road creation shall be based on logging management plans or average width of roads and length of roads produced for logging in the farm. GIS analysis will support final conclusions.
Comments	The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.

Data / Parameter	L_{sk}
Data unit	m
Description	Length of skid trail sk.
Source of data	Reported measurements such as post-harvest assessment reports, post-harvest maps that are based on field measurements, or Annual Operational Plans of the Sustainable Management Plan.
Description of measurement methods and procedures to be applied	The length of all skid trails within a stratum i in year t may be estimated through using systematic sampling with a random start of the entire area logged or within a sampled known logged area within the project boundary to produce a conservative estimate of the length of skid trails created. Where sampling is used, the total length of all skid trails can then be equal to the

	mean length of skid trails per unit area multiplied by the total area logged.
Frequency of monitoring/recording	To be determined, according to the decision listed in the 'Comments' section.
Value applied	Currently not applicable, value will be calculated ex-post as of the moment when SFMPs are implemented.
Monitoring equipment	According to the Annual Operational Plans of the Sustainable Management Plan.
QA/QC procedures to be applied	The measured length of skid trails in current logging gaps will be compared with those of previous logging gaps.
Purpose of data	Calculation of project emissions
Calculation method	Estimations of emissions from skid trail creation shall be based on logging management plans or average length and number of skid trails produced due to logging in the farm.
Comments	The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.

Data / Parameter	W_{SKID}
Data unit	m
Description	Mean width of skid trails.
Source of data	Reported measurements such as post-harvest assessment reports and post-harvest maps that are based on field measurements.
Description of measurement methods and procedures to be applied	The average width of skid trails created within a stratum i can be based on reported widths; a conservative estimate based on machinery used; or additional field measurements. Conservative estimate: Width edge of tires on largest skidder type * 140% is used, as the skidder type is known and used to create all skid trails.

Frequency of monitoring/recording	To be determined, according to the decision listed in the 'Comments' section.
Value applied	Currently not applicable, value will be calculated ex-post as of the moment when SFMPs are implemented.
Monitoring equipment	Data obtained from annual forest management and reports.
QA/QC procedures to be applied	The measured width of skid trails in current logging gaps will be compared with those of previous logging gaps.
Purpose of data	Calculation of project emissions
Calculation method	Conservative estimate: Width edge of tires on largest skidder type * 140% is used, as the skidder type is known and used to create all skid trails.
Comments	It is assumed that all diameter trees are destroyed and therefore the aboveground and belowground tree biomass that is destroyed by the skidder conservatively equates to the maximum aboveground biomass carbon stock observed in all strata. Based on the overall area of skid trails related to the Project Area, the values estimated for emissions from skid trails are not significant according to T-SIG, as they represent much less than 5% of total emissions. Thus, the inclusion of these emissions in final calculations is indisputably conservative <i>per se</i>. The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.

Data / Parameter	A_{DistPA}
Data unit	ha
Description	Area impacted by natural disturbance in the project stratum i converted to natural disturbance stratum q in year t; ha
Source of data	Remote Sensing imagery combined with ground verification or GPS coordinates
Description of measurement methods and procedures to be applied	Minimum monitoring unit shall be equal to a minimum of 11 Landsat pixels or one hectare.

Frequency of monitoring/recording	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied	0
Monitoring equipment	Remote sensing and GIS tools
QA/QC procedures to be applied	The Mapbiomas project contributes to understanding land-use dynamics in Brazil. The data generated by this program is used in this project. Mapbiomas data are applicable for use in this project, according to the criteria listed below (Methodology VM0007): i) Mapbiomas data covers the entire project area, leakage belt and reference region. ii) Mapbiomas data cover the entire reference period (beginning, middle and end) of the fixed baseline period. iii) Mapbiomas monitors conversion of forest land to non-forest land. iv) Monitoring occurred during the entire fixed baseline period. In case of unavailability of Mapbiomas data for the monitoring period, other sources will be consulted such as PRODES or a classification of imagery (Landsat8) will be carried out to measure deforested area: 1) Land use and land cover mapping is assessed using images with spatial resolution superior to 30 meters. Image acquisition is performed during the period of low incidence of clouds and rainfall in the region, within July and September. 2) Images undergo geometric correction by means of geo-referencing, using topographic maps as reference or USG-NASA orthorectified images. 3) For analysis of areas with cloud cover, visual interpretation of radar image would be performed. 4) Evaluation of classification accuracy is performed by analyzing the overall accuracy and kappa index obtained from a confusion matrix. The minimum accuracy of the mapping classification should be over 90%, considered very high.
Purpose of data	Calculation of project emissions
Calculation method	Ex-ante, estimations of emissions from natural disturbances shall be based on historic incidence of such event in the Project region
Comments	N/A

Data / Parameter	CAB_{tree, dest}
Data unit	t CO ₂ -e ha ⁻¹
Description	Carbon stock in aboveground tree biomass assumed to be killed per unit area resulting from the creation of the skid trail in stratum i.
Source of data	Publicly available scientific data, Annual Operational Plans of SFMPs, and forest management team data.
Description of measurement methods and procedures to be applied	As indicated in module CP-AB.
Frequency of monitoring/recording	The maximum size tree assumed to be killed during skid trail creation must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event.
Value applied	Currently N/A, to be calculated ex-post, after SFMP implementation.
Monitoring equipment	On-the-ground measurement, data according to the Annual Operational Plans of the Sustainable Management Plan, and scientific data review.
QA/QC procedures to be applied	In the case of forest management team data, QA/QC procedures will be in accordance with those stipulated by the SFMPs. Furthermore, the measured area of skid trails will be compared with those of previous skid trails.
Purpose of data	Calculation of project emissions
Calculation method	Multiplication of skid trail dimensions by carbon stock in accordance with parameter CAB _{tree} , described in section 4.1
Comments	N/A to this project during the current monitoring period as there is currently no logging in the project.

Data / Parameter	CBB_{tree,dest}
Data unit	t CO ₂ -e ha ⁻¹

Description	Carbon stock in belowground tree biomass assumed to be killed per unit area resulting from the creation of the skid trail in stratum i
Source of data	Publicly available scientific data, Annual Operational Plans of SFMPs, and forest management team data.
Description of measurement methods and procedures to be applied	As indicated in module CP-AB.
Frequency of monitoring/recording	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied	Currently N/A, to be calculated ex-post, after SFMP implementation.
Monitoring equipment	On-the-ground measurement, Annual Operational Plans of the Sustainable Management Plan, and peer-reviewed data study.
QA/QC procedures to be applied	In the case of forest management team data, QA/QC procedures will be in accordance with those stipulated by the SFMPs. Furthermore, the measured area of skid trails will be compared with those of previous skid trails.
Purpose of data	Calculation of project emissions
Calculation method	Multiplication of skid trail dimensions by carbon stock in accordance with parameter CBB_tree, described in section 4.1
Comments	N/A to this project during the current monitoring period as there is currently no logging in the project.

Data / Parameter	C _{s/u,lg}
Data unit	t C
Description	Carbon stock of trees snapped, leaning, or uprooted in logging gap lg
Source of data	Publicly available scientific data, Annual Operational Plans of SFMPs, and forest management team data.

Description of measurement methods and procedures to be applied	If the forest management team data is used: Measurements (e.g. DBH, H) shall be taken on all trees (>10 cm DBH) that have been significantly damaged and are assumed to be killed by the felling of the timber tree. This shall include all trees where the bark of the stem has been damaged, where the stem has been snapped off, where the stem has been pushed over, and those trees that have been uprooted. The above and belowground carbon stock of each tree must be estimated using the same allometric regression equation and root to shoot ratio used in the module for estimating the carbon pool in trees (CP-AB) in the baseline scenario.
Frequency of monitoring/recording	Measurement shall take place one time prior to any verification event.
Value applied	Currently N/A, to be calculated ex-post, after SFMP implementation.
Monitoring equipment	On-the-ground measurement, Annual Operational Plans of the Sustainable Management Plan, and peer-reviewed data study. If peer-reviewed study data is used, the value of carbon stock of trees snapped, leaning, or uprooted due to logging will be applied in the logging area, that will be measured ex-post, when applicable, using remote sensing and GIS.
QA/QC procedures to be applied	In the case of forest management team data, QA/QC procedures will be in accordance with those stipulated by the SFMPs.
Purpose of data	Calculation of project emission
Calculation method	Literature data from reputed sources will be used and cross-checked with field data from forest management team, if available.
Comments	The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.
Data / Parameter	$C_{B,lg}$
Data unit	t C

Description	Carbon stock of branches knocked to the ground as a direct consequence of tree felling in logging gap lg
Source of data	Publicly available scientific data, Annual Operational Plans of SFMPs, and forest management team data.
Description of measurement methods and procedures to be applied	As indicated in VM0007's M-REDD module.
Frequency of monitoring/recording	Measurement shall take place prior to every verification event.
Value applied	Currently N/A, to be calculated ex-post, after SFMP implementation.
Monitoring equipment	On-the-ground measurement, Annual Operational Plans of the Sustainable Management Plan, and peer-reviewed data study.
QA/QC procedures to be applied	In the case of forest management team data, QA/QC procedures will be in accordance with those stipulated by the SFMPs.
Purpose of data	Calculation of project emissions
Calculation method	Literature data from reputed sources will be used and cross-checked with field data from forest management team, if available.
Comments	The parameter will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management need to have the FSC certification. It is being listed here for precaution.

