2016-2018 ENVIRA AMAZONIA PROJECT MONITORING REPORT

Document Prepared By

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Project Title	The Envira Amazonia Project – A Tropical Forest Conservation Project in Acre, Brazil
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Validation/Verification Body	SCS Global Services Letty B. Brown, Ph.D. Email: LBBrown@scsglobalservices.com Phone: +1 (510) 452-8000 2000 Powell Street, Suite 600 Emeryville, California, 94608, USA
GHG Accounting/ Crediting Period	The Project Start Date is August 2, 2012 with a 10 year GHG Accounting Period and the Project Lifetime is 30 years. The initial baseline period started on August 2, 2012 and is set to continue through August 1, 2022. The Project Lifetime is: 2 August 2012 – 1 August 2042; 30-year total period.
Monitoring Period of this Report	01 January 2016 – 31 December 2018.
History of CCB Status	The CCBS Project Design Document was officially validated on April 15, 2015. The Project's initial CCBS PIR was verified on February 16, 2016 and the Project's second CCBS PIR was verified on November 16, 2017. The Project is now undergoing its third CCBS verification.
Gold Level Criteria	The Envira Amazonia Project was validated to the Gold Level for climate adaptation, along with Gold Level for exceptional community and biodiversity benefits. The Project is incorporating climate adaptation measures, promoting a pro-poor initiative, and conserving several vulnerable tree species along with numerous endemic bird species.

Table of Contents

1 Summary of Project Benefits 4
1.1 Unique Project Benefits 5
1.2 Standardized Benefit Metrics 6
2 General 11
2.1 Project Description 11
2.2 Project Implementation Status 21
2.3 Stakeholder Engagement 52
2.4 Management Capacity 73
2.5 Legal Status and Property Rights 85
3 Climate 87
3.1 Monitoring GHG Emission Reductions and Removals 98
3.2 Quantification of GHG Emission Reductions and Removals 142
3.3 Optional Criterion: Climate Change Adaptation Benefits 155
4 Community 165
4.1 Net Positive Community Impacts 165
4.2 Other Stakeholder Impacts 167
4.3 Community Impact Monitoring 170
4.4 Optional Criterion: Exceptional Community Benefits 179
5 Biodiversity 186
5.1 Net Positive Biodiversity Impacts 186
5.2 Offsite Biodiversity Impacts 200
5.3 Biodiversity Impact Monitoring 201
5.4 Optional Criterion: Exceptional Biodiversity Benefits 206
6 Additional Project Implementation Information 208
7 Additonal Project Impact Information 213

1 SUMMARY OF PROJECT BENEFITS

The Envira Amazonia Project ("Project") is a payment for ecosystem services forest conservation project, otherwise known as a Reducing Emissions from Deforestation and forest Degradation (REDD+) project, on 39,300.6 hectares or approximately 97,072.5 acres of privately-owned land in Acre, Brazil.[1] The total property is 200,000 hectares or approximately 494,000 acres and the Project shall seek to conserve the entire property, but the Project activities will specifically focus on the subset Project Area of 39,300.6 hectares.

The three main Project Proponents are CarbonCo, LLC ("CarbonCo"), Freitas International Group, LLC ("Freitas International Group or Carbon Securities"), and JR Agropecuária e Empreendimentos EIRELI. CarbonCo, the wholly-owned subsidiary of Carbonfund.org, is responsible for getting the Project certified and for early-stage Project finance. Carbon Securities acts as a liaison between CarbonCo and JR Agropecuária e Empreendimentos EIRELI, along with acting as a translator and assisting with logistics for site visits. JR Agropecuária e Empreendimentos EIRELI, which translates into JR Agriculture-Livestock and Ventures, is an Acre, Brazil-based company and is primarily responsible for day-to-day management of the Project and the implementation of activities to mitigate deforestation.

The ultimate project activities are to undertake a forest carbon inventory, model regional deforestation and land-use patterns, and mitigate deforestation pressures by utilizing payments for the Project's ecosystem services, along with ongoing monitoring of the climate, community and biodiversity impacts of the Project. In addition to voluntarily foregoing plans to convert the forests to a large-scale cattle ranch, JR Agropecuária e Empreendimentos EIRELI will also implement numerous activities to assist local communities and mitigate deforestation pressures such as: offering agricultural extension training courses; beginning patrols of potential deforestation sites in the early stages of the Project; granting land tenure to local communities; and establishing alternative economic activities including commercializing the collection of medicinal plants and açaí.

The Project was officially validated by Environmental Services, Inc. (ESI) to the Climate, Community and Biodiversity Standard (CCBS, Third Edition) in April 2015 and to the Verified Carbon Standard (VCS, Version 3.4) in April 2015. The Project was initially verified by ESI to the CCBS and the VCS in February 2016 and May 2016. The Project was then verified by IMAFLORA and Rainforest Alliance to the CCBS and VCS in November 2017. Furthermore, the Project is aligned with the REDD+ Social and Environmental Standards and the State of Acre's Payment for Ecosystem Services (Law # 2.308/2010).

The Project is now being reviewed for its third verification to the VCS and CCBS.

Please contact Brian McFarland of CarbonCo, LLC with any questions, comments or concerns regarding the Envira Amazonia Project 1-240-595-6883 or via email at BMcFarland@CarbonCoLLC.com.

[1] The Term REDD and REDD+ will be used interchangeably. REDD+ includes REDD along with forest conservation, sustainable forest management and the enhancement of carbon stocks. Thus, the Envira Amazonia Project includes elements of forest conservation, sustainable forest management and reforestation.

1.1 Unique Project Benefits

Below are a few of the unique project benefits associated with the Envira Amazonia Project.

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
1) Granting title	From 2016 to 2018, there have been frequent discussions with the local communities about granting them land titles. In May 19, 2017, JR Agropecuária e Empreendimentos EIRELI (JR) held a meeting with the President of the Union of Rural Workers (STR). The Project team discussed with the President, Mr. Antônio José da Conceição, the legalization of the communities' land tenure through the donation of areas where residents already reside within the Project. The talks with STR were very useful, the Project team delivered to the President of the Union a physical copy and the digital archive of the PDD summary, and the meeting ended with a certainty of future partnerships.	2.2.1	Between 2012 and 2015, JR agreed to voluntarily title land to the local communities, the idea of receiving land tenure was discussed with the local communities, and then the Project Proponents drafted a high-level timeline and budget for the eventual titling of land. In 2016, another CarbonCo and Carbon Securities' REDD+ project granted official title to the first community member. This experience, and the technical details, were shared with JR to hopefully make the process more efficient for the Envira Amazonia Project.
2) Dentures	In January 2017, a dentist Marcos Prado conducted dental	2.2.1	The dentist chair was purchased in January

	checkups and offered to return for the delivery of prosthetic teeth for the community. On April 20 and 21, 2017, the dental team returned to the Project when they made 46 dental molds. On May 12 and 13, 2017, the dental team returned to the Project to deliver the prosthetic teeth. JR. Empreendimentos EIRELI also looked into building a standalone health clinic near the Project's headquarter and looked into buying a dentist chair. Supplies for the health clinic were purchased in December 2018 and negotiations to purchase the dental chair were also initiated in December 2018.		2019 and was installed at the Project in March 2019. The onsite health clinic was built from January to March 2019.
3) Community Bathrooms Installed	Supplies for the bathrooms were purchased in December 2018.	2.2.1	A total of 12 community bathrooms were installed from January to March 2019.

1.2 Standardized Benefit Metrics

Below are the Project's net benefits achieved during the monitoring period and since the Project start date.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	Net estimated emission removals in the project area, measured against the without-project scenario	None as growth is not tracked.	3.2.2	None.
	Net estimated emission reductions in	8,005,407 tCO2e	3.2.4	18,345,166 tCO2e

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	the project area, measured against the without-project scenario			
Forest[2] cover	For REDD[3] projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario	15,137 hectares	3.2.2	39,045 hectares
	Number of hectares of non-forest land in which improved land management has occurred as a result of the project's activities, measured against the without-project scenario	Not applicable	N/A	Not applicable
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	Approximately 65 people (health and dental services, environmental education, etc.)	2.2.1	Approximately 65 people (health services, environmental education, upcoming agricultural courses, etc.)
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities of project activities	Approximately 30 women (health and dental services, environmental education, etc.)	2.2.1	Approximately 30 women (health services, environmental education, upcoming agricultural courses, etc.)

[2] Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (*VCS Program Definitions*)
[3] Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (*VCS Program Definitions*)

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
Employment	Total number of people employed in of project activities,[4] expressed as number of full time employees[5]	Approximately 6 people	2.2.1	Approximately 6 people
	Number of women employed in project activities, expressed as number of full time employees	Approximately 1-2 women	2.2.1	Approximately 1-2 women
Livelihoods	Total number of people with improved livelihoods[6] or income generated as a result of project activities	Approximately 65 people (health and dental services, temporary work, etc.)	2.2.1	Approximately 65 people (health services, temporary work, upcoming agricultural courses, etc.)
	Number of women with improved livelihoods or income generated as a result of project activities	Approximately 30 women (health and dental services, temporary work, etc.)	2.2.1	Approximately 30 women (health services, temporary work, upcoming agricultural courses, etc.)
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	Approximately 65 people (access to onsite pharmacy, dental kits, and dentist)	2.2.1	Approximately 65 people (access to onsite pharmacy, dental kits, dentist, and health center)

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

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

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

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	Approximately 30 women (access to onsite pharmacy, dental kits, and dentist)	2.2.1	Approximately 30 women (access to onsite pharmacy, dental kits, dentist, and health center)
Education	Total number of people for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	Approximately 9 people (i.e., a total of 9 people attend adult education classes at headquarters; in addition, children's clothes were donated to school in May 2018)	2.2.1	Approximately 9 people (i.e., a total of 9 people attend adult education classes at headquarters; in addition, children's clothes were donated to school in May 2018)
	Number of women and girls for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	Approximately 1 (i.e., 1 of 9 people attending adult education classes at headquarters is a woman; in addition children's clothes were donated to school in May 2018)	2.2.1	Approximately 1 (i.e., 1 of 9 people attending adult education classes at headquarters is a woman; in addition children's clothes were donated to school in May 2018)
Water	Total number of people who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	No actions during Monitoring Period; however approximately 65 people will benefit from improved water quality due to toilets being installed in	2.2.1	Approximately 65 people have started to benefit from improved water quality due to toilets being installed in February 2019.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
		February 2019.		
	Number of women who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	No actions during Monitoring Period; however approximately 30 women will benefit from improved water quality due to toilets being installed in February 2019.	2.2.1	Approximately 30 women have started to benefit from improved water quality due to toilets being installed in February 2019.
Well-being	Total number of community members whose well-being[7] was improved as a result of project activities	Approximately 65 people (health and dental services, environmental education, temporary work, etc.)	2.2.1	Approximately 65 people (health and dental services, environmental education, temporary work, community bathrooms, etc.)
	Number of women whose well-being was improved as a result of project activities	Approximately 30 women (health and dental services, environmental education, temporary work, etc.)	2.2.1	Approximately 30 women (health services, environmental education, temporary work, community bathrooms, etc.)

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

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation,[8] measured against the without-project scenario	39,300.6 hectares	2.2.1	39,300.6 hectares
	Number of globally Critically Endangered or Endangered species[9] benefiting from reduced threats as a result of project activities,[10] measured against the without-project scenario	Countless	2.2.1	Countless

2 GENERAL

2.1 Project Description

2.1.1 Implementation Description

The Envira Amazonia Project – A Tropical Forest Conservation Project in Acre, Brazil (i.e., the Envira Amazonia Project) seeks to help protect and conserve tropical forest by providing payments for ecosystem services. This type of project is known as a Reducing Emissions from Deforestation and forest Degradation project (REDD project). This project is being developed and registered under the Verified Carbon Standard (VCS) and the Climate, Community and Biodiversity Standard (CCBS). Project development involved engaging a large landowner willing to forego conversion of forest land to a ranching operation, working with the local communities surrounding the Project Area, engaging Acre state officials working on reducing deforestation pressures on the regional/state level, and putting into operation the REDD project implementation plan with the help of local partners.

The Envira Amazonia Project will generate GHG emission reductions by foregoing forest conversion to grassland in favor of conservation of the tropical forest (i.e., maintaining existing carbon stocks). The Project will also mitigate deforestation pressures, including leakage and reducing non-permanence risk factors, in the wider region using a combination of environmental programs and social programs intended to improve the livelihoods of community members living in the vicinity of the Project Area. Social projects and programs for the local communities will not only generate sustainable

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

[9] Per IUCN's Red List of Threatened Species

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

economic opportunities, but will also result in a reduction in deforestation in the region and the preservation of biodiversity.

The Envira Amazonia Project reduced deforestation and mitigated the associated greenhouse gas emissions by JR Agropecuária e Empreendimentos EIRELI voluntarily foregoing the conversion of its property's primary forests to a large-scale cattle ranch. Furthermore, the Project Proponents have also: engaged numerous stakeholders; hired a community specialist to visit the local communities and fully discuss the Project; hired a local project manager to initiate monitoring for deforestation; established community and biodiversity impact monitoring plans; began designing various projects and programs such as commercializing the collection of medicinal plants and açaí, offering agricultural extension services, and granting land tenure; and the Project conserved the Project Area's rich tropical biodiversity including numerous endemic bird species and threatened tree species.

The total emissions reduced by the Envira Amazonia Project over the course of the 2016-2018 monitoring period are 5,021,562 tCO_2e.

Years	GHG emission reductions (tCO2e)
2016	2,311,131
2017	2,394,725
2018	315,706
Total	5,021,562

2.1.2 Project Category and Activity Type

Project Scope 14: Agriculture, Forest and other Land Use (AFOLU)

Project Category: Reduction Emission from Deforestation and Degradation (REDD)

Type of Activity: Avoided Planned Deforestation (APD)

Grouped Project: No

This Project is being registered under the Verified Carbon Standard (VCS) as a Reducing Emissions from Deforestation and forest Degradation (REDD+) project and has been developed in compliance with the Verified Carbon Standard, Version 4.0.[11] The Project will reduce emissions from planned deforestation.

[11] Verra. 2019 VCS Standard. Version 4.0, 19 September 2019. Washington, D.C.

2.1.3 Project Proponent(s)

The three main Project Proponents are CarbonCo, LLC ("CarbonCo"), Freitas International Group, LLC ("Carbon Securities"), and JR Agropecuária e Empreendimentos EIRELI. CarbonCo, the wholly-owned subsidiary of Carbonfund.org, is responsible for getting the project certified and for project finance. Carbon Securities acts as a liaison between CarbonCo and JR Agropecuária e Empreendimentos, acts as a translator, and assists with logistics for site visits. JR Agropecuária e Empreendimentos is an Acre, Brazil-based organization created by the landowner and is primarily responsible for day-to-day management of the Project.

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Organization name	JR Agropecuária e Empreendimentos EIRELI
Contact person	Francisco Umberto Prado Couto ("Chiquinho"), José Elves Araruna de Sousa ("Elves") and Rege Ever C. Vasques.
Title	Francisco Umberto Prado Couto is the company owner. José Elves Araruna de Sousa and Rege Ever C. Vasques are Project Lawyers and Collaborators.
Address	Travessa Alagoas, Number 49, Altos, Bairro Centro Rio Branco, Acre, Brazil, CEP (Zip Code) 69900-412
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Contact person	Pedro Freitas
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2.1.4 Other Entities Involved in the Project

Organization name	Ostrya Conservation, Inc.
Role in the project	Independent consultant to develop project document and advise CarbonCo on all aspects of project development.
Contact person	James Eaton
Title	Director
Address	Ostrya Conservation, Inc. Post Office Box 153 Scottsville, VA – 24590
Telephone	+1 (708) 703-2552
Email	James.Eaton@OstryaConservation.com

Organization name	TerraCarbon LLC
Role in the project	Previous independent consultant which co-led project development kick-off; designed and managed forest carbon inventory; led baseline development task; developed project document and advised CarbonCo on all aspects of project development.
Contact person	James Eaton and David Shoch
Title	James Eaton, Senior Manager, Forestry and Technical Services (Position prior to Ostrya Conservation) David Shoch, Director, Forestry and Technical Services
Address	5901 N. Sheridan Road, Peoria, Illinois 61614, USA
Telephone	+1 (434) 326-1144
Email	David.Shoch@TerraCarbon.com

Organization name	TECMAN
Role in the project	Independent consultant to lead and supervise collection of field data during the course of the forest carbon inventory. TECMAN also identified rare and threatened tree species.
Contact person	Igor Agapejev de Andrade and Fabio Thaines
Title	Igor and Fabio are co-owners of TECMAN
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Telephone	+55 (68) 3227-5273
Email	FabioThaines@tecman.eng.br and IgorAgapejev@tecman.eng.br

Organization name	Antonio Willian Flores de Melo of Universidade Federal do Acre - Centro de Ciências Biológicas e da Natureza
Role in the project	Independent consultant to assist with review of the project baseline.
Contact person	Antonio Willian Flores de Melo
Title	Independent Consultant
Address	Universidade Federal do Acre Centro de Ciências Biológicas e da Natureza, Distrito Industrial, CEP 69.915-900, Rio Branco, Acre, Brasil
Telephone	+55 (68) 3901 2611
Email	willianflores@gmail.com

Organization name	PAV Comércio e Serviços Ltda ("PAV")
Role in the project	Independent consultant to assist with community engagement
Contact person	Ayri Saraiva Rando
Title	Independent Consultant
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Telephone	+55 (19) 9 9930 4488
Email	AyriRando@gmail.com

Organization name	N/A
Role in the project	Independent consultant to assist with ornithological study
Contact person	Tomaz Nascimento de Melo
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Telephone	+55 (92) 9 8259 2411
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2.1.5 Project Start Date (G1.9)

The Envira Amazonia Project has a project start date of August 2, 2012. On this day, the Tri-Party Agreement between the Project Proponents was signed and JR Agropecuária e Empreendimentos EIRELI agreed to pursue a forest conservation project rather than clear the land for lumber and for the establishment of a cattle ranch.

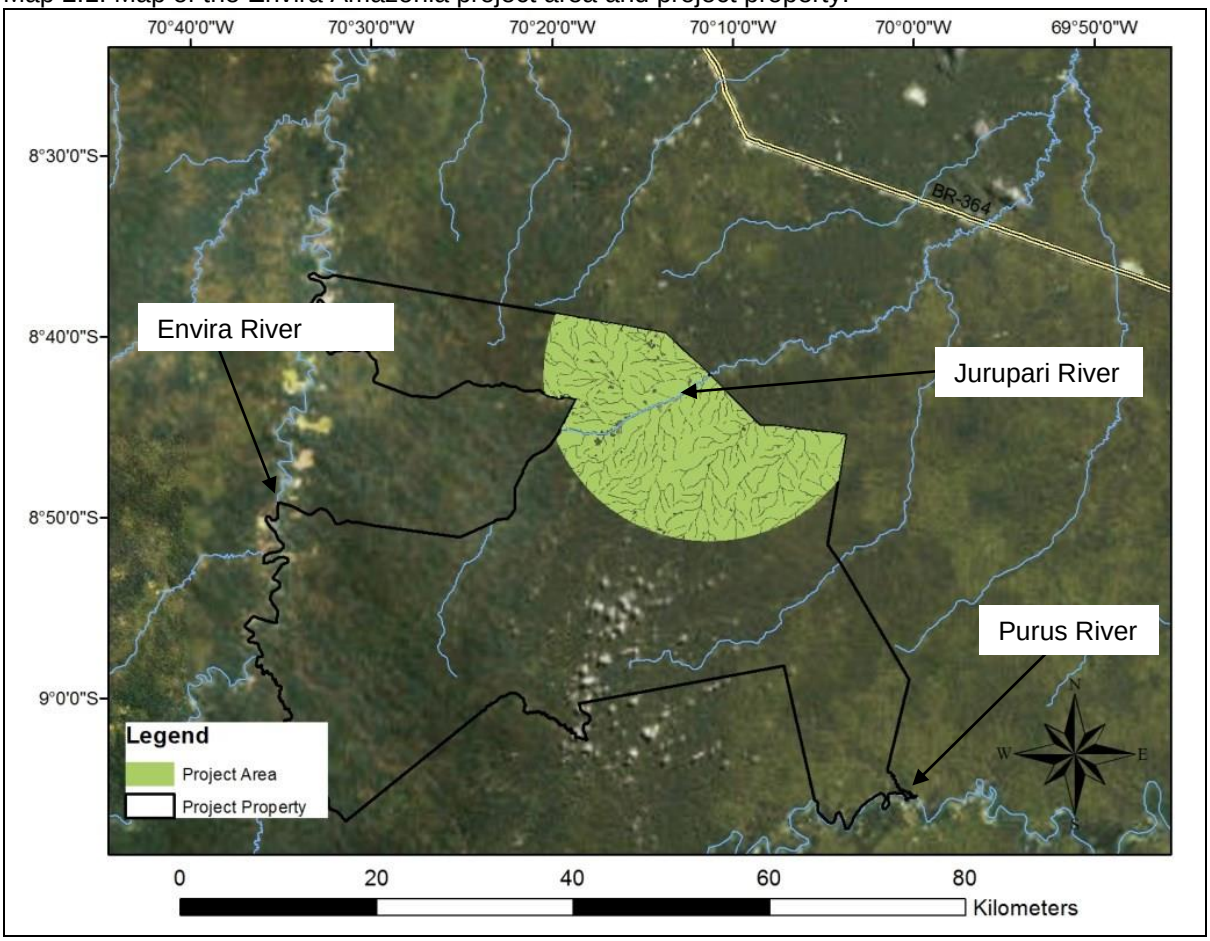
2.1.6 Project Crediting Period (G1.9)

The Envira Amazonia Project has an initial project crediting period of 30 years, starting on August 2, 2012. The initial baseline period started on August 2, 2012 and is set to continue through August 1, 2022. The initial project crediting period is set to end on August 1, 2042.

2.1.7 Project Location

The Envira Amazonia Project Area is located in Acre, Brazil along the banks of the Jurupari River (see Map 2.1) about 60 kilometers southeast of the town Feijó. The total Project Area (i.e., forested area of the property as of the Project start date, and 10 years prior) is 39,300.6 hectares. This represents less the 20% of the Project property which totals 200,000 hectares. The Project Area is the portion of the property closest to BR-364 along the Jurupari River.

Map 2.1. Map of the Envira Amazonia project area and project property.



2.1.8 Title and Reference of Methodology

The Envira Amazonia Project is utilizing the Avoided Deforestation Partners' VCS REDD Methodology, entitled, "VM0007: REDD Methodology Modules (REDD-MF)." The only eligible activity as part of this Project is avoiding planned deforestation, hence only modules related to planned deforestation are required. This Project is eligible as an avoiding planned deforestation project because the forest land is expected to be converted to non-forest land in the baseline case and the land is legally permitted to be converted to non-forest. The specific modules applied to the Envira Amazonia Project are listed below.

REDD-MF, REDD Methodology Framework Version 1.5

Carbon pool modules:

CP-AB "VMD0001 Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools", version 1.1

CP-W "VMD0005 Estimation of carbon stocks in the long-term wood products pool", version 1.1

CP-D, "VMD0002 Estimation of carbon stocks in the dead-wood pool," Version 1.0

Baseline module:

BL-PL "VMD0006 Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation", version 1.2

Leakage modules:

LK-ASP "VMD0009 Estimation of emissions from activity shifting for avoided planned deforestation", version 1.1

LK-ME "VMD0011 Estimation of emissions from market-effects", version 1.0. Mandatory where the process of deforestation involves timber harvesting for commercial markets

Monitoring module:

M-MON "VMD0015 Methods for monitoring of greenhouse gas emissions and removals", version 2.1.

Miscellaneous modules:

E-BB "VMD0013 Estimation of greenhouse gas emissions from biomass burning", v1.0.

X -STR "VMD0016 Methods for stratification of the project area", version 1.0.

X-UNC "VMD0017 Estimation of uncertainty for REDD project activities", version 2.0.

Tools:

T-SIG, CDM tool "Tool for testing significance of GHG emissions in A/R CDM project activities," Version 1.0

T-ADD, "VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities," Version 3.0

T-BAR, "Tool for AFOLU non-permanence risk analysis and buffer determination," Version 4.0

Use of modules, REDD-MF, M-MON, T-ADD, T-BAR, X-UNC, and X–STR, is always mandatory when using the VM0007 methodology. Further use of modules, BL-PL and LK-ASP, is mandatory in the case of projects focusing on planned deforestation. LK-ME and CP-W are mandatory where the process of deforestation involves timber harvesting for commercial markets. Use of the module T-SIG determines whether GHG emissions by sources and/or decreases in carbon pools are insignificant. Finally, CP-AB is mandatory in all cases and while CP-D is optional as the dead wood pool is greater in the project scenario than the baseline scenario.

2.1.9 Other Programs (G5.9)

This section is not applicable because Brazil does not have an emissions trading program and REDD+ projects from Brazil are currently not eligible for any compliance market. In contrast, the Envira Amazonia Project was validated and verified to the VCS and CCBS and shall be regularly verified to both the VCS and CCBS. The issuance of Verified Carbon Units (VCUs) onto the VCS-approved, HIS-Markit Environmental Registry helps to ensure the avoidance of GHG emissions being double counted. In addition, CarbonCo's finances and project portfolio are independently audited each year by a certified public accountant (CPA). This said, the Envira Amazonia Project is not participating in any other GHG programs other than the VCS and CCBS. The Envira Amazonia Project is not generating any other forms of environmental credits such as biodiversity offsets, watershed protection payments, or renewable energy certificates (RECs). Furthermore, the Envira Amazonia Project has not been rejected by any other GHG program.

2.1.10 Sustainable Development

Brazil has participated in the development of the 17 Sustainable Development Goals (SDGs).[12] The following are the 17 SDGs and how the Envira Amazonia Project is working towards helping to meet these voluntary SDGs:

- 1. No poverty
    - The Project is working to increase the communities' access to basic necessities and alleviate poverty.
- 2. Zero hunger
    - While the communities have access to crops, some fish in the Jurupari River, and food from the forests, the Project will be working to help improve the communities' agricultural techniques, while both increasing and diversifying incomes. For instance, this includes eventually helping to commercialize açaí collection.
- 3. Good health and well-being

[12] Itamaraty. "Sustainable Development Goals (SDGs)." http://www.itamaraty.gov.br/en/politica-externa/desenvolvimento-sustentavel-e-meio-ambiente/6298-sustainable-development-goals-sdgs

- The Envira Amazonia Project is focused on good health and well-being of local communities. This includes facilitating dentist visits and giving dentures to local communities. Dental kits have also been distributed and an onsite pharmacy was established in January 2017. An onsite health center was built between January and March 2019. In addition, the Project's urban headquarters provides a place for community members to stay and the Project Proponents assists the communities with access to the local hospital.

- 4. Quality education
  - The headquarters at the Envira Amazonia Project provides a bigger and newer facility for Project EJA (The Territorial Agenda for Integrated Development of Literacy for Youth and Adult Education). More specifically, teachers are hosted at the headquarters and they provide adult education to approximately 9 local community members.
- 5. Gender equality
  - The Project is working to include more women in project activities. For instance, Maria Sueli de Souza e Souza has been trained to voluntarily distribute medicine from the onsite pharmacy and one woman participates in the Project EJA.
- 6. Clean water and sanitation
  - The Envira Amazonia Project has installed 12 community toilets throughout the Project Area, which will improve the local water quality. In the future, the Project will distribute water filters and may explore rainwater catch basins as a method for collecting clean drinking water.
- 7. Affordable and clean energy
  - In May 2017, JR. Empreendimentos EIRELI delivered LED bulbs with solar chargers to each of the local communities. In the future, JR. Empreendimentos EIRELI would like to distribute solar energy kits to the local communities.
- 8. Decent work and economic growth
  - The Project has hired local project managers and local community members have been hired to assist with biodiversity studies, community studies, the forest carbon inventory, to build the headquarters, and to help visitors as guides and cooks.
- 9. Industry, innovation and infrastructure
  - In the future, the Envira Amazonia Project landowners will like to provide the infrastructure to recollect rubber, along with for the collection of açaí and medicinal plants. The Project has also considered removing trees from the Jurupari River to

improve navigation on the river, and the Project has considered improving the small footpath / trail from the communities to the highway.

- 10. Reduced inequalities
    - The Project is seeking to reduce inequalities by providing, amongst many things, free agricultural courses, access to an onsite pharmacy, and land titles.
- 11. Sustainable cities and communities
    - The Project is promoting sustainable communities through providing land titles, agricultural extension courses, and health care services. These activities, in conjunction with other activities, will help reduce deforestation and improve the life quality of local communities which in turn, may reduce the pressure to migrate to neighboring cities such as to Feijó.
- 12. Responsible consumption and production
    - As an avoided deforestation project and in conjunction with its partnership with a local agronomist, the Envira Amazonia Project is promoting responsible production of local crops.
- 13. Climate action
    - One of the main goals of the Project is to reduce deforestation and the associated GHG emissions.
- 14. Life below water
    - The Jurupari River, due to the low water level in the dry season, does not have much fish. This said, the communities already have extensive knowledge on how to practice local, sustainable fishing during the best periods of fishing. In addition, the installation of bathrooms will certainly improve the local water quality and the reduction in deforestation will reduce the siltation of the Jurupari River.
- 15. Life on land
    - One of the main goals of the Project is to reduce deforestation and to conserve the rich biodiversity of the surrounding forests.
- 16. Peace, justice and strong institutions
    - The Project promotes peace, justice and strong institutions through the prohibition of illegal activities such as child exploitation, bribery, and corruption. All the visits made to the Project by the Project Proponents include discussions with the communities about partnerships, mutual aid between the families, and the distribution of equal

benefits. In addition, through the local church, Pastor Circlandio guides the members of the community about good relations and harmonious coexistence among its members. Furthermore, the Project works with a wide-range of stakeholders and institutions.

- 17. Partnerships for the goals
    - The Project is the result of strong international and domestic partnerships including amongst the Project Proponents, local communities, local biologists and forest firms, etc.

2.2 Project Implementation Status

The main objective of the Envira Amazonia REDD APD Project is the conservation of the tropical forest in the Project Area. The primary project activity, undertaken by JR Agropecuária e Empreendimentos EIRELI, is voluntarily foregoing the clearing of the Project Area and conversion of the land to a large-scale cattle ranch.

The Envira Amazonia Project will further mitigate deforestation in the region by mitigating deforestation pressures using a combination of environmental programs and social programs which are intended to improve the livelihoods of community members living in the vicinity of the Project Area. Social projects and programs for the local communities, will not only generate sustainable economic opportunities, but will also result in a reduction in deforestation in the region and the preservation of biodiversity.

2.2.1 Implementation Schedule (G1.9)

The approximate implementation schedule for the Envira Amazonia Project's first 10 years, along with current accomplishments, is as follows:

Pre- and Post-Validation: Years 1 and 2 (2014-2015)

Date	Milestone(s) in the project's development and implementation
2012-2018	Stakeholder consultations and community visits took place throughout 2012-2018. In addition, Ayri Saraiva Rando was hired by CarbonCo in April 2014 as an independent community specialist and visited a total of 41 families between May 20th and June 11th, 2014. The Project Proponents also visited the Project in December 2014, November 2015, January 2017, and May 2018.
August 2, 2012 to June 17, 2013	The signing and authentication of a Tri-Party Agreement between the Project Proponents began when the Tri-Party Agreement was signed on August 2, 2012. After completing the due diligence and believing the Envira Amazonia Project was viable, the Tri-Party Agreement was notarized on May 6, 2013 and then certified by the

	Clerk of the Circuit Court for Montgomery County on May, 10 2013 and was finally authenticated by the Consulate General of Brazil in Washington on June 17, 2013.
August 2012 – Present	Jose Aurimar Tavares Carneiro (“Mazinho”) and Francisco Circlandio (“Francisco”) were hired as the initial local project managers and for general project duties. Circlandio and Mazinho both do temporary contract work from time to time for the Project and are paid for the specific service provided (i.e., helping with site visits, building project headquarters, etc.).
August 2012 – Present	With respect to initiating patrols of deforestation, the Project Proponents have reviewed the satellite imagery from 2012 to 2018. Mazinho and Francisco also began informal monitoring via boat with a focus on the Jurupari River.
August 2012 – December 2016	An initial, informal headquarters was established in August 2012.
January 2014 – March 2015	CarbonCo helped develop both the biodiversity and community impact monitoring plans. A rapid assessment of the Project Zone’s biodiversity was conducted from January to August 2014. The biodiversity monitoring plan of identifying threatened tree species was designed between January 2014 and March 2014. The biodiversity monitoring plan of identifying threatened and endemic bird species was designed and revised between July 2014 and March 2015. The BNS and PRA (two surveys used for the community impact monitoring plan) were designed between November 2013 and March 2014.
February 2014 – February 2019	Professor Flores was contracted by CarbonCo in February 2014, March 2015, March 2016, and February 2017. Professor Flores assisted with the review of the Envira Amazonia Project’s modeling and assisted with data acquisition throughout 2014 to 2017. In 2018 and 2019, James Eaton of Ostrya Conservation was contracted to assist with the acquisition and classification of satellite imagery.
April – July 2014	TECMAN was contracted by CarbonCo in April 2014 to undertake the forest carbon inventory at the Envira Amazonia Project. TECMAN participated in a classroom and field-based training from TerraCarbon in May 2014, and then TECMAN conducted the forest carbon inventory from May to July 2014. TECMAN also identified rare and threatened tree species.
December	The VCS Project Description and CCBS Project Design Documents

2014 – March 2019	were written and revised from December 2014 to March 2015. The VCS Project Monitoring Report and the CCBS Project Implementation Report, along with the joint VCS-CCB Monitoring and Implementation Reports were written, reviewed and revised throughout 2015, 2016, 2017, 2018, and 2019.
April 2015	The Envira Amazonia Project was validated to the CCBS and VCS in April 2015.
February 2016 – November 2017	The Envira Amazonia Project was initially verified to the VCS in February 2016 and to the CCB in May 2016. The Project's second verification was achieved in November 2017. The Project has generated carbon finance, particularly in December 2018, and continues to actively seek additional carbon finance.

Post-Validation: Years 3 to 5 (2016-2018)

Date	Milestone(s) in the project's development and implementation
January 2015, December 2016	Approximately by January 2015, the Envira Amazonia Project established an urban headquarters in Rio Branco. The urban headquarters provides a place for project documents and established two dedicated guest rooms to receive residents from the community. In addition to a place to stay, the Project also provides food, showers, and transportation for visiting community members. In December 2016, Mazinho, with assistance from local community members, built a dedicated headquarters at the Envira Amazonia Project. The headquarters is equipped with a shower, a toilet, a kitchen, a meeting area, and sleeping quarters.
January 2015 – March 2019	In January 2017, JR Agropecuária e Empreendimentos delivered a kit containing several medicines to treat illnesses such as fever, basic worms, various pains, poisonous animal bites, as well as was given a thermometer and equipment to measure blood pressure. In January 2017, the onsite pharmacy was established. In May 2018, CarbonCo provided the funding to replenish medicine at the pharmacy. In December 2018, each family received a kit of medicines containing: 3 boxes of medicine for worms (in general); 1 glass of liquid dipyrone (for pains and fever); and dipyrone in tablets form. In addition, the Project delivered to the community pharmacy:

	3 glasses of medicine to treat bites of venomous animals; 3 boxes of anti-inflammation; and extra medicine kits to treat fever, pain, and worms. Also during the January 2017 visit, a dentist Marcos Prado also attended to do dental checkups and to offer to return for the delivery of prosthetic teeth for the community. On April 20 and 21, 2017, the dental team returned to the Project when they made 46 dental molds. On May 12 and 13, 2017, the dental team returned to the Project to deliver the prosthetic teeth. Furthermore, JR Agropecuária e Empreendimentos EIRELI looked into building a standalone health clinic near the Project's headquarter and looked into buying a dentist chair. Supplies for the health clinic were purchased in December 2018 and negotiations to purchase the dental chair were also initiated in December 2018. The dentist chair was then purchased in January 2019 and was installed at the Project in March 2019. The onsite health clinic was built from January to March 2019. In approximately January 2015, the Envira Amazonia Project's Rio Branco headquarters also created to structure to receive residents from the community. For instance, on August 5, 2017, José Rodrigues de Souza and his daughter Maria Ana de Souza Rodrigues were received at the urban headquarters. During their stay, Maria and José were driven to and from the hospital in Rio Branco, and were given free accommodations and meals by the Project. In addition, during November and December 2017, the Rio Branco headquarters received Mr. João Bispo and his daughter Miquelania Bispo, both residents of the Project. Miss Miquelania received support from the Project with transportation, food, lodging and financial assistance for tests, where a type of cancer was diagnosed. The Project team provided financing for some of the initial medical care, hospitalization, and chemotherapy, and the ongoing procedures were taken care of directly by Mr. João.
May 2017	JR. Empreendimentos EIRELI delivered LED bulbs with solar

	chargers to each of the local communities.
May 2017	In May 19, 2017, JR Agropecuária e Empreendimentos EIRELI held a meeting with the President of the Union of Rural Workers (STR) of the municipality of Newbury/Acre, where the Envira Amazonia Project is located. The Project team discussed with the President, Mr. Antônio José da Conceição, all matters relating to the conditions of the residents and families living in the Project Area. This includes information about the actions undertaken to conserve the forests, social situations, and local biodiversity. In addition, the meeting discussed the legalization of the communities' land tenure through the donation of areas where residents already reside within the Project. The talks with STR were very useful, the Project team delivered to the President of the Union a physical copy and the digital archive of the PDD summary, and the meeting ended with a certainty of future partnerships.
May 2017 – May 2018	In May 2017, Mr. Mateus of the Republic of Açaí, an industrial açaí wine producer based in Feijó, visited the Project headquarters and met with the Project Proponents and the local communities to have a conversation about açaí collection. With over 15 years of business experience, Mr. Mateus was able to provide lessons on local conditions for the production, marketing and storage of açaí. Mr. Wenderson of SOS Amazonia and Mr. Tabot of SEAPROF (Secretaria de Extensão Agro-florestal e Produção Familiar do Estado do Acre in Portuguese or The Agroforestry and Family Production Extension Secretariat of the State of Acre in English) visited the Envira Amazonia Project in May 2018. Mr. Wenderson and Mr. Tabot were conducting a registry of the families who would like to collect rubber and would need sales support. Mr. Wenderson and Mr. Tabot also met with the Project Proponents at the headquarters during their visit.
May 2018	The second Basic Necessity Survey (BNS) and Participatory Rural Assessment (PRA) with a focus on degradation were administered by the Project Proponents with the local communities.
September 2018 – March 2019	The Project Proponents would like to offer agricultural extension courses to local community members. JR Agropecuária e Empreendimentos EIRELI have worked with the local agronomist Jose Dazio Bayma ("Dazio") for several years on different projects. From September to December 2018, JR Agropecuária e Empreendimentos EIRELI started conversations with Dazio

	specifically about offering agricultural extension courses to local community members at the Envira Amazonia Project. In January 2019, JR Agropecuária e Empreendimentos EIRELI verbally contracted Dazio, and then Dazio was contracted and first visited the Project in March 2019. Also on December 29, 2018, kits were delivered for each family that contained 1 hoe, 1 machete, and a grinding file.