Data / Parameter	W_{skid}
Data unit	m
Description	Mean width of skid trails
Source of data	Publicly available scientific data, Annual Operational Plans of SFMPs, and forest management team data
Description of measurement methods	The average width of skid trails created within a stratum i can be based on reported widths; a conservative estimate based on machinery used; or additional field measurements.

and procedures to be applied	Reported width: the average width of field measured skid trails within FSC Post Harvest Assessment reports from logging that has taken place within the project area; Conservative estimate: Width edge of tires on largest skidder type * 140% can only be used where skidder type(s) is known and used to create all skid trails. (skidder defined as heavy vehicle used in logging operation to create path and pull cut trees to logging road); Field measurements: average of field sampling based on systematic sampling with a random start. The width of the skid trail shall be equal to the distance between trees undamaged by skid trail creation on one side to trees undamaged by skid trail creation on the other side. Sufficient number of measurements of road width shall be measured to achieve a precision of equal or less than 15% of the mean at the 95% confidence interval.
Frequency of monitoring/recording	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied	Currently N/A, to be calculated ex-post, after SFMP implementation.
Monitoring equipment	On-the-ground measurement, Annual Operational Plans of the Sustainable Management Plan, and peer-reviewed data study.
QA/QC procedures to be applied	In the case of forest management team data, QA/QC procedures will be in accordance with those stipulated by the SFMPs.
Purpose of data	Calculation of project emissions
Calculation method	Literature data from reputed sources will be used and cross-checked with field data from forest management team, if available.
Comments	N/A to this project during the current monitoring period as there is currently no logging in the project.
Data / Parameter	Leakage outside
Data unit	tCO ₂ /year

Description	Net CO ₂ emissions due to unplanned deforestation displaced outside the leakage belt up to year t*
Source of data	Remote sensing data and GIS. Secondary data.
Description of measurement methods and procedures to be applied	The unplanned activities in leakage management areas that result in carbon stock decrease will be subject to monitoring, when significant.
Frequency of monitoring/recording	Annually
Value applied	Values are described in Table 18
Monitoring equipment	Remote sensing and GIS. Secondary data.
QA/QC procedures to be applied	N/A.
Purpose of data	Calculation of leakage
Calculation method	As per LK-ASU, Step 4.
Comments	N/A.

Data / Parameter	MANFOR
Data unit	ha
Description	Total area of forests under active management nationally
Source of data	Official country-specific data from IBAMA ¹⁴ .
Description of measurement methods and procedures to be applied	As per LK-ASU, a demonstration is required that areas will be protected against deforestation. Such a demonstration must include the existence of forest guards in sufficient numbers to prevent illegal colonization and an active management plan detailing harvest plans and return intervals, and/or evidence that the concession owner has previously evicted illegal colonists/squatters from the forest areas. Ex-ante it can be assumed that MANFOR must remain constant.

¹⁴ Source: Manejo sustentável autorizado pelo Ibama em 2019 totalizou 39 mil hectares

Frequency of monitoring/recording	Annually
Value applied	1,400,000
Monitoring equipment	N/A.
QA/QC procedures to be applied	As per Section 9.3 of REDD+ MF or other VCS methodology that uses this module.
Purpose of data	Calculation of leakage emissions
Calculation method	N/A.
Comments	N/A.

Data / Parameter	PROTFOR
Data unit	ha
Description	Total area of fully protected forests nationally
Source of data	Official country-specific data from ISA ¹⁵ .
Description of measurement methods and procedures to be applied	As per LK-ASU, a demonstration is required that areas will be protected against deforestation. Such a demonstration is made by government mechanisms and national policies. Ex-ante it can be assumed that PROTFOR must remain constant.
Frequency of monitoring/recording	Annually
Value applied	88,566,400
Monitoring equipment	N/A.
QA/QC procedures to be applied	As per Section 9.3 of REDD+ MF or other VCS methodology that uses this module.
Purpose of data	Calculation of leakage emissions
Calculation method	N/A.
Comments	N/A.

¹⁵ Source: <https://uc.socioambiental.org/pt-br/paineldedados>

Data / Parameter	TOTFOR
Data unit	ha
Description	Total available national forest area
Source of data	Official country-specific data. As the country has a great variety of forest biomes in all its extension, TOTFOR considered only the Amazon Rainforest biome. This is a conservative approach. Thus, as a representation of the total area of Amazon Rainforest in Brazilian Territory, TOTFOR consisted of multiplying size of the Brazilian Amazon by 97%, which represents its preserved area, according to SEMA ¹⁶ .
Description of measurement methods and procedures to be applied	As per LK-ASU, forest areas suitable for conversion to livestock. Ex ante it can be conservatively assumed that TOTFOR must remain constant for the baseline period.
Frequency of monitoring/recording	Annually
Value applied	486,461,572
Monitoring equipment	N/A.
QA/QC procedures to be applied	As per Section 9.3 of REDD+ MF or other VCS methodology that uses this module.
Purpose of data	Calculation of leakage emissions
Calculation method	N/A.
Comments	N/A.

Data / Parameter	$\Delta C_{P, LB}$
Data unit	tCO ₂ e
Description	Net greenhouse gas emissions within the leakage belt in the project case
Source of data	As per Module M-REDD

¹⁶ Source: <http://meioambiente.am.gov.br/unidade-de-conservacao/>

Description of measurement methods and procedures to be applied	As per Module M-REDD.
Frequency of monitoring/recording	Annually
Value applied	Values are described in Table 18
Monitoring equipment	N/A.
QA/QC procedures to be applied	As per Section 9.3 of REDD+ MF or other VCS methodology that uses this module.
Purpose of data	Calculation of leakage emissions
Calculation method	As per Module M-REDD.
Comments	N/A.

Data / Parameter	PROP_{IMM}
Data unit	Proportion
Description	Estimated proportion of baseline deforestation caused by immigrating population
Source of data	Official country-specific (government) data. The proportion of baseline deforestation caused by immigrating population (PROP _{IMM}) was estimated for a period from 2012 to 2020. For calculating PROP _{IMM} , it was used local data ¹⁷ for births, deaths and population. It is then assumed that the total annual population growth in a given municipality is attributed to: i) births and ii) immigration. Thus, by subtracting the number of annual births from the total annual population growth, it is possible to infer the number of immigrants.
Description of measurement methods and procedures to be applied	Estimated as proportion of the area deforested in the past 5 years by population that migrated into the leakage belt and project area in the past 5 years (all areas within 2 km of the

¹⁷ Sources: <http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sinasc/cnv/nvam.def> ;
<https://www.ibge.gov.br/estatisticas/sociais/populacao/9103-estimativas-de-populacao.html>

	boundaries of the project area and the leakage belt must be considered here).
Frequency of monitoring/recording	Annually
Value applied	1.33
Monitoring equipment	N/A.
QA/QC procedures to be applied	As per Section 9.3 of REDD+ MF or other VCS methodology that uses this module.
Purpose of data	Calculation of leakage emissions
Calculation method	N/A.
Comments	N/A.

Data / Parameter	$A_{DefPA,i,u,t}$
Data unit	ha
Description	Area of recorded deforestation in the project area in stratum i converted to land use u in year t .
Source of data	As per the M-REDD methodology: Remote sensing imagery.
Description of measurement methods and procedures to be applied	As per the M-REDD methodology: Remote sensing imagery.
Frequency of monitoring/recording	Annually
Value applied	0
Monitoring equipment	N/A.
QA/QC procedures to be applied	As per Section 9.3 of REDD+ MF or other VCS methodology that uses this module.
Purpose of data	Calculation of leakage emissions
Calculation method	Remote sensing and GIS.
Comments	N/A.

Data / Parameter	ADefLB_{i,u,t}
Data unit	ha
Description	Area of recorded deforestation in the leakage belt in stratum <i>i</i> converted to land use <i>u</i> in year <i>t</i>
Source of data	As per Module M-REDD v2.2. Remote sensing imagery.
Description of measurement methods and procedures to be applied	As per Module M-REDD. Satellite imagery analysis.
Frequency of monitoring/recording	Annually
Value applied	2020: 148.99 2021: 853.67
Monitoring equipment	Remote sensing and GIS
QA/QC procedures to be applied	As per Section 9.3 of REDD+ MF or other VCS methodology that uses this module
Purpose of data	Calculation of leakage emissions
Calculation method	N/A.
Comments	N/A.

Data / Parameter	ARoad_{i,t}
Data unit	ha
Description	Area of roads in stratum <i>i</i> in year <i>t</i>
Source of data	Field measurements or reported measurements such as post-harvest assessment reports and post-harvest maps that are based on field measurements.
Description of measurement methods	The area of roads created may be based on the length of roads multiplied by the average width of roads. The length of all roads

and procedures to be applied	created during selective logging within a stratum i in year t must be measured through systematically sampling the entire area logged to produce a conservative estimate of the length of roads created. The average width of the roads may be estimated through systematically sampling road width. Sufficient number of measurements of road width shall be measured to achieve a precision of equal or less than 15% of the mean at the 95% confidence interval. Where different categories of roads exist, different average road widths must be used.
Frequency of monitoring/recording	<i>Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event</i>
Value applied	0 – N/A to this project
Monitoring equipment	N/A.
QA/QC procedures to be applied	N/A.
Purpose of data	N/A.
Calculation method	N/A.
Comments	N/A to this project during the current monitoring period as there is currently no logging in the project.

Data / Parameter	RFt
Data unit	%
Description	Risk factor used to calculate VCS buffer credits
Source of data	- VCS Non-Permanence Risk Report (v3.1), - Remote sensing data and GIS, - Supervisor report. - Literature data.
Description of measurement methods and procedures to be applied	All sources of data from the VCS Non-Permanence Risk Report will be used to measure the various risk factors.