Post-Validation: Years 6 to 10 (2019-2023)

Date	Milestone(s) in the project's development and implementation
2019-2023	Ongoing implementation of aforementioned social projects and programs (i.e., implementation of agricultural extension training, maintenance of onsite health clinic, etc.) at the Envira Amazonia Project.
2020	Follow up bird study by local ornithologist to take place at the Envira Amazonia Project.
May 2022	Third BNS and PRA tentatively scheduled.
August 1, 2022	Initial 10-year baseline of Project expires; Project Proponents will reassess land-use and model new deforestation baseline for second baseline period.

Since August 2012, JR Agropecuária e Empreendimentos EIRELI has begun to implement and/or designed the following project activities:

- Forego Clearing of the Project Area and Conversion to Pasture;
- Raise Project Awareness;
- Hire Project Manager;
- Patrol and Monitor Deforestation;
- Provide Agricultural Extension Services, including Create Structure for Collection, Processing and Sales of Açaí and Medicinal Plants, along with Reestablish Rubber Tree Collection;
- Establish a Project Headquarters;
- Help Communities Obtain Land Tenure; and

- Improve and Build Health Center with Dental Clinic.

Forego Clearing of the Project Area

Beginning in August 2012, JR Agropecuária e Empreendimentos EIRELI has voluntarily foregone the conversion of the Project Area's primary forests to a large-scale cattle ranch despite having all the necessary licenses and approvals. Instead, JR Agropecuária e Empreendimentos EIRELI and the Project team will continue to implement a forest conservation project.

Project Awareness

The communities near the Project Area are an essential component of the Envira Amazonia Project and throughout 2014, the Envira Amazonia Project was discussed in greater detail with the local families to ensure they were fully aware of the Project, were able to contribute to the Project design, able to openly express desired outcomes and concerns, understood the third-party grievance procedure, and were able to voluntarily give Free, Prior and Informed Consent (FPIC).

Ayri Saraiva Rando was hired as an independent community specialist and visited a total of 41 families between May 20th and June 11th, 2014. Local families who wanted to join the Envira Amazonia Project either verbally agreed to join the Project and/or signed an "ata" between May 20th and June 11th, 2014. As of June 2014, all of the community members interviewed within the Envira Amazonia Project area have either signed the "ata" or verbally agreed to assist the project in reducing deforestation.

In December 2014, JR Agropecuária e Empreendimentos EIRELI, CarbonCo, TerraCarbon, and Carbon Securities visited the local communities as part of the validation audit and to introduce the entire project team. The Project Proponents have also visited the Project in December 2014, November 2015, January 2017, and May 2018.

Through meeting with the local families, the Project Proponents have been able to gain the community's insights about project design and to better incorporate the communities into the Project.

A brief summary of Project meetings and stakeholder comments have been provided below.

March 9-18, 2011 - CarbonCo, Carbon Securities and TerraCarbon traveled to Acre, Brazil to better understand how to implement REDD+ projects in Acre, Brazil. A few key milestones included:

- CarbonCo, Carbon Securities and TerraCarbon held initial meetings with PESACRE (Grupo de Pesquisa e Extensão em Sistemas Agroflorestais do Acre), IPAM (Instituto de Pesquisa Ambiental da Amazônia), FUNTAC (Fundacao de Tecnologia do Estado do Acre), and SISA (System of Incentives for Environmental Services) to gain an understanding of the agents and drivers of deforestation in Acre state, how forest biomass stocks vary across the state, and local REDD+ and forest conservation initiatives;

- Carbon Securities and TerraCarbon met with Acre State Officials, including Monica Julissa De Los Rios de Leal and Eufran Amaral, on Friday, March 18th.

- The Purus Project's design, which would later influence how the Envira Amazonia Project was designed, was revised based off this initial site visit in March 2011. For example, the Project Proponents: began to design the Project around the identified drivers and agents of deforestation (i.e., selection of appropriate VCS methodology); chose the source of satellite imagery (i.e., FUNTAC/Climate Change Institute); and began a close, consultative relationship with the State of Acre.

August 9-18, 2011 - CarbonCo, Carbon Securities, and TerraCarbon visited Rio Branco. A few key milestones included:

- TerraCarbon led a classroom forest carbon inventory training for TECMAN field crew for the Purus Project. TECMAN would later be hired for the Envira Amazonia Project.

- CarbonCo, Carbon Securities, TerraCarbon, and TECMAN met with Acre State officials, including Monica Julissa De Los Rios de Leal and Lucio Flavio, to discuss how to best design the forest carbon inventory to align with the State of Acre's goals and future forest inventory plans. The Project's forest carbon inventory design (for example, the size of each plot and the plot design) was revised based off the State of Acre and TECMAN's input;

- CarbonCo, Carbon Securities, and TerraCarbon visited the Purus Project to train TECMAN's field crew in forest inventory practices and standard operating procedures, which would later be used during the Envira Amazonia Project's forest carbon inventory.

- CarbonCo, Carbon Securities, and TerraCarbon met with Willian Flores to discuss the VCS methodology, VM0007 REDD Methodology Modules, applicable to modeling regional deforestation. Willian Flores would later be contracted for assistance with the Envira Amazonia Project.

- CarbonCo, Carbon Securities, TerraCarbon, and Willian Flores met with Acre State officials, including Monica Julissa De Los Rios de Leal, Eufran Amaral and Lucio Flavio on Tuesday, August 9th to discuss how to best develop the project-level baseline; how private projects will nest with a forthcoming state-level baseline; and the type of GIS data available from the State of Acre.

November 21, 2011 – CarbonCo spoke with Shaina Brown, Project Director at the Green Technology Leadership Group and Tony Brunello, the REDD Offset Working (ROW) Group's facilitator to better understand the developments in the State of California and how they relate to the State of Acre.

February 10, 2012 – CarbonCo spoke with Natalie Unterstell, the focal point for REDD+ at Brazil's Federal Ministry of Environment. Discussions were based around:

- The role of Brazil's Federal Government in the REDD+ context; Progress of the Amazon Fund; How States, particularly Acre, might nest into the National Government; How Brazil's domestic cap-and-trade market is shaping up; Market mechanisms and REDD+ as potentially eligible offsets; Where to go for REDD+ information on Federal government updates and how to inform the Government of our Project.

August 2, 2012 – CarbonCo, Carbon Securities and JR Agropecuária e Empreendimentos EIRELI signed the Tri-Party Agreement.

April 5, 2013 - CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro (owner of Russas Project) met again with Eufran Amaral from the Climate Change Institute to give an update on all the Projects, including informing about moving forward with the Envira Amazonia Project, and received updates on the work of the Climate Change Institute.

April 30, 2013 – CarbonCo held another call with Natalie Unterstell of Brazil's Ministry of Environment to update her that the Purus Project became the first dual VCS-CCBS validated REDD+ Project in Acre and that the Envira Amazonia Project would undergo VCS-CCBS validation later in 2014.

January 31, 2014 – Brian McFarland of CarbonCo presented at the Forests as Capital Conference hosted by the Yale School of Forestry & Environmental Studies' Chapter of the International Society of Tropical Foresters. Brian's presentation gave an introduction to CarbonCo, described CarbonCo's Acre REDD+ Projects, and discussed REDD+ and other conservation financing instruments.

May 7-9, 2014 – CarbonCo, Carbon Securities and TerraCarbon met JR Agropecuária e Empreendimentos EIRELI to discuss the VCS Project Description and CCBS Project Design Document. The conversations focused on identifying proxy sites and further refining the proposed project activities.

May 8, 2014 – CarbonCo, Carbon Securities and TerraCarbon met with the Climate Change Institute to give an update on all Acre REDD+ projects, including the Envira Amazonia Project, and received updates on the latest developments at the Climate Change Institute. More specifically, this meeting was with Monica Julissa De Los Rios de Leal and Magaly Medeiros, the new director of the Climate Change Institute.

May 9, 2014 – CarbonCo, Carbon Securities, JR Agropecuária e Empreendimentos EIRELI (particularly Fredis C. Vasques) and TerraCarbon met TECMAN for a classroom training refresher on the Envira Amazonia Project's forest carbon inventory and standard operating procedures.

May 10, 2014 - CarbonCo, Carbon Securities, JR Agropecuária e Empreendimentos EIRELI (particularly Fredis C. Vasques) and TerraCarbon met TECMAN in the field to further refine field techniques for the Envira Amazonia Project's forest carbon inventory and further reviewed the standard operating procedures**.**

May 13, 2014 – CarbonCo and Carbon Securities met Ayri Saraiva Rando to review community surveys and discuss logistics to visit Envira Amazonia Project.

May 13, 2014 – CarbonCo and Carbon Securities met Fronika de Wit to introduce the Project Proponents, gave an overview of all Acre REDD+ projects underway (particularly the Envira Amazonia Project), and discussed how Fronika de Wit might be able to participate in the Project.

May 19, 2014 – Carbon Securities met with Rodrigo Fernandes das Neves, the State Prosecutor, to discuss the Acre REDD+ Projects including the Envira Amazonia Project, and to get an update on the state-level baseline.

May 20-21, 2014 – CarbonCo, Carbon Securities, and JR Agropecuária e Empreendimentos EIRELI met Maron Greenleaf to introduce the Project Proponents, give an overview of all Acre REDD+ projects underway (particularly the Envira Amazonia Project), and discussed Maron Greenleaf's anthropological research in Acre for her PhD at Stanford University.

May 20 – June 11, 2014 – Ayri Rando met with a total of 10 families in the Project Zone and 31 families along the Envira River (i.e., outside the Project Zone) to: explain what is REDD+, explain the landowners' proposed activities and explain the overall Project design; discuss the benefits of the Project and listen to the concerns of the local families and listen to the families' anticipated results; inform the families about another visit in October or November to notify them about the CCBS Public Comment Period and another visit in December with an independent auditor; and to conduct research on basic necessities, agricultural needs, and participatory rural appraisals. The Project was significantly revised based off the families' input. For example, the Project was revised by incorporating specific agricultural extension courses, restructuring the Project's implementation schedule, and targeting the needs of women.

June 24, 2014 – Brian McFarland of CarbonCo presented at Ecosystem Marketplace's State of the Voluntary Carbon Market and gave an overview of CarbonCo's work in Acre, Brazil.

August 10-31, 2014 - CarbonCo and Carbon Securities contacted several potential contractors to assist the Project Proponents in 2015 with a rapid assessment of endemic and vulnerable bird species throughout the Project Zone. This includes Brazilian biologists Guilherme Serpa, Luiz Henrique Medeiros Borges, Fernando Pacheco, and Tomaz Nascimento de Melo.

September 3, 2014 - CarbonCo and TerraCarbon held a call with the VCSA (now known as Verra) to give an update on the Acre REDD+ Projects, including the Envira Amazonia Project, and discussed the future developments necessary to best position the Acre REDD+ Projects for their potential inclusion in a California compliance carbon market.

December 10, 2014 – CarbonCo, Carbon Securities, TerraCarbon and JR Agropecuária e Empreendimentos EIRELI met with Mr. Hammerly Albuquerque, the mayor of Feijó, during his visit to Rio Branco. The Project Proponents introduced the Project and discussed current land-use activities in Feijó.

December 12, 2014 - CarbonCo, Carbon Securities, TerraCarbon, and JR Agropecuária e Empreendimentos EIRELI met José Cláudio Araújo Bomfim (the Secretary of Environmental Affiars) and José Rivaldo Silva de Souza (the Secretary of Agriculture) to discuss the Project and to learn more about their work in Feijó.

January 30, 2015 - Brian McFarland of CarbonCo presented at the US-China Business and Cultural Exchange Center and gave an overview of forest carbon projects and particularly CarbonCo's work in Acre, Brazil.

June 23, 2015 - Brian McFarland of CarbonCo presented "A Global Perspective on the Voluntary Carbon Markets" in Thessaloniki, Greece which included a case study on the Purus Project.

August 29, 2015 - Brian McFarland of CarbonCo presented "Investing in the Voluntary Carbon Markets and Developing Forest Carbon Projects" for the Sustainability & Investing course at the University of Maryland's Robert H. Smith School of Business.

November 12, 2015 – The Project Proponents met again with Mr. Hammerly Albuquerque, the mayor of Feijó. The Project Proponents shared an update on the Envira Amazonia Project and the latest developments with REDD+ policy.

November 22, 2015 – Brian McFarland of CarbonCo met Antonio Viveiros in Brasilia. Antonio's family owns land adjacent to the Envira Amazonia Project. Brian and Antonio discussed how REDD+ projects are developed, the approximate costs, and discussed specifics about both the property of Antonio's family and specifics about the Envira Amazonia Project.

December 5-12, 2015 - CarbonCo and Carbon Securities attended COP21 in Paris, France.

Januuary - February 2016 - Tomaz Nascimento de Melo, the contracted local ornitholigst who undertook a rapid bird study at the Envira Amaoznia Project, published his results in: *Atualidades Ornitológicas*, 189, janeiro e fevereiro de 2016 (*Ornithological News*, 189, January and February 2016).

February 23 - March 3, 2016 – CarbonCo and Carbon Securities met several stakeholders in Brazil including the Climate Change Institute of Acre, the Amazon Fund, USAID, and the Ministry of Environment. Such meetings included a presentation of our Acre REDD+ Projects and a discussion on recent developments in Acre and/or Brazil with respect to REDD+.

May 3, 2016 – Brian McFarland led a several hour post-conference workshop for EUCI in Toronto, Ontario entitled, "Developing a Compliance Strategy for Cap-and-Trade: The Offset Validation and Verification Process."

November 17, 2016 – Brian McFarland presented to two classes at Cornell University on "Global Carbon Markets and Developing Forest Conservation Projects" which included highlighting CarbonCo's projects in Acre.

April 17-21, 2017 – Brian McFarland and Jarett Emert from CarbonCo visited San Francisco, California to attend the North American Carbon World Conference. In addition to attending the Conference, Brian and Jarett also met with numerous stakeholders including Jason Gray from the California Air Resources Board.

May 13, 2017 - In May 2017, Mr. Mateus of the Republic of Açaí, an industrial açaí wine producer based in Feijó, visited the Project headquarters and met with the Project Proponents and the local communities to have a conversation about açaí collection. With over 15 years of business experience, Mr. Mateus was able to provide lessons on local conditions for the production, marketing and storage of açaí.

May 19, 2017 – Mazinho and Rege from JR Agropecuária e Empreendimentos EIRELI held a meeting with Mr. Antônio José da Conceição, the President of the Union of Rural Workers of the municipality of Feijo (STR-Feijo). The Project team discussed all matters relating to the conditions of the residents and families living in the Project Area. This includes information about the actions undertaken to conserve the forests, social situations, and local biodiversity. In addition, the meeting discussed the legalization of the communities' land tenure through the donation of areas where residents already reside within the Project. The talks with STR were very useful, the Project team delivered to the President of the Union a physical copy and the digital archive of the PDD summary, and the meeting ended with a certainty of future partnerships.

Meeting with STR-Feijó (Photo Credit: JR Agropecuária e Empreendimentos EIRELI)

September 19 and 20, 2017 – Elves Araruna participated in a training seminar at the Brasilia headquarters of the National Confederation of Industry (CNI in Portuguese) about the value of ecosystem services and entrepreneurship. The event was organized by Pereni Consultoria and several entities, such as CNI members, several Brazilian states, and the Getulio Vargas Foundation, participated. Elves presented the Project's experiences working with local communities and the voluntary carbon markets, and also explored the different possibilities of generating revenue via the extraction of non-timber forest products.

August to December 2017 - JR Agropecuária e Empreendimentos EIRELI participated as a representative of private REDD+ initiatives in several work groups organized by the Climate Change Institute. All of these workshop meetings were held in Rio Branco and most of the meetings were held at the FUNTAC Auditorium. Approximately fifteen people participated in each meeting with representatives from Acre Government, the Climate Change Institute, and local NGOs. JR Agropecuária e Empreendimentos EIRELI discussed the Envira Amazonia Project and the activities planned to be carried out at the Project.

October 10-15, 2017 – Brian McFarland and Jarett Emert from CarbonCo visited London, England to meet with international stakeholders interested in CarbonCo's REDD+ Projects.

October 18, 2017 – Brian McFarland presented for a brownbag lunch at the New England Aquarium about REDD+ Projects and highlighted CarbonCo's projects in Acre.

November 15, 2017 - Brian McFarland's book, *Conservation of Tropical Rainforests: A Review of Financial and Strategic Solutions*, is published by Springer / Palgrave Macmillan. The book provides orientation to conservation finance and specifically forest carbon offset projects, along with a case study a different Acre REDD+ project developed by CarbonCo and Carbon Securities called the Purus Project.

April 4-6, 2018 - Jarett Emert of CarbonCo attended the annual North American Carbon World conference in San Francisco and met with a wide-variety of carbon market stakeholders.

May 2-5, 2018 – The Project Proponents held several community meetings at the Envira Amazonia Project. During these May 2018 meetings, Mr. Wenderson of SOS Amazonia and Mr. Tabot of SEAPROF (Secretaria de Extensão Agro-florestal e Produção Familiar do Estado do Acre in Portuguese or The Agroforestry and Family Production Extension Secretariat of the State of Acre in English) visited the Envira Amazonia Project. Mr. Wenderson and Mr. Tabot were conducting a registry of the families who would like to collect rubber and would need sales support. Mr. Wenderson and Mr. Tabot also met with the Project Proponents at the headquarters during their visit.

May 8, 2018 – CarbonCo and Carbon Securities, along with representatives from the Russas and Valparaiso Projects hosted a public meeting in Cruzeiro do Sul to discuss REDD+ projects.

June 10-15, 2018 - Jarett Emert and Brian McFarland of CarbonCo traveled to London to participate in the European Responsible Business Summit and Code REDD's annual REDD Talks. In addition, Brian and Jarett met with several potential buyers of carbon offset credits from CarbonCo's REDD+ Projects in Brazil.

July 8 – 24, 2018 – CarbonCo and Carbon Securities met with numerous stakeholders including CONAREDD (the Brazilian National REDD Commission) in Brasilia and the IMC in Rio Branco.

Hire Project Manager

Jose Aurimar Tavares Carneiro (Jose's nickname is "Mazinho") is the local project manager of the Envira Amazonia Project. Mazinho helps with monitoring for deforestation, along with helping visitors at the Project by providing logistics. Mazinho also helped with the biodiversity and community impact monitoring plans. More specifically, Mazinho assisted the local community specialist Ayri Rando from May to June 2014 with the community surveys and then Mazinho assisted the local biologist Tomaz Nascimento from April to May 2015 with the bird study. Mazinho helped build the Project headquarters in December 2016, helped with the dentist visits from January to May 2017, helped build the onsite health clinic from December 2018 to March 2019, and helped with all of the Project Proponent visits from 2013 to 2019.

Mazinho was born on the property and has good rapport with the local families. Mazinho currently splits his time between staying at his house in Feijó and staying at his house along the Envira River.

In addition to Mazinho's assistance, Francisco Circlandio ("Francisco") will also assist with the Project as Francisco lives along with Jurupari River. Francisco is the son of Cazuza Circlandio; Cazuza lives in Feijó and Cazuza's house along the Jurupari River once temporarily served as the Envira Amazonia Project's informal headquarters.

Patrol and Monitor Deforestation

In addition to serving as local project managers, Jose Aurimar Tavares Carneiro (Mazinho) and Francisco Circlandio will both informally monitor for deforestation in the Project Area. Mazinho was originally hired back in 2003 to informally monitor the property.

When deforestation is identified, JR Agropecuária e Empreendimentos EIRELI will document and transfer this information to Carbon Securities and CarbonCo. Collectively, CarbonCo and JR Agropecuária e Empreendimentos will discuss the appropriate actions to undertake to counteract any reported deforestation.

Forest monitors will write down observations, document community meetings, input this data into the monitoring template, and share this information among the Project Proponents. A monitoring template will be completed, including the following information:

- Name of Monitor;
- Date of Monitor;
- Communities Visited;
- Meeting Notes with Community;
- Grievances and Concerns of Community;
- Location and Date of Deforestation;
- Responsible Actor for Deforestation;
- Observations Pertaining to Deforestation;
- Biodiversity Observed; and
- Other Notes Related to the Project.

In addition, satellite imagery from 2012 to 2018 was reviewed by TerraCarbon, Ostrya Conservation, and CarbonCo to assess deforestation within the Project Area.

Provide Agricultural Extension Services

Between 2012 and 2014, the Project Proponents discussed agricultural extension courses with the local communities, identified the most desired courses, and then drafted a high-level timeline and budget for the offering of such agricultural extension courses.

Based off feedback from the local families, JR Agropecuária e Empreendimentos EIRELI will offer several agricultural extension courses in 2019. Such agricultural extension courses shall include: alternatives to the use of fire in land preparation; improved pasture management, including rotational cattle pastures and vaccinations; extraction and processing of medicinal plants for commercial purposes; production of açaí; and raising chickens.

JR Agropecuária e Empreendimentos EIRELI have worked with the local agronomist Jose Dazio Bayma ("Dazio") for several years on different projects. From September to December 2018, JR Agropecuária e Empreendimentos EIRELI started conversations with Dazio specifically about offering agricultural extension courses to local community members at the Envira Amazonia Project. Also on December 29, 2018, kits were delivered for each family that contained 1 hoe, 1 machete, and a grinding file. In January 2019, JR Agropecuária e Empreendimentos EIRELI verbally contracted Dazio, and then Dazio was contracted and first visited the Project in March 2019.

Between 2012 and 2014, the Project Proponents also discussed with the local communities the idea of creating a structure to collect, transport and sell locally-sourced rubber, açaí and medicinal plants. Upon receiving a high-level of interest, the Project Proponents then developed a high-level budget and timeline for their implementation.

In May 2017, Mr. Mateus of the Republic of Açaí visited the Project headquarters and met with the Project Proponents and the local communities to have a conversation about açaí collection.

In addition, Mr. Wenderson of SOS Amazonia and Mr. Tabot of SEAPROF (Secretaria de Extensão Agro-florestal e Produção Familiar do Estado do Acre in Portuguese or The Agroforestry and Family Production Extension Secretariat of the State of Acre in English) visited the Envira Amazonia Project in May 2018. Mr. Wenderson and Mr. Tabot were conducting a registry of the families who would like to collect rubber and would need sales support. Mr. Wenderson and Mr. Tabot also met with the Project Proponents at the headquarters during their visit.

Agricultural extension trainings will assist the Project Proponents achieve both the climate and community objectives of the Envira Amazonia Project. These activities will result in both net GHG emission reductions by reducing the communities' dependence on forest resources through intensifying agriculture and livestock, while also providing the communities with alternative incomes.

Create Structure for Collection, Processing and Sales of Açaí

JR Agropecuária e Empreendimentos EIRELI will develop a structure for the collection, processing, transportation and eventual sales of açaí.

This structure will involve the creation of decentralized units throughout the Project Area, with each unit managed by a local community member. Each unit will collect locally produced açaí berries, the raw berries will be transported to a processing plant, the açaí berries will be processed into açaí juice, and then the finished products will be sold to end consumers.

Between 2012 and 2015, the idea of creating a structure for açaí was formulated, the idea was discussed with the local communities to gauge their level of interest and then the Project Proponents drafted a high-level timeline and budget. Furthermore, CarbonCo engaged an international firm to look into developing an agroforestry project with a specific focus on sustainably sourced cacao. The initial engagement began in late 2015 with a Memorandum of Agreement (MOA) signed in February 2016.

In May 2017, Mr. Mateus of the Republic of Açaí, an industrial açaí wine producer based in Feijó, visited the Project headquarters and met with the Project Proponents and the local communities to have a conversation about açaí collection. With over 15 years of business experience, Mr. Mateus was able to provide lessons on local conditions for the production, marketing and storage of açaí.

In the future, Mr. Mateus may assist the residents of the Project Area with more specific actions related to identifying the best areas for native açaí plants, specific harvesting and storage techniques, and Mr. Mateus may develop a feasibility study on the production and harvesting of açaí in the region. This feasibility study would be shared with the Project Proponents and the local communities in order to help improve their incomes.

One challenge that arose is that the communities said the local açaí matures in July, which is during the low water season, and this makes it very difficult to transport the product for sale.

The collection, processing, and sales of açaí will help the Envira Amazonia Project achieve the climate, community and biodiversity objectives. Thus, by diversifying the landowners and local communities' incomes, there will be less pressure on forest resources and shall help preserve the Project Zone's biodiversity.

Create Structure for Collection, Processing and Sales of Medicinal Plants

JR Agropecuária e Empreendimentos EIRELI would also like to create a management and sales structure that would enable the local communities to collect and dry medicinal plants.

The company will eventually apply to the government for approval to sell a specific quantity of medicinal plants. Collecting and selling medicinal plants will provide alternative economic opportunities for both local communities and for JR Agropecuária e Empreendimentos EIRELI. For example, there is a factory called Dr. Roots in Rio Branco, that sells medicinal roots and there is also a cosmetic factory in Tarauacá which sells to national markets. In the past, the landowner was working with a French company about medicinal plants.

According to the local families, some of the most important medicinal plants found in the region include:

- Amburana
- Andiroba
- Balso

- Copaiba
- Espra ai
- Jatoba
- Mastruz
- Quina-Quina

Between 2012 and 2014, the idea of collecting medicinal plants was formulated, the idea was discussed with local communities to gauge their level of interest, the most important medicinal plants were identified, and then the Project Proponents drafted a high-level timeline and budget. The Project Proponents also informally visited potential buyers of medicinal plants in Rio Branco in 2014 and 2015.

Collecting, drying and selling medicinal plants will enable the Project Proponents to achieve the climate, community and biodiversity objectives. By diversifying and increasing community and JR Agropecuária e Empreendimentos EIRELI revenue, there will be less deforestation pressure on the tropical forests while simultaneously reducing GHG emissions.

Reestablish Rubber Tree Collection

JR Agropecuária e Empreendimentos EIRELI will reestablish a rubber trees project. The region is very rich in rubber, but the local families do not know how to sell the rubber because of the crash in rubber prices. Although rubber prices have recovered, the local families do not have the management and sales structure. Essentially, rubber throughout the Project Area will be collected and transferred to Feijó. The rubber will then be primarily sold to São Paulo for use in the soles of shoes.

Between 2012 and 2014, the idea to start recollecting rubber was formulated and the idea was discussed with communities to gauge their level of interest. The Project Proponents then drafted a high-level timeline and budget. The Project Proponents also started to look into the market for rubber and preliminarily identified potential places to reforest with rubber trees. As previously mentioned, CarbonCo engaged an international firm to look into developing an agroforestry project with a specific focus on sustainably sourced cacao. The initial engagement began in late 2015 with a Memorandum of Agreement (MOA) signed in February 2016.

Mr. Wenderson of SOS Amazonia and Mr. Tabot of SEAPROF (Secretaria de Extensão Agro-florestal e Produção Familiar do Estado do Acre in Portuguese or The Agroforestry and Family Production Extension Secretariat of the State of Acre in English) visited the Envira Amazonia Project in May 2018. Mr. Wenderson and Mr. Tabot were conducting a registry of the families who would like to collect rubber and would need sales support. Mr. Wenderson and Mr. Tabot also met with the Project Proponents at the headquarters during their visit.

Collecting rubber, reforesting deforested areas with rubber trees, and selling rubber will enable the Project Proponents to achieve the climate, community and biodiversity objectives. By diversifying and increasing community and JR Agropecuária e Empreendimentos EIRELI revenue, there will be less deforestation pressure on the tropical forests while simultaneously reducing GHG emissions.

Establish a Project Headquarters

In the past, JR Agropecuária e Empreendimentos EIRELI had a headquarters established along the Envira River and the headquarters was called the "Casarao Antigo do Seringal Canada." In the future, this headquarters may be reactivated and in beginning stages of the Project, Cazuza's house along the Jurupari River was temporarily used as the informal headquarters of the Envira Amazonia Project.

Between 2012 and 2014, the idea of a formal headquarters was discussed amongst the Project Proponents, with CarbonCo and Carbon Securities sharing examples from their other REDD+ projects in Acre. In addition, the Project Proponents drafted a high-level timeline and budget for the eventual creation of a formal headquarters.

In December 2016, an official headquarters was established inside the Project Area along the Jurupari River. The headquarters provides: a place for visitors to sleep and eat; a place for community meetings and teaching courses; storage for project equipment and education. The headquarters, which was built by Mazinho with assistance from local community members, is equipped with a shower, toilet, a kitchen, meeting area, and sleeping quarters.

Headquarters at Envira Amazonia Project (Photo Credit: JR Agropecuária e Empreendimentos EIRELI)

In January 2017, an onsite pharmacy was established at the Project's headquarters.

Furthermore, the headquarters was maintained throughout 2017, 2018 and 2019.

In approximately January 2015, the Envira Amazonia Project established an urban headquarters in Rio Branco. The urban headquarters provides a place for project documents and established two dedicated guest rooms to receive residents from the community. In addition to a place to stay, the Project also provides food, showers, and transportation for visiting community members.

For instance, on August 5, 2017, José Rodrigues de Souza and his daughter Maria Ana de Souza Rodrigues were received at the urban headquarters. During their stay, Maria and José were driven to and from the hospital in Rio Branco, and were given free accommodations and meals by the Project.

In addition, during November and December 2017, the Rio Branco headquarters received Mr. João Bispo and his daughter Miquelania Bispo, both residents of the Project. Miss Miquelania received support from the Project with transportation, food, lodging and financial assistance for tests, where a type of cancer was diagnosed. The Project team provided financing for some of the initial medical care, hospitalization, and chemotherapy, and the ongoing procedures were taken care of directly by Mr. João.

Furthermore, the headquarters at the Envira Amazonia Project provides a bigger and newer facility for Project EJA (The Territorial Agenda for Integrated Development of Literacy for Youth and Adult Education). More specifically, teachers are hosted at the headquarters and they provide adult education to approximately nine local community members.

Building the headquarters helps contribute to the community objective because the office serves as a centralized headquarters and will facilitate JR Agropecuária e Empreendimentos EIRELI's social projects and programs.

Help Communities Obtain Land Tenure

Community members that have been living on the land and who made the land productive (e.g., by growing agriculture or raising animals) for ten years have the right to be titled to land. JR Agropecuária e Empreendimentos EIRELI will voluntarily recognize whatever area is currently deforested and under productive use by each family and up to the recommended size that a family in the municipality of Feijó needs for a sustainable livelihood according to State and Federal laws. All communities, whether they join the Envira Amazonia Project or not, will be titled the land they have put under productive use.

Between 2012 and 2014, JR Agropecuária e Empreendimentos EIRELI agreed to voluntarily title land to the local communities, the idea of receiving land tenure was discussed with the local communities, and then the Project Proponents drafted a high-level timeline and budget for the eventual titling of land. The Project Proponents also identified potential independent organizations (e.g., STR-Feijó) in case assistance is needed. In 2016, another REDD+ project developed by CarbonCo and Carbon Securities granted official title to the first community member. This experience, and the technical details, were shared with JR Agropecuária e Empreendimentos EIRELI to hopefully make the process more efficient for the Envira Amazonia Project.

In May 19, 2017, JR Agropecuária e Empreendimentos EIRELI held a meeting with the President of the Union of Rural Workers (STR) of the municipality of Newbury/Acre, where the Envira Amazonia Project is located. The Project team discussed with the President, Mr. Antônio José da Conceição, all matters relating to the conditions of the residents and families living in the Project Area. This includes information about the actions undertaken to conserve the forests, social situations, and local biodiversity. In addition, the meeting discussed the legalization of the communities' land tenure through the donation of areas where residents already reside within the Project. The talks with STR were very useful, the Project team

delivered to the President of the Union a physical copy and the digital archive of the PDD summary, and the meeting ended with a certainty of future partnerships.

Helping families obtain land tenure will assist the Project Proponents with facilitating the community's sustainable economic opportunities. This formal recognition of the community's land tenure and the ability of families to access credit (i.e., due to their property collateral) will reduce GHG emissions as families will have greater responsibility and ownership over their land.

Improve and Build Health Center and Dental Clinic

JR Agropecuária e Empreendimentos EIRELI plan to improve the health center along the Envira River and has built a health center in the Project Area along the Jurupari River. These health centers will provide local families with preventive and curative medicine, including dental. JR Agropecuária e Empreendimentos EIRELI would also like to facilitate the increased frequency of visits from the doctor in Feijó via the boat being purchased.

Between 2012 and 2014, the Project Proponents discussed the eventual creation of a local health center and dental clinic, discussed how to incorporate climate change adaptation techniques, discussed the idea with local communities, and then drafted a high-level timeline and budget. JR Agropecuária e Empreendimentos EIRELI donated dental hygiene kits with toothbrushes and toothpaste to the local communities in November 2015. At the time, JR Agropecuária e Empreendimentos EIRELI also wanted to distribute medicine including malaria pills. Also in 2015, CarbonCo and Carbon Securities shared details of the health clinic that was constructed at another one of their REDD+ projects in Acre, along with details on how the doctor and dentist visits were arranged.

In January 2017, JR. Empreendimentos EIRELI delivered a kit containing several medicines to treat illnesses such as fever, basic worms, various pains, poisonous animal bites, as well as was given a thermometer and equipment to measure blood pressure. The onsite pharmacy was established in January 2017. Also during the January 2017 visit, a dentist Marcos Prado attended to do dental checkups and to offer to return for the delivery of prosthetic teeth for the community. On April 20 and 21, 2017, the dental team returned to the Project when they made 46 dental molds. On May 12 and 13, 2017, the dental team returned to the Project to deliver the prosthetic teeth.

In May 2018, CarbonCo provided the funding to replenish medicine at the pharmacy. In December 2018, each family received a kit of medicines containing: 3 boxes of medicine for worms (in general); 1 glass of liquid dipyrone (for pains and fever); and dipyrone in tablets form. In addition, the Project delivered to the community pharmacy: 3 glasses of medicine to treat bites of venomous animals; 3 boxes of anti-inflammation; and extra medicine kits to treat fever, pain, and worms.

Furthermore, JR. Empreendimentos EIRELI looked into building a standalone health clinic near the Project's headquarter and looked into buying a dentist chair. Supplies for the health clinic were purchased in December 2018 and negotiations to purchase the dental chair were also initiated in December 2018. The dentist chair was then purchased in January 2019 and was installed at the Project in March 2019. The onsite health clinic was built from January to March 2019.

In approximately January 2015, the Envira Amazonia Project's Rio Branco headquarters also created structure to receive residents from the community. For instance, in August 5, 2017, José Rodrigues de Souza and his daughter Maria Ana de Souza Rodrigues were received at the urban headquarters. During their stay, Maria and José were driven to and from the hospital in Rio Branco, and were given free accommodations and meals by the Project. In addition, during November and December 2017, the Rio Branco headquarters received Mr. João Bispo and his daughter Miquelania Bispo, both residents of the Project. Miss Miquelania received support from the Project with transportation, food, lodging and financial assistance for tests, where a type of cancer was diagnosed. The Project team provided financing for some of the initial medical care, hospitalization, and chemotherapy, and the ongoing procedures were taken care of directly by Mr. João.

The health center and dental clinic is also relevant to the community objective because this is another main social project that JR Agropecuária e Empreendimentos EIRELI would like to facilitate. The health centers will ultimately improve life quality and increase life expectancies, which will result in healthier, more productive community members. For instance, there is increased joy of the residents and community where several of its members recovered the right to eat using their teeth and to smile without the embarrassment of showing the flaws and lack of teeth in their mouths.

2.2.2 Methodology Deviations

The following deviations to the methodology are applied.

1) Trees in the Cecropia genus will not be included as part of the forest inventory, due to the unavailability of applicable biomass equations. This has been proposed as a deviation as it stands in conflict with the CP-AB requirement that "all the trees above some minimum DBH in the sample plots" be measured.

2) While sampling lying dead wood using the line intersect method:

- Two 92-meter transect lines were used rather than two 50-meter transect lines;
- The sampling lines did not bisect each sample plot, but rather ran from one plot center to the next; and
- The sampling lines were oriented to the north and east, and no randomization in the bearing of the first line was employed.

3) Rather than using a root to shoot ratio to estimate belowground biomass as per the CP-AB module, belowground biomass was estimated using an allometric equation developed by Cairns et al.[13] Cairns et al. is appropriate for determining belowground biomass as this equation is published in a peer-reviewed scientific journal. In fact, guidance for new methodologies as found in VCS AFOLU Requirements version 3.4 specifically mentions the Cairns et al. equations in reference to established procedures for quantifying belowground biomass, thus indicating the appropriateness of this source.

[13] Cairns, M. A., S. Brown, E. H. Helmer, and G. A. Baumgardner. 1997. Root biomass allocation in the world's upland forests. Oecologia 111, 1-11.

4) The forest inventory has deviated from the criteria for selection (i.e., the equation is based on a datasets comprising at least 30 trees, with an r^2 that is ≥ 0.8) and validation of the allometric equation related to palm biomass, however the equation used is likely to result in a conservative estimate of palm biomass for the following reasons:

-Volume is calculated as the volume of a parabaloid rather than the volume of a cylinder; and

-Only stem biomass is estimated, thus conservatively excluding other aboveground biomass including palm fronds.

5) Dead wood collected for density determination was opportunistically sampled from within forest strata present in the project area. The forest inventory collected a total of 39, 42, 37 samples for the sound, intermediate, and rotten[14] classes, respectively.

6) Parameter $U_{P,SS,i,pool\#}$ will be monitored at least once every 10 years, on re-measurement of forest carbon stocks. While module X-UNC requires that monitoring of this parameter occur every ≤ 5 years, this requirement is inconsistent with the VM0007 pools modules, which specify that stock estimates (from which uncertainty is calculated) are assumed valid for 10 years. Therefore, a deviation to module X-UNC is applied to permit parameter $U_{P,SS,i,pool\#}$ to be monitored every ≤ 10 years, putting it into alignment with modules CP-AB and CP-D.

7) Rather than monitoring Cpost using modules CP-AB and CP-D as described in the MON modules, C(post) can conservatively be assumed to be zero in the with project case, not only for natural disturbance (CP,Dist,q,i , as stated in Section 5.2.3 of the M-MON module) but also for deforestation (CP,post,u,i). This deviation is conservative because subtracting zero from the baseline stocks, leads to the conclusion that ΔCpools,Def,u,i,t is equal to C(BSL,i), which leads to the maximum emission in the with project case, which is conservative. This deviation may be used for the first and each subsequent monitoring period.

8) The parameter ARRL,forest was not monitored or updated in 2018 as the Acre dataset, the input for the calculation of ARRL,forest, was discontinued in 2017 and the follow-on dataset had not been released by the Brazilian government at the time of reporting. As this parameter does not drive project accounting, its neglect does not negatively impact the conservativeness of the quantification of GHG emission reductions or removals.

9) The frequency which degradation needs to be monitored has been increased from 2 years to less than 5 years to streamline monitoring requirements and ensure consistency throughout the M-MON module. The requirement to conduct the PRA every 2 years does not make sense because even where the PRA indicates degradation is occurring, degradation is then estimated by a “limited sampling” approach (as found in M-MON) which would only be implemented in the field at a sampling frequency of less than 5 years. Further, the degradation PRA is the only parameter (as listed in 3.1.2 Data and Parameters Monitored) which necessitates a frequency of measurement less than 5 years. This deviation “from the

[14] Note that 27 of the 37 rotten samples were sourced outside the project area as those sourced from within the project area did not return to the lab intact.

criteria and procedures relating to monitoring or measurement" as set out in the methodology has been first utilized during the 2016-2018 monitoring period. The deviation does not negatively impact the conservativeness of the quantification of GHG emission reductions or removals. This is the case because this initial PRA is only used to indicate as to whether degradation is de minimis or not. This deviation relates only to the criteria and procedures for monitoring or measurement, and does not relate to any other part of the methodology as it only affects the degradation emission parameter in the M-MON module.

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

There are no minor changes to the project description.

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

There are no deviations to the project description.

2.2.5 Grouped Projects

The Envira Amazonia Project is not a grouped project and therefore this section of the monitoring report is not applicable.

2.2.6 Risks to the Project (G1.10)

The following are the potential natural, anthropogenic, and project risks along with the mitigation measures identified by the Project Proponents. Overall, the risks associated with the Envira Amazonia Project are considered low and justify a relatively low Verified Carbon Standard buffer reserve established for any verified emission reductions (i.e., VERS; also known as carbon offsets or carbon credits). These risks were identified and reviewed by the Project Proponents between 2012 and 2018.

Natural and Human-Induced Risks

The following are some potential natural and human-induced risks that could impact forest conservation projects and particularly the Envira Amazonia Project. None of these risks significantly impacted the Envira Amazonia Project from 2012 to 2018.

Natural Risks

The following are several natural risks identified by the Project Proponents which could impact the Envira Amazonia Project:

- Seedling, sapling and tree survival;
- Drought and flooding;
- Severe weather;
- Forest fire;

- Disease, invasive species, and pest infestations; and
- Risks related to ability to adapt to climate change and climate variability.

Due to the fact that the Project is primarily a forest conservation project, there is limited risk of seedling, sapling and tree survival because reforestation is not the major climate objective. While there will be some reforestation activities, the carbon sequestration of these activities will not be counted towards the generation of verified emission reductions (VERs).

With respect to drought and flooding, the Envira-Jurupari-Purus River basin is a wetland ecosystem where the native habitat thrives under periodically flooded conditions. Being a tropical climate, the Project is not prone to snowstorms and there are no volcanoes in the general vicinity. Furthermore, the State of Acre historically has not experienced hurricanes, monsoons, or tornadoes with only minimal effects from Chilean earthquakes.[15]

Another risk to the Project is a forest fire. Forest fire historically has not been a problem in the Project Area. Most of the Project Area is un-fragmented forest, with few areas of bordering pasture/non-forest. Most forest fires that occur in the region are anthropogenic, and thus sources of fire outbreaks in the Project Area are limited.

Incidence of fire in the Amazon has increased with recent severe droughts of 1998, 2005 and 2010. While drought conditions facilitate forest fire, fire still requires sufficient fuel loads (typically produced from previous disturbance) and an ignition source, both of which can reasonably be assumed to be less (and by extension, fire incidence should be less) in the large, intact block of forest at the Project (and maintained through project-funded protection activities) than in the surrounding land-use matrix. Aragao and Shimbukuro (2010) show that the state of Acre, which has large blocks of intact forest, has no observed increase in fire incidence from 1998 to 2006, as compared with more developed and impacted areas of the Eastern and Central Amazon (e.g. Para, Mato Grosso, Rondônia and Maranhao).[16] Consequently, the rates of fire incidence referenced in the Project's VCS Risk Report (Cochrane and Laurance 2002), based on data from Para state, should be considered overestimates of expected incidence in Acre, and therefore conservative.

Aragao and Shimbukuro (2010) further observe that "fire-free land-management can substantially reduce fire incidence by as much as 69%." The state of Acre, as part of its State System of Incentives for Environmental Services (SISA), has instituted state-wide fire control and monitoring activities since 2010, and should be expected to show results similar to those areas of fire-free land-management witnessed (between 1998 and 2006) by Aragao and Shimbukuro. The Project Area should be expected to benefit in terms of reduced fire risk from decreased fire incidence and proximal ignition sources in the surrounding land-use matrix.

[15] Center for Weather Prediction and Climate Studies, "Home," Available: http://www1.cptec.inpe.br/
National Observatory, "Seismic Data," mhttp://www.on.br/conteudo/modelo.php?endereco=servicos/servicos.html
[16] Luiz E. O. C. Aragão and Yosio E. Shimabukuro, "The Incidence of Fire in Amazonian Forests with Implications for REDD." *Science* 328, 1275 (2010); DOI: 10.1126/science.1186925

Furthermore in a study[17] of fires in the Amazon, Cochrane and Laurance documented a relationship between fire incidence and distance from forest edge, with decreasing fire return intervals with increasing distance from edge. They also found that effects of forest fires depend on the extent and condition of fuel sources. In general, drought conditions need to be present prior to the initiation of rainforest fires. While initial fires can have a significant effect on the smaller diameter (<40 cm dbh) trees, it is only with subsequent burns, that significant losses (mortality of up to 40% of trees) of forest biomass can be expected.[18] Despite fire induced tree mortality, tree mortality itself is unlikely to result in the loss of substantial biomass due to incomplete combustion of live aboveground biomass. Biomass is merely transferred from the live biomass to dead biomass pool, which is also accounted for in this Project.

Further as fire is unlikely to affect the whole Project Area, the significance of any single fire event is likely to be minor and result in less than 25% loss in carbon stocks in the Project Area.

The Cochrane and Laurance study[19] mentioned above, calculated a fire return intervals in another part of the Amazon as 10 to 15 years. While the agents of deforestation (and fire) are similar between the region of the study (Para) and the Project region (Acre), deforestation rates and likely incidences of fire are greater in Para. This fire return interval therefore is likely to represent a conservative estimate of the fire return interval in the Project region with the actual interval likely being longer than 15 years.

It is also important to note that the State of Acre has some of the highest precipitation levels in the world with annual rainfall ranges from 1,600 – 2,750 millimeters (i.e., approximately 63 – 108 inches).[20] For more information with respect to fire, please see the VCS Non-Permanence Risk Assessment.

With regard to disease, invasive species and insect infestation, Brazil's Department of the Environment has approved a permanent technical committee known as the National Biodiversity Commission (CONABIO) which carefully monitors these developments.[21] The Project Proponents are aware that the Global Invasive Species Database, which is managed by the Invasive Species Specialist Group of the IUCN's Species Survival Commission, has identified 62 natural forest species which are either native to Brazil and act as an invasive species elsewhere or are native species elsewhere and are considered invasive species within Brazil.[22] Furthermore, three species native to Brazil (i.e., and which are considered invasive species elsewhere) are on the Global Invasive Species Database's 100 of the World's Worst Invasive Alien Species List.[23] The Project Proponents will carefully monitor any invasive

[17]Cochrane M.A.& Laurance W.F., 2002. Fire as a large-scale edge effect in Amazonian forests, Journal Of Tropical Ecology, 18:311-325.
[18]Cochrane M.A., Alencar A., Schulze M.D., Souza C.M., Nepstad D.C., Lefebvre P. & Davidson E.A., 1999. Positive feedbacks in the fire dynamic of closed canopy tropical forests, Science, 284(5421):1832-1835.
Cochrane M.A.& Schulze M.D., 1999. Fire as a recurrent event in tropical forests of the eastern Amazon: Effects on forest structure, biomass, and species composition, Biotropica, 31(1):2-16.
[19] Cochrane M.A.& Laurance W.F., 2002. Fire as a large-scale edge effect in Amazonian forests, Journal of Tropical Ecology, 18:311-325.
[20] State Government of Acre Portal, "Geographic Data,"
[21] National Biodiversity Commission, "Technical Committee," Available: http://www.mma.gov.br/sitio/index.php?ido=conteudo.monta&idEstrutura=15&idConteudo=7474&idMenu=368
[22] Global Invasive Species Database, "Alien Species," Available: http://www.issg.org/database/species/search.asp?sts=sss&st=sss&fr=1&sn=&rn=brazil&hci=1&ei=-1&lang=EN&Image1.x=30&Image1.y=10
[23] Global Invasive Species Database, "100 of the World's Worst Invasive Alien Species List," Available: http://www.issg.org/database/species/search.asp?st=100ss&fr=1&str=&lang=EN

species known to exist in Acre and will not extract any known species from the Project that are considered native species but which are invasive species elsewhere. For more information on the risk of invasive species, please see the VCS Non-Permanence Risk Assessment.

Regarding risks related to climate change and climate variability, the Project Proponents studied the CREAS Project (Regional Climate Change Scenarios for South America). According to the CREAS Project, the following scenarios and impacts are possible for the Amazon Region and particularly, the State of Acre where the Envira Amazonia Project is located:

Summary of future climate change scenarios for the end of the XXI Century and possible impacts in Brazil

AMAZON REGION
A2: 4-8 C warmer, 15-20% less rainfall.
B2: 3-5 C warmer, 5-15 % less rainfall
Possible impacts: High frequency of dry spells in eastern Amazonia and intense rainfall events in western Amazonia, losses in natural ecosystems, rain forest and biodiversity. Low river levels affecting transportation and commerce. Possible impacts on moisture transport and rainfall in Southeastern South America. Impacts on hydroelectric generation. More favorable conditions for spread of forest fires. Impacts on health and commerce due to smoke.

NORTHEAST BRAZIL
A2: 2-4 C warmer, 15-20% less rainfall.
B2: 1-3 C warmer, 10-15 % less rainfall
Possible impacts: High frequency of dry spells and evaporation rates and low soil moisture levels affecting levels of channels and reservoirs. Losses in natural ecosystems caatinga.Tendency towards aridization and desertification in the semiarid region. Water scarsity. Waves of climate refugees migrating towards large cities agravating social problems. Impacts on human health

WEST CENTRAL BRAZIL
A2: 3-6 C warmer,
B2: 2-4 C warmer,
Possible impacts: High frequency of intense rainfall events and dry spells. High evaporation rates and lower soil moisture can affect agriculture (coffee) and hydroelectric generation. Soil erosion due to high temperatures and intense dry spells can affect agriculture and natural ecosystems Pantanal and cerrado. .

SOUTHERN BRAZIL
A2: 2-4 C warmer, 5-10% more rainfall.
B2: 1-3 C warmer, 0-5 % more rainfall
Possible impacts: High frequency of intense rainfall events, increase in warm nights frequency (reduction of cold nights). Intense rainfall and high evaporation due to dry spells can affect agriculture (weath and soybean). Losses in natural ecosystems. High temperatures and intense rainfall can affect human health

SOUTHEASTERN BRAZIL
A2: 3-6 C warmer,
B2: 2-3 C warmer,
Possible impacts: High frequency of intense rainfall events. High evaporation rates and lower soil moisture can affect agriculture (coffee) and hydroelectric generation. High temperatures and intense rainfall can affect human health. Possible sea level rise.

Sources: INPE, MMA-PROBIO, EMBRAPA, CEPAGRI

[24]

As forecasted by the CREAS Project, "intense rainfall events in western Amazonia, losses in natural ecosystems, rain forest and biodiversity" are the primary risks. The anticipated climate change of "intense rainfall events" will have an impact on the well-being of families in the Project Zone and surrounding regions. For example, major flooding took place in Acre in February to April 2014 and in January to April 2015. Fortunately, only normal flooding took place during the rainy season from 2016 to 2018.

To mitigate these risks, the Project Proponents will incorporate adaptation activities. This includes: building the community health clinic and establishing an onsite pharmacy (to mitigate potential increase in mosquito-borne illnesses); ensuring agricultural extension courses incorporate climate change adaptation

[24] Jose A. Marengo, "Regional Climate Change Scenarios for South America - The CREAS," Available: projecthttp://unstats.un.org/unsd/climate_change/docs/papers/Session3_CCPapers_Marengo_1.pdf.

techniques; assisting communities with access to markets for their products to overcome increased difficulty in transportation networks (e.g., flooded highways and low river levels); and locating facilities such as the headquarters and health centers further away from river banks to minimize risk of flooding.

Reforestation activities within degraded areas will also help to minimize the risks of soil runoff.

Human-Induced Risks

The following are some potential human-induced risks that could impact forest conservation projects and particularly the Project:

- Illegal logging;
- Illegal hunting of endangered fauna;
- Illegal collection of endangered flora;
- Human-induced fires;
- Continued community willingness to participate in the Project; and
- Encroachment along a newly established ramal off of BR-364 highway and/or encroachment from an igarape (i.e., stream) near the Project Area.

The Project Proponents will regularly monitor the climate, community and biodiversity objectives of the Project and thus, will be able to identify early on if there are illegal logging or hunting activities taking place. The alternative economic activities such as collection of medicinal plants and rubber will reduce the need to use fire, and the agricultural extension courses will teach local families how to practice agriculture without using fire. Regarding the community's continued willingness to participate in the Project, the Project was designed and will be implemented in close consultation with the local families to ensure they are receiving both short-term and long-term benefits.

The original plan to mitigate the risk identified about encroachment along a newly established ramal off of BR-364 highway and/or encroachment from an igarape (i.e., stream) near the Project Area was for Mazinho to visit both the ramal and the igarape in June 2019; however, Mazinho was injured in a motorcycle accident. Mazinho is now recovering and doing better. The revised plan is for Mazinho to visit both the ramal and the igarape the week of July 22, 2019. Mazinho will take pictures and videos of the areas deforested. In addition, Mazinho will inform those responsible for the deforestation that beyond their areas is a private property doing a conservation project and deforestation is not allowed. If Mazinho is able to identify the people responsible for deforesting, JR Agropecuária e Empreendimentos EIRELI will follow the proper legal process by contacting IBAMA. More specifically, a compliant would be filed with IBAMA, IBAMA would check by their means to see if the complaint is legitimate and if the complaint is valid, IBAMA would then try to visit the area, and IBAMA would levy fines if necessary. Alternatively, the landowner could also file a "Ownership Return" paperwork with the State Prosecutor and this would be a formal way to have people removed from the area by the police department. This process is

comparable to an eviction notice. As of right now, there does not appear to be deforestation within the Project Area and will be continually monitored.

Project Risks

A few of the potential project risks identified by the Project Proponents include:

- A fixed plot of land per family is given, but an increasing family population results in less land per capita.
- As incomes increase, the use of illicit drugs, alcoholism and violence might increase.
- "An influx of relatively large cash sums in areas with weak governance or where local organizations lack appropriate systems runs the risks of mismanagement, corruption, and 'elite capture."[25]
- "Increased land speculation or in-migration, thus creating conditions for increased competition and social conflict within and between communities."[26]
- Restriction of cattle, results in lower wages, less assets and lower food security; similarly, crops could be less profitable than cattle.
- Organizations and/or individuals that provide agricultural extension courses might not be effective at providing such agricultural extension to communities.
- If many communities throughout the Project Area start producing the same crop, the price might fall due to supply-demand mismatch; similarly, the price of carbon could fall.
- Project Proponents build health and dental clinics throughout Project Zone, but no staff nor medicine are available.
- JR Agropecuária e Empreendimentos EIRELI decides to move forward with a planned deforestation project instead of maintaining the forest conservation project.

To address these aforementioned risks, the Project Proponents developed the following mitigation plans and shall utilize adaptive management to address future issues.

As previously discussed, community members that have been living on the land and who made the land productive (e.g., by growing agriculture or raising animals) for ten years, have the right to be titled. JR Agropecuária e Empreendimentos EIRELI will voluntarily recognize whatever area is currently deforested and under productive use by each family. All communities, whether they join the Envira Amazonia

[25] Richards, M. 2011. Social and Biodiversity Impact Assessment (SBIA) Manual for REDD+ Projects: Part 2 – Social Impact Assessment Toolbox. Climate, Community & Biodiversity Alliance and Forest Trends with Rainforest Alliance and Fauna & Flora International. Washington, DC. Page 6.
[26] Richards, M. 2011. Social and Biodiversity Impact Assessment (SBIA) Manual for REDD+ Projects: Part 2 – Social Impact Assessment Toolbox. Climate, Community & Biodiversity Alliance and Forest Trends with Rainforest Alliance and Fauna & Flora International. Washington, DC. Page 6.

Project or not, will be titled the land they have put under productive use. If necessary, this process will be facilitated by an independent group such as FTR-Feijó. Thus, this titling of land to local communities should prevent conflicts over local landownership because communities will receive at least the full amount of area recommended by INCRA. Improved agricultural techniques will be taught in addition to granting land tenure. Furthermore, job creation should allow for less dependency on the land.

The design of the Project's health center will educate the communities about the social problems surrounding illicit drugs, alcoholism and family violence. In addition, through the local church, Pastor Circlandio guides the members of the community about good relations and harmonious coexistence among its members. If worse comes to worse, there are federal and civil police who will take care of illicit drug use and violence.

To minimize corruption and 'elite capture,' the Project Proponents shall treat everyone fairly and equally. For example, everyone was given an equal opportunity to choose agricultural classes and all benefits (e.g., access to health center and dental clinic) will be offered to everyone. The Basic Necessities Survey will also monitor the distribution of assets, inequality and poverty.

Agricultural training courses are being offered to surrounding communities as one method to counteract potential in-migration. Some of the Project's benefits (for example, access to health center) will be offered to surrounding communities. Ultimately, the Envira Amazonia Project is privately-owned land and in-migration will not be allowed. The deforestation monitoring plan will ensure the rapid identification and resolution of in-migration.

Carbon finance will ideally supplement the reduction in any income that may result from fewer cattle. Agricultural trainings will also help diversify crops and increase food security. One course of interest among the local families is pasture management which would allow for cattle using less land. Protein can also be supplemented via chicken, fish and pigs. Ultimately, the goal is to not increase the overall number of cattle expanding into primary forest. It is also important to note that there are relatively few cattle within the Project Area and alongside the Jurupari River.

There are numerous leading institutions and individuals, such as EMBRAPA, the Center for Technical Production, SEAPROF (Secretaria de Extensão Agro-florestal e Produção Familiar do Estado do Acre in Portuguese or The Agroforestry and Family Production Extension Secretariat of the State of Acre in English), and Jose Dazio Bayma ("Dazio"), who are experts at providing agricultural extension trainings and researching cutting-edge sustainable agriculture and pasture management. Similarly, Carbon Securities and CarbonCo have overseen the agricultural extension courses successfully offered at their other REDD+ projects in Acre. Thus, the risk of their efforts failing is minimal.

The overall crop production among communities is relatively small and should not create a downward pressure on prices of a given crop throughout the Project Zone. The same is true with the future collection of açaí, rubber and medicinal plants. Diversity of crop production should act as an insurance mechanism against the price drop of a given crop. If carbon prices fall, the Project Proponents will seek alternative sources of funding to continue the Project and compliment the then-reduced funding from carbon finance.

Regarding the health centers, JR Agropecuária e Empreendimentos EIRELI has established the physical infrastructure of a health and dental center. For instance, the dental chair was purchased in January 2019 and the supplies for the health center were purchased in December 2018, with its construction taken place from January to March 2019. The initial plan was for the Brazilian Government to staff the facilities, which is technically the government's responsibility. However, JR Agropecuária e Empreendimentos EIRELI has decided that, in the future, they will pay out of pocket for these services and will not rely on government assistance for staffing the facilities.

There is a legally-enforceable Tri-Party Agreement valid in both the United States and Brazil that will mitigate the risk of JR Agropecuária e Empreendimentos EIRELI deciding to move forward with a planned deforestation project (i.e., the establishment of a large-scale cattle ranch) instead of respecting the forest conservation project.

For a more extensive identification of risks and mitigation strategies (i.e., measures to address these climate, community and biodiversity risks), please see the VCS Non-Permanence Risk Assessment.

2.2.7 Benefit Permanence (G1.11)

There are a variety of measures, both in place and planned, to ensure the Envira Amazonia Project's climate, community and biodiversity benefits are maintained and enhanced beyond the Project Lifetime. This includes:

- The Tri-Party Agreement's Longevity;
- Social Projects;
- Education and Outreach; and
- Legalization of Community Land Tenure.

Tri-Party Agreement's Longevity

The Tri-Party Agreement between CarbonCo, Carbon Securities and JR Agropecuária e Empreendimentos EIRELI stipulates a minimum 30 year Project Lifetime, followed by two renewable terms of 40 years each. Within these contractual time periods, the initial Project Crediting Period will be for 10 years which started on August 2, 2012 and ends on August 1, 2022. While the Project's Project Lifetime is 30 years, the Project Proponents are committed to maintaining forest cover within the Envira Amazonia Project beyond both the Project Crediting Period and the initial Project Lifetime.

Both the Tri-Party Agreement and the Project Documents will be filed at the Brazilian Registry Office to ensure the Envira Amazonia Project remains with the property even if the property is sold. Furthermore, the Project and its Project Documents (both VCS and CCBS) will eventually be registered with the State of Acre's Climate Change Institute (IMC). As of December 2018, the Envira Amazonia Project was pre-registered with IMC and both its Project Documents (i.e., VCS PD, CCBS PDD, Monitoring Reports,

Verification Reports, etc.) and its chosen methodology (i.e., VM0007 and relevant modules were translated into Portuguese) were reviewed by IMC.

Social Projects

The social projects – such as the collection, processing and sale of both medicinal plants and açaí, along with the establishment of health centers - are designed to provide long-lasting climate, community and biodiversity benefits beyond the Project Lifetime.

Education and Outreach

There are a variety of education and outreach activities which will both maintain and enhance the climate, community and biodiversity benefits beyond the Project Lifetime. In addition, it is the Project Proponents' hope that such benefits will not only extend temporally (i.e., beyond the Project Lifetime), but also in a spatial manner (i.e., beyond Project Zone, across State of Acre, across the country of Brazil and internationally). Such education and outreach activities include:

- Potential Visitation by School Groups;
- Local Contractors (further knowledge on how to develop elements of REDD+ projects);
- Landowner spreading the word beyond the Project to other landowners and companies; and
- Informing the State of Acre how REDD+ projects on privately-owned lands can work alongside the State of Acre's state-level work.

From 2012 to 2018, the Project Proponents have engaged a wide-range of stakeholders including the State of Acre and the Project Proponents also worked with numerous local contractors. For instance:

- José Elves Araruna de Sousa, as a representative of JR Agropecuária e Empreendimentos EIRELI, participated in the National Confederation of Industry event in Brasilia and a series of workshops at the FUNTAC auditorium sponsored by Acre's Climate Change Institute;
- Brian McFarland, as a representative of CarbonCo, has published 20+ articles and two books, along with giving several presentations. Such presentations include speaking to Cornell University, Columbia University, and at industry events such as the State of the Voluntary Carbon Markets;
- The Project Proponents have brought a range of stakeholders to the Envira Amazonia Project, including a PhD student, independent auditors, independent contractors (i.e., TerraCarbon, local ornithologist, etc.), and local service providers (dentist, doctors, etc.); and
- The Project Proponents have presented to a range of stakeholders throughout Brazil including the Amazon Fund in Rio de Janeiro, the US Embassy and World Bank in Brasilia, the Climate Change Institute and Ministry of Environment in Rio Branco, and to the local mayor and secretaries (i.e., agriculture and environment) in Feijó.

Furthermore, the Project will aim to educate children living in the Project Area to ensure the long-term vision of the Project. Likewise, the headquarters at the Envira Amazonia Project provides a bigger and newer facility for Project EJA (The Territorial Agenda for Integrated Development of Literacy for Youth and Adult Education). More specifically, teachers are hosted at the headquarters and they provide adult education to approximately nine local community members.

Legalization of Community Land Tenure

The legalization of the community land tenure will continue in perpetuity.

2.3 Stakeholder Engagement

The Project Proponents are committed to stakeholder engagement and thus, "Communities and Other Stakeholders are involved in the project through full and effective participation, including access to information, consultation, participation in decision-making and implementation, and Free, Prior and Informed Consent."[27] Timely and adequate written information was made available to Communities and Other Stakeholders in both English and Portuguese, along with being available in a Summary Document. The Project has an established feedback and Grievance Redress procedure, and best worker safety practices were utilized. Please see section 2.2.1 for a summary of several stakeholder engagements since 2012. Furthermore, information is also presented to stakeholders via radio announcements and via in-person meetings.

2.3.1 Stakeholder Access to Project Documents (G3.1)

The Envira Amazonia Project's full project documentation will be made available to Communities and Other Stakeholders throughout the Project Lifetime. For example, the Climate, Community and Biodiversity Standard's Project Design Document (CCBS PDD) and the Project Implementation Reports (PIRs) are available online in both English and Portuguese. A Summary Document, in both English and Portuguese, is also available online. The Summary Documents were distributed to local families and additional copies of the full CCBS PDD and Monitoring Reports are available at the Project's headquarters (both at the Project and in Rio Branco). In addition, the Project Documents were either emailed, or hand delivered to numerous Other Stakeholders (e.g., to the President of Rural Workers' Union). Also, the Public Comment Period – which includes links to the full project documents – is announced via radio throughout the State of Acre and emailed to hundreds of Other Stakeholders. Ongoing project documents – including the VCS Monitoring Reports – will also be made available.

2.3.2 Dissemination of Summary Project Documents (G3.1)

Background information on the Envira Amazonia Project, along with ongoing monitoring results, are incorporated into the Summary Documents (both in English and in Portuguese) and shared with stakeholders, including the local communities. Links are available online at the VCS Project Database

[27] CCBA, "CCB Standards, 3rd Edition," Available: https://s3.amazonaws.com/CCBA/Third_Edition/CCB_Standards_Third_Edition_December_2013.pdf

and on the IHS-Markit Environmental Registry. Links to the Envira Amazonia Project are also publicly distributed during the CCBS Public Comment Period via Carbonfund.org's newsletter.

2.3.3 Informational Meetings with Stakeholders (G3.1)

The Project Proponents have held numerous informational meetings with a wide range of stakeholders. Most of these meetings are considered private meetings and are not publicized. This includes meetings ranging from the World Bank, to CONAREDD (National REDD+ Commission), to NGOs such as Conservation International and The Nature Conservancy, to local NGOs such as SOS Amazonia and local associations and government bodies like the Ministry of Environment, IMC, and STR-Feijó. Meetings with local stakeholders, particularly during the CCBS Public Comment Period, is publicized via radio, via word-of-mouth, and via Carbonfund.org's newsletter announcements.

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

CarbonCo hired the independent community specialist Ayri Rando to visit in-person with local families throughout the Project Zone and with local families outside the Project Zone along the Envira River to share information on the costs, risks and benefits of the Envira Amazonia Project. These meetings included both individual meetings and also community-wide meetings.

The Project Proponents had an initial, tentative list of project benefits and the list was further refined through the feedback provided by the local families. Ayri Rando also provided information on the risks and costs – primarily the opportunity cost of reducing deforestation – to the communities and asked the communities about their own concerns such as what would prevent them from participating in the project, what concerns them about the project, and how the project can mitigate their concerns.

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

Ayri Rando, the independent community specialist, personally met with a total of 41 families from May 20th to June 11th, 2014. Part of Ayri Rando's initial discussion with the families included an explanation of the validation process such as describing the Public Comment Period and giving the families an early notice about the visit of an auditor in December 2014. Furthermore, Mazinho and Kidney da Cunha Aires visited the Project Zone in November 2014 to inform the families about the Public Comment Period, solicit comments, and to deliver the project documents. Kidney was, at the time, the local project manager at the Purus Project, assisted with the biodiversity monitoring plan at the Russas and Valparaiso Projects, and will provide periodic assistance, if necessary, at the Envira Amazonia Project.

For the initial verification of the Envira Amazonia Project, Mazinho visited the Project Zone in late October 2015 to inform the families about the Public Comment Period, explain the verification process, solicit any comments, deliver the project documents (i.e., Project Implementation Report and Summary Document) and deliver dental kits, and to also inform the families of the auditor visit from approximately November 15th – 20th, 2015. For the second verification of the Envira Amazonia Project, Mazinho visited the Project Zone from December 2016 to January 2017. For the third verification of the Envira Amazonia Project, Mazinho is tentatively scheduled to visit the Project Zone in April 2019.

The Project Proponents have frequently discussed the validation and verification process to Other Stakeholders, such as the Climate Change Institute.

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

As previosuly mentioned, local communities and Other Stakeholders are informed about the Public Comment Period and the auditors' site visit via world-of-mouth from Mazinho, via local radio announcement in Acre, and via an annoucement in Carbonfund.org's newsletter. All possible arrangements are made to allow local communities and Other Stakeholders to directly meet with the independent auditors during their onsite visit and to share any comments or concerns.

2.3.7 Stakeholder Consultation (G3.4)

The Project Proponents recognize the central importance of the local families to the success of the Envira Amazonia Project and incorporated their feedback into the project design. These consultations, in addition to being documented (see section 2.2.1 for summary of meetings), respected local customs, values, institutions, and High Conservation Values. Furthermore, Ayri Rando consulted with different age groups, with both men and women, and regardless of socio-economic status.

As previously mentioned, the independent community specialist Ayri Rando met with a total of 41 families from May 20th to June 11th, 2014. Ayri Rando explained the project's preliminary activities and goals and Ayri received substantial feedback from the communities. The Project was modified including a reconfiguration of the project implementation schedule and specific activities were added to the project design such as specific agricultural courses.

As an example of respecting local customs and values, Ayri Rando met at the families' houses and asked how (e.g., individual, community meetings, or via radio) and when (e.g., weekends, evenings, etc.) the families would like be consulted in the future.

After a lengthy discussion about the Project, Ayri Rando asked the communities if they would like to join the Project and if so, how (i.e., verbal agreement or via signing an "ata") they would like to demonstrate their willingness to join the Project.

Furthermore as a forest conservation project, the Envira Amazonia Project has respected High Conservation Values (HCVs) such as the region's forests and water.

FIAT

Meetings between Ayri Rando and Communities Outside Project Zone along Envira River (Photo Credit: Ayri Rando)

M N O P Q R S T U V W X Y Z

F G H I J K L M N O P Q R S T U V W X Y Z

Meetings between Ayri Rando and Communities in Project Zone along Jurupari River (Photo Credit: Ayri Rando)

2.3.8 Continued Consultation and Adaptive Management (G3.4)

The Project Proponents aim to collectively meet with the local communities at least once per year. This includes visits in December 2014, November 2015, January 2017, and May 2018. The local project manager Mazinho meets with the local communities several times a year. Furthermore, the Project Proponents also meet with Other Stakeholders, particularly in Rio Branco, approximately 1-3 times per year.

CarbonCo has added information to the CCB-VCS Monitoring Report about the type of communication and consultation this is planned for the next visit in May 2020.