Frequency of monitoring/recording	Annually
Value applied	10
Monitoring equipment	VCS-approved AFOLU Non-Permanence Risk Tool
QA/QC procedures to be applied	Literature data from reputed sources will be used and critically checked. When possible, the average of two or more sources will be used.
Purpose of data	Calculation of project emissions
Calculation method	All the risk factors described in the VCS Risk Report were assessed.
Comments	N/A

4.3 Monitoring Plan

The monitoring plan of the MR1 period encompassed four main tasks:

- i) Monitoring of project implementation;
- ii) Monitoring of actual carbon stock changes and GHG emissions within the project area;
- iii) Monitoring of leakage; and
- iv) Ex post calculation of net anthropogenic GHG emissions reductions.

This Monitoring Plan describes how these tasks were implemented for the current MR1 period. For each task, the monitoring plan includes the following aspects:

- a) Technical description of the monitoring tasks;
- b) Data to be collected;
- c) Overview of data collection procedures;
- d) Quality control and quality assurance procedures;
- e) Data archiving; and
- f) Organization and responsibilities of the parties involved in all the above.



Figure 13. General overview of parties involved in monitoring activities.

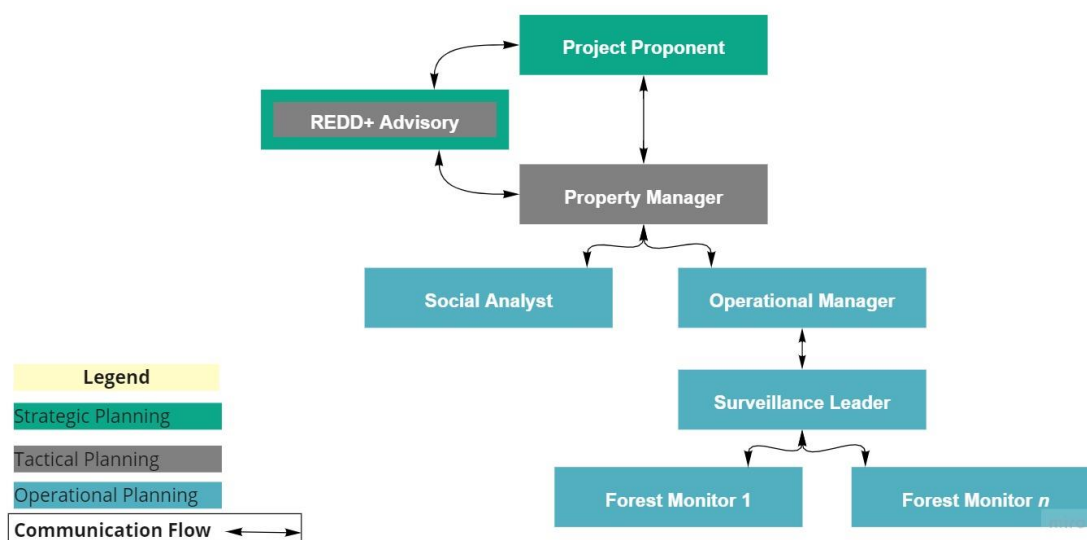


Figure 14. General overview of staff in the Project Area

Figure 14 exemplifies the current project organization chart, being the communication flow arrows between the team members. The “Procedure for Asset Control”¹⁸ document describes in detail the processes for monitoring, combating and preventing fires. However, the Carbonext team and the owners are together reviewing the operating procedures to standardize monitoring actions, determine responsibilities, how evidence should be recorded, how to prevent risks to forest integrity and combat procedures in case of occurrences. This review aims to make actions more assertive and agile in combating and preventing deforestation, invasion and forest fires.

In case new instances are added, the same procedure will be applied, with safeguards for necessary adjustments.

The central GHG information system and controls, associated with the project and its monitoring, are under the technical responsibility of Carbonext. The backup of central GHG information system and controls is kept in a cloud drive, as well as backed up on hard drives of project proponents for security. The owners are responsible for on-site monitoring, as well as for carrying out action plans if there are any occurrences. Owners will forward the evidence of the actions to the Carbonext team, who will analyze and record the occurrences for audit purposes.

4.3.1 Monitoring of Actual Carbon Stock Changes and GHG Emissions within the Project Area

4.3.1.1 Monitoring of project implementation

a) Technical description of the monitoring tasks.

Project activities implemented within the project area were monitored to be consistent with the management plans of the Project Area and the PD.

b) Data to be collected.

Monitoring of deforestation activities was performed by means of evaluations of the surveillance rounds and using satellite imagery to continuously inspect the forest condition within the Project Area. All images, maps and records generated during project implementation were conserved and made available to VCS verifiers at verification for inspection, to demonstrate that the AUD project activity was actually implemented.

Monitoring of social and biodiversity parameters of project implementation was based on data required in Table 4 (see section 1.10) and Table 5 (section 3.1), which attest to the foreseen activities being effectively implemented. A system was implemented to record data on costs and

¹⁸ Document in Drive: Proce_d_Controlre Patrimonial e Combate a Incendio

investments, based on invoices, receipts and contracts related to activity implementation, as well as signed attendance lists.

c) Overview of data collection procedures.

All invoices, receipts and contracts related to activities implemented in this REDD project were conserved in printed version. Whenever possible, documentation was also kept in electronic format.

d) Quality control and quality assurance procedures.

The project proponent trained personnel to collect and keep all documentation in a safe place. All electronic documentation should also be sent to CARBONEXT to further security and checking.

e) Data archiving.

All maps and records generated during project implementation were conserved and made available to VCS verifiers at verification. Backup copies of files were made available in the project proponent's facilities, as well as at CARBONEXT's offices.

All documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.

f) Organization and responsibilities of the parties involved in all the above.

The project proponent is responsible for implementing this monitoring item. CARBONEXT is co-responsible for archiving, and quality control and quality assurance procedures.

4.3.1.2 Monitoring of land-use and land-cover change within the project area

a) Technical description of the monitoring tasks.

Monitoring of land-use and land-cover change within the Project Area was performed annually by analyzing satellite imagery of the Project Area.

Imagery analysis of land use will be based on secondary information from Mapbiomas project, referring mainly to the classes "Forest Land" and "Non-Forest Land".

b) Data to be collected.

The categories of change that will be subject to MRV-A (monitoring, reporting, verification and accounting) are "Area of forest land converted to non-forest land", "Area of forest land undergoing carbon stock decrease" and "Area of forest land undergoing carbon stock increase".

In this context, data to be collected consists of annual land use cover processed by Mapbiomas project for the entire land coverage of Project Area and other such as Leakage belt and Reference Region.

The validation will be performed by using satellite images from Landsat 8 TM (orbits 230/65, 230/66, 231/65 and 231/66) to cover the total geographic scope of the Project Area and Reference Region. Other optical sensors could be use for accuracy assessment in case of cloud cover such as Sentinel 2 and CBERS.

c) Overview of data collection procedures.

The Mapbiomas project contributes to understand the land use dynamics in Brazil. The data generated by this program is used in this project. Mapbiomas data are applicable for use in this project, according to the criteria listed below (Methodology VM0007):

- i) Mapbiomas data cover the entire project area, leakage belt and reference region.
- ii) Mapbiomas data cover the entire reference period (beginning, middle and end) of the fixed baseline period.
- iii) Mapbiomas monitors conversion of forest land to non-forest land.
- iv) Monitoring occurred during the entire fixed baseline period.

d) Quality control and quality assurance procedures.

The validation of land-use data used for modeling of land use will be performed by using a confusion matrix, in order to calculate the overall index of success by period and by class. Three specific classes will be used: forest, accumulated deforestation and other (hydrography, not forest, clouds, roads, residues, unclassified objects, and others).

The validation will be performed by using satellite images from Landsat 8 TM (orbits 230/65, 230/66, 231/65 and 231/66) to cover the total geographic scope of the Project Area and Reference Region. Other optical sensors could be use for accuracy assessment in case of cloud cover such as Sentinel 2 and CBERS.

With the help of the "Create Random Points" tool in ArcGIS 10.0, at least 100 random points will be generated for each class / year as samples for evaluation, using satellite images as reference, making it possible to generate a confusion matrix for calculation of the accuracy indexes, and the Kappa index (indicators for validation of mapping accuracy). Land-use classification accuracy must be over 90%, as required by the VMD0007 3.3 module.

e) Data archiving.

All maps and records generated during project implementation will be conserved and made available to VCS verifiers at verification for inspection to demonstrate that the AUD project activity has actually been implemented.

All documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.

f) Organization and responsibilities of the parties involved in all the above.

All satellite imagery assessments will be performed either in-house by CARBONEXT or by a third-party specialized partner company such as AVIX. CARBONEXT is responsible for reporting and data archiving, according to VM0007, and for providing assistance during verification audits. The Project Proponent is co-responsible for data archiving.

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

a) Technical description of the monitoring tasks.

Monitoring of carbon stocks is mandatory in the following cases:

Within the project area:

a) Areas subject to significant carbon stock decrease in the project scenario according to the *ex-ante* assessment. These will be areas subject to controlled deforestation and planned harvest activities, such as logging. In these areas, carbon stock changes must be estimated at least once after each harvest event.

b) Areas subject to unplanned and significant carbon stock decrease, e.g., due to uncontrolled forest fires and other catastrophic events. In these areas, carbon stock losses must be estimated as soon as possible after the catastrophic event.

Within leakage management areas:

a) Areas subject to planned and significant carbon stock decrease in the project scenario according to the *ex-ante* assessment. In these areas, carbon stocks must be estimated at least once after the planned event that caused the carbon stock decrease.

b) Data to be collected.

The results of monitoring activity data and carbon stocks must be reported using the same formats and tables used for the *ex-ante* assessment, according to Methodology VM0007 (the applicability of each table must be evaluated *ex post*, in the Monitoring Report).

Non-CO₂ emissions from forest fires are subject to monitoring and accounting, when significant.