During the verification site visit in April-May 2019, it was discovered that many of the communities would like another in-depth explanation about the Project. The Project Proponents are planning an extended visit for May 2020. This visit, which will conicide with the second bird monitoring study, will provide communities with consultation on numerous topics including a review of the:

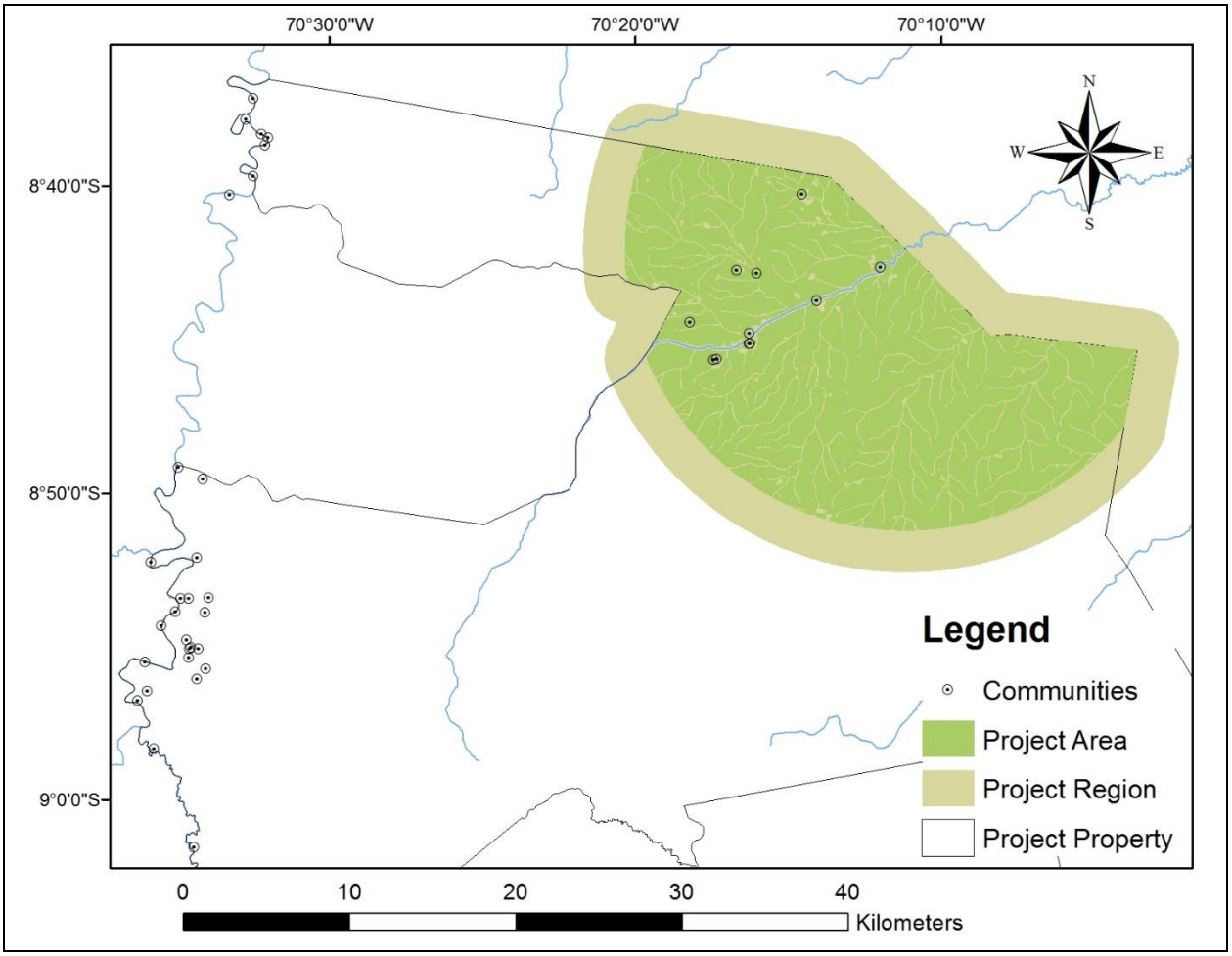
- Project's historical accomplishments;
- Future planned activites, including status of land tenure and temporary employment opportunities (i.e., and how to diversity opportunities to incorporate more families);
- Overview of Project's implementation schedule;

- Grievance procedure and how to contact the Project Proponents; and
- Relevant laws, such as anti-discrimination, sexual harassment, and labor laws;

The Project Proponents contacted Ayri Rando (i.e., the independent community specialist that was hired back in 2014) in July 2019 about possibly being rehired to visit the communities again in 2020; however, Mr. Rando's current employment sitation prohibits external employment or consulting opportunities. The Project Proponents will now look into hiring someone from Rio Branco that knows a lot about community development and REDD+ such as someone from IMAC, IMC, SOS Amazonia, and/or STR-Feijo.

2.3.9 Stakeholder Consultation Channels (G3.5)

Ayri Rando, the independent community specialist, directly met with a total of 41 families from May 20th to June 11th, 2014. The following map is the location of all 41 families:



Map 2.2: Location of Community Consultations (Credit: TerraCarbon and Ayri Rando)

Ayri Rando also asked if there were community decision-making traditions and asked about local institutions. This said, there are no traditions of community decision-making and the only local institution

identified was Sindicato de Trabalhadores Rurais (STR, translated into Rural Workers Union)-Feijó which has been consulted by the Project Proponents.

In December 2015, Duarte Jose do Couto Neto ("Duarte") spoke over the phone with Mr. Cesonir Paiva Freitas, the President of STR-Feijó to present the Envira Amazonia Project. Both agreed to meet in person to strengthen the relationship and to further explore potential areas of assistance from STR-Feijo. Then in May 2017, Mazinho and Rege from JR Agropecuária e Empreendimentos EIRELI held a meeting with Mr. Antônio José da Conceição, the President of the Union of Rural Workers of the municipality of Feijo (STR-Feijo).

As previously mentioned, the Project Proponents regularly meet with the local community members and the Project Proponents have also regularly met with Other Stakeholders – such as the Climate Change Institute and the Vice-Governor of Acre – to discuss the Envira Amazonia Project. Furthermore, the local project manager Mazinho regularly met with the local communities throughout 2012 to 2018.

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

The measures needed to enable effective participation began with the identification and contracting of Ayri Rando, who specializes in community consultations for REDD+ projects in the State of Acre, Brazil. Thus, Ayri Rando speaks Portuguese, is familiar with riverine communities throughout Acre, is familiar with REDD+ and community engagement including cultural and gender sensitivities, and previously assisted CarbonCo at the Purus Project.

The next measure to enable effective participation was to directly meet with local families and Ayri Rando spent nearly a month visiting families for the Envira Amazonia Project.

An additional measure to enable effective participation is to incorporate the community's feedback in order to design the Project activities so that the activities directly benefit the local families.

Further, the Project Proponents will continue to engage the local families and will continue to monitor community impacts to ensure effective participation is maintained.

2.3.11 Anti-Discrimination Assurance (G3.7)

The Brazilian Constitution and Consolidation of Labor Laws prohibit discrimination and harassment in Brazil. A discrimination guidance document was developed by the Brazilian Ministry of Labor and Employment,[28] and will be distributed to future, local hires. The issue of labor law in Brazil is widely publicized and rights, such as no discrimination, are disseminated through schools, radio programs, etc.

Carbonfund.org Foundation, the parent company of CarbonCo, has an employee handbook that prohibits any form of discrimination or sexual harassment based on age, sex, race, religion, or sexual orientation by its employees. All Project Proponents and contractors are required to abide by labor laws including

[28] Ministry of Labor and Employment, "Bullying and Sexual Harassment at Work," Available: http://portal.mte.gov.br/data/files/8A7C812D3CB9D387013CFE571F747A6E/CARTILHAASSEDIOMORALESEXUAL%20web.pdf

the prohibition of any form of discrimination. More specifically, CarbonCo's contract with all providers (e.g., TerraCarbon, TECMAN, etc.) states that the provider "shall abide by all local, state, and federal laws of Brazil including, but not limited to, forestry and labor laws." CarbonCo now includes language on anti-discrimination and links to Brazilian labor laws in its contract with providers.

Furthermore, no accusations or convictions of discrimination or sexual harassment have been made against any of the Project Proponents or their contractors. With respect to the assurance that Project Proponents have never acted with discrimination or acts of sexual harassment against members living in the Project Area, what can be explained is throughout all these years of project development, there have been no complaints in this regard. There were numerous visits made to the Project by the Project Proponents to meet with the community and these meetings have always taken place in a respectful and cordial manner, with no disrespect on both sides. The Brazilian law related to sexual harassment has was added to the Monitoring Report and the Summary Reports, and the Project Proponents will discuss this topic with the communities during their next collective visit in May 2020.

2.3.12 Grievances (G3.8)

In case any disputes arise, the Project Proponents formalized a clear process for handling unresolved conflicts and grievances throughout the Project's planning and implementation phases.

Essentially, if conflicts or grievances are unable to be resolved by the Project Proponents (particularly JR Agropecuária e Empreendimentos EIRELI and the local project manager Mazinho), the State of Acre's Ombusdman – acting as a third party mediator to prevent any conflict of interest - will hear, respond to, and help resolve all reasonable grievances with the Project through an impartial and accessible process.

More specifically, the State of Acre's Climate Change Institute has established an Ombudsman who will be the specific person to receive and refer any grievances about the Project. Any stakeholder is free to contact or visit the Climate Change Institute with any unresolved conflicts or grievances. Below is the physical address, phone numbers, fax numbers and email address:

Instituto de Mudanças Climáticas e Regulação de Serviços Ambientais (Climate Change Institute)

Address: Rua das Acácias, 279 - Bairro Distrito Industrial - Rio Branco, Acre – CEP: 69920-175

Telephone: +55 (68) 3223-1933 Fax: +55 (68) 3223 9962

Email Address: gabinete.imc@ac.gov.br Website: http://imc.ac.gov.br/

The Climate Change Institute's process for hearing, responding to, and resolving reasonable grievances is as follows:

- Receiving: Any person may visit or contact the Climate Change Institute. Any person who makes contact with the Ombudsman over the internet will receive a notification of receipt by email.
- Verification and Acceptance: The Ombudsman will decide whether a complaint is considered reasonable and whether the complaint should be accepted by the Climate Change Institute.

- Referral to Internal Areas: When deciding to accept a demand, the Ombudsman records the compliant and informs the person raising the complaint of the protocol number and the deadline for a response. If the demand is accepted, the demand will be internally referred to the appropriate specialist. If the demand is rejected, the Ombudsman will inform the person of the reason for the rejection.
- Monitoring: The Ombudsman will monitor the protocol and will monitor the internal areas responsible for collecting the answers to the compliant.
- Resolution: When the settlement is decided, the Ombudsman will make contact with the person who raised the complaint and the Ombudsman will close the protocol. All complaints received by the Ombudsman are usually answered within five working days and the person can call to know the progress of their protocol.

Each month the Ombudsman shall prepare a report and forward it to Board and President of the Climate Change Institute. In this report, the Ombudsman will: summarize actions taken to address complaints; quantify complaints and provide graphics to compare number of complaints against previous months; report amount of open and closed protocols; and provide relevant suggestions for process improvements and final considerations of the Ombudsman.

Furthermore, all conflicts or grievances will be addressed within a reasonable timeframe, the resolutions will be documented, and this process has been publicized to all stakeholders and especially to the local communities. Stakeholders are free to contact the Climate Change Institute and the Ombudsman to access the grievance reports. In the future, the Ombudsman would like to have an established website that will publicly post the grievances.

If the Ombudsman and Climate Change Institute are unable to resolve the complaint, then the issue will be referred to the courts in Acre.

To the best of the Project Proponents' knowledge, there were no grievances about the Envira Amazonia Project from August 2012 to December 2018, and nor did any grievances about the Envira Amazonia Project get referred to the Ombudsman.

It is important to note that in early 2019, the Climate Change Institute was dissolved and the Project temporarily did not have a third-party ombudsman. However, the Climate Change Institute of Acre was reinstated in late May 2019 and will continue to serve as the ombudsman for the Envira Amazonia Project.

2.3.13 Worker Training (G3.9)

The Project Proponents will continuously offer orientation and training for the Project's workers and contractors. In addition, the Project Proponents will seek to locally hire in order to increase local participation, increase knowledge transfer, and facilitate cultural exchange. The Project will also aim to build capacity amongst women and marginalized people in the community.

As an example of orientation and training, TerraCarbon, CarbonCo and Carbon Securities provided a refresher, on-the-ground training for TECMAN to undertake the forest carbon inventory in May 2014. Classroom training and on-the-ground training was originally provided to TECMAN in August 2011 and a refresher, online training was conducted in January 2013.

Forest Carbon Inventory Training in May 2014 (Photo Credit: Brian McFarland)

Additional trainings and orientation to the Envira Amazonia Project were provided to Professor Willian Flores and Ayri Rando. Ayri Rando then provided extensive orientation to communities throughout the Project Zone and to Other Stakeholders along the Envira River.

Orientation to the Envira Amazonia Project was also given to Tomaz Nascimento de Melo, the selected ornithologist, from January to April 2015. In May 2015, Tomaz Nascimento de Melo conducted the bird study at the Envira Amazonia Project, hired several local community assistants, and provided training and orientation to the community about his bird study.

In September 2017, Elves Araruna participated in a training seminar at the Brasilia headquarters of the National Confederation of Industry (CNI in Portuguese) about the value of ecosystem services and entrepreneurship. The event was organized by Pereni Consultoria and several entities, such as CNI members, several Brazilian states, and the Getulio Vargas Foundation, participated. Elves presented the Project's experiences working with local communities and the voluntary carbon markets, and also explored the different possibilities of generating revenue via the extraction of non-timber forest products.

From August to Decemnber 2017, JR Agropecuária e Empreendimentos EIRELI participated as a representative of private REDD+ initiatives in several work groups organized by the Climate Change Institute. All of these workshop meetings were held in Rio Branco and most of the meetings were held at the FUNTAC Auditorium. Approximately fifteen people participated in each meeting with representatives from Acre Government, the Climate Change Institute, and local NGOs. JR Agropecuária e Empreendimentos EIRELI discussed the Envira Amazonia Project and the activities planned to be carried out at the Project.

Maria Sueli de Souza e Souza received training guided by JR Agropecuária e Empreendimentos EIRELI on how to gauge blood pressure and how to distribute specific medicines for pain, fever, worms, and for bites by poisonous animals.

From 2012 to 2018, Brian McFarland of CarbonCo has provided orientation to tropical rainforests, deforestation, REDD+ projects, and CarbonCo's work in Acre via numerous articles and presentations. This includes, for instance, a several hour training workshop conducted in Toronto on May 3, 2016.

In the future, there will be trainings associated with offering agricultural extension courses, along with trainings for the collection, transportation, processing and sales of açaí, rubber and medicinal plants.

2.3.14 Community Employment Opportunities (G3.10)

Communities throughout the Project Zone will be given an equal opportunity to fill all work positions. Available positions will be announced on the radio and will be communicated directly to families via the local project manager. Such positions will also include orientation and training from the Project Proponents. Positions will be fulfilled based off merit and will be made available to both women and marginalized people. To date, most of these employment opportunities have been temporary contract work from time to time for the Project and the local community members are paid for the specific services provided (i.e., helping with site visits, building project headquarters, building onsite health clinic, etc.).

During the verification site visit in April-May 2019, it was revealed that several community members believed too few families were chosen to work for the Project and that only a few families economically benefited from the hires. The Project Proponents have hired two main, temporary employees Mazinho and Circlandio who are from different families. Going forward, the Project Proponents will strive to diversify those hired to assist with Project activities such as with the bird monitoring study scheduled for May 2020. This will be further discussed during the community meetings planned for May 2020.

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

The Project shall meet, or exceed, all applicable laws and regulations covering worker rights in Brazil and the Project Proponents will inform all workers about their rights. As of March 1, 2019, the following is a list of Brazil's relevant laws and regulations covering worker's rights:

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

- Prohibition of discrimination.[29]

In addition to the Constitution, there are two additional decrees related to Brazilian labor laws.

- Consolidação das Leis do Trabalho (CLT): DECRETO-LEI N.º 5.452, DE 1º DE MAIO DE 1943 (Consolidate of Working Laws).[30] This decree gives more clarification on:
  - Hourly, daily, weekly and monthly work hours;
  - Employment of minors and women;
  - Establishes a minimum wage;
  - Worker safety and safe working environments;
  - Defines penalties for non-compliance by employers; and
  - Establishes a judicial work-related process for addressing all worker related issues.
- Estatui normas reguladoras do trabalho rural: LEI Nº 5.889, DE 8 DE JUNHO DE 1973 (Establishes Regular Norms for Rural Workers).[31] This is a complimentary law to the aforementioned 1943 decree because prior to 1973, rural workers did not have the same rights as urban workers. In 1973, this law was established to specify the equality between urban and rural workers, along with compensation for overtime.

Compliance with Law

Agreements between the Project Proponents as well as Agreements between CarbonCo and its contractors stipulate firms to abide by labor laws (for example, wages above Brazil's federal minimum wage) and an assurance that all Brazilian employment taxes and insurance are paid.

In addition, CarbonCo has an employee handbook to ensure proper guidelines are followed by its employees. Contractors, such as Carbonfund.org's lead consultant TerraCarbon, have their own employee handbook.

All Brazilian workers – including TECMAN employees and future employees of JR Agropecuária e Empreendimentos EIRELI – receive a "Carteira de Trabalho" or "worker notebook." This "notebook" is where the employer signs, registers the salary, documents the admission and dismissal period, and some labor rights are explained. For example, the "notebook" explains workers right to compensation if injured, overtime, vacation time, etc. This "notebook" is a way for the Federal Government of Brazil to make sure workers are aware of their rights. According to the Brazilian Ministry of Labor and Employment, "in fact,

[29] Massachusetts Institute of Technology, "Brazilian Constitution," Available: http://web.mit.edu/12.000/www/m2006/teams/willr3/const.htm
[30] Presidency of the Republic, "DECRETO-LEI N.º 5.452, DE 1º DE MAIO DE 1943, Available: http://www.planalto.gov.br/ccivil_03/decreto-lei/Del5452.htm
[31] Presidency of the Republic. "LEI Nº 5.889, DE 8 DE JUNHO DE 1973," Available: http://www.planalto.gov.br/ccivil_03/leis/L5889.htm

the work permit is nonetheless a passport for citizens has protected labor and social security rights, such as regular salary, vacation, Christmas bonus, paid leave and retirement."[32]

As previosuly mentioned, the issue of labor law in Brazil is widely publicized and rights, such as no discrimination, are disseminated through schools, radio programs, etc.

CarbonCo undergoes a financial audit by an independent accountant to ensure all taxes, including employment, social and corporate, are paid. Furthermore, JR Agropecuária e Empreendimentos EIRELI provided a "Receita Federal" which certify that all taxes (including employee and business) and insurance (including social) are paid.

The Project Proponents will forever continue to work with the well-being of the local families in mind. The local families will be offered meaningful employment, have the ability to directly shape the Project, and are given the freedom to express any and all grievances.

Title of Law

In addition to labor laws, there are a few laws that specifically deal with sexual harassment, which is important to workers. For instance, there is Law No. 8,122 of 1990, Article 216-A do Código Penal (Penal Code), Article 223-C of the CLT (labor reform 2017), and Law No. 13,467 of 2017.

Summary of Law

Law No. 8,122 of 1990 actually deals with matters related to public servants who work for the public authority and likewise, is not relevant to the Envira Amazonia Project, which is a private project.

The Código Penal (Penal Code)[33] defines sexual harassment as follows:

> "Sexual harassment is characterized by a set of acts aimed at embarrassing or persuading the victim to engage in sexual favors or engage in sexually with the abuser. It is usually practiced by a hierarchical superior, who has the power to harm or benefit the career or employment of the victim."

Article 216-A[34] do Código Penal (Penal Code) further defined sexual harassment as follows:

> "Constricting someone with the purpose of gaining advantage or sexual favor, prevailing the agent of his status as superior or inherent in the exercise of employment, position or

[32] Brazilian Ministry of Labor and Employment, "Carteira de Trabalho e Previdência Social (CTPS)," Available: http://www.mte.gov.br/index.php/carteira-de-trabalho-e-previdencia-social-ctps
[33] Jusbrasil, "Código Penal - Decreto-lei 2848/40 | Decreto-lei no 2.848, de 7 de dezembro de 1940," Available: https://presrepublica.jusbrasil.com.br/legislacao/91614/codigo-penal-decreto-lei-2848-40
[34] Jusbrasil "Art. 216A do Código Penal - Decreto Lei 2848/40." Available: https://www.jusbrasil.com.br/topicos/28003933/artigo-216a-do-decreto-lei-n-2848-de-07-de-dezembro-de-1940

function. Penalty - detention, from 1 (one) to 2 (two) years. The penalty is increased by up to one-third if the victim is under 18 (eighteen) years."[35]

Article 223-C of the Labor Reform Law of 2017 further "expresses the protection of honor, image, freedom of action, and sexual orientation, which has consolidated a right already provided for by the Federal Constitution and widely recognized by labor jurisprudence."[36] More specifically, "Art. 223-C. [labor reform 2017] states "honor, image, intimacy, freedom of action, self-esteem, sexuality, health, leisure and physical integrity are the legally protected assets inherent in the individual. (Included by Law No. 13,467 of 2017)."[37]

Compliance with Law

As previously mentioned, Carbonfund.org Foundation, the parent company of CarbonCo, has an employee handbook that prohibits any form of discrimination or sexual harassment based on age, sex, race, religion, or sexual orientation by its employees. All Project Proponents and contractors are required to abide by labor laws including the prohibition of any form of discrimination, including sexual harassment. More specifically, CarbonCo's contract with all providers (e.g., TerraCarbon, TECMAN, etc.) states that the provider "shall abide by all local, state, and federal laws of Brazil including, but not limited to, forestry and labor laws." CarbonCo now includes language on anti-discrimination and links to Brazilian labor laws in its contract with providers.

Furthermore, no accusations or convictions of discrimination or sexual harassment have been made against any of the Project Proponents or their contractors. With respect to the assurance that Project Proponents have never acted with discrimination or acts of sexual harassment against members living in the Project Area, what can be explained is throughout all these years of project development, there have been no complaints in this regard. There were numerous visits made to the Project by the Project Proponents to meet with the community and these meetings have always taken place in a respectful and cordial manner, with no disrespect on both sides. The Project Proponents will discuss this topic with the communities during their next collective visit in May 2020.

2.3.16 Occupational Safety Assessment (G3.12)

From 2012 to 2014, the Envira Amazonia Project Proponents comprehensively assessed the situations and particular occupations that could pose risks to worker safety. The Project Proponents informed workers and contractors of such risks, explained how to minimize such risks, and the Project Proponents will continue to use best work practices. These risks were revisited in 2015, 2016, 2017 and 2018 and remain the most important risks to worker safety. The main potential risks to workers identified by the Project Proponents include:

- Drowning;

[35] Jusbrasil "Art. 216A do Código Penal - Decreto Lei 2848/40." Available: https://www.jusbrasil.com.br/topicos/28003933/artigo-216a-do-decreto-lei-n-2848-de-07-de-dezembro-de-1940
[36] Rege Ever C. Vasques, personal communication.
[37] Jusbrasil, "Art. 223C Consolidação das Leis do Trabalho - Decreto Lei 5452/43," Available: https://www.jusbrasil.com.br/topicos/173000241/artigo-223c-do-decreto-lei-n-5452-de-01-de-maio-de-1943

- Heat Exhaustion and Dehydration;
- Getting lost in Remote Forest;
- Venomous Snake Bites; and
- Tropical Diseases.

Drowning

It is important to note, that all boats travel relatively slow on the Envira, Jurupari and Purus Rivers, many participants know how to swim, and life preservers are always onboard in case a boat does happen to capsize.

Heat Exhaustion and Dehydration

Workers and Project Proponents are familiar with tropical rainforests (for example, high levels of humidity and tropical temperatures) and prepare for each trip with sufficient food and water.

Getting Lost

Global positioning systems (GPS) and/or compasses are used during trips into the deep forest to minimize the risk of getting lost. Local guides from the community and the landowner's familiarity with the area also helps to minimize the chances of getting lost. In January 2018, CarbonCo also purchased a satellite phone for use on all trips to Brazil.

Venomous Snake Bites

The most substantial risk to workers, particularly TECMAN's employees during the forest carbon inventory, was the potential encounter with venomous snake bites. Snake bites are relatively common in South America[38] and specifically within the State of Acre.[39] The snake species of greatest concern are the fer-de-lance (*Bothrops atrox*) and the South American bushmaster (*Lachesis muta*).[40] There are also many poisonous spiders and scorpions in tropical rainforests. To mitigate such risk, all TECMAN's employees were equipped with and required to wear protective snake chaps.

[38] J.-P. Chippaux. "Reviews/Analyses," Available: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2305789/pdf/bullwho00388-0084.pdf
[39] Pierini SV et al., "High incidence of bites and stings by snakes and other animals among rubber tappers and Amazonian Indians of the Juruá Valley, Acre State, Brazil,"
[40] Fabiano Waldez and Richard C. Vogt, "Ecological and epidemiological aspects of snakebites in riverside communities of the lower Juruá River, Amazonas, Brazil," Available: http://piagacu.org.br/?attachment_id=416

TECMAN's Employees with Snake Chaps (Photo Credit: Brian McFarland)

Worker safety is of the highest importance. For TECMAN's forest carbon inventory work, there was a discussion of safety procedures and TECMAN has a safety manual entitled, *Procedimentos de Segurança em Campo* (Field Safety Procedures, in English).

Tropical Diseases

There are many tropical diseases in Acre, Brazil such as malaria, yellow fever, zika and chagas disease. The Project Proponents are encouraged to get yellow fever vaccinations, malaria pills are available, and mosquito nets are frequently used. CarbonCo provides a health and safety document to trip participants and conducts a pre-trip discussion of all known risks.

2.4 Management Capacity

The Project Proponents, along with their partners, have "adequate human and financial resources for effective implementation" of the Envira Amazonia Project.

2.4.1 Required Technical Skills (G4.2)

The key technical skills required to successfully implement the Project, include:

- Stakeholder identification and community engagement;
- Biodiversity assessment and monitoring;

- Carbon stock measurement and monitoring;
- Regional deforestation and land-use modelling;
- Project management;
- Local knowledge and fluency in Portuguese; and
- Sales of carbon offset credits to raise climate finance.

The Project's management team and advisors have both the expertise and prior experience with financing, designing, and implementing forest carbon projects.

2.4.2 Management Team Experience (G4.2)

The three primary Project Proponents responsible for the Project's design and implementation are JR Agropecuária e Empreendimentos EIRELI, CarbonCo, and Freitas International Group (doing business as Carbon Securities).

The following shall provide the overall governance structure, along with specific roles and responsibilities.

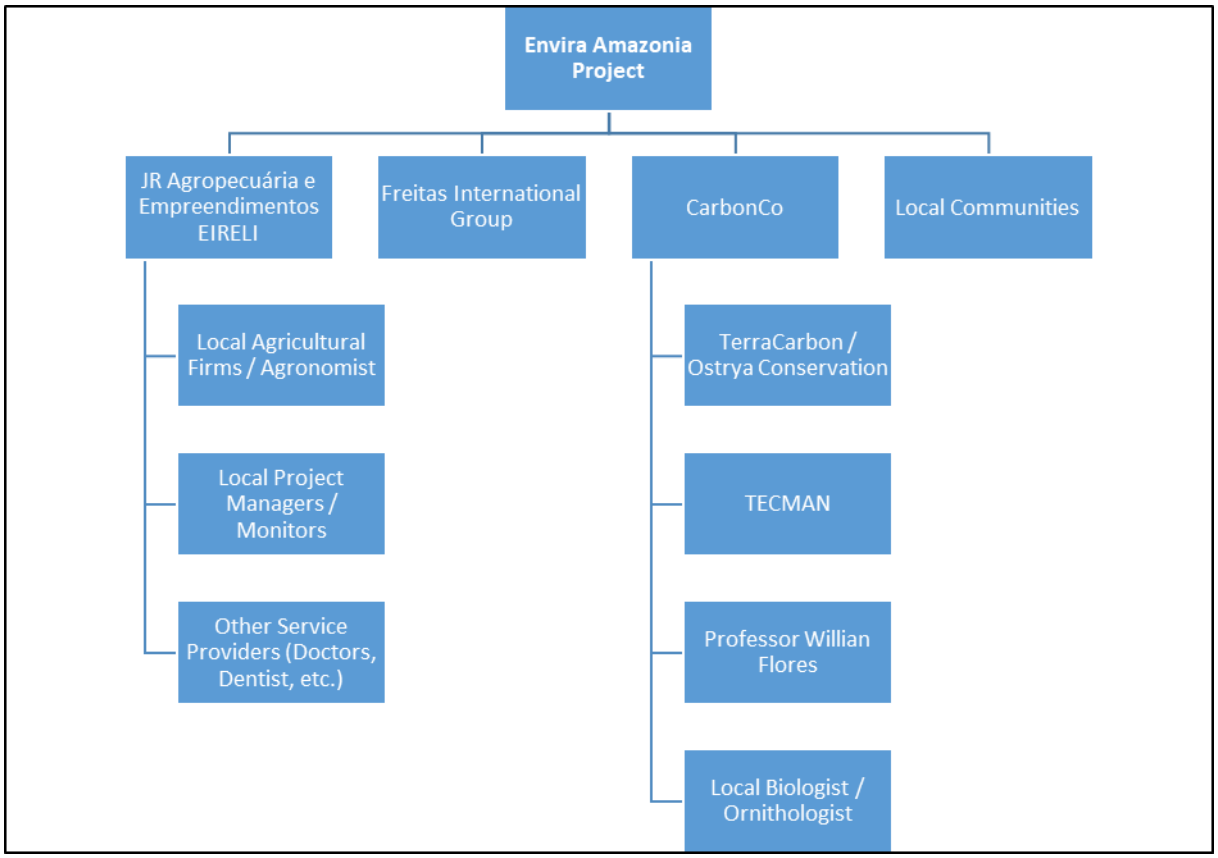


Figure 2.1: Governance Structure / Organizational Chart of the Project

CarbonCo LLC

CarbonCo, LLC ("CarbonCo"), the wholly-owned subsidiary of Carbonfund.org Foundation, is a limited liability company based in East Aurora, New York.

CarbonCo develops carbon reduction projects by working with private landowners on the documentation and programs needed to ensure large tracts of land are protected from deforestation, attain international certification, and create value for all Project Proponents.

CarbonCo is managing the project development portion of Carbonfund.org's work but is not in the business of climate change education and outreach, small scale carbon offset retail sales, nor corporate sustainability programs. CarbonCo instead is focusing on a number of project opportunities and the advisory services necessary to help these conservation projects reach certification. This experience includes financing and developing the Purus Project, which was the first-ever REDD+ project in the State of Acre to achieve dual VCS-CCBS validation and verification, along with the VCS-CCBS validated and verified Russas and Valparaiso Projects. To learn more, visit: www.CarbonCoLLC.com.

More specifically, CarbonCo's contractual obligations and specific responsibilities include:

- Performing due diligence to determine the feasibility of the Project;
- Selecting an international certification standard and appropriate REDD+ methodology;
- Acquiring satellite images and/or remote sensing;
- Determining an appropriate deforestation rate, reference region and leakage areas;
- Measuring the Project's carbon stock via a forest carbon inventory;
- Developing the VCS Project Description and CCBS Project Design Document;
- Posting the CCBS Project Design Document for a 30-day Public Comment Period;
- Contracting an independent and approved auditor to validate and verify the Project;
- Addressing all Corrective Action Requests raised by the audit team;
- Registering the Verified Emission Reductions (VERs) on a VCS-approved registry; and
- Providing advice on the marketing, sale and transfer of VERs.

Furthermore, CarbonCo's entire financial portfolio is audited by an independent, certified public accountant and CarbonCo shall also keep all documents and records (i.e., including contracts) in a secure manner for at least two years (i.e., seven years for the CCBS PDD) after the end of the Project Crediting Period. This includes publicly displaying the completed VCS Project Description, as well as keeping hard copies of documents in easily accessible file cabinets and electronic copies in the cloud and on a backed-up share drive.

Contact: Brian McFarland - BMcFarland@CarbonCoLLC.com or +1 (240) 247-0630

Freitas International Group, LLC and Carbon Securities

Freitas International Group, LLC is a Florida limited liability company, doing business as Carbon Securities, with a main office located in Miami, Florida and associates in the Brazilian cities of Goiânia, Brasília, Rio Branco, Belém, and São Paulo.

Carbon Securities works with CarbonCo, LLC to identify and develop high quality carbon reduction projects in the Amazon Basin. This experience includes the Purus Project, which was the first-ever REDD+ project in the State of Acre to achieve dual VCS-CCBS validation and verification, along with the VCS-CCBS validated and verified Russas and Valparaiso Projects. To learn more about Carbon Securities, please see the validated CCBS PDD and visit: http://www.carbonsecurities.org.

More specifically, Carbon Securities' contractual obligations and specific responsibilities include:

- Promoting, encouraging and facilitating the participation and cooperation of Landowner;
- Facilitating due diligence on the Project;
- Serving as a liaison and translator for the Landowner and CarbonCo; and
- Assisting CarbonCo which includes establishing meetings with Landowner and relevant stakeholders, arranging site visits, providing information and documentation such as previous studies, photographs, and satellite images related to the Project.

Contact: Pedro Freitas - PedroFreitas@CarbonSecurities.org or +1 (305) 209-0909

Contact: Marco Aurélio Freitas - MarcoFreitas@CarbonSecurities.org or +55 (62) 9969-2022

JR Agropecuária e Empreendimentos EIRELI

JR Agropecuária e Empreendimentos EIRELI (which translates into JR Agriculture-Livestock and Ventures) was formed on July 13, 2009 and is the company that owns the Envira Amazonia Project. JR Agropecuária e Empreendimentos EIRELI was established by Duarte Jose do Couto Neto ("Duarte") and his wife Francisca das Graças Prado Couto ("Graças"). Francisco Umberto Prado Couto ("Chiquinho"), the son of Duarte and Graças, is now the current owner of JR Agropecuária e Empreendimentos EIRELI and the Envira Amazonia Project.

The company is currently established, active, and headquartered at the following address:

JR Agropecuária e Empreendimentos EIRELI

Cadastro Nacional da Pessoa Jurídica (CNPJ) Number: 11.313.775/0001-33

Travessa Alagoas, Number 49, Altos, Bairro Centro

Rio Branco, Acre, Brazil, CEP (Zip Code) 69900-412

Rege Ever C. Vasques, Jose Elves Araruna Sousa and Almir Santana Ribeiro are assisting Chiquinho with the design and implementation of the Envira Amazonia Project.

Contractual obligations and specific responsibilities for JR Agropecuária e Empreendimentos EIRELI include:

- Providing all evidence of ownership of the Property such as deeds, titles and maps which clearly define the Property's boundaries and registered with government authorities;
- Eliminating the drivers and causes of deforestation;
- Acknowledging and agreeing to not execute any activity that otherwise might interfere with the implementation during the term of the Project and with the VER generation and certification at the Property, including, but not limited to (i) clearing the forest for livestock; (ii) clearing the forest for agriculture; (iii) expanding old roads or constructing new roads; (iv) expansion into new forests on Property for community use or infrastructure facilities (i.e., bridges, housing, electricity, etc.); (v) expanding logging operations; and (vi) deforestation for new mining or mineral extraction.
- Taking all actions necessary to avoid any risks associated with the Project, notably the spread of invasive species, forest fires and pests;
- Demonstrating legal ownership of any and all pre-existing carbon credit rights;
- Paying any and all pending liens, taxes, fines and/or any other debts against the Property;
- Cooperating with CarbonCo and Carbon Securities in any manner and whenever required in order to obtain the VERs which includes interviews aiming to gather additional information on the Project, verifying information written in the project documents, granting access to the Project site, attending meetings with the authorities and community to explain the Project.
- Elaborating a community impact monitoring plan;
- Meeting with community to inform and explain the proposed Project along with providing a means for the community to express, and be available to address, reasonable grievances;
- Incorporating community comments into the development of the Project and resolve any reasonable grievances with the Project;
- Landowner acknowledges and agrees that all conservation/preservation measures to be taken in connection with the Project will be carried out by Landowner voluntarily; and
- Making the project documentation publicly available at the Landowner's office and at the Property.

Contact: Francisco Umberto Prado Couto - FUPCouto@hotmail.com or +55 (68) 9 8112 3902

Contact: Rege Ever C. Vasques – RegeEver@hotmail.com or +55 (68) 9201-1060

Contact: Jose Elves Araruna Sousa – ElvesAraruna@gmail.com or +55 (68) 8402-8151

Brian McFarland, Senior Vice President of Carbon Projects and Origination

Brian McFarland, who earned a dual graduate degree in Business Administration and Global Environmental Policy from American University, is the Senior Vice President of Carbon Projects and Origination for Carbonfund.org and CarbonCo.

Brian's graduate thesis was entitled, *Origins, Development and Potential of the International REDD Market*. Brian has also published 23 articles and two books entitled, 1) *REDD+ and Business Sustainability: A Guide to Reversing Deforestation for Forward Thinking Companies* and 2) *Conservation of Tropical Rainforests: A Review of Financial and Strategic Solutions*. His forthcoming book is entitled, *Conservation of Tropical Coral Reefs: A Review of Financial and Strategic Solutions*.

Brian is currently responsible for project origination at CarbonCo and project portfolio management at Carbonfund.org. More specific to the Project, this includes writing Project Documents, structuring project implementation activities (i.e., advising on social projects, designing both community and biodiversity monitoring plans, etc.), coordinating site visit logistics, contracting validation and verification services, and managing both local and technical contractors. Brian's previous experience with REDD+ projects in the State of Acre includes spearheading the Purus Project, which became the first-ever REDD+ project in the State of Acre to achieve dual VCS-CCBS validation and verification, along with the Envira Amazonia, Russas and Valparaiso Projects.

While finishing his Psychology and International Development undergraduate degree from Clark University, Brian conducted authentic environmental fieldwork in Mexico, Costa Rica, Kenya and Brazil. Such fieldwork included addressing human-wildlife conflicts, working on sustainable community development projects and biodiversity monitoring. During graduate school, Brian also volunteered for the Smithsonian Institution, the United Nations Global Compact, and the U.S. Department of State.

Brian is a certified Project Management Professional from the Project Management Institute, a certified Sustainability Professional from the International Society of Sustainability Professionals, and was a certified Greenhouse Gas Inventory Quantifier from CSA Standards.

Pedro Freitas, Founder and President

Pedro Freitas is the Founder and President of Freitas International Group, LLC and has more than seven years of experience in the environmental field. Pedro, while studying a graduate program in Sustainability and Environmental Management at Harvard University, has chosen to dedicate his time to the protection of tropical forests.

Pedro, who did his undergraduate degree in international business at the Catholic University of Goiás, is an American citizen born and raised in Brazil with fluency in both Portuguese and English. From 2002 to 2004, Pedro also worked with a variety of private companies on teak and eucalyptus reforestation

projects in Goiás, Brazil. Pedro also personally assisted in a variety of manners with the Envira Amazonia, Russas, Valparaiso and Purus Projects.

Francisco Umberto Prado Couto, Owner of JR Agropecuária e Empreendimentos EIRELI

Francisco Umberto Prado Couto ("Chiquinho"), the son of Duarte and Graças, is now the current owner of JR Agropecuária e Empreendimentos EIRELI and the Envira Amazonia Project. Chiquinho currently resides in the Municipality of Itacoatiara in the State of Amazonas, but he frequently visits Rio Branco. Today, Chiquinho works with transportation of wood products and cattle ranching. Chiquinho has visited the Envira Amazonia Project on a regular basis and is very excited to contribute to the improvement of the living conditions of the families who live in the Project Area.

Rege Ever Carvalho Vasques, Advisor to JR Agropecuária e Empreendimentos EIRELI

Rege Ever Carvalho Vasques is a professional lawyer accredited to both the OAB/AC (Order of Lawyers of Brazil for State of Acre) and to the OAB/MT (Order of Lawyers of Brazil for State of Mato Grosso). Rege has been practicing law since February 2006 and works for the firm Vasques Assessoria Jurídica, which translates as Vasques Legal Advice.

Rege graduated from the Faculty of Mato Grosso do Sul in 2005, became a resident of Acre in 2007, and is currently active in agricultural and environmental causes in the administrative and judicial spheres.

Jose Elves Araruna de Sousa, Advisor to JR Agropecuária e Empreendimentos EIRELI

Jose Elves Araruna de Sousa was born in Brasília on March 16, 1965 and at the age of 20, Jose moved to town of Porto in the State of Rondônia. During this time, Jose served as a public official in the State Court. In addition, Jose also worked in the communications field for two local radio stations.

In 1990, Jose went to work in the city of Rio Branco, in the production of a majority political campaign, exercised the functions of a host broadcaster, produced radio and television programs as well as acting as a sound coordinatior, where he managed to succeed in electing the then-Governor Edmundo Pinto de Almeida Neto. Jose settled in Rio Branco, and later worked in the production of events and concerts, owned nightclubs, and coordinator modulated radios.

Jose then decided to attend law school and today, Jose practices civil law and labor law. Jose recently completed a post-graduate tax law program and owns his own law office in Rio Branco.

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

CarbonCo does not directly employ staff with the technical skills to perform and execute some of the requisite activities and hired TerraCarbon and then Ostrya Conservation for assistance.

TerraCarbon LLC

TerraCarbon LLC is an advisory firm specialized in the forestry and land-use sector of the carbon markets. TerraCarbon provides a range of technical, transaction, and strategic services to clients that implement market oriented programs or projects to restore and protect the world's forests.

TerraCarbon was formed in 2006 by Scott Settelmyer, the former CFO of the Chicago Climate Exchange, and Bernhard Schlamadinger, world-renown expert in forest carbon and bioenergy, to provide specialized expertise to participants in the forest and land-use sector of the carbon market. Since its founding, TerraCarbon has advised clients from around the world on projects ranging from reforestation to avoided deforestation to peatland restoration. TerraCarbon, with clients including forestry companies, forest project developers, carbon funds, international multi-lateral agencies, and non-profit organizations, has a mission to provide practical advice rooted in experience to help clients implement forest and land-based carbon activities that mitigate climate change. To learn more, visit: http://terracarbon.com/.

Specific to the Project, TerraCarbon has extensive experience including:

- Part of the core technical team convened by Avoided Deforestation Partners to develop VCS methodologies for REDD projects, including drafting text and revisions to incorporate peer review and validation comments.
- Technical development of a REDD project in Peru for a local and an international NGO, including deforestation modeling and preparation of technical elements for VCS and CCB Project Design Documents.
- Ongoing feasibility analysis for a potential IFM and REDD project in Chile that will be developed under the VCS. Scope of work includes eligibility analysis, methodological analysis, development of emission reduction estimates, and preparation of a plan and budget for technical development.
- Providing technical inputs on the development of a REDD pilot project in Guyana with Conservation International for the IADB and Government of Guyana. The project involved estimating forest carbon stocks across the entire country, based on literature and existing inventory data, covering all forest types and ecosystems.
- Designed and implemented forest carbon inventories for a range of domestic and international forest carbon projects to determine baseline and with project carbon stocks. This has consisted of developing sampling strategies, training personnel, and collecting and analyzing statistical data from the inventories.
- Extensive staff experience in modeling carbon stock dynamics in forests.
- Provided technical project development services, particularly with respect to the forest carbon inventory and deforestation baseline modeling, for CarbonCo's Envira Amazonia, Russas, Valparaiso and Purus Projects in Acre, Brazil.

David Shoch, Vice President, Forestry and Technical Services

David advises TerraCarbon's clients on technical and methodological issues related to forest carbon offset projects. David is a forester and has over ten years of experience in forest biomass carbon measurement and monitoring, and forest growth and yield modeling. He has contributed authorship on seminal publications including the Verified Carbon Standard (formerly known as the Voluntary Carbon Standard) and the Intergovernmental Panel on Climate Change (IPCC) Supplementary Methods and Good Practice Guidance for Land-use, Land-use Change and Forestry (LULUCF) Activities. David is currently a member of the core team convened by Avoided Deforestation Partners to develop VCS methodologies for REDD projects.

Prior to his position at TerraCarbon, David served with The Nature Conservancy's Climate Science Team and with Winrock International. He has been a member of the Society of American Foresters since 1997.

James Eaton, Senior Manager, Forestry and Technical Services

Up until 2017, Jamie provided technical support to TerraCarbon's clients that were assessing or developing forest or land-based carbon projects. This included providing technical project development services to CarbonCo for the Envira Amazonia, Purus, Russas and Valparaiso Projects.

Prior to joining TerraCarbon, Jamie was a science policy analyst for the Terrestrial Carbon Group, where he was involved in researching and advising on the technical aspects of carbon accounting on REDD and Agriculture, Forestry and Other Land Use (AFOLU) project types. From 2006 to 2008, he led a large-scale soil carbon inventory project in the Republic of Ireland, which produced results that were used in Ireland's reporting to the United Nations Framework Convention on Climate Change (UNFCCC). Jamie holds a MS in Environmental Science from the University of Virginia and a BA in Biology from Saint Louis University.

Rebecca Dickson, Senior Manager, Remote Sensing & Spatial Modeling

Rebecca Dickson is the senior manager of remote sensing and spatial modeling at TerraCarbon. She advises TerraCarbon's clients on technical issues related to the feasibility, design, and monitoring of forest carbon projects. She is an expert in geographic information systems (GIS) and remote sensing analysis with extensive experience in land-cover classification, change analysis, and spatial modeling. Rebecca was a member of the CCB Standards Committee.

Prior to joining TerraCarbon, Rebecca was an assistant research professor and a postdoctoral research associate at Wake Forest University, where her research focused on land-use and land-cover change in southeastern Peru and included fusing ground data plots with remote sensed imagery analysis to develop estimates of carbon stocks across the landscape. Rebecca directed research on land-cover classification and analysis of secondary forest cover in the southern Yucatán while at the Graduate School of Geography at Clark University. She has also worked as an independent consultant for Beartooth Capital. Rebecca holds a PhD and Master of Arts in Geography from Clark University and is a former NASA Earth System Science Fellow.

Ostrya Conservation, Inc.

Ostrya Conservation, Inc. was founded in 2017, with the vision of supporting environmental conservation efforts by creating value for natural ecosystems and managed lands, developing ecosystem services projects, and providing environmental consulting services to land owners and organizations pursuing market-based conservation projects and alternative natural resource derived revenue streams.

Ostrya Conservation assists projects and conservation initiatives in a diverse range of ecosystems including forest, wetland, and coastal landscapes with an array of services including project development and management, field-based ecosystem monitoring, and geographic information system.

A genuine love of ecology and a desire to create sustainable financing, which effectively conserves natural ecosystems and other managed lands, drives the efforts of Ostrya Conservation. To learn more, please visit: https://www.ostryaconservation.com/.

James Eaton, Director

Jamie decided to start Ostrya Conservation after working for nearly a decade developing and implementing ecosystems services projects around the world. He has extensive experience in the fields of forest ecology, geographic information systems, soil biogeochemistry, land-use change science, and tropical ecology. He is passionate about using ecosystem markets and conservation tools to improve, conserve and protect native plants, wildlife and fish habitat, and natural ecosystems. Jamie is an aspiring naturalist and community ecologist with a strong interest in sustainable farming, outdoor recreation, and environmental education.

For 10 years, Jamie has led the planning and design, and assisted with the implementation of, conservation projects which have conserved over a million acres of land throughout the world. These ecosystem service projects work with local communities and land owners to provide financing which enable these stakeholders to protect and conserve natural lands. While many of these projects have been in the realm of voluntary and compliance greenhouse gas mitigation projects, he has also developed nutrient banks, wetland mitigation banks, and stream mitigation banks. Project management skills and consulting experience has allowed Jamie to pull together diverse stakeholders' including private individuals, environmental nongovernmental organizations, public companies, and government agencies in pursuit of these conservation efforts worldwide. His conservation project development and research experience has been global in scale including work in Brazil, the Caribbean, Chile, China, Ecuador, Ireland, Malaysia, Mexico, Poland, Switzerland, Tanzania, Uganda, and throughout the United States.

Contact: James Eaton - James.Eaton@OstryaConservation.com or +1 (708) 703-2552

TECMAN LTDA

CarbonCo, with the guidance of TerraCarbon, hired TECMAN LTDA ("TECMAN") to perform the Project's forest carbon inventory. TECMAN is a Rio Branco-based environmental consulting and forest management firm founded in 2000 to meet a growing demand for forestry and environmental projects in the state of Acre, Brazil. Acquired by Fabio Thaines and Igor Agapejev de Andrade in 2007, TECMAN's

recent accomplishments include over 50,000 hectares of sustainable forestry management work including within the Antimary State Forest of Acre, Brazil. TECMAN also successfully completed the forest carbon inventories for the Envira Amazonia, Russas, Valparaiso and Purus Projects. To learn more, visit: http://tecman.eng.br/.

Contact: Fabio Thaines - FabioThaines@tecman.eng.br or +55 (68) 3227-5273

Contact: Igor Agapejev de Andrade - IgorAgapejev@tecman.eng.br or +55 (68) 3227-5273

Antonio Willian Flores de Melo

CarbonCo, with the guidance of TerraCarbon, hired Professor Antonio Willian Flores de Melo ("Professor Willian Flores") to assist with data acquisition and to review the Project's regional deforestation and land-use modeling. Willian Flores is a Professor at the Federal University of Acre (UFAC) within UFAC's Center for Biological Science and Nature. Professor Willian Flores received a degree in Agronomy from the Federal University of Acre and a Masters' of Science from the University of Sao Paulo in Ecological Studies and Agronomy. Professor Willian Flores is currently working towards a PhD and assisted CarbonCo and TerraCarbon with the deforestation baseline modelling of the Purus Project and reviewed the baseline for the Envira Amazonia, Russas and Valparaiso Projects.

Contact: Antonio Willian Flores de Melo - WillianFlores@gmail.com or +55 (68) 3901-2611

Tomaz Nascimento de Melo

CarbonCo hired Tomaz Nascimento de Melo to conduct a rapid bird study at the Envira Amazonia Project. Tomaz earned a Bachelor in Tourism (2007) and a Bachelor in Biological Sciences (2012) from the University of Vale do Paraíba, Brazil. Tomaz also earned a Master's Degree in Ecology and Natural Resource Management by the Federal University of Acre (2015). Tomaz has experience in management and recovery of degraded areas, the release and monitoring of birds in a Release and Monitoring Area, avifauna surveys, and environmental education. Tomaz has also worked with environmental consulting and as a bird watching guide in the states of Acre and Amazonas. In addition, Tomaz worked as a consultant in ornithology at the Amazon Museum, in Manaus, where he coordinated the observation and monitoring of birds. Furthermore, Tomaz has field experience in both the Atlantic Forest and in the Amazon, and conducts research on the natural history of neotropical birds. Currently, Tomaz is a PhD student in Zoology at the Federal University of Amazonas, studying the use of habitat and the effect of hydroelectric power plants on lowland avifauna on the Madeira River. Tomaz also contributes to several citizen science platforms and digital collections, such as Wikiaves, iNaturalist, eBird, Internet Bird Collection, Neotropical Birds and Macaulay Library.

Contact: Tomaz Nascimento de Melo - TomazNMelo@hotmail.com - +55 (92) 9 8259 2411

Local Community

The local community in the Project Area consists of approximately ten families and approximately 60-70 people. Ayri Rando consulted and interviewed the following individuals living within the Project Area:

- José Magalhães da Silva ("Zé do Nel");
- João Nazário Rodrigues;
- Ademar Felipe de Sousa;
- José Ferreira de Sousa (José "Mundico");
- Raimundo Maurício do Nascimento ("Novo");
- José Sousa do Nascimento ("Zé Mangu");
- Antônio Francisco Lopes da Silva;
- Raimundo Cunha da Silva ("Carlisto");
- Jorginaldo da Silva Pedrosa ("Naldo"); and
- Francisco Cirlândio Dimas de Sousa.

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

Carbonfund.org provided financial resources to its wholly-owned subsidiary CarbonCo to implement several REDD+ projects in Acre, Brazil including the Envira Amazonia Project. CarbonCo successfully financed the Russas, Valparaiso and Purus Projects and is thus, well-aware of the financial resources required for the REDD+ projects in Acre, Brazil.

Carbonfund.org's independently audited Internal Revenue Service (IRS) Form 990s are publicly available and document Carbonfund.org's financial health. To learn more, please see GuideStar: http://www2.guidestar.org/organizations/20-0231609/carbonfund-org.aspx.

Furthermore, contractual agreements outlining the financial arrangement between the Project Proponents, along with a detailed pro forma, were provided to auditors of the Project.

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

Carbonfund.org and CarbonCo are both independently audited by a certified public accountant and neither organization nor its representatives have been suspected of, charged with, or found guilty of corruption, bribery, embezzlement, fraud, favoritism, cronyism, nepotism, extortion, or collusion.

2.4.6 Commercially Sensitive Information (*Rules* 3.5.13 – 3.5.14)

Not applicable – there was no commercially sensitive information excluded from the public version of the Envira Amazonia Project's CCB VCS 2016-2018 Monitoring Report.

2.5 Legal Status and Property Rights

2.5.1 Recognition of Property Rights (G5.1)

The Project Proponents have the unconditional, undisputed and unencumbered ability to claim the Project generated the climate, community and biodiversity benefits.

The Envira Amazonia Project is privately owned by JR Agropecuária e Empreendimentos EIRELI and this is demonstrated via the property's geo-referencement and "certidão." There is a Tri-Party Agreement between the three Project Proponents which is legally valid in both the United States and Brazil.

With respect to private ownership of carbon rights in Brazil, a Presidential Decree on July 7, 1999 by the Brazilian Government established the Inter-ministerial Commission on Global Climate Change as the Designated National Authority for approval of projects under the UNFCCC Kyoto Protocol's Clean Development Mechanism (CDM).[41]

José D.G. Miguez, Executive Secretary of the Brazilian Interministerial Commission on Global Climate Change, presented on March 18, 2003 at the Organisation for Economic Co-operation and Development (OECD) Global Forum on Sustainable Development: Emissions Trading Concerted Action on Tradable Emissions Permits (CATEP) Country Forum. Within in presentation, Mr. Miguez specifically indicated the private sectors ability "to design, develop and implement CDM project activities" in Brazil.[42] This said, there are currently numerous private sector CDM and voluntary carbon market projects in Brazil including projects within the Agricultural, Forestry and Other Land-use (AFOLU) sector.

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

JR Agropecuária e Empreendimentos EIRELI voluntarily signed a Tri-Party Agreement on August 2, 2012 with Carbon Securities and CarbonCo to develop the Envira Amazonia Project on its privately-owned property. The company has been actively engaged throughout the entire process, numerous Skype calls and in-person meetings have been held, and the company is advised by several knowledgeable lawyers.

The Project Proponents also ensured the local families were able to give Free, Prior and Informed Consent to participate in the Envira Amazonia Project, in part by hiring the independent community specialist Ayri Rando.

Free

The local families are free to voluntarily join and leave the Envira Amazonia Project. There was no coercion, intimidation, manipulation, threat or bribery. In contrast, the local families shall receive the Project benefits – such as access to the onsite health center and granting of land tenure – whether or not they decide to join the Project. The Project's ongoing assessment by an independent auditor shall demonstrate the families' ability to freely join or leave the Project.

[41] Ministry of Science, Technology and Innovation, "Designated National Authority (Interministerial Commission on Global Climate Change)," Available: http://www.mct.gov.br/index.php/content/view/14666.html
[42] José D.G. Miguez, "CDM in Brazil," Available: www.oecd.org/dataoecd/9/6/2790262.pdf

Prior

Ayri Rando consulted local communities throughout the Project Zone and outside the Project Zone from May 20th to June 11th, 2014 on all aspects on the Envira Amazonia Project. This consultation with the communities took place approximately three months before Project activities were decided upon, approximately four months before Project documents were finalized, five months before the official CCBS Public Comment Period, and six months before the visitation of independent auditors.

Informed

Ayri Rando has extensive experience with REDD+ and Ayri informed the community during his May 20th to June 11th, 2014 visit about all aspects of the Envira Amazonia Project including: describing what is REDD+ and the role of the Project Proponents; the proposed Project activities; tentative Project implementation schedule; duration of the Project; how to best engage women; costs, benefit sharing, and risks of participation in the Project; the Project's grievance procedure; the role of independent auditors in validation and verification; and the official Public Comment Period.

Consent

Ayri Rando obtained permission to discuss the Project with local families and later asked whether or not the local families would like to join the Project. If the local family decided to initially join the Project, Ayri Rando then asked if they would prefer to verbally agree to the Project or if they would prefer to sign an "ata." If the local family decided to not join the Project, they were asked how the Project could be altered in order for them to more likely join the Project in the future.

2.5.3 Property Right Protection (G5.3)

The Envira Amazonia Project will not involve any involuntary removal or relocation. In contrast, the Project shall grant official land title to formalize and strengthen local land tenure.

2.5.4 Identification of Illegal Activity (G5.4)

The following are the illegal activities that could affect the Project's climate, community and biodiversity benefits throughout the Project Zone. It is important to note that none of these illegal activities were identified or believed to have occurred from 2012 to 2018.

- Commercial hunting, fishing, or collecting endangered flora and fauna;
- Illegal logging;
- Cultivation, transportation or distribution of illegal drugs; and
- Corruption, bribery, embezzlement, fraud, favoritism, cronyism, nepotism, or collusion.

While conducting deforestation monitoring, along with community and biodiversity impact monitoring, the Project Proponents have kept their eyes open for illegal activities.

Ultimately, illegal activities of any kind – whether it be wildlife trafficking, corruption, or bribery – will not be allowed in the Envira Amazonia Project and the appropriate authorities will be contacted.

2.5.5 Ongoing Disputes (G5.5)

There are no ongoing or unresolved conflicts over land rights throughout the Project Zone of the Envira Amazonia Project. Furthermore, there are no overlapping title claims and no internal conflicts with, or amongst, the local communities. There were some claims from the local communities made in the Cadastro Ambiental Rural (CAR) database. However as previously mentioned, JR Agropecuária e Empreendimentos EIRELI shall grant official land title to the local communities to formalize and strengthen local land tenure.

2.5.6 National and Local Laws (G5.6)

As of March 1, 2019, the following is a list of all the international, national and state-level laws and regulations identified by the Project Proponents which are relevant to the Project. To the best of the Project Proponents' knowledge, there have not been any new laws relevant to the Project since the Project's last verification.

Brazil is a party to numerous international conventions and treaties such as the:

- Convention on Biological Diversity;
- United Nations Framework Convention on Climate Change;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora;
- International Tropical Timber Organization (i.e., Brazil is a Producing Member);
- Ramsar Convention on Wetlands;
- Universal Declaration of Human Rights;
- United Nations Declaration on the Rights of Indigenous Peoples;
- Convention on the Elimination of All Forms of Discrimination Against Women; and
- International Labor Organization Convention.

There was also a Memorandum of Understanding (MOU) signed on March 3, 2010 between Brazil and the United States of America on "cooperation regarding climate change."[43]

[43] The Government of Brazil and the Government of the United States of America, "Memorandum of Understanding Between the Government of the Federative Republic of Brazil and the Government of the United States of America on Cooperation Regarding Climate Change," http://www.brazilcouncil.org/sites/default/files/MOUonCooperationRegardingClimateChange-Mar032010.pdf

Furthermore, there was an international MOU between California (United States), Chiapas (Mexico) and Acre (Brazil) signed on November 16, 2010.[44]

The State of Acre is also an active member in the Governors' Climate and Forest Task Force (GCF) and hosted the annual GCF meeting in August 2014.[45] The Project Proponents attended the annual meeting in August 2014, which was held in Rio Branco.

National Laws and Regulatory Frameworks

With respect to national laws and regulatory frameworks, the Project has abided by Brazilian national laws and especially the Brazilian Constitution. This includes Chapter 6 of the Brazilian Constitution which specifically discusses environmental issues in Article 225.[46]

Compliance with Law

Although the Project is privately-owned and Paragraph 1 of Article 225 specifically states "it is incumbent upon the Government," the Project Proponents will nevertheless seek to preserve the Project's ecosystems, preserve the diversity of fauna and flora, and promote environmental education. This preservation can be documented via satellite imagery, firsthand observations, and via the Project's biodiversity monitoring plan, while the local schools within the Project will incorporate environmental education.

The Brazilian Forest Code is of particular importance to the Project. This includes:

- The original Brazil Forest Code entitled, Law No. 4771, September 15, 1965;[47]
- Revision of Brazil Forest Code under Law No. 7803, July 18, 1989;[48]
- Provisional Measure entitled 2166-67, August 24, 2001;[49] and
- Revision of Brazil Forest Code under Law No. 12.651 of May 25, 2012.[50]

[44] The State of Acre, the State of Chiapas, and the State of California, "Memorandum of Understanding on Environmental Cooperation between the State of Acre of the Federative Republic of Brazil, the State of Chiapas of the United Mexican States, and the State of California of the United States of America," http://www.gcftaskforce.org/documents/MOU_Acre_California_and_Chiapas.pdf
[45] Governors' Climate and Forest Task Force, "About GCF," http://www.gcftaskforce.org/about.php
[46] Georgetown University, "1988 Constitution, with 1996 reforms in English," Available: http://pdba.georgetown.edu/Constitutions/Brazil/english96.html#mozTocId920049
[47] Presidency of the Republic, "Law No. 4771, September 15, 1965," Available: http://www.planalto.gov.br/ccivil_03/Leis/L4771.htm
[48] Presidency of the Republic, "Law No. 7803, July 18, 1989," Available: http://www.planalto.gov.br/ccivil_03/leis/L7803.htm
[49] Presidency of the Republic, "Provisional Measure 2166-67, August 24, 2001," Available: https://www.planalto.gov.br/ccivil_03/MPV/2166-67.htm
[50] Presidency of the Republic, Civil House Cabinet Subcommittee for Legal Affairs, "Law No. 12,651, OF 25 MAY 2012," Available: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12651.htm

Title of Law

Law Number 4771 of September 15, 1965, entitled "Establishing the new Forest Code."

Summary of Law

Law Number 4771 of September 15, 1965 was the original Brazil Forest Code. A few major provisions of the Forest Code were the establishment of permanent preservation areas (APP), establishment of legal reserves of 50% on properties in the Legal Amazon, and designation of Acre State (among others) as within the Legal Amazon territory.[51] Many of these provisions have been revised since 1965.

Compliance with Law

The Project, as can be documented via satellite imagery or firsthand observations, has respected the Project's permanent preservation areas and legal reserves.

Title of Law

Law Number 7803 of July 18, 1989 entitled, "Change the wording of Law No. 4771 of September 15, 1965, and repealing Laws Nos. 6535 of June 15, 1978, and 7511 of 7 July 1986."

Summary of Law

Law Number 7803 was the first significant amendment to the original 1965 Forest Code. For example, the permanent preservation areas were reclassified. The Law also stipulated that "the exploitation of forests and succeeding formations, both public domain and private domain, will depend on approval from the Brazilian Institute of Environment and Renewable Natural Resources - IBAMA, and the adoption of techniques of driving, exploitation, reforestation and management compatible with the varied ecosystems that form the tree cover.[52]

Compliance with Law

The Project, both in the "without project land-use scenario" and in the "with project land-use scenario" has abided by the new guidance on permanent preserve areas such as to not clear forests on steep slopes or within one hundred meters proximity to rivers.

Title of Law

The Provisional Measure Number 2166-67 of August 24, 2001 entitled, "Changes the arts. 1, 4, 14, 16 and 44, and adds provisions to Law No. 4771 of September 15, 1965, establishing the Forest Code and amending art. 10 of Law No. 9393 of December 19, 1996, which provides for the Property Tax Territorial Rural - ITR, and other measures."

[51] Presidency of the Republic, "Law No. 4771, September 15, 1965," Available: http://www.planalto.gov.br/ccivil_03/Leis/L4771.htm
[52] Presidency of the Republic, "Law No. 7803, July 18, 1989," Available: http://www.planalto.gov.br/ccivil_03/leis/L7803.htm

Summary of Law

The Provisional Measure Number 2166-67 of August 24, 2001 was one of the latest revisions to the original 1965 Forest Code and to the amendments of Law Number 7803. The most relevant change to the Project was the revision of the legal reserve requirement in the Legal Amazon (i.e., including the State of Acre) from 50% to 80% which shall be conserved.[53]

Compliance with Law

As mentioned previously, the Project - as can be documented via remote sensing or firsthand observations - has respected both the Project's permanent preservation areas and the recently revised legal reserve requirement.

Title of Law

Law Number 12.651 of May 25, 2012 is the latest Brazilian Forest Code and supersedes earlier versions in 1965, 1989, and 2001.[54]

Summary of Law

The latest Brazilian Forest Code, "Provides for the protection of native vegetation; amends Laws Nos. 6938 of August 31, 1981, 9,393, of December 19, 1996, and 11,428 of December 22, 2006, repealing the Laws No. 4771, 15 September 1965 and 7754, of April 14, 1989, and Provisional Measure No. 2.166-67, of August 24, 2001, and other provisions." Key tenets of the Brazilian Forest Code include:

- Chapter 1. General Provisions
    - Article 1-A. This act lays down general rules on the protection of vegetation, Permanent Preservation Areas and Legal Reserves, forest exploitation, the supply of forest raw materials, control the origin of forest products and the prevention and control of forest fires, and provides economic and financial instruments for the achievement of its objectives.
    - II. This act reaffirms the importance of the strategic role of farming and the role of forests and other forms of native vegetation in sustainability, economic growth, improving the quality of life of the population and the country's presence in the domestic and international food and bioenergy.
    - VI. This act states the creation and mobilization of economic incentives to encourage the preservation and restoration of native vegetation and to promote the development of sustainable productive activities.

[53] Presidency of the Republic, "Provisional Measure 2166-67, August 24, 2001," Available: https://www.planalto.gov.br/ccivil_03/MPV/2166-67.htm
[54] Presidency of the Republic, Civil House Cabinet Subcommittee for Legal Affairs, "Law No. 12,651, OF 25 MAY 2012," Available: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12651.htm

- Article 3. For the purposes of this Act, the following definitions apply:
    - I - Amazon: the states of Acre, Pará, Amazonas, Roraima, Rondônia, Mato Grosso and Amapá and the regions north of latitude 13 ° S, the states of Goiás and Tocantins, and west of 44 ° W , State of Maranhão;
    - II - Permanent Preservation Area - APP: protected area, or not covered by native vegetation, with the environmental function of preserving water resources, landscape, geological stability, biodiversity, facilitate gene flow of fauna and flora, soil protection and ensure the well-being of human populations;
    - III - Legal Reserve area located within a rural property or ownership, demarcated according to Article 12, with the function of ensuring a sustainable economic use of natural resources of rural property, assist the conservation and rehabilitation of ecological processes and to promote the conservation of biodiversity, as well as shelter and protection of wildlife and native flora;
    - VI - alternative land use: replacement of native vegetation and succeeding formations other ground covers such as agricultural activities, industrial, power generation and transmission of energy, mining and transport, urban settlements or other forms of human occupation

- Chapter 2. Area of permanent preservation
    - Section I. Delimitation of Areas of Permanent Preservation
        - Licensing is done by a competent environmental authority.
        - The property will be registered in the Rural Environmental Registry (i.e., CAR).
- Chapter 4. Legal reserve area
    - Section I. Delimitation of the Legal Reserve Area
        - Article 12. All property must maintain native vegetation cover in rural area, as a legal reserve, without prejudice to the application of the rules on the Permanent Preservation Areas, subject to the following minimum percentages in relation to the area of the property, except as specified in art. 68 of this Act:
            - 80% of properties located in the Amazon
            - 35% of properties located in the Cerrado
            - 20% of properties located in other regions of the country
- Chapter 5. The suppression of vegetation for alternative use of soil

- Article 26. The removal of native vegetation for conversion to alternative land uses, both public domain and private domain, depend on the registration of the property in CAR, mentioned in Article 29, and the prior authorization of the competent state agency, SISNAMA [Sistema Nacional do Meio Ambiente].[55]

Compliance with Law

The Envira Amazonia Project is in compliance with the latest Brazil Forest Code. Acre is considered part of the Legal Amazon and thus the property will maintain 80% forest cover as a legal reserve. This is demonstrated via firsthand observations and by reviewing satellite imagery. The "without project land-use scenario" was the licensing to practice alternative land use (e.g., cattle ranching and agriculture), which was registered in the CAR and approved by IMAC (in English: The Acre Environmental Institute) which is overseen by SISNAMA.

In addition to the Forest Code, Brazil's National Environmental Policy is also relevant to the Project.[56]

Title of Law

Law Number 6.938 of August 31, 1981 entitled, "Provides for the National Environmental Policy, its aims and mechanisms for the formulation and implementation, and other measures."

Summary of Law

Law Number 4771 of August 21, 1981 is based off Brazil's constitution and established Brazil's National Environmental Policy. Essentially, the "National Policy on the Environment is aimed at the preservation, improvement and restoration of environmental quality conducive to life, to ensure, in the country, conditions for the socio-economic development, the interests of national security and protecting the dignity of life human." Agencies were also established to carry out the National Environmental Policy.[57]

Compliance with Law

The Project has identified, consulted and shall continue to work with the relevant agencies responsible for environmental protection, particularly with respect to REDD+ projects. Furthermore, the Project has conserved soil and water resources, protected rare and threatened ecosystems, and in the future will promote the recovery of degraded areas and encourage environmental education.

Another important national Brazilian law that is relevant to the Project is the National Climate Change Policy (NCCP).[58]

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[55] Presidency of the Republic, Civil House Cabinet Subcommittee for Legal Affairs, "Law No. 12,651, OF 25 MAY 2012," Available: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12651.htm
[56] Presidency of the Republic, "Law No. 6.938, August 31, 1981," Available: http://www.planalto.gov.br/ccivil_03/leis/L6938.htm
[57] Presidency of the Republic, "Law No. 6.938, August 31, 1981," Available: http://www.planalto.gov.br/ccivil_03/leis/L6938.htm
[58] World Bank, "State and Trends of the Carbon Market 2010," Available: http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/StateAndTrend_LowRes.pdf.

Compliance with Law

A key component of Brazil's National Climate Change Policy is the voluntary reduction of greenhouse gas emissions. The Project is in compliance with this voluntary target because the Project is a Reducing Emissions from Deforestation and forest Degradation (REDD+) project. Furthermore, this compliance will be demonstrated via periodic verifications of the Project.

Related to the National Climate Change Policy, is a recent Brazilian federal decree addressing REDD+.

Title of Law

The title of the Decree 8.576, of 26 November 2015, is "Establishing the National Commission for the Reduction of Greenhouse Gas Emissions from Deforestation and Forest Degradation, Conservation of Forest Carbon Stocks, Sustainable Management of Forests and Increase Forest Carbon Stocks - REDD+."

Summary of Law

The Brazilian Federal Decree 8.576/2015 establishes "the National Commission for REDD+" which "creates a committee responsible for coordinating, monitoring, and implementing the National Strategy for REDD+."

See here for the complete Federal Decree 8.576/2015:
http://pesquisa.in.gov.br/imprensa/jsp/visualiza/index.jsp?data=27/11/2015&jornal=1&pagina=1&totalArquivos=232

Compliance with Law

The Project Proponents have spoken numerous times to the State of Acre's Climate Change Institute and Brazil's Federal Ministry of the Environment and neither entity informed the Project Proponents of any restrictions placed on their private, voluntary REDD+ projects – particularly the Envira Amazonia Project - as a result of Federal Decree 8.576/2015. The Project Proponents will continue to follow and report on this Decree as it applies to the Project.

The Project Proponents have abided by Acre's state laws and regulatory frameworks. The two most relevant laws as of November 1, 2016 are Acre's State Forestry Law (Bill Number 1.426 of December 27, 2001) and Bill Number 2.308 of October 22, 2010 entitled, The State System of Incentive for Environmental Services (SISA).

SISA was "created, with the aim of promoting the maintenance and expansion of supply of the following ecosystem products and services:

> I - sequestration, conservation and maintenance of carbon stock, increase in carbon stock and decrease in carbon flow;
>
> II - conservation of natural scenic beauty;

III - socio-biodiversity conservation;

IV - conservation of waters and water services;

V - climate regulation;

VI - increase in the value placed on culture and on traditional ecosystem knowledge;

VII - soil conservation and improvement."[59]

Compliance with Law

As a tropical forest ecosystem services project, otherwise known as REDD+, the Project has conserved the forests' carbon stock, while also conserving the natural scenic beauty, biodiversity, water, and soil resources, along with working alongside the local community. Such compliance is demonstrated via remote sensing, firsthand observations, and via the periodic independent assessments of the Project.

Related to SISA is a Normative Instruction that was released by the Climate Change Institute (IMC) to provide guidance for how special projects should register with the State of Acre.

Title of Law

IMC's Normative Instruction nº 01, of 19 October 2015. – "Regulating the item IV of the art. 7 of Law No. 2308 of 22 October 2010, disciplining the admission procedure of special projects and linked within the Environmental Services incentive program – Carbon (ISA-Carbon), State System of Incentives for Environmental Services-SISA."

Summary of Law

The Normative Instruction outlines how special projects shall register with the State of Acre including the review of the methodology, review of project documents, fees required to be paid to the State of Acre, etc.

Compliance with Law

The Project Proponents are working closely with the State of Acre's Climate Change Institute and their SISA-Carbono Program. As of December 31, 2018, the Envira Amazonia Project was not incorporated into the State of Acre's jurisdictional program and thus, the Project was not yet officially participating in any GHG Program. To prevent double-counting, this voluntary private REDD+ project is using the IHS-Markit Environmental Registry to issue and trade verified carbon units (VCUs). If in the future the Envira Amazonia Project is nested into the State of Acre's SISA-Carbono Program, then the Project will follow the guidance of Verra and/or the State of Acre.

[59] State of Acre, "Unofficial Translation, State of Acre, Bill No. 2.308 of October 22, 2010," Available: http://www.gcftaskforce.org/documents/Unofficial%20English%20Translation%20of%20Acre%20State%20Law%20on%20Environmental%20Services.pdf

The Project Proponents have done the following to conform to the State of Acre's SISA legislation and more specifically, the IMC Normative Instruction #1 of October 19, 2015:

- 1. Original signed, notarized copy in English and Portuguese of "Formulário de Cadastro de Desenvolvedores" (Developers Registration Form) was submitted to the IMC.
- 2. Physical copy of Project Proponents' (CarbonCo and Carbon Securities) Good Standing.
- 3. Physical copy of Representative's Brazilian visa and/or passport. This was done for Brian McFarland of CarbonCo and Pedro Freitas of Carbon Securities.
- 4. There was also a "Term Assignment of Use of Information" form signed between CarbonCo and the Climate Change Institute (IMC) that allowed access to the classified satellite imagery.
- 5. The landowners submitted their landownership documentation (i.e., Inteiro Teor document) to the IMC.
- 6. The VCS Methodology VM007, which was used by the Envira Amazonia Project, was translated into Portuguese and submitted to the IMC for review on April 1, 2016.
- 7. The IMC then received electronic copies of our VCS and CCBS Project Documents (i.e., VCS PDs and Monitoring Reports; CCBS PDDs and PIRs).

Going forward and where required, the Project Proponents will continue to follow the IMC Normative Instruction.

Acre's State Forestry Law (Bill Number 1.426 of December 27, 2001) essentially, "provides for the preservation and conservation of State forests, establishing the State System of Natural Areas, creates the State Forest Fund and other measures."[60] The Law also established the institutional responsibility for the management of State Forests, defines forests, and outlines the administrative penalties for non-compliance.