Decreases in carbon stocks and increases in GHG emissions (e.g., in case of forest fires) due to natural disturbances (such as hurricanes, earthquakes, volcanic eruptions, tsunamis, flooding, drought, fires, tornados or winter storms) or man-made events, including those over which the project proponent has no control (such as acts of terrorism or war), are subject to monitoring and must be accounted under the project scenario, when significant.

If the area (or a sub-set of it) is affected by natural disturbances or man-made events generated VCUs in past verifications, the total net change in carbon stocks and GHG emissions in the area(s) that generated VCUs must be estimated, and an equivalent amount of VCUs must be cancelled from the VCS buffer.

c) Overview of data collection procedures.

The Mapbiomas project contributes to understand the land use dynamics in Brazil. The data generated by this program is used in this project. Mapbiomas data are applicable for use in this project, according to the criteria listed below (Methodology VM0007):

- i) Mapbiomas data cover the entire project area, leakage belt and reference region.
- ii) Mapbiomas data cover the entire reference period (beginning, middle and end) of the fixed baseline period.
- iii) Mapbiomas monitors conversion of forest land to non-forest land.
- iv) Monitoring occurred during the entire fixed baseline period.

d) Quality control and quality assurance procedures.

The validation of land-use data used for modeling of land use will be performed by using the confusion matrix, in order to calculate the overall index of success by period and by class. Three specific classes will be used: forest, accumulated deforestation and other (hydrography, not forest, clouds, roads, residues, unclassified objects, and others).

The validation will be performed by using satellite images from Landsat 8 TM (orbits 230/65, 230/66, 231/65 and 231/66) to cover the total geographic scope of the Project Area and Reference Region. Other optical sensors could be use for accuracy assessment in case of cloud cover such as Sentinel 2 and CBERS.

With the help of the "Create Random Points" tool in ArcGIS 10.0, 100 random points will be generated for each class / year as samples for evaluation, using satellite images as reference, making it possible to generate a confusion matrix for calculation of the accuracy indexes, and the Kappa index (indicators for validation of mapping accuracy).

Land-use classification accuracy and Kappa index must be over 90%, as required in VM0007 1.6 methodology.

e) Data archiving.

All maps and records generated during project implementation will be conserved and made available to VCS verifiers at verification for inspection to demonstrate that the AUD project activity has actually been implemented.

All documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.

f) Organization and responsibilities of the parties involved in all the above.

All satellite imagery assessments will be performed by a third-party specialist GIS company, currently represented by Avix. CARBONEXT is responsible for reporting and data archiving, and for providing assistance during verification audits. The Project Proponent is co-responsible for data archiving.

4.3.2 Monitoring of Leakage

a) Technical description of the monitoring tasks

The sources of leakage identified as significant in the *ex-ante* assessment are subject to monitoring. Two sources of leakage are potentially subject to monitoring:

- I. Decrease in carbon stocks and increase in GHG emissions associated with leakage prevention activities;
- II. Decrease in carbon stocks and increase in GHG emissions in due to activity displacement leakage.

This Project Activity does not involve decrease in carbon stocks and increase in GHG emissions associated with leakage prevention activities. In this project, leakage prevention activities do not involve any carbon stock reduction due to deforestation or additional emissions caused by increased grazing activities. In this case, only the decrease in carbon stocks and increase in GHG emissions in due to activity displacement leakage will be monitored.

b) Data to be collected.

Deforestation above the baseline in the leakage belt area will be considered activity displacement leakage.

The result of the *ex-post* estimations of carbon stock changes must be reported using the same table formats used in the *ex-ante* assessment of baseline carbon stock changes in the leakage belt.

Where strong evidence can be collected that deforestation in the leakage belt is attributable to deforestation agents that are not linked to the Project Area, the detected deforestation will not

be attributed to the Project Activity and considered leakage. The operational entity verifying the monitoring data shall determine whether the documentation provided by the project proponent represents sufficient evidence to consider the detected deforestation as not attributable to the Project Activity and therefore not leakage.

To estimate the increased GHG emissions due to forest fires in the leakage belt area the assumption is made that forest clearing is done by burning the forest. The parameter values used to estimate emissions shall be the same used for estimating forest fires in the baseline, except for the initial carbon stocks (Cab, Cdw) which shall be those of the initial forest classes burned in the leakage belt area.

Report the result of the estimations using the same table formats used in the ex-ante assessment of baseline GHG emissions from forest fires in the project:

- Parameters used to calculate emissions from forest fires in the leakage belt area
- Ex post estimated non-CO₂ emissions from forest fires in the leakage belt area.

c) Overview of data collection procedures.

The Mapbiomas project contributes to understand the land use dynamics in Brazil. The data generated by this program is used in this project. Mapbiomas data are applicable for use in this project, according to the criteria listed below (Methodology VM0007):

- i) Mapbiomas data cover the entire project area, leakage belt and reference region.
- ii) Mapbiomas data cover the entire reference period (beginning, middle and end) of the fixed baseline period.
- iii) Mapbiomas monitors conversion of forest land to non-forest land.

Monitoring occurred during the entire fixed baseline period.

d) Quality control and quality assurance procedures.

The validation of land-use data used for modeling of land use will be performed by using the confusion matrix, in order to calculate the overall index of success by period and by class. Three specific classes will be used: forest, accumulated deforestation and other (hydrography, not forest, clouds, roads, residues, unclassified objects, and others).

The validation will be performed by using satellite images from Landsat 8 TM (orbits 230/65, 230/66, 231/65 and 231/66) to cover the total geographic scope of the Project Area and Reference Region. Other optical sensors could be used for accuracy assessment in case of cloud cover such as Sentinel 2 and CBERS.

With the help of the "Create Random Points" tool in ArcGIS 10.0, at least 100 random points will be generated for each class / year as samples for evaluation, using satellite images as reference, making it possible to generate a confusion matrix for calculation of the accuracy indexes, and the Kappa index (indicators for validation of mapping accuracy). Land-use classification accuracy and Kappa index must be over 90%, as required in VM0007 1.6 methodology.

e) Data archiving.

All maps and records generated during project implementation will be conserved and made available to VCS verifiers at verification for inspection to demonstrate that the AUD project activity has actually been implemented.

All documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.

f) Organization and responsibilities of the parties involved in all the above.

All satellite imagery assessments will be performed by the third-party GIS company. CARBONEXT is responsible for reporting and data archiving, and for providing assistance during verification audits. The Project Proponent is co-responsible for data archiving.

4.3.3 Ex Post Calculation of Net Anthropogenic GHG Emission Reduction

a) Technical description of the monitoring tasks.

The calculation of ex post net anthropogenic GHG emission reductions is similar to the ex-ante calculation with the only difference that ex post estimated carbon stock changes and GHG emissions must be used in the case of the project scenario and leakage.

b) Data to be collected.

Report the ex post estimated net anthropogenic GHG emissions and calculation of Verified Carbon Units (VCU) using the same table format used for the ex-ante assessment:

- Ex post estimated net anthropogenic GHG emission reductions and VCUs.

c) Overview of data collection procedures.

Data collection procedures are the same as described in previous steps. This step involves compilation of data from previous procedures to calculate ex post net anthropogenic GHG emission reduction.

d) Quality control and quality assurance procedures.

A map showing Cumulative Areas Credited within the project area shall be updated and presented to VCS verifiers at each verification event. The cumulative area cannot generate additional VCUs in future periods.

e) Data archiving.

All maps and records generated during project implementation will be conserved and made available to VCS verifiers at verification for inspection to demonstrate that the AUD project activity has actually been implemented.

All documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.

f) Organization and responsibilities of the parties involved in all the above.

All satellite imagery assessments will be performed by AVIX. CARBONEXT is responsible for reporting and data archiving, and for providing assistance during verification audits. The Project Proponent is co-responsible for data archiving.

4.3.4 Community and Biodiversity Variables Monitored

Community:

a) Technical description of the monitoring tasks.

Of the activities proposed in the PD Monitoring Plan, in the present MR, the project proponent has only conducted the Advice on nutritional and health aspects (see table below). Specifically, during the community public consultation (between July 15 and 17, 2021), training in first aid and care for venomous animals was carried out. Further training in health and safety will be carried out following the of validation and sale of carbon credits.

The majority of the planned social capacity-building initiatives are dependent on the completion of the validation process and the carbon credit sales to be implemented, and therefore have not occurred yet, as shown in the table below.

b) Data collected.

The indicators monitored are described in the Table 4

Table 4. Social parameters to be monitored

Activity	Scope	Indicator	Unit	Monitoring Frequency	Status
Training of Fire Brigade	Project Area	Attendance	N° of attendees	Annual	It will be carried out after project validation and credit sale
Health and Security monitoring	Project Area	Occurrences	N° of occurrences registered; N° of corrective actions performed	Semiannual	
Advice on nutritional and health aspects	Project Area	Attendance	N° of attendees	Annual	On July 17, 2021, a first aid training was held for 24 participants (residents and neighbors)
Training on sustainable forest management	Regional	Attendance	N° of attendees	Annual	It will be carried out after project validation and credit sale
Training on sustainable wild-harvesting	Regional	Attendance	N° of attendees	2 years	

c) Overview of data collection procedures.

The following forms will be applied after any of the trainings or the advice on nutritional aspects are completed for data collection:

- I. **Attendance List:** It contains the name of the participant, type of affiliation with the project and signature.
- II. **Reaction Assessment:** participants will be able to register their perceptions regarding the content presented, making it possible to evaluate the content and make suggestions for future training. This assessment can be done anonymously and is not mandatory.

In relation to the Health and Security Monitorings, there is a checklist (named “Vistoria de Saúde e Segurança”) that will be applied.

d) Quality control and quality assurance procedures.