Compliance with Law

The Project is on private property and thus, this law is not relevant. Nevertheless, the Project Proponents has contributed to the sustainable use of forest resources, preserved biodiversity, and in the future, will also "promote ecotourism, recreation, forestry research and education."[61]

There are several additional Acre State laws such as:

- Law nº 1.117/1994, which establishes the Environmental Policy in the State of Acre;

[60] The Governor of the State of Acre, "Acre Forestry Law, December, 27, 2001," Available: http://webserver.mp.ac.gov.br/?dl_id=800
[61] The Governor of the State of Acre, "Acre Forestry Law, December, 27, 20 01," Available: http://webserver.mp.ac.gov.br/?dl_id=800

- Law 1.904/2007, which establishes the Ecological and Economic Zoning (EEZ) map of the State of Acre;
- Decree nº 3.416/2008, which regulates the second stage of the EEZ map of the State of Acre;
- Law nº 2693 de 17/01/2013, which amends law nº 1.904/2007, and "creates the State Program of Productive Family Unity Certification of the state of Acre;"
- State of Acre's Plan to Prevent and Control Deforestation (PPCD/AC); and
- Normative ordinance Nº 004/2013, which authorizes the use of fires for family farming

The Project Proponents are also in compliance with these laws as outlined below.

Title of Law

Law nº 1.117/1994 is entitled, "The Foundation of the State's Environmental Policy."

Summary of Law

This law establishes the Environmental Policy in the State of Acre and describes "its implementation and monitoring, establishing basic objectives, guidelines and standards for the protection, conservation and preservation of the environment and environmental resources, as a quality of life of the population."[62]

Compliance with Law

As a validated and verified REDD+ project, the Envira Amazonia Project is seeking to conserve the environment and its natural resources which are foundations of Acre's Environmental Policy.

Title of Law

Three laws/decrees that relate to Acre' ecological and economic zoning are law 1.904/2007, entitled "Establishes the Ecological - Economic Zoning of the State of Acre – ZEE," decree nº 3.416/2008, and law nº 2693 of 17/01/2013, entitled "amends laws nos. 1.904, dated June 5, 2007, which 'Establishes the Ecological and Economic Zoning of the State of Acre – ZEE,' and 2.025, dated October 20, 2008, which 'Creates the State Program for Certification of Family Production Units of the State of Acre,' and provides other measures."[63]

Summary of Law

Law 1.904/2007 initially established the ecological and economic zoning (EEZ) map of the State of Acre. The State Decree nº 3.416/2008 regulates the second stage of the EEZ map for the State of Acre.[64] Law nº 2693 of 17/01/2013, amends laws nº 1.904/2007, which "Imposes the Ecological - Economic Zoning

[62] LegisWeb. "Lei nº 1.117 de 26/01/1994," Available: https://www.legisweb.com.br/legislacao/?id=116194
[63] LegisWeb. "Lei Nº 2693 DE 17/01/2013," Available: https://www.legisweb.com.br/legislacao/?id=250191
[64] Official Diary of the State of Acre. "October 22, 2009." Available: http://www.diario.ac.gov.br/edicoes/DO10157_22102009.pdf. Page 7.

map of the state of Acre – ZEE," and "Creates the State Program of Productive Family Unity Certification of the state of Acre."[65]

Compliance with Law

The Envira Amazonia Project is in the process of registering with the CAR and is conserving the property's Legal Reserve, along with Areas of Permanent Preservation. In addition, the landowner is not a part of the State Program of Productive Family Unity Certification and thus, this aspect is not applicable.

Title of Law

PPCD/AC of 2010 is entitled, "The Plan to Prevent and Control Deforestation of Acre."[66]

Summary of Law

PPCD/AC of 2010 consists of three parts: spatial planning and land tenure; productive chains and sustainable practices; and monitoring and control.

Compliance with Law

The Envira Amazonia Project is geo-referenced and is in the process of being registered with CAR. In addition, the Project seeks to provide titles to local communities. The Project will also develop productive and sustainable supply chains via agricultural extension trainings. As part of a validated and verified REDD+ project, the Project will annually monitor for climate, community and biodiversity impacts.

Title of Law

IMAC issued normative ordinance entitled, "nº 004/2013."

Summary of Law

IMAC's normative ordinance entitled, "nº 004/2013," authorizes small-scale fires for family farming.

Compliance with Law

The landowner of the Envira Amazonia Project does not use fire and nor is the property an INCRA settlement. The landowner does allow the communities to use small-scale fires to clear land for subsistence agriculture. This said, the future agricultural extension courses and ongoing trainings will discuss alternatives to the use of fire.[67,68]

[65] LegisWeb. "Lei Nº 2693 DE 17/01/2013," Available: https://www.legisweb.com.br/legislacao/?id=250191
[66] State of Acre Government. "Plano Estadual de Prevenção e Controle do Desmatamento do Acre." Available: https://www.scribd.com/document/154380731/PPCD-AC-2010
[67] Globo. "Autorização de queimadas controladas podem ser solicitadas," Available: http://g1.globo.com/ac/acre/noticia/2013/05/autorizacao-de-queimadas-controladas-podem-ser-solicitadas.html
[68] State of Acre Government. "Imac começa a emitir autorização para queimadas controladas," Available: http://www.agencia.ac.gov.br/imac-comeca-a-emitir-autorizacao-para-queimadas-controladas/

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation

Data and parameters calculated during the course of project development include those listed in this section.

Data Unit / Parameter:	$\Delta C_{BSL,PAplanned}$
Data unit:	t CO_2-e
Description:	Net greenhouse gas emissions in the baseline from planned deforestation
Source of data:	Derived in Section 3.1 of PD
Value applied:	

Year	ΔCBSL,PA,unplanned
2013	3,277,844
2014	3,402,275
2015	3,560,825
2016	3,783,480
2017	3,864,401
2018	456,342
2019	456,342
2020	456,342
2021	456,342
2022	456,342

Justification of choice of data or description of measurement methods and procedures applied:	Derived and justified in Section 3 of PD in which baseline is set
Purpose of Data	Calculation of baseline emissions
Comments	

Data Unit / Parameter:	*CFn*
Data unit:	t C t^{-1} d.m.
Description:	Carbon fraction of biomass
Source of data:	IPCC 2006GL
Value applied:	0.47
Justification of choice of data or description of	Global default

measurement methods and procedures applied:	
Purpose of Data	Calculation of baseline emissions
Comments	

Data Unit / Parameter:	fj(X,Y)
Data unit:	t d.m. tree-1
Description:	Allometric equation for species j linking measured tree variable(s) to aboveground biomass of living trees.
Source of data:	Data resulting from the forest inventory.
Value applied:	See forest inventory excel workbook.
Justification of choice of data or description of measurement methods and procedures applied:	The Brown 1997 equation was validated as per methodological guidance. See "Forest biomass carbon inventory for the Russas and Valparaiso Properties, Acre State, Brazil," 2014 for details. Brown, S., 1997. Estimating biomass and biomass change of tropical forests: A primer. FAO Forestry Paper: vii, 55 p.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Comments	

Data Unit / Parameter:	Root Biomass Density
Data unit:	t d.m. ha-1
Description:	Allometric equation for predicting root biomass density as a function of aboveground biomass density.
Source of data:	Data resulting from the forest inventory.
Value applied:	See forest inventory excel workbook.
Justification of choice of data or description of measurement methods and procedures applied:	Cairns et al. 1997 is a widely accepted peer reviewed scientific publication. Cairns, M. A., S. Brown, E. H. Helmer, and G. A. Baumgardner. 1997. Root biomass allocation in the world's upland forests. Oecologia 111, 1-11.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Comments	

Data Unit / Parameter:	LIF
Data unit:	t C m-3
Description:	Logging infrastructure factor;
Source of data:	LK-ME
Value applied:	*0.29*
Justification of choice of data or description of measurement methods and procedures applied:	Default value in LK-ME
Purpose of data	Calculation of leakage emissions
Comments	

Data Unit / Parameter:	BEF
Data unit:	Dimensionless
Description:	Biomass expansion factor for conversion of merchantable volume to total aboveground tree biomass
Source of data:	Higuchi et al. 1998 (1/0.656=1.524390244).
Value applied:	1.524390244
Justification of choice of data or description of measurement methods and procedures applied:	BEF calculated using data from the Brazilian Amazon (i.e., country and ecoregion specific)
Purpose of data	Calculation of baseline emissions Calculation of leakage emissions
Comments	This parameter has been calculated as a BEF to fix equation 4 of the CP-W module.

Data Unit / Parameter:	LDF
Data unit:	t C m-3
Description:	Logging damage factor
Source of data:	LK-ME
Value applied:	*0.53*
Justification of choice of data or description	Default value for broadleaf and mixed forests in LK-ME

of measurement methods and procedures applied:	
Purpose of data	Calculation of leakage emissions
Comments	

Data Unit / Parameter:	LFME
Data unit:	Dimensionless
Description:	Leakage factor for market-effects calculations
Source of data:	LK-ME
Value applied:	0.4
Justification of choice of data or description of measurement methods and procedures applied:	The species that would be extracted in the project area are Amazonian species, and could only be sourced from other native forest sites in the Brazilian Amazon. They would also need to be sourced from relatively mature forests where millable size trees (> 40 cm DBH) can be readily found. Stem (merchantable portion) biomass as a percent of total aboveground biomass is fairly constant in mature Amazonian forests, averaging around 66% (Higuchi et al 1998), and is not expected to differ between those mature native forests in the project area and in other parts of the Brazilian Amazon.
Purpose of data	Calculation of leakage emissions
Comments	

Data Unit / Parameter:	SLFs
Data unit:	Dimensionless
Description:	Fraction of wood products that will be emitted to the atmosphere within 5 years of timber harvest for sawn wood
Source of data:	CP-W module
Value applied:	*0.2*
Justification of choice of data or description of measurement methods and procedures applied:	Default value from the CP-W module
Purpose of data	Calculation of baseline emissions Calculation of project emissions

	Calculation of leakage emissions
Comments	

Data Unit / Parameter:	OFts
Data unit:	Dimensionless
Description:	Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest for sawn wood
Source of data:	CP-W module
Value applied:	*0.84*
Justification of choice of data or description of measurement methods and procedures applied:	Default value from the CP-W module
Purpose of data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage emissions
Comments	

Data Unit / Parameter:	WWs
Data unit:	Dimensionless
Description:	The fraction immediately emitted through mill inefficiency for sawn wood
Source of data:	CP-W module
Value applied:	*0.24*
Justification of choice of data or description of measurement methods and procedures applied:	Default value from the CP-W module
Purpose of data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage emissions
Comments	

Data Unit / Parameter:	VBSL,EX,i,t

Data unit:	m^3
Description:	Volume of timber projected to be extracted from within the project boundary during the baseline in stratum i at time t
Source of data:	Calculated
Value applied:	

Year	VBSL,EX,i,t (m3)
2013	348,800
2014	348,800
2015	348,800
2016	348,800
2017	318,306
2018	0
2019	0
2020	0
2021	0
2022	0

Justification of choice of data or description of measurement methods and procedures applied:	Derived using Equation 4 of the LK-ME module
Purpose of data	Calculation of leakage emissions
Comments	None

Data Unit / Parameter:	Dmn
Data unit:	t d.m. m-3
Description:	Mean wood density of commercially harvested species
Source of data:	Calculated
Value applied:	*0.74*
Justification of choice of data or description of measurement methods and procedures applied:	This value uses site specific data on commercial log volume and estimates of wood density as found in Chave et al. 2006.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Comments	Value calculated using a combination of project specific data on commercial log volume and estimates of wood density as found in

	Chave et al. 2006. See "Env_ComVol_ 2015.03.13.xls" file in project archive.

Data Unit / Parameter:	PMLFT
Data unit:	%
Description:	Mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type
Source of data:	Feldpausch, T. R., McDonald, A. J., Passos, C. A., Lehmann, J., & Riha, S. J. (2006). Biomass, harvestable area, and forest structure estimated from commercial timber inventories and remotely sensed imagery in southern Amazonia. *Forest Ecology and Management*, *233*(1), 121-132
Value applied:	8%-12%
Justification of choice of data or description of measurement methods and procedures applied:	Volumetric weighted wood density as suggested by the methodology and volume by species.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Comments	None

Data Unit / Parameter:	COMF i
Data unit:	dimensionless
Description:	Combustion factor for stratum i
Source of data:	Derived from Table 2.6 of IPCC, 2006.
Value applied:	0.45
Justification of choice of data or description of measurement methods and procedures applied:	Value is for primary open tropical forest.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Comment	None

Data Unit / Parameter:	Gg,i
Data unit:	kg t-1 dry matter burnt
Description:	Emission factor for stratum i for gas g
Source of data:	Derived from Table 2.5 of IPCC, 2006.
Value applied:	G,N20 (kg/t d.m. burnt): 0.2 G,CH4 (kg/t d.m. burnt): 6.8
Justification of choice of data or description of measurement methods and procedures applied:	Default parameter from IPCC
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Comment	None

3.1.2 Data and Parameters Monitored

Details on data and parameters monitored are provided below.

Data Unit / Parameter:	$\Delta C_{P,Def,i,t}$
Data unit:	t CO_2-e
Description:	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	Year: 2016, ΔCP,DefPA,i,t (t CO2-e): 6,147 Year: 2017, ΔCP,DefPA,i,t (t CO2-e): 46,334 Year: 2018, ΔCP,DefPA,i,t (t CO2-e): 46,334
Monitoring equipment:	None.
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.

Purpose of data	Calculation of project emissions
Calculation method:	Equation 3, VMD0015
Comments	None

Data Unit / Parameter:	$\Delta C_{P,DistPA,i,t}$
Data unit:	t CO_2-e
Description:	Net carbon stock change as a result of natural disturbance in the project case in the project area in stratum i at time t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	Year / ΔCP,DistPA,i,t (t CO2-e) 2016 / 0 2017 / 0 2018 / 0
Monitoring equipment:	None.
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of data	Calculation of project emissions
Calculation method:	Equation 20, VMD0015
Comments	None

Data Unit / Parameter:	$A_{DefPA,u,i,t}$
Data unit:	Ha
Description:	Area of recorded deforestation in the project area stratum i converted to land use u at time t
Source of data:	Monitored at each monitoring/verification event through the use of classified satellite imagery
Description of measurement methods and procedures to be applied:	Detailed procedures are provided below under monitoring plan description. Monitoring responsibilities are listed in section 3.1.3,

	below.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	

Year	FAP + FAB + FD ADefPA ,u,i,t (ha)	FAP + FAB ADefPA, u,i,t (ha)	FAB + FAP ADefPA, u,i,t (ha)	FAB - Aluvial ADefPA, u,i,t (ha)
2016	7.0	0.0	0.0	3.2
2017	50.0	1.5	1.1	24.0
2018	50.0	1.5	1.1	24.0

Monitoring equipment:	*ArcGIS*
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	$A_{DefLK,,i,t}$
Data unit:	Ha
Description:	The total area of deforestation by the baseline agent of the planned deforestation in stratum I at time, t
Source of data:	Monitored at each monitoring/verification
Description of measurement methods and procedures to be applied:	Detailed procedures are provided below under monitoring plan description. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	

Year	AdefLK,i,t (ha)
2016	0
2017	0
2018	0

Monitoring equipment:	*ArcGIS*
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of leakage emissions

Calculation method:	Not relevant
Comments	This parameter is monitored. Ex-ante, it is assumed this value is zero and the agent of deforestation is a project proponent.

Data Unit / Parameter:	$A_{DistPA,q,i,t}$
Data unit:	Ha
Description:	Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i, at time t
Source of data:	Monitored at each monitoring/verification event through the use of classified satellite imagery
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	Year: $A_{DistPA,q,i,t}$ (ha) 2016: 0 2017: 0 2018: 0
Monitoring equipment:	*ArcGIS*
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	$C_{BSL,i}$
Data unit:	t CO_2-e ha^{-1}
Description:	Carbon stock in all pools in the baseline case in stratum i
Source of data:	Estimated from forest carbon inventory.
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description Monitoring responsibilities are listed in section 3.1.3,

	below.
Frequency of monitoring/recording:	Every ≤ 10 years.
Value applied:	<table><tr><td>Strata</td><td>CBSL,i (t CO2-e ha-1)</td></tr><tr><td>FAP + FAB + FD</td><td>546.5</td></tr><tr><td>FAP + FAB</td><td>513.2</td></tr><tr><td>FAB + FAP</td><td>498.0</td></tr><tr><td>FAB - Aluvial</td><td>655.4</td></tr></table>
Monitoring equipment:	dbh tape, measuring tape, GPS, clinometer
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Use equations as stated in the forest inventory, including allometric equations as found in Brown (1997), a volumetric based palm equation, Cairns et al. (1997), Van Wagner (1968)
Comments	None

Data Unit / Parameter:	ΔCpools,Def,u,i,t
Data unit:	t CO_2-e ha^{-1}
Description:	Net carbon stock changes in all pools in the project case in land use u in stratum i at time t
Source of data:	Calculated.
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years.
Value applied:	536.5
Monitoring equipment:	None.
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Equation 5, VMD0015

Comments	None

Data Unit / Parameter:	$A_{DegW,i,t}$
Data unit:	Ha
Description:	Area potentially impacted by degradation processes in stratum i
Source of data:	Delineated based on survey results indicating general area of project potentially accessed and typical depth of penetration of illegal harvest activities from points of access.
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Repeated each time the PRA indicates a potential for degradation. PRA conducted every < 5 years or if verification occurs on a frequency of less than every 5 years PRA must occur prior to any verification event".
Value applied:	Year / $A_{DegW,i,t}$ (ha) 2016 / 0 2017 / 0 2018 / 0
Monitoring equipment:	None.
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of data	Calculation of project emissions
Calculation method:	Not relevant
Comments	PRAs indicated no degradation

Data Unit / Parameter:	$C_{DegW,i,t}$
Data unit:	t CO_2-e
Description:	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum i at time t
Source of data:	Estimated from diameter measurements of cut stumps in sample plots
Description of measurement	Detailed procedures provided below under monitoring

methods and procedures to be applied:	plan description. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	Year / $C_{DegW,i,t}$ (t CO_2-e) 2016 / 0 2017 / 0 2018 / 0
Monitoring equipment:	None.
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of data	Calculation of project emissions
Calculation method:	Equation 8, VMD0015
Comments	PRAs indicated no degradation

Data Unit / Parameter:	AP_i
Data unit:	Ha
Description:	Total area of degradation sample plots in stratum i
Source of data:	Calculated as 3% of $A_{DegW,i,t}$
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	N/A
Monitoring equipment:	*ArcGIS*
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of data	Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	$\Delta C_{P,Deg,i,t}$
Data unit:	t CO_2-e
Description:	Net carbon stock changes as a result of degradation in stratum i in the project area at time t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	0
Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of data	Calculation of project emissions
Calculation method:	Equation 8, VMD0015
Comments	PRAs indicated no degradation

Data Unit / Parameter:	Aburn,q,i,t.
Data unit:	Ha
Description:	Area burnt in post-natural disturbance stratum q in stratum i, at time t;
Source of data:	See parameter $A_{DistPA,q,i,t}$ and ADefPA,u,i,t
Description of measurement methods and procedures to be applied:	Monitored as part of $A_{DistPA,q,i,t}$ Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	

Year	FAP + FAB + FD ADefPA,u,i,t (ha)	FAP + FAB ADefPA,u,i,t (ha)	FAB + FAP ADefPA,u,i,t (ha)	FAB - Aluvial ADefPA,u,i,t (ha)
2016	7.0	0.0	0.0	3.2
2017	50.0	1.5	1.1	24.0
2018	50.0	1.5	1.1	24.0

Monitoring equipment:	None.
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of project emissions
Calculation method:	Aburn,q,i,t.= $A_{DistPA,q,i,t}$ (area burnt in natural disturbance) + ADefPA,u,i,t (area burnt via deforestation in project ex post)
Comments	None

Data Unit / Parameter:	dbh
Data unit:	cm
Description:	diameter at breast height
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	See forest inventory excel sheet.
Monitoring equipment:	dbh tape, measuring tape,
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	dbasal
Data unit:	cm
Description:	Basal diameter
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of	Every ≤ 10 years

monitoring/recording:	
Value applied:	See forest inventory excel sheet.
Monitoring equipment:	dbh tape, measuring tape,
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	Dbh may be used as a conservative estimate of dbasal

Data Unit / Parameter:	H
Data unit:	m
Description:	Height of tree
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	See forest inventory excel sheet.
Monitoring equipment:	measuring tape, clinometer
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	Dn
Data unit:	cm
Description:	Diameter of piece n of dead wood along the transect
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.

Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	See forest inventory excel sheet.
Monitoring equipment:	dbh tape, measuring tape
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	N
Data unit:	dimensionless
Description:	Total number of wood pieces intersecting the transect
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	See forest inventory excel sheet.
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	L
Data unit:	m
Description:	Length of the transect
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3,

applied:	below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	184 m
Monitoring equipment:	measuring tape,
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	$U_{P,SS,i,pool\#}$
Data unit:	%
Description:	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks and greenhouse gas sources in the with-project case (1,2…n represent different carbon pools and/or GHG sources)
Source of data:	Calculations arising from field measurement data
Description of measurement methods and procedures to be applied:	Uncertainty in pools derived from field measurement with 95% confidence interval calculated as the standard error of the averaged plot measurements in each stratum multiplied by the t value for the 95% confidence level. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Monitored at least once every 10 years (on re-measurement of forest carbon stocks)
Value applied:	Same as UBSL,SS,i,pool# values below.
Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant

Comments	Same as UBSL,SS,i,pool# values below as forest carbon stock growth was not tracked.

Data Unit / Parameter:	EBSL SS,i, pool#
Data unit:	t CO2-e
Description:	Carbon stock or GHG sources (e.g. trees, dead wood, soil organic carbon, emission from fertilizer addition, emission from biomass burning etc.) in the baseline case
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years.
Value applied:	

Strata	Live aboveground tree biomass	Belowground biomass	Standing dead wood	Lying dead wood
FAP + FAB + FD	6,388,286	1,430,909	25,996	242,238
FAP + FAB	7,455,498	1,676,716	56,615	205,832
FAB + FAP	1,150,968	259,555	9,093	31,791
FAB - Aluvial	1,701,983	376,116	38,440	33,835

Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	Baseline stocks and sources are estimated ex-ante for each baseline period

Data Unit / Parameter:	UBSL,SS,i,pool#
Data unit:	%
Description:	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks and greenhouse gas sources in the baseline case

	(1,2…n represent different carbon pools and/or GHG sources)
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years.
Value applied:	

Strata	Live aboveground tree biomass	Belowground biomass	Standing dead wood	Lying dead wood
FAP + FAB + FD	6.6%	6.1%	52.2%	76.8%
FAP + FAB	9.1%	8.4%	43.5%	37.2%
FAB + FAP	13.9%	12.9%	222.6%	66.6%
FAB - Aluvial	10.2%	9.4%	264.1%	122.0%

Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	See equation 4 in the X-UNC module.
Comments	Baseline stocks and sources are estimated ex-ante for each baseline period

Data Unit / Parameter:	EBSL SS,i
Data unit:	t CO2-e
Description:	Sum of combined carbon stocks and GHG sources in stratum i multiplied by the area of stratum i (Ai) in the baseline case
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years.

Value applied:	

Strata	EBSL,SS,t,I (tCO2e)
FAP + FAB + FD	8,087,429
FAP + FAB	9,394,661
FAB + FAP	1,451,406
FAB - Aluvial	2,150,373

Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	Baseline stocks and sources are estimated ex-ante for each baseline period

Data Unit / Parameter:	UBSL,SS,i
Data unit:	%
Description:	Percentage uncertainty in the combined carbon stocks and greenhouse gas sources in stratum i in the baseline case
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years.
Value applied:	

Strata	UncertaintyBSL,SS,I (%)
FAP + FAB + FD	5.8%
FAP + FAB	7.4%
FAB + FAP	11.4%
FAB - Aluvial	9.7%

Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of data	Calculation of baseline emissions Calculation of project emissions

Calculation method:	See equation 5 in the X-UNC module.
Comments	Baseline stocks and sources are estimated ex-ante for each baseline period

Data Unit / Parameter:	Bi,t
Data unit:	tonnes d. m. ha-1
Description:	Average aboveground biomass stock before burning stratum i, time t
Source of data:	Calculated using forest inventory data
Description of measurement methods and procedures to be applied:	Detailed forest inventory procedures are provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	

FAP + FAB + FD B,i,t (t d.m./ha)	FAP + FAB B,i,t (t d.m./ha)	FAB + FAP B,i,t (t d.m./ha)	FAB - Aluvial B,i,t (t d.m./ha)
261.0	244.7	237.3	313.8

Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Calculation method:	Use equations as stated in the forest inventory, including allometric equations as found in Brown (1997) and a volumetric based palm equation, Van Wagner (1968)
Comments	Ex-ante Bi,t is the weighted average across all strata

Data Unit / Parameter:	AGB
Data unit:	tonnes d. m. ha-1
Description:	Aboveground biomass density
Source of data:	Calculated using forest inventory data
Description of measurement methods and procedures to be applied:	Detailed forest inventory procedures are provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3,

	below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	Plot level values can be found in the Forest Inventory Report
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Use equations as stated in the forest inventory, including allometric equations as found in Brown (1997) and a volumetric based palm equation, Van Wagner (1968)
Comments	None

Data Unit / Parameter:	Asp
Data unit:	ha
Description:	Area of sample plots in ha
Source of data:	Recording and archiving of number and size of sample plots
Description of measurement methods and procedures to be applied:	Detailed forest inventory procedures are provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	0.16619 ha or a 23m radius circle
Monitoring equipment:	M
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	Hsdw
Data unit:	M
Description:	Height of standing dead tree in m

Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	See forest inventory excel workbook.
Monitoring equipment:	measuring tape, clinometer
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comments	None

Data Unit / Parameter:	DDWdc
Data unit:	t d.m. m-3
Description:	Mean wood density of dead wood in the density class (dc) – sound (1),intermediate (2), and rotten (3); t d.m. m-3
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	**Density Class** / **Density (t d.m. m-3)** Rotten (P) / 0.131 Intermediary (I) / 0.382 Solid (S) / 0.517
Monitoring equipment:	dbh tape, measuring tape, drying oven
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant

Comments	None

Data Unit / Parameter:	CP,Dist,q,i
Data unit:	t CO2-e ha-1
Description:	Carbon stock in all pools in post-natural disturbance q in baseline stratum i
Source of data:	Monitored
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document. Monitoring responsibilities are listed in section 3.1.3, below.
Frequency of monitoring/recording:	Prior to each verification event and at least every 5 years.
Value applied:	0
Monitoring equipment:	dbh tape, measuring tape, GPS, clinometer
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of project emissions
Calculation method:	Use equations as stated in the forest inventory, including allometric equations as found in Brown (1997) and a volumetric based palm equation, Cairns et al. (1997), Van Wagner (1968). Carbon stocks must be measured and estimated using the methods given in module CP-AB and CP-D.
Comments	Alternatively, it can be conservatively assumed that a post-natural disturbance live and dead vegetation pool is equal to zero

Data Unit / Parameter:	Ai
Data unit:	ha
Description:	Total area of stratum i
Source of data:	GIS coverages
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every $\leq$ 10 years
Value applied:	

	Strata in Project: FAP + FAB + FD — Ai (ha): 14,800 FAP + FAB — 18,306 FAB + FAP — 2,915 FAB - Aluvial — 3,281
Monitoring equipment:	*ArcGIS*
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Calculation method:	N/A
Comments	*Ex-ante,* it shall be assumed that stratum area will remain constant for the baseline period

Data Unit / Parameter:	AAplanned,i,t
Data unit:	Ha
Description:	Annual area of baseline planned deforestation for stratum i at time t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	

Year	Actual AAplanned,i,t	Conservative AAplanned,i,t
2013	32,205	8,000
2014	7,095	8,000
2015	0	8,000
2016	0	8,000
2017	0	7,301
2018	0	0
2019	0	0
2020	0	0
2021	0	0

	2022	0	0	
Monitoring equipment:	N/A			
QA/QC procedures to be applied:	N/A			
Purpose of data	Calculation of baseline emissions			
Calculation method:	Uses Equation 3 in BL-PL			
Comments	None			

Data Unit / Parameter:	Aplanned,i
Data unit:	Ha
Description:	Total area of planned deforestation over the baseline period for stratum i
Source of data:	Monitored
Description of measurement methods and procedures to be applied:	Determined using a GIS
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	200,000
Monitoring equipment:	GIS
QA/QC procedures to be applied:	None
Purpose of data	Calculation of baseline emissions
Calculation method:	N/A
Comments	This is the total area of the project property.

Data Unit / Parameter:	ALT,i
Data unit:	t CO2-e
Description:	Summed emissions from timber harvest in stratum i in the baseline case potentially displaced through implementation of carbon project
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every ≤ 10 years

Value applied:	

Year	ALT,i
2013	1,493,538
2014	1,493,538
2015	1,493,538
2016	1,493,538
2017	1,362,966
2018	0
2019	0
2020	0
2021	0
2022	0

Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data	Calculation of leakage emissions
Calculation method:	Equation 3 in LK-ME
Comments	None

Data Unit / Parameter:	CXB,sawnwood
Data unit:	t CO2-e
Description:	Carbon emission due to displaces timber harvests in the baseline scenario in stratum in time t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	

Year	CBSL,XBFWC,i,t
2013	348,800
2014	348,800
2015	348,800
2016	348,800
2017	318,306
2018	0
2019	0
2020	0

	2021	0
	2022	0
Monitoring equipment:	N/A	
QA/QC procedures to be applied:	N/A	
Purpose of data	Calculation of leakage emissions	
Calculation method:	Equation 4 in LK-ME	
Comments	None	

Data Unit / Parameter:	Pcomi
Data unit:	Dimensionless
Description:	Commercial volume as a percent of total aboveground volume in stratum i
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	*N/A*
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	0.13
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Calculation method:	1) commercial portion of a tree (.656) x 49.1 tons d.m./ha, total aboveground biomass for commercial species, forest inventory 2) 246.5 tons d.m./ha, average total aboveground biomass, forest inventory
Comments	None

Data Unit / Parameter:	CWP100,i
Data unit:	t CO2/ha
Description:	Carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years from stratum *i*; t CO2-e ha-1

Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	24.1
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Calculation method:	Uses Equation 2 in the CP-W module
Comments	None

Data Unit / Parameter:	CWP,i
Data unit:	t CO2/ha
Description:	Carbon stock entering wood products pool at time of deforestation from stratum *i*
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	27.7
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Calculation method:	Uses Equation 2 in the CP-W module
Comments	None

Data Unit / Parameter:	NewRi,t

Data unit:	Ha
Description:	New calculated forest clearance in stratum i at time t by the baseline agent of the planned deforestation where no leakage is occurring
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	

Year	NewRi,t
2013	0
2014	0
2015	0
2016	0
2017	0
2018	23
2019	23
2020	23
2021	23
2022	23

Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data	Calculation of leakage
Calculation method:	Uses Equation 4 in the LK-ASP module
Comments	None

Data Unit / Parameter:	PMPi
Data unit:	%
Description:	Merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries
Source of data:	Within each stratum divide the summed merchantable biomass (defined as “Total gross biomass (including bark) of a tree 40 cm DBH or larger from a 30 cm stump to a minimum 10 cm top DOB of the central stem”) by the summed total aboveground tree biomass Merchantable biomass is equal to merchantable volume

	multiplied by wood density (Dmn)
Description of measurement methods and procedures to be applied:	N/A
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:	11.9
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data	Calculation of leakage
Calculation method:	N/A
Comments	None

3.1.3 Monitoring Plan

This monitoring plan has been developed in close conjunction with module VMD0015 of the REDD Methodological Module, "Methods for monitoring of greenhouse gas emissions and removals (M-MON)." This section focuses on establishing procedures for monitoring deforestation, illegal degradation, natural disturbance, and project emissions ex-post in the project area and leakage areas. Further, procedures for updating the forest carbon stocks and revising the baseline are also provided below.

For accounting purposes, the Project conservatively assumes stable stocks and no biomass monitoring is conducted in areas undergoing carbon stock enhancement, as permitted in the methodology monitoring module VMD0015, hence $\Delta C_{P,Enh,i,t}$ is set to 0.

Further as no commercial harvest of timber (including FSC selective logging) occurs in the with project case, the degradation due to harvest of timber will not be monitored, thus parameter $\Delta C_{P,SelLog,i,t}$ is set to 0.

A separate section on quality assurance/quality control and data archiving procedures covers all monitoring tasks.

Organizations responsible for monitoring are listed below in Table 3.8. These organizations are responsible for implementing all aspects of a particular monitoring task, as described in the monitoring sub-sections below.

Estimation of Ex-Post Net Carbon Stock Changes and Greenhouse Gas Emissions

Ex-post net carbon stock changes and greenhouse gas emissions can only be calculated after monitoring:

- The net carbon stock change as a result of deforestation in the Project area;
- The net carbon stock change as a result of degradation in the Project area;
- The net carbon stock change as a result of natural disturbance in the Project area; and
- The greenhouse gas emissions as a result of deforestation and degradation activities within the Project area.

Monitoring Deforestation and Natural Disturbance

Forest cover change due to deforestation and natural disturbance is monitored through periodic assessment of classified satellite imagery, see below, covering the Project Area. Emissions ($\Delta C_{P,Def,i,t}$ and $\Delta C_{P,DistPA,i,t}$ for deforestation and natural disturbance, respectively) are estimated by the multiplying areas $A_{DefPA,u,i,t}$ and $A_{DistPA,q,i,t}$,, for deforestation and natural disturbance, respectively, by average forest carbon stock per unit area. Note that $A_{DistPA,q,i,t}$,, is limited to the area where credits have been issued and is identified as the overlap between the delineated area of the disturbance and the summed area of deforestation in the project area to the year in which the disturbance occurred. Stock estimates from the initial field inventory completed in 2014, are valid for 10 years (per VM0007). Table 3.1 shows the data and parameters monitored.

Table 3.1 Data and Parameters for Monitoring Deforestation and Natural Disturbance.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
$\Delta C_{P,Def,i,t}$	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t	t CO_2e	Calculated
$\Delta C_{P,DistPA,i,t}$	Net carbon stock change as a result of natural disturbance in the project case in the project area in stratum i at time t	t CO_2e	Calculated
$A_{DefPA,u,i,t}$	Area of recorded deforestation in the project area stratum i converted to land use u at time t	Ha	Monitored for each verification event
$A_{DistPA,q,i,t}$	Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i, at time t	Ha	Monitored for each verification event
$C_{BSL,i}$	Carbon stock in all pools in the baseline case in stratum i	t CO_2e ha^{-1}	Estimated from the forest carbon inventory

Changes in forest cover ($A_{DefPA,u,i,t}$ and $A_{DistPA,q,i,t}$) will be monitored using data provided by the State of Acre. UCEGEO, the GIS department within the Climate Change Institute, Acre State government, produces an annual dataset on the extent and spatial location of all deforestation within the state using Landsat images. This dataset extends back to 1988. The definition of forest used in the classified dataset

is in broad agreement with the Brazilian definition of a forest[69] as set by the Clean Development Mechanism Designated National Authority.

The UCGEO classification methodology includes atmospheric and geometric correction and uses a supervised classification approach. Landsat images with cloud cover covering less than 10% of a scene were downloaded and corrected for any atmospheric problems (using Carlotto HAZE algorithm) and geometric correction (using images Geocover 2000). Georeferencing was conducted with the nearest neighbor method, using a minimum of 20 points, and had an error (RMS) of less than 1 pixel. The image processing phase includes image segmentation (into statistically homogeneous areas) using Landsat bands 3, 4 & 5 (Blue, green and red). Then representative samples (training sites) of Forest, Non-Forest Water, Cloud and Cloud Shadow are selected using expert knowledge that are distributed throughout the image and represent the variability within each class. A supervised classification[70] approach was used with the Support Vector Machine (SVM) classification algorithm. All processing was implemented in ENVI + IDL 4.6 except georeferencing which was carried out using ERDAS IMAGINE 9.

Additional details on pre-processing can be found in the UCEGEO methodology. Deforestation and natural disturbance will be distinguished using ancillary data which may include but is not limited to high resolution imagery, digital elevation models (to identify steep areas prone to landslides), information from local land managers, etc.

In the case, where this dataset ceases to be available, ex-post deforestation will be determined by classification of remotely sensed imagery and land use change detection procedures.

The Project Area as set in the PD, will serve as the initial “forest cover benchmark map” against which changes in forest cover will be assessed over the interval of the first monitoring period; the entire project area has been demonstrated to meet the forest definition at the beginning of the crediting period. For subsequent monitoring periods, change in forest cover will be assessed against the preceding classified forest cover map marking the beginning of the monitoring interval. Thus, the forest benchmark map is updated at each monitoring event.

<u>Monitoring Illegal Degradation</u>

Emissions due to illegal logging will be tracked by conducting surveys in the surrounding areas every two years. Locations surveyed will include:

- Families residing on the Envira property adjacent to the Project Area; and
- Nearby ranches and rural properties, along the Jurupari and Envira Rivers.