All communication with workers and communities will be registered in minutes of meeting, which might be signed by all parties involved. Reports should be produced according to the monitoring frequency adopted. These reports should clearly inform the results of variables involved in monitoring, by means of photos, interviews, and documents.

e) Data archiving.

All records generated during project implementation will be conserved and made available to VCS verifiers at verification for inspection to demonstrate that the AUD project activity has actually been implemented.

All documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.

f) Organization and responsibilities of the parties involved in all the above.

The Project Proponent is responsible for financing, implementing, and monitoring social aspects within the Project Area. Carbonext is co-responsible for monitoring the realization of the trainings and keep the evidence in a data room.

Biodiversity:

a) Technical description of the monitoring tasks.

These activities are dependent on the completion of the validation process and on the sales of carbon credits to be implemented.

The monitoring tasks aim to assess the diversity of the project area in a certain period of time. The primary data generated by these inventories comprise one of the most important steps in decisions making regarding the management of natural areas and conservation actions.

These activities are dependent on the completion of the validation process and on the sales of carbon credits to be implemented.

b) Data collected.

This assessment will be monitored and reported according to the frequency adopted, as described in the Table 5.

Table 5. Biodiversity parameters to be monitored

Activity	Scope	Indicator	Unit	Monitoring Frequency	Goal
Biomass, fauna and flora inventory	Project Area	Carbon Stock	tCO ₂ per hectare	5 years	Will be carried out after project validation and credit sale
		Endangered fauna species	Nº of endangered species		
		Total fauna species	Nº of species		
		Endangered flora species	Nº of endangered species		
		Total flora species	Nº of species		

c) Overview of data collection procedures.

Data collection and records will be carried out by the local administrator.

d) Quality control and quality assurance procedures.

The quality control and quality assurance procedures will be determined by the local administrator.

e) Data archiving.

All records generated during project implementation will be conserved and made available to VCS verifiers at verification for inspection to demonstrate that the AUD project activity has actually been implemented.

All documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.

f) Organization and responsibilities of the parties involved in all the above.

The Project Proponent is responsible for all assessments in this Project Activity.

Carbonext is co-responsible for data archiving.

4.3.5 Monitoring degradation due to selective logging of forest management areas possessing a FSC certificate

a) Technical description of the monitoring tasks;

During the present Monitoring period the present parameter was not monitored, as forest management has not yet occurred.

The monitoring due to selective logging will only be measured if the project proponents decide to have forest management, depending on the market conditions and knowing that the management needs to have the FSC certification. It is being listed here as a precaution.

In the case of forest management, the net emissions are estimated by combining:

- Emissions arising from logging gap: encompass emissions from felling timber tree and emissions from incidental damage caused by falling timber tree,
- Emissions from infrastructure: from constructing logging infrastructure for removal of timber, such as haul roads, skid trails and logging decks,
- Removals from long term wood products resulting from timber extraction

b) Data to be collected:

The calculation procedure for estimating net ex post emissions and removals related to selective logging activities in the project case will be equal to the summed emissions arising from selective logging operations. Emissions resulting from selective logging may be omitted if they are deemed de minimis through the use of the Tool T-SIG.

c) Overview of data collection procedures:

Data will be collected from official forest management reports combined with the LDF taken from the most recent version of VMD0011 (LK-ME) for broadleaf and mixed forests.

d) Quality control and quality assurance procedures:

In accordance with FSC certification.

e) Data archiving:

All records generated during project implementation will be conserved and made available to VCS verifiers at verification for inspection to demonstrate that the AUD project activity has actually been implemented.

All documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period

f) *Organization and responsibilities of the parties involved in all the above:*

All satellite imagery assessments will be performed by AVIX. CARBONEXT is responsible for reporting and data archiving, and for providing assistance during verification audits. The Project Proponent is co-responsible for data archiving.

4.3.6 Monitoring areas undergoing carbon stock enhancement

a) Technical description of the monitoring tasks:

Given that it is not the case for the present project that “the project contains forest areas that are both deforested in the baseline and assumed to be accumulating carbon”, and furthermore that it is conservative to omit this variable, the variable was not included in the Monitoring Plan for the present period.

According to the VMD0015 module of the VM0007 methodology, “if during initial stratification (using Module X-STR) the project contains forest areas that are both deforested in the baseline and assumed to be accumulating carbon, then their geographic boundaries will be known— this will be one or more of the strata. The system in place for monitoring the project area will be used for monitoring any changes that occur in this stratum (or strata). Ground measurements will be used to monitor the change in carbon stocks through time as given in the carbon pool modules.

It is conservative to assume that no carbon stock enhancement is occurring. Projects may elect to set $\Delta CP_{Enh,i,t} = 0$.”

Given that it is not the case for the present project that “the project contains forest areas that are both deforested in the baseline and assumed to be accumulating carbon”, and furthermore that it is conservative to omit this variable, the variable was not included in the Monitoring Plan for the present period.

4.3.7 Monitoring areas undergoing natural disturbance

a) Technical description of the monitoring tasks:

No occurrences of the present variable were registered during the MR1 period, so it was not applicable to the present MR.

In accordance with the VMD0015 module, for monitoring of areas undergoing natural disturbance ex-post in the project area such as tectonic activity (earthquake, landslide, volcano), extreme weather (hurricane), pest, drought, or fire that result in a loss of forest carbon stocks (excepting forest degradation), the area disturbed shall be delineated and the resulting emissions estimated.

b) Data to be collected:

Monitoring of deforestation-avoidance activities will be performed by means of evaluations of the surveillance rounds and using satellite imagery to continuously inspect the forest condition within the Project Area. All images, maps and records generated during project implementation should be conserved and made available to VCS verifiers at verification for inspection, to demonstrate that the AUD project activity has actually been implemented.

c) Overview of data collection procedures:

The category of change that will be subject to MRV-A (monitoring, reporting, verification and accounting) is area of “Area of forest land disturbed” which will be ascertained via overlaying land use / land change map with fire alert data from INPE-BDQUEIMADAS¹⁹.

Regarding the land use / land change map for the monitoring period, as previously mentioned: data to be collected consists of annual land use cover processed by Mapbiomas project for the entire land coverage of Project Area and other such as Leakage belt and reference region.

The validation will be performed by using satellite images from Landsat 8 TM (orbits 230/65, 230/66, 231/65 and 231/66) to cover the total geographic scope of the Project Area and Reference Region. Other optical sensors could be used for accuracy assessment in case of cloud cover such as Sentinel 2 and CBERS.

Additionally, on-the-ground monitoring of deforestation will complement the remote sensing activities mentioned above, to detect areas undergoing natural disturbance. These will be performed by means of evaluations of the surveillance rounds and using satellite imagery to continuously inspect the forest condition within the Project Area. All images, maps and records generated during project implementation should be conserved and made available to VCS verifiers at verification for inspection, to demonstrate that the AUD project activity has actually been implemented.

d) Quality control and quality assurance procedures:

Regarding the GIS components mentioned above, the QA/QC procedure is as follows: The validation of land-use data used for modeling of land use will be performed by using the confusion matrix, in order to calculate the overall index of success by period and by class. Three specific

¹⁹ Source: <http://www.inpe.br/queimadas/abasFogo.php> (last visited on 04/07/2021))

classes will be used: forest, accumulated deforestation and other (hydrography, not forest, clouds, roads, residues, unclassified objects, and others).

The validation will be performed by using satellite images from Landsat 8 TM (orbits 230/65, 230/66, 231/65 and 231/66) to cover the total geographic scope of the Project Area and Reference Region. Other optical sensors could be used for accuracy assessment in case of cloud cover such as Sentinel 2 and CBERS.

With the help of the "Create Random Points" tool in ArcGIS 10.0, at least 100 random points will be generated for each class / year as samples for evaluation, using satellite images as reference, making it possible to generate a confusion matrix for calculation of the accuracy indexes, and the Kappa index (indicators for validation of mapping accuracy). Land-use classification accuracy must be over 90%, as required by the VMD0007 3.3 module.

Regarding the on-the-ground patrolling aspects the procedure is: The project proponent will train personnel to collect and keep all documentation in a sure place. All electronic documentation should also be sent to CARBONEXT to further security and checking.

e) Data archiving:

All maps and records generated during project implementation will be conserved and made available to VCS verifiers at verification for inspection to demonstrate that the AUD project activity has actually been implemented.

Regarding on-the-ground monitoring, all maps and records generated during project implementation will be conserved and made available to VCS verifiers at verification. Backup copies of files should be available in the project proponent facilities, as well as in CARBONEXT facilities.

Regarding all aspects above, all documents and records will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.

f) Organization and responsibilities of the parties involved in all the above:

All satellite imagery assessments will be performed either in-house by CARBONEXT or by a third-party partner company specialized in GIS. CARBONEXT is responsible for reporting and data archiving, according to the VM0007 requirements, and for providing assistance during verification audits.

4.3.8 Degradation through extraction of trees for illegal timber or fuelwood and charcoal

a) Technical description of the monitoring tasks:

It is noted that forest degradation is not included in the scope of the monitoring and remote sensing activities of the Evergreen REDD Project. The Project Area, Reference Region, and

Leakage Belt are subject to the monitoring activities, which utilize primarily MapBiomass sources, described in the present section of this MR as well as the Evergreen VCS PD.

Therefore, the present parameter is not monitored.

4.3.9 Monitoring forest degradation

a) Technical description of the monitoring tasks:

As above, forest degradation is not included in the scope of the monitoring and remote sensing activities of the Evergreen REDD Project, therefore the present parameter is not monitored. This practice has been adopted for conservativeness purposes and to avoid inaccuracy of degradation measurements.

4.3.10 Revisiting the Baseline Projections for Future Fixed Baseline Period

According to VM0007, the baseline will be revisited every 10 years. Thus, the first revision of the baseline is scheduled for 2030. For this purpose, the following tasks will be carried out:

- Updating information on agents, drivers and underlying causes of deforestation, which involves the following sub-tasks:
 - Collecting information that is relevant to understand deforestation agents, drivers and underlying causes;
 - Redoing step 3 of the ex-ante methodology, as specified in the methodology;
 - Recalibrating the model for projection of future deforestation, using new “Factor Maps” for the subsequent fixed baseline period.
- Adjusting the land-use and land-cover change component of the baseline, which involves reassessing the following components of the baseline projections:
 - The annual areas of baseline deforestation.
 - The location of baseline deforestation.
 - Adjustment of the annual areas of baseline deforestation.
 - Adjustment of the location of the projected baseline deforestation.
- Adjusting, as needed, the carbon component of the baseline (this task will only be carried out if more accurate methods for carbon stocks estimates are available in the occasion of baseline revision).

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Avoided Unplanned Deforestation

In accordance with the VCS VMD0007-BL-UP_v3.3 methodological module, given that deforestation location analysis was not required due to being a transition configuration of deforestation, the following conservative approach was defined as mandatory: “Future deforestation is assumed to happen first in the strata with the lowest carbon stocks (in all relevant carbon pools)”.

Table 6. Above- and below-ground per-stratum carbon stocks

Stratum	Area (ha)	Proportion (%)	Aboveground (total) (t/ha)	Belowground (t/ha)	Total aboveground per stratum (t)	Total belowground per stratum (t)
Submontane dense	44,551	42.8%	251	148	11,201,920	6,578,905
Submontane open	59,524	57.2%	254	149	15,114,547	8,876,797
Total	104,075	100.0%	N/A	N/A	26,316,466	15,455,702

As shown above, in the case of this project the stratum with the lower biomass is submontane dense, at 251 C_{AB_tree} (tCO_{2e}/ha), as compared to Submontane open 254 C_{AB_tree} (tCO_{2e}/ha), while their below-ground biomass levels are 148 C_{BB_tree} (tCO_{2e}/ha) and 149 C_{BB_tree} (tCO_{2e}/ha), respectively.

Furthermore, the Avoided Planned Deforestation (APD) area was removed from the Avoided Unplanned Deforestation (AUD) area, as the two are mutually exclusive. The APD area corresponds to 20% of the Alvorada property, corresponding to 26,470.9 ha. The remaining AUD area is therefore:

$$\text{total PA area: } 130,554.00 \text{ ha} - \text{APD area } 26,470.9 \text{ ha} = 104,083.9 \text{ ha}$$

In order to calculate the deforestation rate, the deforestation rate within the RRD Reference Region was measured over the 2012 – 2020 historical reference period, utilizing Mapbiomas data²⁰, with the following results:

Table 7. Historical deforestation measurements in the RRD Reference Region
(Source: Mapbiomas²¹)

Deforestation	
Year	Hectares
2012	670.7
2013	532.8
2014	1,025.0
2015	2,665.8
2016	5,787.5
2017	5,867.9
2018	11,613.3
2019	4,307.3
2020	11,495.4
Total	43,965.5

The resulting average rate of deforestation is therefore 43,965.5 ha/ 262,661.6 ha (RRD area)/ 9 year historical period = 1.86%.

In order to calculate the baseline emissions relating to the years of 2020 and 2021, which are only partially included in the calculation, a further factor was added to account for the monitoring period. Regarding the period of 2020 (25/11/2020 – 31/12/2020 = 37 days), the factor was equal to: $37 / 365 = 0.1014$. For 2021 (01/01/2021 – 31/07/2021 = 212 days), the factor was equal to: $212 / 365 = 0.5808$

The full calculation to obtain the projected baseline deforestation for the MR period was therefore:

AUD proportion of PA area x deforestation rate x partial year factor

²⁰ Source Mapbiomas (2020) Coleção 5: <https://mapbiomas.org/produtos>

Table 8. Baseline deforestation in all the strata of the Project Area over the Monitoring Period

Stratum Submontane dense Annual baseline deforestation in the Project Area			
Year	Conservative approach	Total yearly area (ha/year)	Total cumulative area (ha)
2020	196.2	196.2	196.2
2021	1,122.2	1,122.2	1,318.5

Stratum Submontane open Annual baseline deforestation in the Project Area			
Year	Conservative approach	Total yearly area (ha/year)	Total cumulative area (ha)
2020	0.0	0.0	0.0
2021	0.0	0.0	0.0

Stratum Sum of strata Annual baseline deforestation in the Project Area			
Year	Conservative approach	Total yearly area (ha/year)	Total cumulative area (ha)
2020	196.2	196.2	196.2
2021	1,122.2	1,122.2	1,318.5

Avoided Planned Deforestation

Regarding Avoided Planned Deforestation (APD), as described in PD section 3.4 (Baseline Scenario), the schedule regarding Avoided Planned Deforestation (APD) is from June 2022 to June 2027, involving 26,407 hectares, therefore it is outside the scope of the present Monitoring Report.

5.2 Project Emissions

Over the monitoring period (25/11/2020 – 31/12/2020), no deforestation was detected in the Project Area, as displayed in the map and table below.

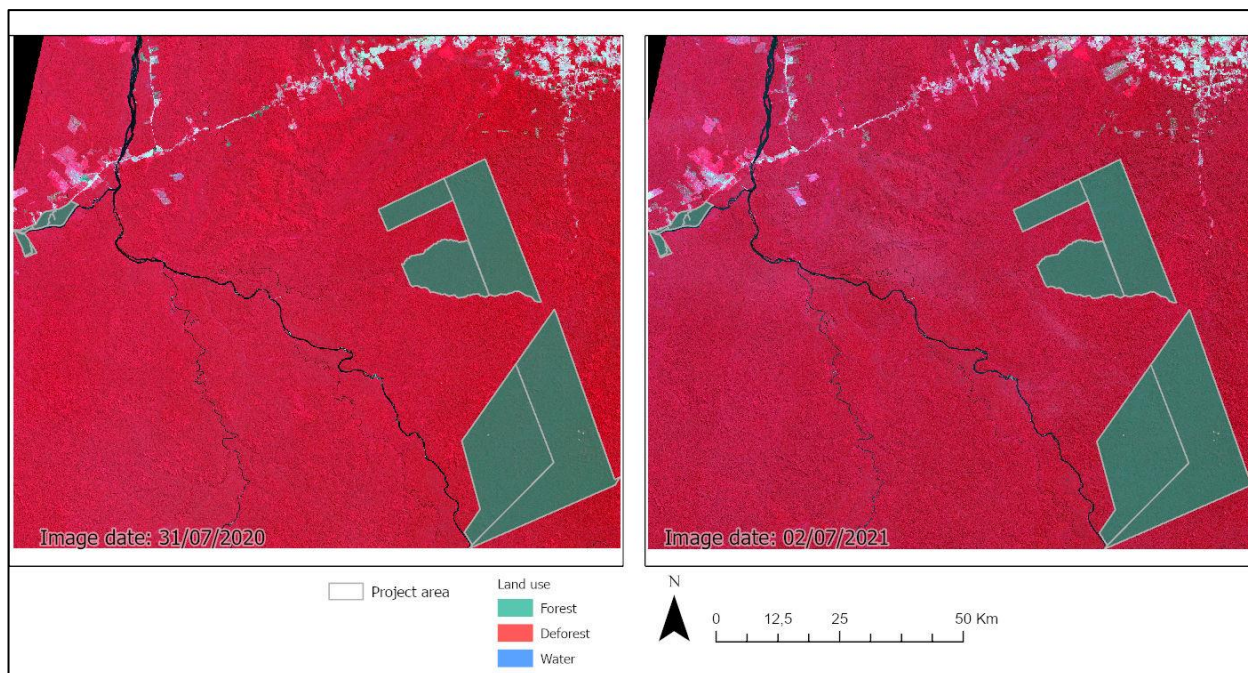


Figure 15. Land use change in Project area.

Table 9. Project Emissions numbers from 2020 to 2021

Area	Forest cover		Variation (ha)
	2020 (ha)	2021 (ha)	
Project Area	130,554.81	130,554.81	00.00

The analysis was carried out based on Landsat 8²² images used to map deforestation, according to the following path/row scenes: 230/65, 230/66, 231/65 and 231/66 (Table below).

²² Landsat 8 source: <https://earthexplorer.usgs.gov/>

Table 10. Project emissions satellite sensor and specification data utilized

Source	Sensor	Spatial rs.	Spectral rs.	Bands	Acquisition date (DD/MM/YYYY)
Satellite	Landsat8	30x30	0.45 – 8.87	2-3-4-5	31/07/2020
Satellite	Landsat8	30x30	0.45 – 8.87	2-3-4-5	02/07/2021

The images were composed with three bands to enable the identification of features that represent the land use classes of interest such as forest, deforest and water. A collection of spectral samples has been selected to train the image operator and generate the land use map for the whole image.

A confusion matrix was adopted to measure the classification accuracy in both images. The *Overall Kappa Index* showed 97% for 2020 image and 96% for 2021 image of classification accuracy.

Table 11. Confusion matrix for 2020 image classification

		REFERENCE				
		Forest	Non-forest	Hydrography	Total	User Accuracy
CLASSIFIED	Forest	3189	85	0	3274	97%
	Non-forest	7	193	2	202	96%
	Hydrography	0	21	24	45	53%
	Total	3196	299	26	3521	
Producer Accuracy		100%	65%	92%		97%

Table 12. Confusion matrix for 2021 image classification

		REFERENCE				
		Forest	Non-forest	Hydrography	Total	User Accuracy
CLASSIFIED	Forest	3174	94	1	3269	97%
	Non-forest	22	187	0	209	89%
	Hydrography	0	18	25	43	58%
	Total	3196	299	26	3521	
Producer Accuracy		99%	63%	96%		96%

The Project Area currently does not carry out any economic activities, so in that respect there are no further project emissions to report at the time of audit.