[69] The Clean Development Mechanism Designated National Authority in Brazil has set the forest definition as:
1. Minimum tree crown cover of 30 per cent;
2. Minimum land area of 1 hectare; and
3. Potential to reach a minimum tree height of 5 meters at maturity
See http://cdm.unfccc.int/DNA/ARDNA.html?CID=30, accessed March 5, 2012.
[70] There is no overlap between the accuracy assessment points and the data used for classification.

Surveys will produce information on wood consumers (i.e., fuel wood and wood for construction and charcoal production) in the surroundings areas, as well as general indications on the areas where wood is sourced from and maximum depth of penetration of harvest activities from access points. In the event that any potential of illegal logging occurring in the project area is detected from the surveys (i.e. ≥ 10% of those interviewed/surveyed believe that degradation may be occurring within the project boundary), then an estimation of emissions associated with illegal logging will be produced from the survey data and the T-SIG tool applied. The information collected in the PRAs will be used to calculate logging emissions in conjunction with conservative assumptions/estimates including that all wood collected was live, use of a regional charcoal recovery rate, use of a logging damage factor from the methodology, and that trees harvested were in the 99th percentile in terms of dbh.

In the event that the initial assessment indicated that illegal logging is occurring and significant in the area; the potential degradation area within the project area ($A_{DegW,i}$) will be delineated based on survey results, incorporating general area information and depth of penetration. Degradation monitoring plots will be allocated to achieve a 3% sample of this area. Rectangular plots 10 meters by 1 kilometer (1 ha area) will be randomly or systematically allocated in the area, sufficient to produce a 3% sample of the area, and any recently-cut stumps or other indications of illegal harvest will be noted and recorded. Diameter at breast height, or diameter at height of cut, whichever is lower, of cut stumps will be measured. Biomass will be estimated from measured diameters (conservatively assuming that diameters of stumps cut below breast height are equivalent to diameter at breast height) applying the allometric equations of Brown (1997) and otherwise maintain consistency with analytical procedures applied in the original forest inventory report. Emissions due to illegal logging ($\Delta C_{P,DegW,i,t}$) are estimated by multiplying area ($A_{DegW,i}$) by average biomass carbon of trees cut and removed per unit area ($C_{DegW,i,t}/AP_i$).

The 3% sample will be carried out once every 5 years where initial surveys continue to indicate possibility of illegal logging in the project area to produce an estimate of emissions resulting from illegal logging ($\Delta C_{P,DegW,i}$). Estimates of emissions will be annualized (to produce estimates in t CO_2e per year) by dividing the emission for the monitoring interval by the number of years in the interval.

Table 3.2 Data and Parameters for Monitoring Illegal Degradation.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
$A_{DegW,i,t}$	Area potentially impacted by degradation processes in stratum i	Ha	Delineated based on survey results indicating general area of project potentially accessed and typical depth of penetration of illegal harvest activities from points of access
$C_{DegW,i,t}$	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum i at time t	t CO_2e	Estimated from diameter measurements of cut stumps in sample plots

AP_i	Total area of degradation sample plots in stratum i	Ha	Calculated as 3% of $A_{DegW,i,t}$
$\Delta C_{P,DegW,i,t}$	Net carbon stock changes as a result of degradation in stratum i in the project area at time t	t CO_2e	Calculated

Monitoring Project Emissions

With project emissions are calculated as the sum of emission from fossil fuel combustion (EFC,i,t) + non-CO_2 emissions due to biomass burning (EBiomassBurn,i,t) + direct N_2O emissions as a result of nitrogen application (N2Odirect-N,i,t.). As stipulated in the methodology, fossil fuel combustion in all situations is an optional emission source. Further, no nitrogen is applied on pasture land in the with project case and hence project emissions therefore equal EBiomassBurn and are calculated using the VMD0013, "Estimation of greenhouse gas emissions from biomass burning (E-BB)" of the AD Partners modular REDD Methodology.

Non CO_2 emissions from biomass burning in the project case include emissions from burning associated with deforestation and burning associate with natural disturbance, i.e. forest fire. It will be conservatively assumed that the total area burnt during the deforestation process is equal to the area deforested, ADefPA,u,i,t. Thus, the area used when calculating E-BB is equal to Aburn,i,t. (area burnt) = Aburn,q,i,t. (area burnt in natural disturbance) + ADefPA,u,i,t (area burnt via deforestation in project ex post)."

Also, it is conservatively assumed that burning is a part of the forest conversion process in all incidents of deforestation taking place in the activity shifting leakage areas. Thus, the parameter $A_{burn,i,t}$ (Area burnt for stratum *i* at time *t*; ha) will be set equal to monitored parameter $A_{DefLK,i,t}$ (Area of recorded deforestation in the activity shifting leakage areas at time t; ha). The T-SIG tool can then be applied, and if parameter $E_{BiomassBurn,t}$ (Greenhouse emissions due to biomass burning as part of deforestation activities in stratum *i* in year *t*) is determined to be insignificant, $E_{BiomassBurn,t}$, can be assumed equal to zero.

Table 3.3 Data and Parameters for Monitoring Emissions from Biomass Burning.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
E BiomassBurn,t	Greenhouse emissions due to biomass burning as part of deforestation activities in stratum i in year t	tCO_2e of each GHG (CH_4, N_2O)	Calculated
Aburn,i,t	Area burnt for stratum i at time t	Ha	Monitored for each verification event
Bi,t	Average aboveground biomass stock before burning stratum i, time t	tonnes d. m. ha-1	Conservatively assumed to be the carbon stock in all pools in the baseline case (CBSL,i).

COMF i	Combustion factor for stratum i; dimensionless	dimensionless	0.45 for primary open tropical forest. Derived from Table 2.6 of IPCC, 2006.
Gg,i	Emission factor for stratum i for gas g	kg t-1 dry matter burnt	GCH_4 = 6.8 g kg-1 and GN_2O = 0.2 g kg-1. Derived from Table 2.5 of IPCC, 2006.
GWPg	Global warming potential for gas g	t CO_2/t gas g	Default values from IPCC SAR: CH_4 = 21; N_2O = 310).

Monitoring of Leakage Carbon Stock Changes and Greenhouse Gas Emissions

Two sources of leakage will be monitored: activity-shifting leakage and market leakage.

Activity-Shifting Leakage

Activity-shifting leakage will be monitored by tracking areas of deforestation ($A_{defLK,i,t}$), across all lands outside of the Project Area owned or under management by the baseline agent, JR Agropecuária e Empreendimentos EIRELI, including properties listed in Table 3.4. This will be accomplished by examining remote sensing data, and/or legal records, and/or survey information.

The baseline agents of deforestation will be surveyed for verification events. Further, this information will be checked against remote sensing/aerial imagery where available, including but not limited to: the most recent Acre deforestation dataset, Google Earth, or other. In the event that deforestation is noted, further confirmation will be made that the deforestation resulted from authorized deforestation activities by JR Agropecuária e Empreendimentos EIRELI.

Table 3.4. List of properties in Brazil owned by the JR Agropecuária e Empreendimentos EIRELI.

Number	Property	Land Owner/Manager	State
1	Propriedade Envira	Duarte Jose do Couto Neto	Acre
2	Fazenda Pelicano	Rubens Vasques	Mato Grosso
3	Fazenda Esperanca	Bento Ferraz Pacheco	Mato Grosso
4	Seringal Canada	Duarte Jose do Couto Neto	Acre
5	Seringal Bom Principio	Duarte Jose do Couto Neto	Acre
6	Seringal Agrilo do Norte	Duarte Jose do Couto Neto	Acre
7	Seringal Porto Envira	Duarte Jose do Couto Neto	Acre
8	Seringal Nazareth	Duarte Jose do Couto Neto	Acre
9	Seringal Liberdade Parte A	Duarte Jose do Couto Neto	Acre
10	Seringal Ceci	Duarte Jose do Couto Neto	Acre
11	Gleba Canada II	Duarte Jose do Couto Neto	Acre

Market Leakage

Market leakage values calculated ex-ante are also used ex-post as no with project harvesting of timber, fuel wood or charcoal is destined for commercial markets.

Table 3.5 Data and Parameters for Leakage.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
ADefLK,i,t	The total area of deforestation by the baseline agent of the planned deforestation in stratum I at time, t	ha	Monitored for each verification event

Monitoring of Actual Carbon Stock Changes and Greenhouse Gas Emissions

Forest carbon stock estimates will be derived from field measurements less than or equal to 10 years old. Aboveground and belowground live tree and dead wood stocks will be re-assessed on or before 2023. For each stratum, where the re-measured estimate is within the 90% confidence interval of the t=0 estimate, the t=0 stock estimate takes precedence and is re-employed, and where the re-measured estimate is outside (i.e. greater than or less than) the 90% confidence interval of the t=0 estimate, the new stock estimate takes precedence and is used for the subsequent period.

Sample plots will be randomly located in areas within the Envira Amazonia Project and measured following standard operating procedures located in Appendix B of the Project document. Biomass will be estimated applying the following allometric equations and otherwise maintain consistency with analytical procedures applied in the original inventory ("Forest biomass carbon inventory for the Envira Project, Acre State, Brazil," 2014).

For live trees, biomass is calculated as a function of diameter at breast height (DBH; in cm) using the predictive model developed by Brown[71] for tropical moist forest stands. Application of the "moist" equation reflects the annual precipitation for the inventoried area, 2200mm.

aboveground biomass (kg) = ((42.69-12.8*(DBH)+1.242*(DBH)^2)) Equation 3.1

For palms, height and basal diameter measurements are used to estimate the aboveground volume of a paraboloid and then mean (species level) Amazonian palm specific gravity of 0.31 g/cm3 estimated by Baker et al (2004) will be applied. The estimate of biomass for palms is therefore to be limited to the main trunk (bole) of the palm. Thus, for palms

aboveground biomass (Mg) = $0.5*\Pi*(\text{basal diameter(cm)}/200)^2*\text{height(m)}*0.31$ Equation 3.2

[71] Brown, S., 1997. Estimating biomass and biomass change of tropical forests: A primer. FAO Forestry Paper: vii, 55 p.

Root biomass density is estimated at the cluster sample level applying the equation developed by Cairns et al.[72] , where

Root Biomass Density (t/ha) = EXP (-1.085 + 0.925 LN(aboveground biomass density)) Equation 3.3

The volume of lying dead wood per unit area is estimated using the equation (Warren and Olsen[73]) as modified by Van Wagner[74] separately for each dead wood density class:

$$V_{LDW} = \frac{\pi^2 * \left(\sum_{n=1}^{N} D_n^{\,2} \right)}{8 * L}$$

Equation 3.4

where:

V_{LDW} Volume of lying dead wood per unit area; $m^3\ ha^{-1}$

D_n Diameter of piece n of dead wood along the transect; cm

N Total number of wood pieces intersecting the transect; dimensionless

L Length of the transect; m

Length of each transect was corrected for slope. The volumes per unit area of each dead wood density class are then multiplied by their respective densities to convert to a mass per unit area.

Biomass of standing dead wood is estimated using the allometric equation for live trees in the decomposition class 1. In decomposition class 2, the estimate of biomass was limited to the main trunk (bole) of the tree, in which case the biomass was calculated converting volume to biomass using dead wood density classes. Volume was estimated as the volume of a cone, as specified in the VM0007 module, “Estimation of carbon stocks in the dead wood pool”.

Density of dead wood is determined through sampling and laboratory analysis. Discs are collected in the field and decomposition class and green volume determined as per standard protocols (see Appendix B of the Project document for more details). The resulting dry weight is recorded and used to calculate dead wood density as oven-dry weight (g) / green volume (cm^3) for each sample.

Dry mass is converted to carbon using the default carbon fraction of 0.47 t C/t d.m. (as recommended by IPCC[75] Guidelines for National Greenhouse Gas Inventories).

[72] Cairns, M. A., S. Brown, E. H. Helmer, and G. A. Baumgardner. 1997. Root biomass allocation in the world’s upland forests. Oecologia 111, 1-11.
[73] Warren, W.G. and Olsen, P.F. (1964) A line intersect technique for assessing logging waste. Forest Science 10: 267-276.
[74] Van Wagner, C.E. (1968). The line intersect method in forest fuel sampling. Forest Science 14: 20-26.
[75] IPCC 2006 Guidelines for National Greenhouse Gas Inventories. Chapter 4 AFOLU (Agriculture, Forestry and Other Land-use).

Table 3.6 Data and Parameters for Monitoring Carbon Stocks Changes and GHG Emissions.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
CWP100,i	Carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years from stratum i	t CO2-e ha-1	Calculated
ΔCAB_tree,i	Baseline carbon stock change in aboveground tree biomass in stratum i	t CO2-e ha-1	Estimated from the forest carbon inventory
ΔCBB_tree,i	Baseline carbon stock change in belowground tree biomass in stratum i	t CO2-e ha-1	Estimated from the forest carbon inventory
ΔCDW,i	Baseline carbon stock change in dead wood in stratum i	t CO2-e ha-1	Estimated from the forest carbon inventory

Revision of the Baseline

The baseline will be revised every 10 years from the Project start date. As the entire Project Area will have been deforested during the initial baseline period, no new areas will be deforested post 2022 in the baseline. From 2023 onward, the baseline is therefore limited to delayed emissions in the dead wood, below ground biomass, and wood product pools resulting from deforestation in the initial baseline period. Should an analysis of proxy areas be warranted to estimate a rate of deforestation, the BL-PL module will be consulted. Data collection procedures in regards to revision of the baseline will include participatory rural appraisals, interviews and collaboration with the Acre State government, UCEGEO, the GIS department within the Climate Change Institute, and municipal officials. In the case, where the Acre State government no longer produces the annual dataset on the extent and spatial location of all deforestation within the state, deforestation maps will be prepared by classifying remotely sensed imagery. Other datasets used to substantiate aspects of the baseline with be from official government sources, peer reviewed publications, or other reputable sources.

Table 3.7 Data and Parameters for Revising the Baseline.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
ΔCBSL,planned	Net greenhouse gas emissions in the baseline from planned deforestation	t CO_2e	Calculated every 10 years
ΔCBSL,i,t	Net carbon stock changes in all pools in the baseline stratum i at time t	t CO2-e	Calculated every 10 years

GHGBSL-E,i,t	Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline stratum i during project year t	t CO2-e year-1	Calculated every 10 years
AAplanned,i,t,	Annual area of baseline planned deforestation for stratum i at time t	ha	Calculated every 10 years
ΔCstocks,i	Baseline carbon stock change in stocks in stratum i	t CO2-e ha-1	Estimated from the forest carbon inventory. See Table 4.6 of the PD.

Quality Assurance/Quality Control and Data Archiving Procedures

Monitoring Deforestation, Natural Disturbance, and Leakage

To ensure consistency and quality results, spatial analysts carrying out the imagery processing, interpretation, and change detection procedures will strictly adhere to best practices and good practice guidelines, when using the alternative method for quantifying deforestation. All data sources and analytical procedures will be documented and archived (detailed under data archiving below).

Data provided by UCEGEO has undergone geometric correction, extensive processing, and accuracy evaluation as mentioned by the State of Acre (2011) in their "Review of deforestation dynamics of deforestation in Acre."[76] Accuracy of the classification, for both the baseline and monitoring, will be assessed by comparing the classification with ground-truth points or samples of high resolution imagery. Any data collected from ground-truth points will be recorded (including GPS coordinates, identified land-use class, and supporting photographic evidence) and archived. Any sample points of high resolution imagery used to assess classification accuracy will also be archived. Samples used to assess classification accuracy should be well-distributed throughout the project area (as far as is possible considering availability of high resolution imagery and/or logistics of acquiring ground-truth data), with a minimum sampling intensity of 50 points each for the forest and non-forest classes.

The classification will only be used in the forest cover change detection step if the overall classification accuracy, calculated as the total number of correct samples / the total number of samples, is equal to or exceeds 90%.

All data sources and processing, classification and change detection procedures will be documented and stored in a dedicated long-term electronic archive.

Information related to monitoring deforestation maintained in the archive will include:

- Forest / non-forest maps;

[76] ACRE - Governo do Estado do Acre. REVISÃO DA DINÂMICA DO DESMATAMENTO NO ESTADO DO ACRE: ANÁLISE TEMPORAL DE 23 ANOS (PERÍODO DE 1988 A 2010). Rio Branco: (UCEGEO - FUNTAC/SEMA), 2011.

- Documentation of software type and procedures applied (including all pre-processing steps and corrections, spectral bands used in final classifications, and classification methodologies and algorithms applied), if applicable; and
- Data used in accuracy assessment - ground-truth points (including GPS coordinates, identified land-use class, and supporting photographic evidence) and/or sample points of high resolution imagery.

Forest Carbon Stocks and Degradation

The following steps will be taken to control for errors in field sampling and data analysis:

1. Trained field crews will carry out all field data collection and adhere to standard operating procedures. Pilot sample plots shall be measured before the initiation of formal measurements to appraise field crews and identify and correct any errors in field measurements. Field crew leaders will be responsible for ensuring that field protocols are followed to ensure accurate and consistent measurements. To ensure accurate measurements, the height of diameter at breast height (1.3 m) will be periodically re-assessed by personnel during the course of the inventory.
2. Field measurement data will be recorded on standard field data sheets and entered into an excel database for data management and quality control. Potential errors in data entry (anomalous values) will be verified or corrected consulting the original data sheets or personnel involved in measurement. Original data sheets will be permanently archived in a dedicated long-term electronic archive. The electronic database will also archive GIS coverages detailing forest and strata boundaries and plot locations.

Quality control procedures for sampling degradation will include steps 1 and step 3, above.

Quality control procedures related to monitoring leakage include conducting baseline agent surveys and reviewing records documenting deforestation by the agent of deforestation and checking these figures against remotely sensed imagery where available.

Personnel involved in the revising of the baseline will have detailed knowledge in regards to spatial modeling and land use change and deep familiarity with REDD methodologies. Remote sensing data used will include officially published dataset, or classified imagery, which meets accuracy assessment requirements as laid out in the methodology.

All measurement and monitoring equipment requiring calibration will be calibrated according to the equipment's specifications and/or relevant national or international standards.

Data Archiving

Data archived will be maintained through at least two years beyond the end of the Project crediting period. All Project records are secure and retrievable. This includes Project documents saved on the desktop of CarbonCo's Project Director and stored in the Director's file cabinets (based in Windham, New

Hampshire). An identical version of the Project documents are remotely saved on an external hard drive and in the cloud via DropBox. Furthermore, many Project documents (e.g., VCS Project Description, Monitoring Reports, CCBS Project Design Document, Project Implementation Reports, Validation and Verification Reports, etc.) are publicly available and stored on both the Standards' website and on the IHS-Markit Environmental Registry. Given the extended time frame and the pace of production of updated versions of software and new hardware for storing data, electronic files will be updated periodically or converted to a format accessible to future software applications, as needed.

Organization, Responsibilities, and Monitoring Frequency

For all aspects of Project monitoring, Envira Amazonia Project staff will ensure that data collection, processing, analysis, management and archiving are conducted in accordance with the monitoring plan.

Table 3.8. Type of Monitoring and Party Responsible for Monitoring.

Variables to be monitored	Responsible	Frequency
Monitoring deforestation and natural disturbance	JR Agropecuária e Empreendimentos EIRELI	Prior to each verification
Monitoring illegal degradation	JR Agropecuária e Empreendimentos EIRELI	Prior to each verification
Monitoring project emissions	CarbonCo	Prior to each verification
Activity shifting leakage assessment	JR Agropecuária e Empreendimentos EIRELI	Prior to each verification
Updating forest carbon stocks estimates	CarbonCo	At least every 10 years.
Revision of the baseline	CarbonCo	At least every 10 years.

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

Monitoring results are incorporated into the Summary Documents (both in English and in Portuguese) and shared with stakeholders, including the local communities. Links are available online at the VCS Project Database and on the IHS-Markit Environmental Registry. Links to the Envira Amazonia Project is also publicly distributed during the CCBS Public Comment Period via Carbonfund.org's newsletter.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions

Emissions for the baseline project activities are found in Table 3.9 below. These baseline emissions were derived from Section 3.1 of the VCS PD.

Table 3.9. Baseline emissions in the project area.

Year	ΔCBSL,planned (tCO2e)
2013	3,277,844
2014	3,402,275
2015	3,560,825
2016	3,783,480
2017	3,864,401
2018	456,342
2019	456,342
2020	456,342
2021	456,342
2022	456,342

3.2.2 Project Emissions

Project emissions are estimated by applying module M-MON (VMD0015, Version 2.1) of Methodology VM0007.

Deforestation Data

As the Acre State deforestation dataset was no longer available, a new classification of 2018 Landsat imagery was used to monitor deforestation, as per the monitoring plan approved in the Project document. Landsat 8 OLI imagery (path 3 row 66) was downloaded from USGS through Earth Explorer. The image acquired was from 2018-09-06, contained 0% cloud cover, and had little atmospheric distortion. This data is Landsat Tier 1 data, meaning that it “contains the highest quality Level-1 Precision Terrain (L1TP) data considered suitable for time-series analysis. The geo-registration is consistent and within prescribed tolerances [<12m root mean square error (RMSE)]. Image classification was done using a clustering technique to identify all pixels with similar spectral patterns. A total of 30 clusters were then grouped into forest and non-forest classes. This data was then combined with the 2016 Acre State dataset, which contained information on all deforestation in the state prior to 2017.

The 2016 deforestation dataset was produced by UCEGEO, the GIS department within the Climate Change Institute, Acre State government, which produces an annual dataset on the extent and spatial location of all deforestation within the state. This dataset is based on classification of a series of Landsat imagery. Each image selected for classification contains less than 10% cloud cover. This is followed by

processing of the images by applying the filter HAZE. This algorithm was developed by Carlotto[77] and aims to improve visibility by reducing the effect of atmospheric haze and smoke. This algorithm was applied using the software ENVI, version 4.6. This step was followed by geometric correction using the NASA GeoCover 2000 product as the base data. ENVI + IDL, version 4.6 were used to group multispectral bands (Landsat 3, 4 & 5), while ERDAS IMAGINE 9.1 software was used for georeferencing. The RMS error of the georeferenced product was < 1 pixel, meeting good practice standards in remote sensing. Additional details on pre-processing can be found in the UCEGEO methodology.[78]

Changes in forest cover were then determined using the 2018 forest/nonforest land cover layer. This layer was made by combining the 2018 classification work with all deforestation in the 2016 Acre dataset. This approach ensures monitoring for the Envira Amazonia Project agrees with Acre state deforestation mapping to the maximum extent possible. The deforestation in the Project Area is derived by subtracting the non-forested area at the time of the last monitoring from the non-forested area at the end of this monitoring period. Figure 3.1 shows the area of deforestation in the Project Area for this monitoring period. Figure 3.2a shows the 2015 benchmark map and forest cover at the start of the monitoring period. Figure 3.2b shows the 2018 forest benchmark map which was produced using the aforementioned approach.

[77] CARLOTTO, M. J. Reducing the effects of space-varying wavelength-dependent scattering in multispectral imagery. International Journal of Remote Sensing, v. 20, n. 17, p. 3333-3344, 1999.
[78] ACRE - Governo do Estado do Acre (no prelo). REVISÃO DA DINÂMICA DO DESMATAMENTO NO ESTADO DO ACRE: ANÁLISE TEMPORAL DE 23 ANOS (PERÍODO DE 1988 A 2010). Rio Branco: (UCEGEO - FUNTAC/SEMA), 2011.

Figure 3.1. Map of the deforestation in the current monitoring period in the project area.

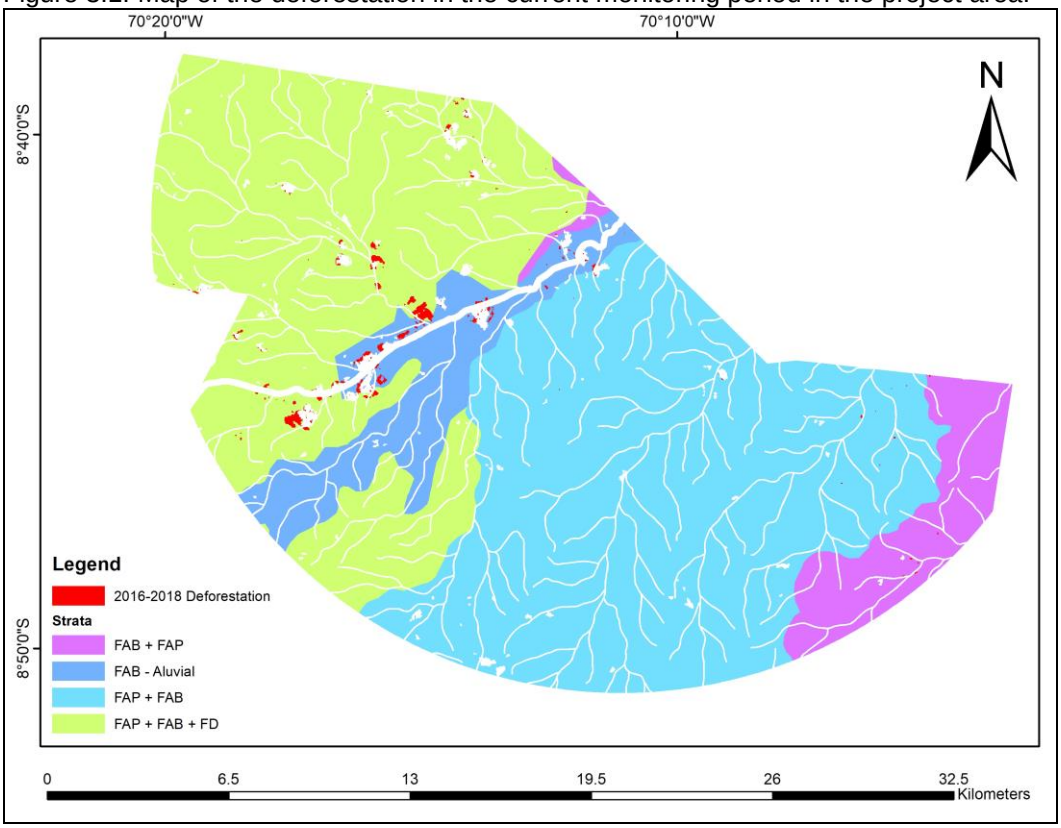


Figure 3.2a. Existing forest cover at the end of the last monitoring period and start of the current monitoring period, December 2015.

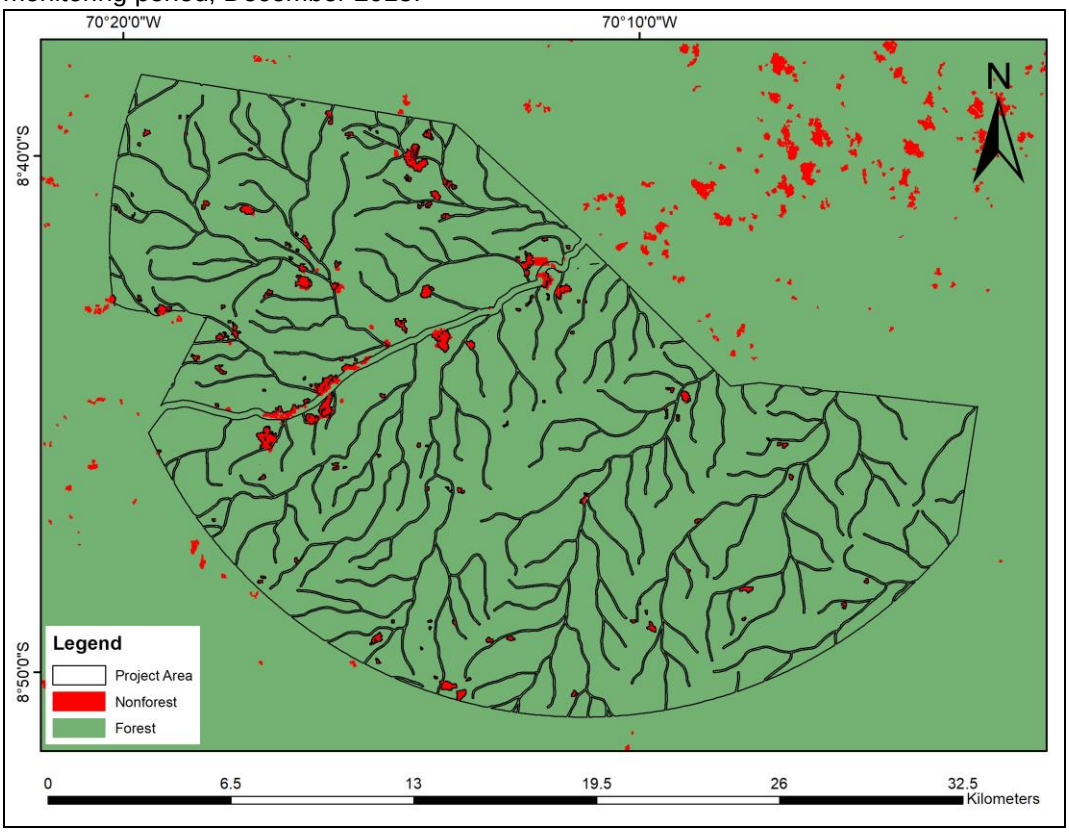
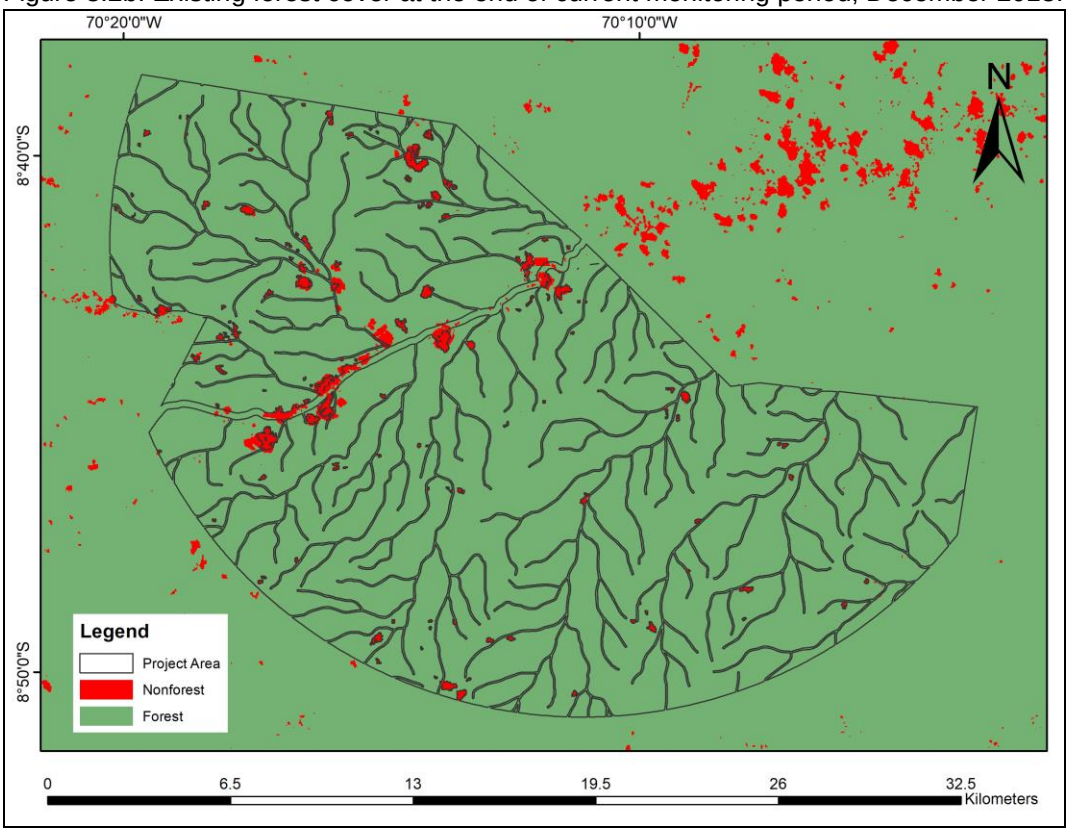


Figure 3.2b. Existing forest cover at the end of current monitoring period, December 2018.



Accuracy Assessment

An accuracy assessment was conducted using a Sentinel-2 image dated 2018-12-21. This image was loaded into ArcMap and areas of overlap between the image and the 2018 forest/nonforest land cover layer were used to create 100 random points. These points were then assessed as forest or nonforest and checked for accuracy. Some points were not included in the final matrix due to cloud cover, but the total number of points that were cloud free were more than sufficient to assess accuracy. The sample points used to assess classification accuracy are recorded and archived (with an ID number, geographic position information, identified land-use class). Samples used to assess classification accuracy are well-distributed throughout the area (as far as is possible considering availability of high resolution imagery and/or logistics of acquiring ground truth data). Verification samples gathered from high-resolution imagery were from within 12 months of the latest imagery used for classification.

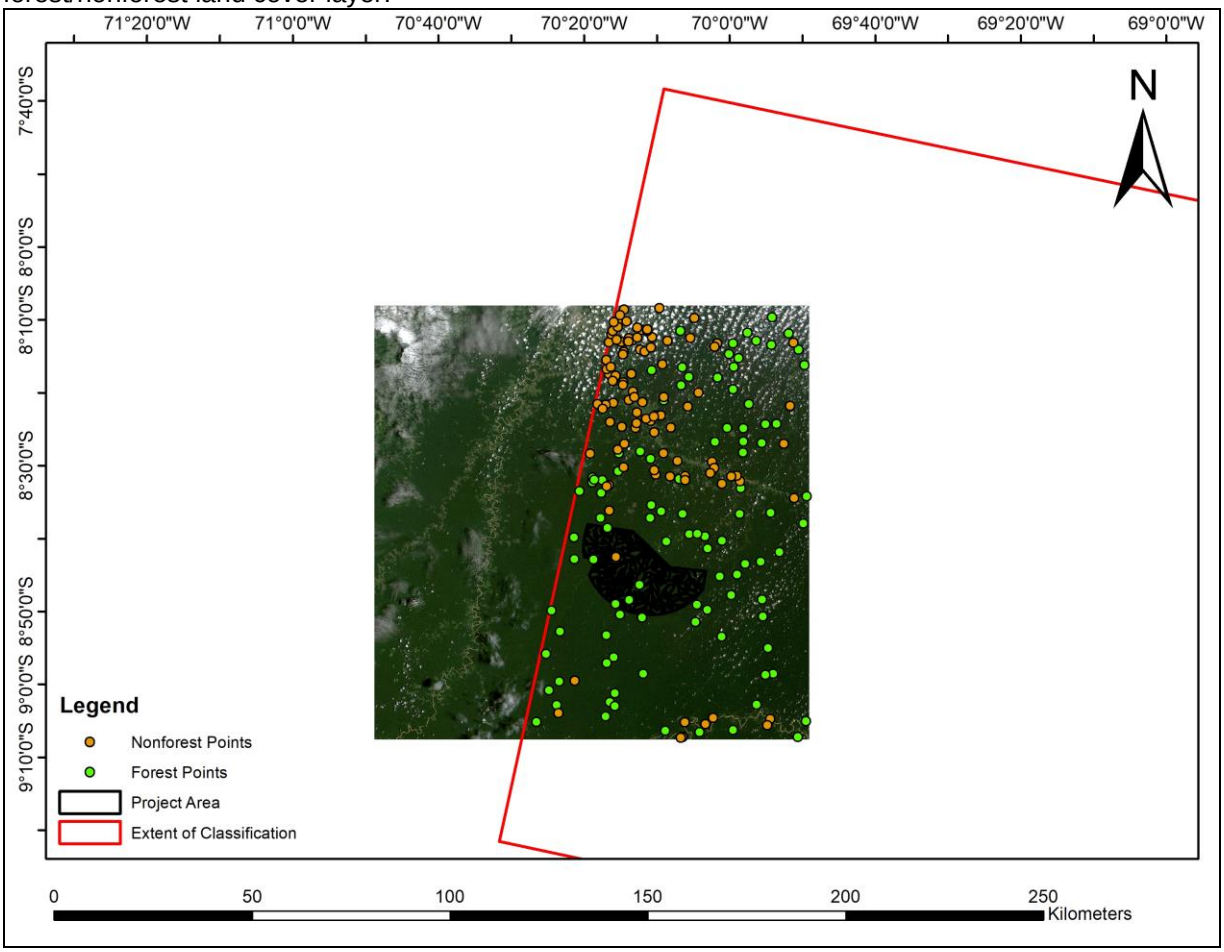
Results of the accuracy assessment are presented in the matrix below.

Classification	Forest	Nonforest	Total	User Accuracy
Forest	92	0	92	100.00%
Non Forest	8	76	84	90.48%

Total	100	76	176	0
Producer Accuracy	92.00%	100.00%		95.45%

The classification will only be used in the forest cover change detection step if the overall classification accuracy, calculated as the total number of correct samples/ the total number of samples, is equal to or exceeds 90%. The accuracy of the 2018 classification meets this criteria, with an overall accuracy of 95.45%.

Figure 3.3. Distribution of accuracy assessment points where Sentinel-2 imagery overlaps the 2018 forest/nonforest land cover layer.