5.3 Leakage

Activity Shifting Leakage – (LK-ASU)

Total GHG emissions due to activity shifting leakage from unplanned deforestation were estimated by the following equations:

$$\Delta CL_{LK-AS,unplanned} = \Delta CL_{LK-ASU-LB} + \Delta CL_{LK-ASU-OLB} + GHG_{LK,E}$$

$$GHG_{LK-WRC-AS,unplanned} = \Delta CL_{LK-ASU-PEAT} + \Delta CL_{LK-ASU-TW}$$

$$GHG_{LK,E} = \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t})$$

Where:

$\Delta CL_{LK-AS,unplanned}$	Net greenhouse gas emissions due to activity shifting leakage for projects preventing unplanned deforestation Net CO2 emissions up to year t* (tCO2e)
$\Delta CL_{LK-ASU-OLB}$	Net CO2 emissions due to unplanned deforestation displaced outside the leakage belt up to year t* (t CO2e)
$\Delta CL_{LK-ASU-LB}$	Net CO2 emissions due to unplanned deforestation displaced from the project area to the leakage belt up to year t* (t CO2e)
$GHG_{LK,E}$	Greenhouse gas emissions as a result of leakage prevention activities up to year t* (t CO2e)
$GHG_{LK-WRC-AS,unplanned}$	Net GHG emissions due to wetland degradation from unplanned deforestation displaced from the project area up to year t* (t CO2e)
$\Delta CL_{LK-ASU-PEAT}$	Net GHG emissions due to peatland drainage from unplanned deforestation displaced from the project area up to year t* (t CO2e)
$\Delta CL_{LK-ASU-TW}$	Net GHG emissions due to tidal wetland degradation from unplanned deforestation displaced from the project area up to year t* (t CO2e)
$E_{BiomassBurn,i,t}$	Non-CO2 emissions due to biomass burning in stratum i in year t (t CO2e)
$N_2O_{direct-N,i,t}$	Direct N2O emission as a result of nitrogen application on the alternative land use in stratum i in year t (t CO2e)

Over the monitoring period (25/11/2020 – 31/07/2021), 1,002.66 hectares of deforestation were detected in the Leakage Belt, as displayed in the map and table below.

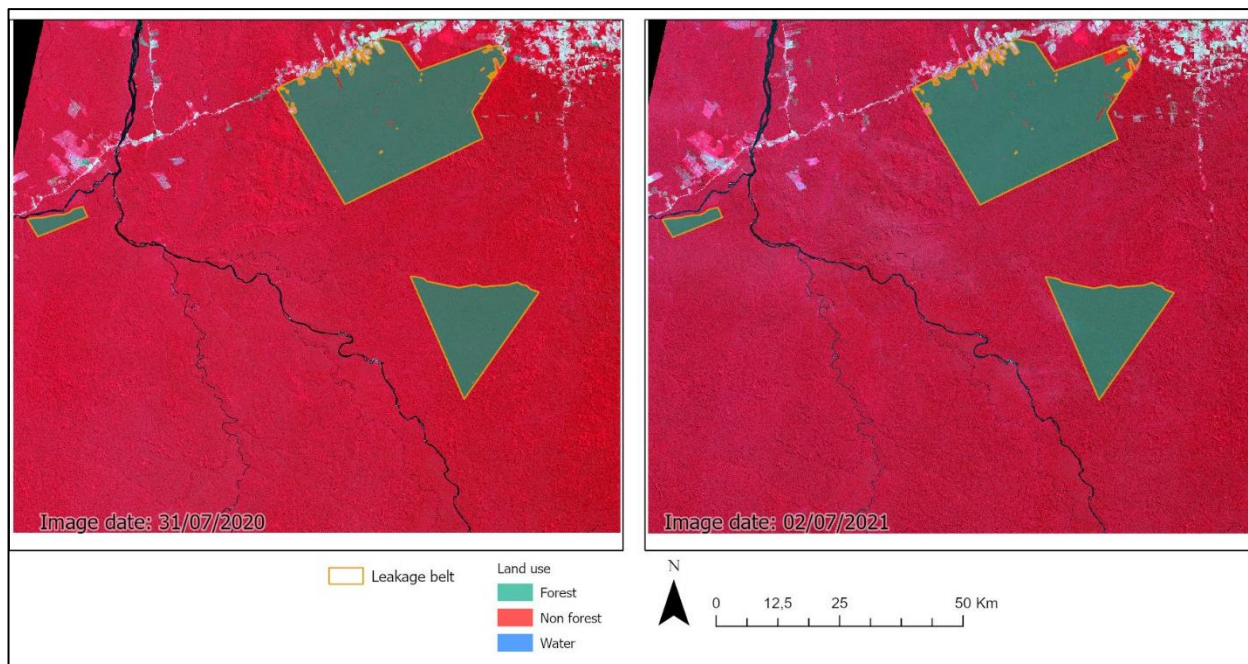


Figure 16. Land use change in Leakage belt

The closest image found at Landsat 8 for the beginning of the monitoring period (25/11/2020) was from August. When compared to an image from July 2021, it resulted in a total deforestation of 1,348.95 ha. To calculate the leakage for the MR period, the total value was corrected considering the number of days. The leakage found from the period of August 2020 to July 2021, and the corrected leakage for this MR period are presented in the tables below.

Table 13. Gross leakage Emissions numbers from August 2020 to July 2021

Item	Deforestation (ha)		Variation (ha)
	August 2020	July 2021	
Shifting Leakage	692.66	2,041.62	1,348.95

Table 14. Corrected leakage emissions for the MR period

Item	Deforestation (ha)		Total (ha)
	25/11/2020 to 31/12/2020	01/01/2021 to 31/07/2021	

Shifting Leakage	148.99	853,67	1,002.66
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In accordance with VM0007 module LK-ASU v1.2 the net CO₂ emissions due to deforestation displaced from the project area to the leakage belt are calculated as follows:

$$\Delta C_{LK-ASU-LB} = C_{P,LB} - \Delta C_{BSL,LK,unplanned}$$

Where:

$\Delta C_{LK-ASU-LB}$ Net CO₂ emissions due to unplanned deforestation displaced from the project area to the leakage belt up to year t^* (t CO₂e)

$\Delta C_{BSL,LK,unplanned}$ Net CO₂ emissions in the baseline from unplanned deforestation in the leakage belt up to year t^* (t CO₂e)

$\Delta C_{P,LB}$ Net greenhouse gas emissions within the leakage belt in the project case up to year t^* (t CO₂e)

If $\Delta C_{LK-ASU-LB}$ as calculated is <0 then $\Delta C_{LK-ASU-LB}$ must be set equal to 0 (to prevent positive leakage).

To convert the value of hectare into tCO₂, the following two coefficients are applied:

$$\begin{aligned} \text{Carbon Fraction in dry biomass (CF)} & 0.47 \\ \text{C to tCO}_2\text{e Coefficient} & \frac{44}{12} \end{aligned}$$

As seen in the table below, the corrected observed deforestation ($\Delta C_{P,LB}$) was lower than the net ex-ante predicted baseline leakage ($\Delta C_{BSL,LK,unplanned}$), and the Shifting leakage ($\Delta C_{LK-ASU-LB}$) is set to 0, in accordance with the methodology section outlined above.

Table 15. Net shifting leakage Emissions numbers over the MR period

Year	Ex-ante predicted leakage in the LB for the MR Period (ha)	Ex-post leakage in the LB for the MR Period (ha)	Actual Shifting leakage (ha)
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2020	196.23	148.99	0.00
2021	1122.23	853.67	0.00

The analysis was carried out based over the same Landsat8 images mentioned on item 5.2, Table 8 and applied the same methodology described in the section above (item 5.2). A confusion matrix was again adopted to measure the classification accuracy, and the *Overall Kappa Index* was of 97% for the 2020 image and 96% for the 2021 image of classification accuracy as per section 5.2, Table 11 and Table 12.

Market Leakage - LK-ME

As is the case for the Reference Area and Project Area, the Leakage Belt is also subject to risks of land-grabbing promoted by illegal organizations (i.e. family-scale land-grabber associations, land-property documentation forgers), mostly supported by unscrupulous sawmills and political interests. Thus, market leakage estimate is mandatory for this project. Total GHG emissions due to market-effects leakage through decreased timber harvest is equal to the summed emissions from timber harvest in the baseline case potentially displaced plus a leakage factor:

$$LK_{MarketEffects,Timber} = \sum_{i=1}^M (LF_{Me} * AL_{T,i})$$

Where:

$LK_{MarketEffects,Timber}$	Total GHG emissions due to market- effects leakage through decreased timber harvest; t CO2-e
LF_{Me}	Leakage factor for market-effects calculations; dimensionless
$AL_{T,i}$	Summed emissions from timber harvest in stratum i in the baseline case potentially displaced through implementation of carbon project; t CO2-e
i	1,2,3,...M strata

The deduction factor (LF_{ME}) was adopted as 0.2, given that the forest is considered to be less in Project Area than in the rest of Amazon Biome. When evaluating the Leakage Belt deforestation factors and general forest characteristics (stratification, forest type, carbon stocks), the same parameters used for the Project Area are assumed to be equal in the Leakage Belt. This

assumption is valid based on previous similarity analysis, which demonstrates that the Leakage Belt area and the Project Area present similarities in the following criteria: Politics and Legislation, Soil and Landscape, Climate and Vegetation, and Accessibility.

The total volume that would have been logged in the baseline in the Project Area, across strata and time periods, is estimated as follows:

$$AL_{T,i} = \sum_{t=1}^t (C_{BSL,XBT,i,t})$$

Where:

$AL_{T,i}$	Summed emissions from timber harvest in stratum i in the baseline case potentially displaced through implementation of carbon project; t CO2-e
$C_{BSL,XBT,i,t}$	Carbon emission due to displaced timber harvests in the baseline scenario in stratum i in time t; t CO2-e
i	1,2,3,...M strata
t	1, 2, 3, ... t years elapsed since the projected start of the REDD project activity

The carbon emission due to the displaced logging has two components: the biomass carbon of the extracted timber and the biomass carbon in the forest damaged in the process of timber extraction:

$$C_{BSL,XBT,I,T} = ([V_{BSL,XE,I,t} * D_{mn} * CF] + [V_{BSL,XE,I,t} * LDF] + [V_{BSL,XE,I,t} * LIF]) * \frac{44}{12}$$

Where:

$C_{BSL,XBT,i,t}$	Carbon emission due to displaced timber harvests in the baseline scenario in stratum i in time t; t CO2-e
$V_{BSL,XE,I,t}$	Volume of timber projected to be extracted from within the project boundary during the baseline in stratum i at time t; m3
D_{mn}	Mean wood density of commercially harvested species; t d.m.m-3
CF	Carbon fraction of biomass for commercially harvested species j; t C td.m.-1
LDF	Logging damage factor; t C m-3 (default 0.53 t C m-3 for broadleaf and mixed forests)
LIF	Logging infrastructure factor; t C m-3 (default 0.29 t C m-3)
i	1,2,3,...M strata

t 1, 2, 3, ... t years elapsed since the projected start of the REDD project activity

The table below summarizes the calculation steps and results of market leakage estimates for the Evergreen REDD+ Project.

D_{mn} 0.59 t/m³
CF 0.47
LDF 0.53 tC/m³
LIF 0.29 tC/m³

Table 16. Market Leakage: calculation steps and annual estimates

Year		C _{BSL,XBT,i,t}
2020	(10 + 18.5924 + 10.1732) * 3.666667 =	141.2 tCO₂/ha
2021	(10 + 18.5924 + 10.1732) * 3.666667 =	141.2 tCO₂/ha

Year	V _{BSL} m ³ /ha	Year	ha/year	ha (Cumulative)	C _{BSL,XBT} tCO ₂ /year	AL _T *LF _{ME} tCO ₂ /year
2020	35,1	2020	196.23	196.23	27,699.74	5,539.9
2021	35,1	2021	1,122.23	1,318.46	158,412.79	31,682.56

Leakage outside the Leakage Belt (Step 4 - LK-ASU)

Immigrants prevented from migrating into and deforesting the project area are conservatively assumed to migrate to an alternative forest area and to cause deforestation in the alternative area. The alternative forest area could be within the Leakage Belt or it could be elsewhere in the country. The proportion migrating to the Leakage Belt is calculated as the area of the Leakage Belt as a proportion of the total available forest area nationally (AVFOR). AVFOR was estimated as follows:

$$AVFOR = TOTFOR - PROTFOR - MANFOR$$

Where:

AVFOR	Total available national forest area for unplanned deforestation; ha
TOTFOR	Total available national forest area; ha
PROTFOR	Total area of fully protected forests nationally; ha
MANFOR	Total area of forests under active management nationally; ha

As the country has a great variety of forest biomes spread across its territory, TOTFOR considered only the Amazon Rainforest biome. This is a conservative approach. Thus, as a representation of the total area of Amazon Rainforest in Brazilian Territory, TOTFOR consisted of multiplying size of the Brazilian Amazon by 97%, which represents its preserved area, according to SEMA²³. As a result, TOTFOR represents 486,461,572 ha.

According to Embrapa²⁴, PROTFOR is estimated at 88,566,400 ha. MANFOR is estimated at 1,400,000, according to IBAMA²⁵. In this context, AVFOR is estimated at 396,495,172 ha.

The proportion of Leakage Belt area related to the total available national forest area (PROPLB) is calculated by dividing LBFOR (119,087 ha) by AVFOR (396,495,172 ha). This procedure results in PROPLB.

The average carbon stock across the Leakage Belt (C_{LB} ; 435.8 tCO₂/ha; based on similarity analysis, data from the Project Area was applied to Leakage Belt area) and the average carbon stock for all available forest area outside the Leakage Belt (C_{OLB} ; 578.1 tCO₂/ha²⁶) were taken for calculation of the proportional difference in carbon stocks between areas of forest available for unplanned deforestation both inside and outside the Leakage Belt (PROP_{CS}). PROP_{CS} is calculated by dividing the stock outside the Leakage Belt (C_{OLB}) by the stock inside the Leakage Belt (C_{LB}), which results in a value of: PROP_{CS} = 1.3266

The proportion of baseline deforestation caused by immigrating population (PROP_{IMM}) was estimated for a period from 2012 to 2020. For calculating PROP_{IMM}, it was used local data²⁷ for births, deaths and population. It is then assumed that the total annual population growth in a given municipality is attributed to: i) births and ii) immigration. Thus, by subtracting the number of annual births from the total annual population growth, it is possible to infer the number of

²³ Source: <http://meioambiente.am.gov.br/unidade-de-conservacao/>

²⁴ Source: <https://www.embrapa.br/car/sintese>

²⁵ Source: Manejo sustentável autorizado pelo Ibama em 2019 totalizou 39 mil hectares

²⁶ Source: S.S. Saatchi, R.A. Houghton, R.C. dos Santos Alvalá, J.V. Soares, and Yifan Yu. Distribution of Aboveground Live Biomass in the Amazon Basin. 2007.

https://www.researchgate.net/publication/227502927_Distribution_of_aboveground_live_biomass_in_the_Amazon_basin

²⁷ Sources: <http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sinasc/cnv/nvam.def> ;

<https://www.ibge.gov.br/estatisticas/sociais/populacao/9103-estimativas-de-populacao.html>

immigrants. According to the number of immigrants, we have inferred the proportion of deforestation attributed to immigrant agents ($PROP_{IMM}$) as 1.33%.

The proportional leakage for areas with immigrating populations (LK_{PROP}) was then equal to the immigrating proportion multiplied by the proportion of available national forest area outside the Leakage Belt multiplied by the proportional difference in stocks between forests inside and outside the Leakage Belt.

$$LK_{PROP} = PROP_{IMM} * (1 - PROP_{LB}) * PROP_{CS}$$

Where:

LK_{PROP}	Proportional leakage for areas with immigrating populations; proportion
$PROP_{IMM}$	Estimated proportion of baseline deforestation caused by immigrating population; proportion
$PROP_{LB}$	Area of forest available for unplanned deforestation as a proportion of the total national forest area available for unplanned deforestation; proportion
$PROP_{CS}$	Proportional difference in stocks between areas of forest available for unplanned deforestation both inside and outside the Leakage Belt; proportion

LK_{PROP} was estimated at 0.018.

Leakage due to the proportion of the baseline deforestation actors who are displaced to areas outside the Leakage Belt was therefore equal to the change in stocks in the baseline scenario minus the change in stocks in the project scenario multiplied by the proportional leakage factor for areas with immigrating populations:

$$\Delta C_{LK-ASU,OLB} = (\Delta C_{BSL,LK,unplanned} - \Delta C_{P,LB,}) * LK_{PROP}$$

Where:

$\Delta C_{LK-ASU,OLB}$	Net CO2 emissions due to unplanned deforestation displaced outside the Leakage Belt ; t CO2-e
$\Delta C_{BSL,LK,unplanned}$	Net CO2 equivalent emissions in the baseline from unplanned deforestation in the leakage belt; t CO2-e
$\Delta C_{P,LB,}$	Net CO2 equivalent emissions within the leakage belt in the project case; t CO2-e
LK_{PROP}	Proportional leakage for areas with immigrating populations; proportion

The table below summarizes the results obtained for calculation of Leakage outside the Leakage Belt.

Table 17. Estimation results for leakage outside the Leakage Belt

Leakage Outside	Sum of Strata
	$\Delta C_{LK-ASU,OLB}$
Year	tCO ₂ /year
2020	726.04
2021	4,160.04

Total Leakage (final result)

Based on the values obtained for Market Leakage, Leakage Outside the Leakage Belt, and Activity Shifting Leakage, the Total Leakage was as follows:

Table 18. Total leakage during the MR period

Leakage			
Market leakage (tCO ₂)	Leakage outside (tCO ₂)	Shifting leakage (tCO ₂)	Total (tCO ₂)
5,539.95	726.04	0.0	6,265.99
31,682.56	4,160.04	0.0	35,842.60

5.4 Net GHG Emission Reductions and Removals

Net GHG Emission Reductions and Removals can be summarized as the “Estimated baseline emissions” minus the “Estimated project emissions” minus the “Estimated leakage emissions”, whose components are presented below.

Estimate baseline emissions

= *Baseline emissions from unplanned deforestation*

+Emissions from biomass burning in the baseline

–Sum of wood products and pasture carbon pools in the baseline case

Estimate project emissions

= Emissions arising from logging gap in Project Area

+Emissions from constructing logging infrastructure for removal of timber in Project Area

–Wood Products Carbon Pool in Project Area

Estimate leakage emissions

= Market Leakage

+ Leakage outside the Leakage Belt

+ Activity Shifting Leakage

The project's non-permanence risk rating is 10% in accordance with the non-permanence risk tool

Table 19. Evergreen REDD+ Project's net GHG Reductions and removals over monitoring period

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)	Buffer pool allocation	VCUs eligible for issuance
2020	134,967	0	6,266	126,944	12,888	114,057
2021	771,867	0	35,843	725,976	73,703	652,273
Total	906,835	0	42,109	852,920	86,590	766,330

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