Equation 3.5 is used to calculate ex-post project emissions, along with parameters listed in Table 3.10.

Equation 3.5. Equation for calculating the net GHG emissions within the project area under the Project scenario.

$$\Delta C_P = \sum_{t=1}^{t^*} \sum_{i=1}^{M} \left(\Delta C_{P,DefPA,i,t} + \Delta C_{P,Deg,i,t} + \Delta C_{P,DistPA,i,t} + GHG_{P-E,i,t} - \Delta C_{P,Enh,i,t} \right)$$

Table 3.10. Parameters used to calculate ex-post project emissions.

Parameter	Description
ΔC_P	Net greenhouse gas emissions within the project area under the project scenario; t CO_2e
$\Delta C_{P,DefPA,i,t}$	Net carbon stock change as a result of deforestation in the project area in the project case in stratum i at time t; t CO_2e
$\Delta C_{P,Deg,i,t}$	Net carbon stock change as a result of degradation in the project area in the project case in stratum i at time t; t CO_2e
$\Delta C_{P,DistPA,i,t}$	Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum i at time t; t CO_2e
$GHG_{P-E,i,t}$	Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project case in stratum i in year t; t CO_2e
$\Delta C_{P,Enh,i,t}$	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline in stratum i at time t; t CO_2e

Deforestation

Emissions resulting from deforestation in the with-project case (ΔCP,DefPA,i,t) are calculated as the area of deforestation (ADefPA,u,i,t) multiplied by the net change in carbon stocks. All parameters in Table 3.11 are sourced from Section 3.1.1 and 3.1.2 of this report. The area deforested was derived from the 2018 forest/nonforest land cover layer (see above for detail) combined with the original strata map. CBSL, Cpost, and Cwp values were those derived in the original forest inventory and the project document, respectively.

Table 3.11. Net carbon stock change (t CO2-e) as a result of deforestation in the project area (ΔCP,DefPA,i,t).

Year	FAP + FAB + FD ADefPA,u,i,t (ha)	FAP + FAB ADefPA,u,i,t (ha)	FAB + FAP ADefPA,u,i,t (ha)	FAB - Aluvial ADefPA,u,i,t (ha)	FAP + FAB + FD CBSL,i (t CO2-e/ha)	FAP + FAB CBSL,i (t CO2-e/ha)	FAB + FAP CBSL,i (t CO2-e/ha)	FAB - Aluvial CBSL,i (t CO2-e/ha)	Cpost (t CO2-e/ha)	CWP,i With Project (t CO2-e/ha)	ΔCP,DefPA,i,t (t CO2-e)
2016	7.0	0.0	0.0	3.2	546.5	513.2	498.0	655.4	0.0	0.0	5,887
2017	50.0	1.5	1.1	24.0	546.5	513.2	498.0	655.4	0.0	0.0	44,379
2018	50.0	1.5	1.1	24.0	546.5	513.2	498.0	655.4	0.0	0.0	44,379

A total of 163.4 ha were deforested in the Project Area over this monitoring period. These emissions were not attributable to the Project Proponents. As the amount of deforestation in the baseline over 2016-2018 (i.e. this monitoring period) was 15,301 ha (AAplanned,i,t), Project activities contributed to a reduction in deforestation of 15,300.6 ha - 163.4 ha = 15,137.2 ha.

Degradation

Net carbon stock change accounted as a result of degradation in the Project Area ($\Delta C_{P,Deg,i,t}$) is limited to emissions resulting from degradation due to illegal logging (ΔCP,DegW). No commercial logging occurs in the with-project case (i.e., ΔCP,SelLog,i,t is equal to zero). Degradation surveys were conducted in May 2018. Eighty eight percent of the survey respondents indicated they utilize charcoal or timber, most of which originates from forested areas. Using conservative assumptions and further survey information on the amount of charcoal/timber collected, emissions from degradation were estimated. Degradation emission estimates were very small due to the low population pressures and insignificant amounts of charcoal and timber collected.[79] Using the T-SIG tool, degradation emissions (8,008 t CO2) are determined to be de minimis because they are less than five percent of the total GHG benefits generated during the same monitoring period (6,862,805 t CO2), and thus are not accounted in net GHG benefit calculations. The net carbon stock change as a result of degradation in the Project Area ($\Delta C_{P,Deg,i,t}$) is therefore equal to zero for the 2016-2018 monitoring period.

[79] See “2018_EnviraDegradation 2019.03.15.xls” in the project database for details of the de minis analysis.

Natural Disturbance

No areas of natural disturbance were reported during the current period by forest monitors or local land managers, nor was evident or could be distinguished (from anthropogenic deforestation, accounted for above) with remote sensing, and therefore $A_{DistPA,q,i,t}$ is assumed to be 0. As there is no ground based evidence of natural disturbance, net carbon stock changes resulting from natural disturbance in the Project Area in the Project case are reported to be zero (i.e., $\Delta C_{P,DistPA,i,t} = 0$).

GHG Emissions

As fire is commonly used to cleared land, N_2O and CH_4 emissions from biomass burning have been accounted for. Using parameters found in Section 3.1.1 and Table 3.3, emissions from biomass burning (EBB) were calculated as the product of the area burned, the aboveground carbon stocks, a combustion factor, a GHG emission factor, and the global warming potential. It was conservatively assumed that Aburn,i,t = ADefPA,u,i,t (i.e., all areas deforested in the project area were burnt).

Table 3.12. Calculation of E-BiomassBurning in the project area.

Year	FAP + FAB + FD ADefPA,u,i,t (ha)	FAP + FAB ADefPA,u,i,t (ha)	FAB + FAP ADefPA,u,i,t (ha)	FAB - Aluvial ADefPA,u,i,t (ha)	FAP + FAB + FD B,i,t (t d.m./ha)	FAP + FAB B,i,t (t d.m./ha)	FAB + FAP B,i,t (t d.m./ha)	FAB - Aluvial B,i,t (t d.m./ha)	E-N2O Biomass Burning (tCO2e)	E-CH4 Biomass Burning (tCO2e)	E-Biomass Burning (tCO2e)	GHGP-E,i,t (t CO2-e)
2016	7.0	0.0	0.0	3.2	261.0	244.7	237.3	313.8	78.5	180.8	259.4	259.4
2017	50.0	1.5	1.1	24.0	261.0	244.7	237.3	313.8	591.8	1,363.1	1,955.0	1,955.0
2018	50.0	1.5	1.1	24.0	261.0	244.7	237.3	313.8	591.8	1,363.1	1,955.0	1,955.0

As justified in Section 3.1.1, total Project GHG emissions (GHGP) equal emissions from biomass burning (EBB) as other sources are equal to zero.

Forest Growth and Sequestration

As stated in the Project document, it is conservative to exclude forest growth and sequestration during the project, hence the parameter $\Delta C_{P,Enh,i,t}$ has been set to zero.

Net Project Emissions

Net emissions within the Project Area are calculated in Table 3.13.

Table 3.13. Net project emission within the project area, ΔCP (t CO2-e).

Year	ΔCP,DefPA,i,t (t CO2-e)	ΔCP,Deg,i,t (t CO2-e)	ΔCP,DistPA,i,t (t CO2-e)	GHGP-E,i,t (t CO2-e)	ΔCP,Enh,i,t (t CO2-e)	ΔCP (t CO2-e)
2016	5,887	0	0	259	0	6,147
2017	44,379	0	0	1,955	0	46,334
2018	44,379	0	0	1,955	0	46,334

3.2.3 Leakage

Leakage emissions from displacement of planned deforestation are estimated in conformance with the VCS modular REDD methodology VM0007, specifically the LK-ASP module and LK-ME module. These modules provide for the accounting of activity shifting leakage resulting from the actions of the agents of deforestation and market effects leakage.

Activity Shifting Leakage

Activity-shifting leakage was tracked by monitoring areas of deforestation ($A_{defLK,i,t}$), across all lands outside of the Project Area owned or under management by the baseline agent, JR Agropecuária e Empreendimentos EIRELI, including properties listed in Table 3.4. Activity-shifting leakage ($LKA_{planned,i,t}$) is calculated as the area of leakage in the with project case ($A_{defLK,i,t}$) minus the leakage baseline (NewRi,t). Leakage emissions were then calculated as the difference between stocks before and after deforestation, as for project emissions. Emissions due to biomass burning were also calculated as per the procedures in the E-BB module. CBSL and Cpost values were those derived in the original forest inventory and the project document, respectively.

Table 3.14. Calculation of the area of activity shifting leakage and associated leakage emissions.

Year	AdefLK,i,t	NewRi,t	$LKA_{planned}$ (ha)	ΔCBSL,i (t CO2-e/ha)	E-N2O Biomass Burning (tCO2e)	E-CH4 Biomass Burning (tCO2e)	E-Biomass Burning (tCO2e)	GHGLK-E,i,t (t CO2-e)	ΔCLK-AS,planned (t CO2-e)
2016	0	0	0	525.5	0.0	0.0	0.0	0.0	0
2017	0	0	0	525.5	0.0	0.0	0.0	0.0	0
2018	0	0	0	525.5	0.0	0.0	0.0	0.0	0

The baseline agents of deforestation, JR Agropecuária e Empreendimentos EIRELI, did not deforest any lands owned or under management by them as confirmed in a letter found in the project database. As such, there was no activity shifting leakage during this monitoring period.

Market Leakage

Market leakage values calculated ex-ante (in Section 3.3 of the PD) are also used ex-post as no with project harvesting of timber, fuel wood or charcoal is destined for commercial markets. Please see Table 3.15 for market leakage estimates.

Table 3.15. Market leakage estimates for the first baseline period.

Year	ΔCLK-ME (t CO2-e)
2013	597,415
2014	597,415
2015	597,415
2016	597,415
2017	545,186
2018	0
2019	0
2020	0
2021	0
2022	0

Total Leakage

Total project leakage for this monitoring period (1,142,602 t CO2-e) is calculated as the sum of activity shifting leakage and market effects leakage (Table 3.16).

Table 3.16. Estimation of total leakage due to the displacement of planned deforestation.

Year	ΔCLK-AS,planned (t CO2-e)	ΔCLK-ME (t CO2-e)	ΔCLK (t CO2-e)
2016	0	597,415	597,415
2017	0	545,186	545,186
2018	0	0	0

3.2.4 Net GHG Emission Reductions and Removals

Uncertainty was assessed applying module X-UNC.

Uncertainty in the baseline rate, parameter $Uncertainty_{BSL,RATE}$, is equal to 1.96%, as documented in Section 3.4 of the PD.

Total uncertainty in carbon stocks in forest (parameter $Uncertainty_{BSL,SS}$) is equal to combined uncertainty of forest carbon pool stock estimates, calculated using propagation of errors (equation 4 of VM0007

module X-UNC). Parameter $Uncertainty_{BSL,SS}$ is thus calculated to be 4.17% at the 95% confidence level (calculations detailed in Forest Biomass Carbon Inventory Report) for the initial forest inventory.

As stated in the uncertainty module "where no ex post (re-)measurements of carbon pools or GHG sources have been made, i.e. uncertainty from these sources is already included in UncertaintyBSL,t*, cumulative project uncertainty through time t is therefore equal to uncertainty in baseline estimates." As no ex post measurements of carbon pools or GHG sources have occurred, parameters related to calculating uncertainty in the with-project scenario, including EP,SS,i, Pool# and UP,SS,i,pool#, have not been included in the project.

Results of overall uncertainty calculations are presented below in Table 3.17. As the overall uncertainty calculations, 4.61%, are less than precision requirements of the methodology, +/- 15% of the mean (at a 95% confidence level), no uncertainty deduction was warranted or applied.

Table 3.17. Summary of uncertainty calculations.

X-UNC Equation Number	5		6	10	11
Parameter	$Uncertainty_{BSL,SS}$	$Uncertainty_{BSL,RATE,}$	$Uncertainty_{BSL,t*}$	$C_{REDD_ERROR,t*}$	*Adjustment factor applied to* $C_{REDD,\ t*}$
Value	4.17%	1.96%	4.61%	4.61%	100%

Estimates of GHG credits eligible for issuance as VCUs were calculated in Table 3.18, below; where

Estimated GHG emission reduction credits =

Baseline emissions, fixed for 10 years at validation *minus*

Project emissions *minus*

Leakage *minus*

Non-permanence Risk Buffer withholding (calculated as a percent of net change in carbon stocks prior to deduction of leakage)

Table 3.18. Estimate of Net Emission Reduction Credits. Values in this table have been rounded to the nearest whole number.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2016	3,783,480	6,147	597,415	3,179,918
2017	3,864,401	46,334	545,186	3,272,880

2018	456,342	46,334	0	410,008
Total	8,104,223	98,815	1,142,601	6,862,806

Table 3.19. Estimate of Net Emission Reduction Credits with Risk Buffer. Values in this table have been rounded to the nearest whole number.

Years	Baseline emissions or removals (tCO_{2e})	Project emissions or removals (tCO_{2e})	Leakage emissions (tCO_{2e})	Risk buffer (%)	Deductions for AFOLU pooled buffer account (tCO2e)	Net GHG emission reductions or removals issued as VCUs (tCO_{2e})
2016	3,783,480	6,147	597,415	23%	868,787	2,311,131
2017	3,864,401	46,334	545,186	23%	878,155	2,394,725
2018	456,342	46,334	0	23%	94,302	315,706

Thus, during the monitoring period of 2016 to 2018, the total net change in carbon stocks results in the net GHG emission reductions of 6,862,806 tCO_2e.

3.3 Optional Criterion: Climate Change Adaptation Benefits

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

The Envira Amazonia Project has incorporated activities for climate change adaptation benefits.

Likely Regional Climate Change, Climate Variability Scenarios, and Impacts

The Project Proponents studied the CREAS Project (Regional Climate Change Scenarios for South America in English) to better understand the regional climate change and climate variability scenarios for Acre, Brazil. According to the CREAS Project, the following scenarios and impacts are possible for the Amazon Region and particularly within the State of Acre where the Envira Amazonia Project is located:

Summary of future climate change scenarios for the end of the XXI Century and possible impacts in Brazil

AMAZON REGION
A2: 4-8 C warmer, 15-20% less rainfall.
B2: 3-5 C warmer, 5-15 % less rainfall
Possible impacts: High frequency of dry spells in eastern Amazonia and intense rainfall events in western Amazonia, losses in natural ecosystems, rain forest and biodiversity. Low river levels affecting transportation and commerce. Possible impacts on moisture transport and rainfall in Southeastern South America. Impacts on hydroelectric generation. More favorable conditions for spread of forest fires. Impacts on health and commerce due to smoke.

NORTHEAST BRAZIL
A2: 2-4 C warmer, 15-20% less rainfall.
B2: 1-3 C warmer, 10-15 % less rainfall
Possible impacts: High frequency of dry spells and evaporation rates and low soil moisture levels affecting levels of channels and reservoirs. Losses in natural ecosystems caatinga.Tendency towards aridization and desertification in the semiarid region. Water scarsity. Waves of climate refugees migrating towards large cities agravating social problems. Impacts on human health

WEST CENTRAL BRAZIL
A2: 3-6 C warmer,
B2: 2-4 C warmer,
Possible impacts: High frequency of intense rainfall events and dry spells. High evaporation rates and lower soil moisture can affect agriculture (coffee) and hydroelectric generation. Soil erosion due to high temperatures and intense dry spells can affect agriculture and natural ecosystems Pantanal and cerrado. .

SOUTHERN BRAZIL
A2: 2-4 C warmer, 5-10% more rainfall.
B2: 1-3 C warmer, 0-5 % more rainfall
Possible impacts: High frequency of intense rainfall events, increase in warm nights frequency (reduction of cold nights). Intense rainfall and high evaporation due to dry spells can affect agriculture (weath and soybean). Losses in natural ecosystems. High temperatures and intense rainfall can affect human health

SOUTHEASTERN BRAZIL
A2: 3-6 C warmer,
B2: 2-3 C warmer,
Possible impacts: High frequency of intense rainfall events. High evaporation rates and lower soil moisture can affect agriculture (coffee) and hydroelectric generation. High temperatures and intense rainfall can affect human health. Possible sea level rise.

Sources: INPE, MMA-PROBIO, EMBRAPA, CEPAGRI

[80]

As forecasted by the CREAS Project, “intense rainfall events in western Amazonia, losses in natural ecosystems, rain forest and biodiversity” are the primary risks, along with the potential for “low river levels affecting transportation and commerce” and “more favorable conditions for spread of forest fires.” For example, major flooding took place in Acre in February to April 2014 and in January to April 2015.

These intense rainfall events in western Amazonia, in conjunction with the absence of the Project, would likely increase the rate of top soil erosion and more quickly deplete soil nutrients which in turn would likely increase the conversion of primary forests to agriculture and pasture lands by the local community.

Significant flooding throughout the Project Zone would likely result from the Project’s deforestation, along with the increase in both localized rainfall as well as increased rainfall and continuing deforestation in neighboring Peru. Such flooding could impact local land-use scenarios due to: local crops destroyed which leads to communities planting more hectares to maintain historic harvest levels; fishing grounds could be disrupted due to faster moving currents and oxbow lakes could be altered; increased mosquito-borne illnesses due to greater pools of water; and game could move further into the forests to escape raising water levels.

[80] Jose A. Marengo, “Regional Climate Change Scenarios for South America - The CREAS,” Available: projecthttp://unstats.un.org/unsd/climate_change/docs/papers/Session3_CCPapers_Marengo_1.pdf.

Climate Changes' Impact on Communities and/or Biodiversity

The State of Acre and neighboring state of Rondônia are already experiencing increased rainfalls and severe flooding. In March and April 2014, the flooding of the Madeira River led Acre to declare a state of emergency due to the trade of vital resources (e.g., food, health supplies, fuel, etc.) being disrupted.[81] If State and Federal governmental scarce resources are used to repair roads, bridges, and other infrastructure due to climate change and its impacts, then there will be fewer resources available to help riverine communities.

The families throughout the Project Zone and along the Envira River are already feeling the local impact of global climate change. The following are ten excerpts from the conversations Ayri Rando had with community members:

1. "The temperature is higher, causing farmers to be unable to work more because they are directly exposed to the sun." (João Nazário Rodrigues)

2. "Previously, the Amazon winter ended in May, but lately you never know when it ends, it will be in May, June, or even in July. Another change perceived is that the weather is warmer." (Antônio Francisco Lopes da Silva)

3. "The sun is getting stronger and deforestation is one of the causes." (Manoel Pereira do Nascimento)

4. Before I "could work all day and be exposed to direct sun, but now I cannot due to the fact the sun is stronger. Moreover, at the time of the Amazonian summer it is difficult to travel by river because of smoke from forest fires." (Francisco Chagas Silva de Araújo)

5. I "notice a lot of smoke at the time of the Amazonian summer, which makes breathing difficult." (Joaquim de Oliveira da Silva)

6. "The temperature is getting higher, before it was not so hot." (Antônio Geovan de Sousa Rodrigues)

7. "The temperature {has} increased, it seems that the "haze" is greater." (José Bento de Paula)

8. "The temperature is getting warmer and the river is shallower with each passing year. Furthermore, {the} Envira River fills and empties very quickly." (Espedito da Silva Menezes)

9. "The sun is warmer due to forest destruction." (Jeandro Castro de Araújo)

10. "Time has changed a lot, the temperature is higher and suddenly it rains and {then} it's cold, it's changing very fast." (Manoel Joaquim Gomes da Silva)

[81] Travel and Tour World, "Brazil state Acre declared a state of flood calamity," Available: http://www.travelandtourworld.com/news/article/brazil-state-acre-declared-a-state-of-flood-calamity/

Adaptation Measures to Assist Communities and/or Biodiversity

The Project Proponents incorporated climate change adaptation activities and the following Theory of Change causal models demonstrate how the project activities intend on achieving the Project's predicted climate change adaptation benefits.

These climate change adaptation benefits include, but are not limited to: building the community health center and onsite pharmacy to mitigate potential increases in mosquito-borne illnesses; ensuring agricultural extension courses incorporate climate change adaptation techniques; assisting local families with access to markets for their products to overcome increased difficulty in transportation networks; and locating facilities such as the headquarters and health centers further away from river banks to minimize risk of flooding.

During the monitoring and reporting period of August 2012 to December 2014, the Project Proponents collaborated with local communities to finalize the list of climate change adaptation activities and then the Project Proponents discussed a timeline for implementation, began to work through the technical details, drafted a preliminary budget, and identified potential partners.

The following Theory of Change model is for building the community health center to mitigate potential increases in mosquito-borne illnesses:

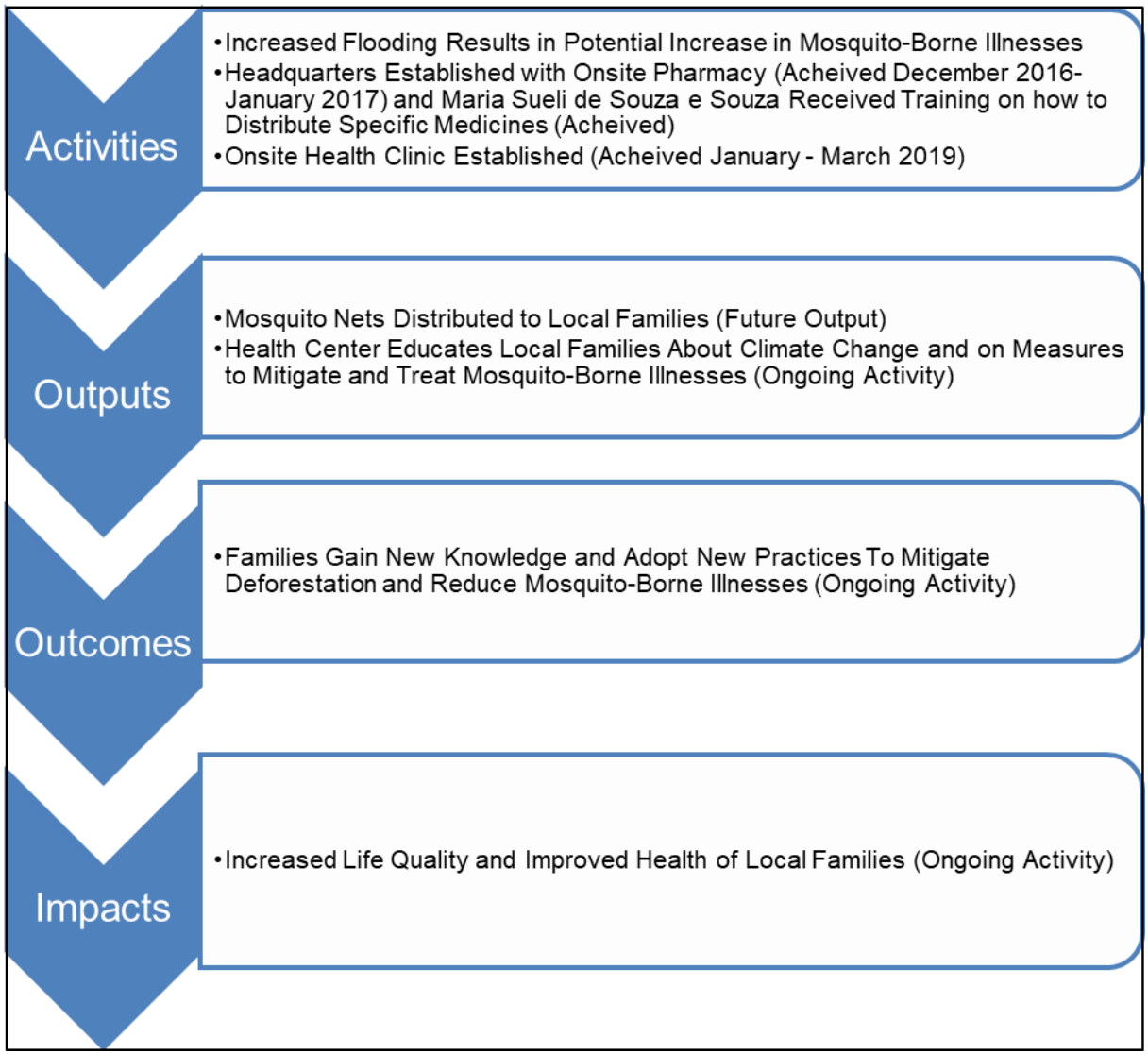


Figure 3.4: Activities, Outputs, Outcomes and Impacts of Mitigating Increase in Mosquito-Borne Illnesses

The following Theory of Change model is for the Project's incorporation of climate change adaptation techniques into the agricultural extension courses:

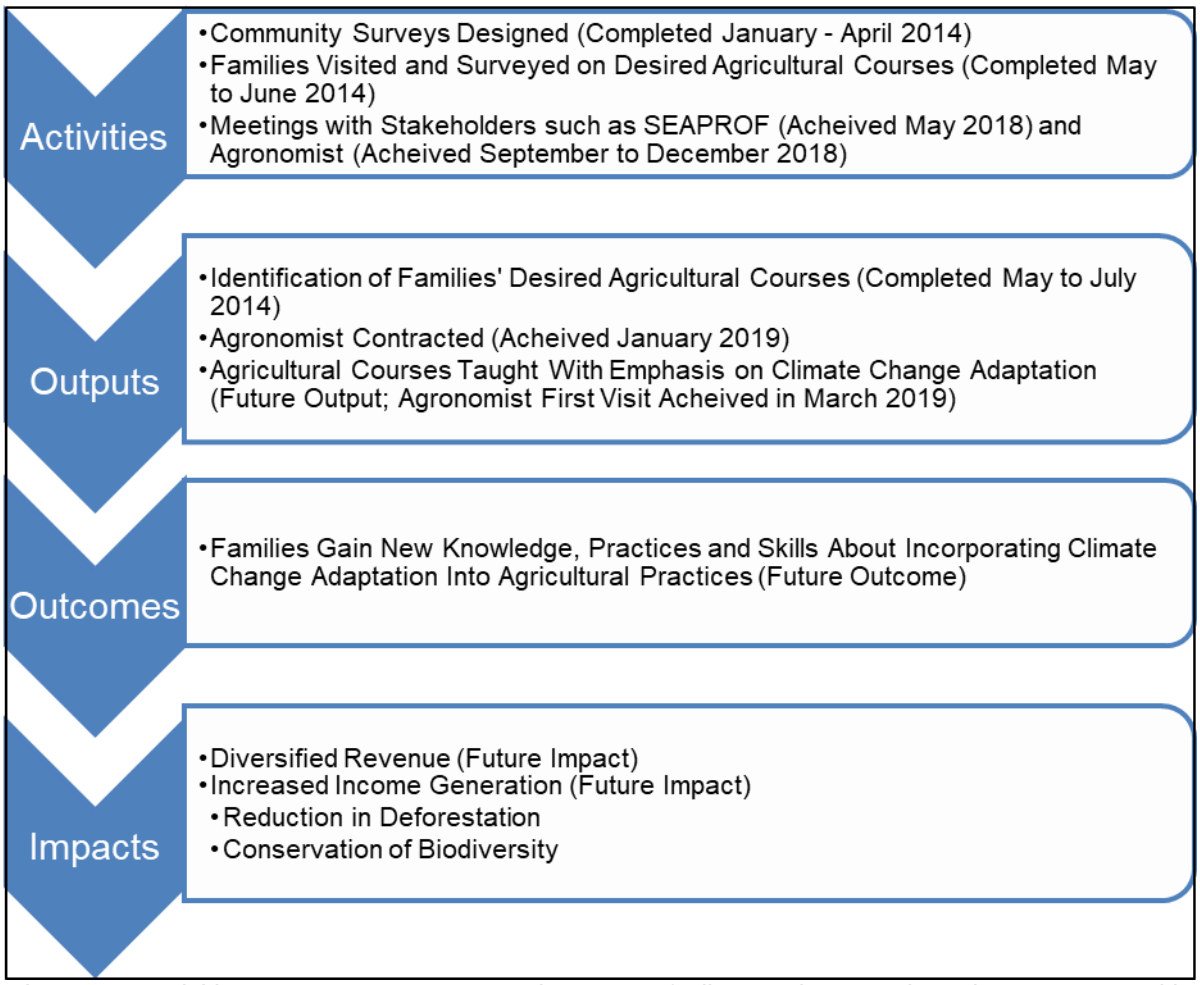


Figure 3.5: Activities, Outputs, Outcomes and Impacts of Climate Change Adaptation Incorporated in Agricultural Extension Courses

The following Theory of Change model is for the Project's assisting communities with access to markets for their products to overcome increased difficulty in transportation networks

Thus, localized flooding and increased rainfall will likely increase the difficulty of road transportation along highways in western Amazonia, including BR-364, which will likely increase the loss of agricultural products due to spoilage and result in less money for local families. In addition, the resulting lower river levels will increase the difficulty transportation along rivers such as the Envira and Jurupari Rivers.

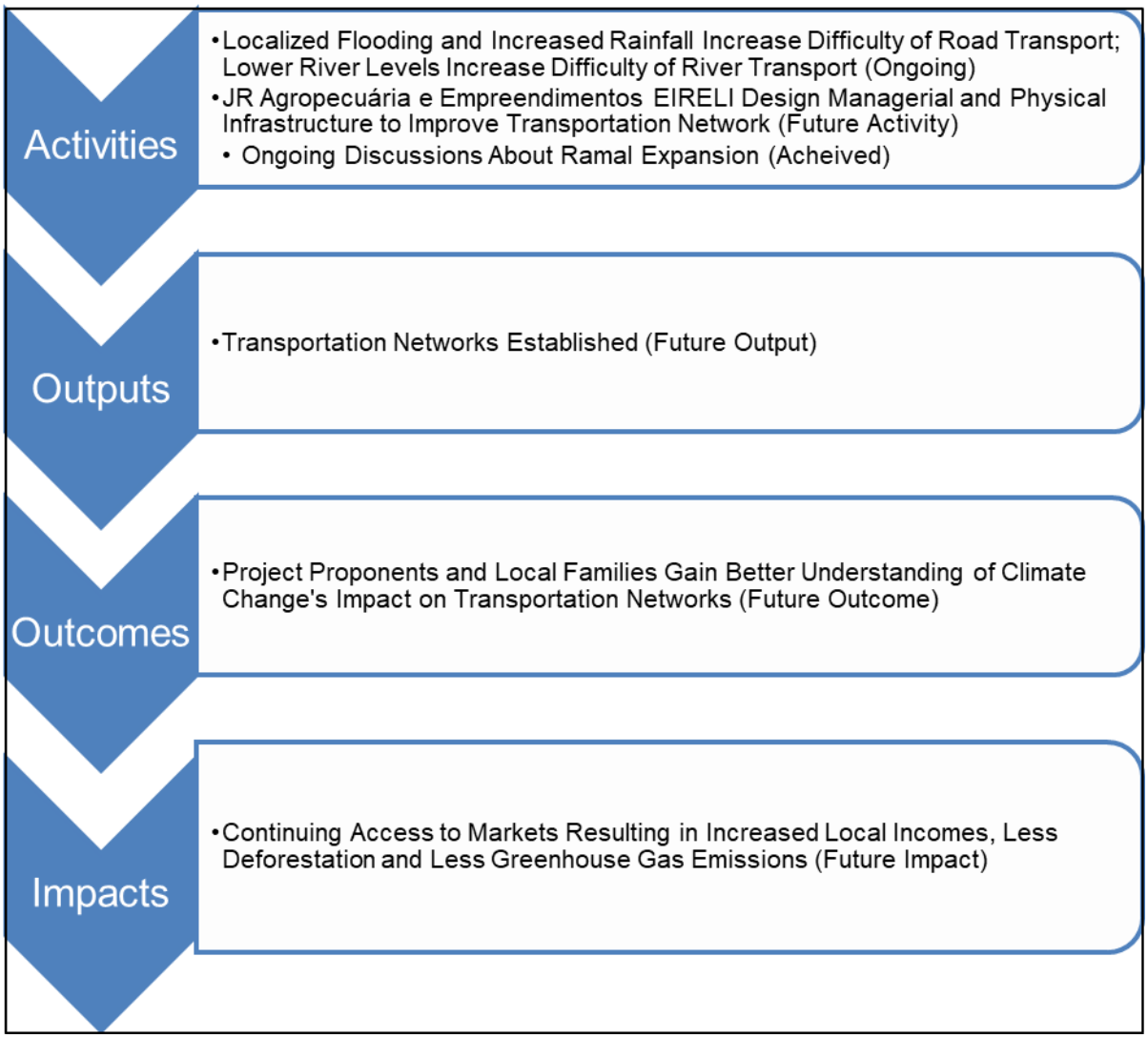


Figure 3.6: Activities, Outputs, Outcomes and Impacts of Improving Transportation Networks

The following Theory of Change model is for the Project's locating of facilities further away from river banks to minimize risk of flooding:

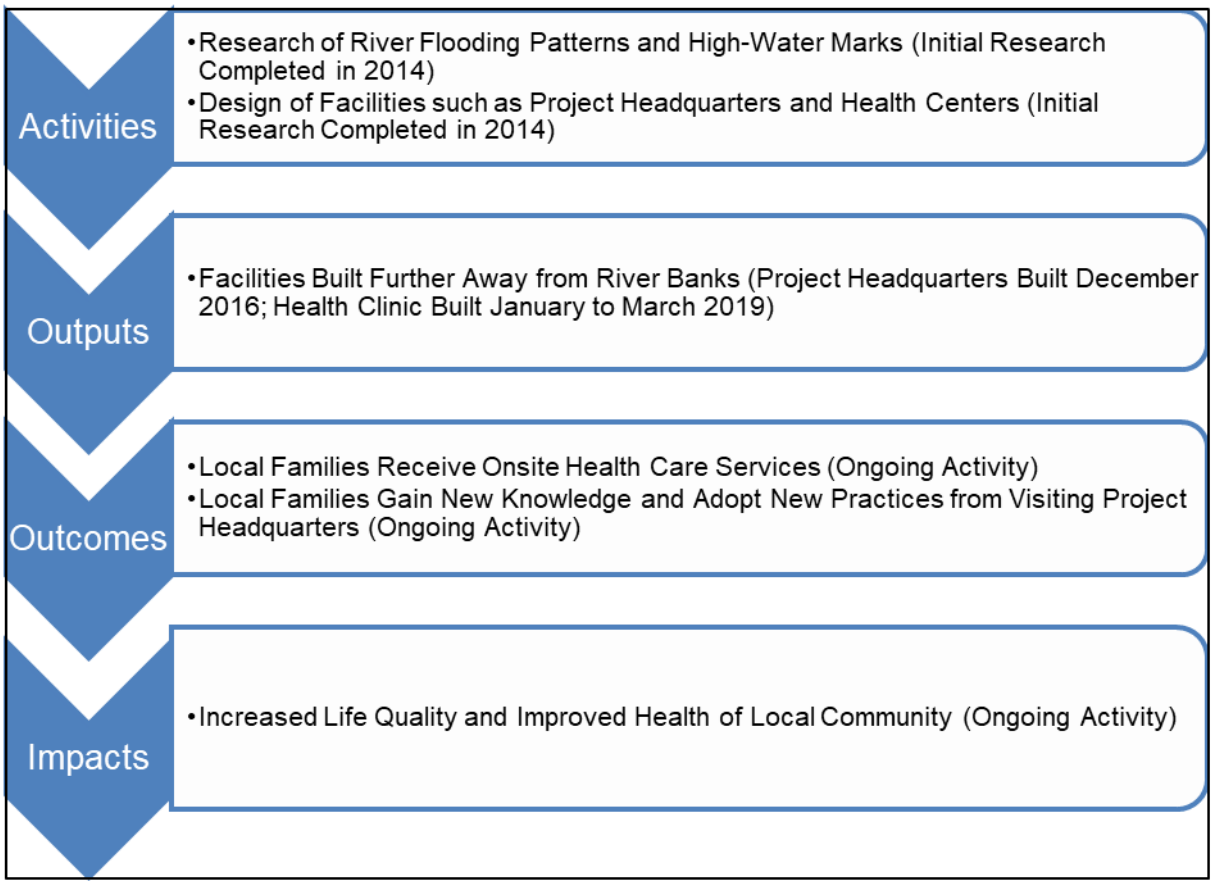


Figure 3.7: Activities, Outputs, Outcomes and Impacts of Establishing Facilities Far from River Banks

Indicators for Adaptation Benefits to Communities

CarbonCo, and its parent company Carbonfund.org, are both climate change organizations and will continuously monitor the latest developments in climate change science and climate change impacts. For instance, CarbonCo and Carbon Securities attended the UNFCCC COP20 in Paris, France and both plan on attending the UNFCCC COP25 in Chile in December 2019. Furthermore, CarbonCo is a regular participant in the Navigating the American Carbon World (i.e., now known as the North American Carbon World) conferences in California.

The Project Proponents incorporated adaptation activities into the Envira Amazonia Project and have incorporated the following indicators to demonstrate the Project activities are assisting local families to adapt to the probable impacts of climate change:

Mitigate Increase in Mosquito-Borne Illnesses

The Project Proponents will continue to monitor the following indicators to assess whether the Project is effectively mitigating an increase in mosquito-borne illnesses:

- Number of Health Centers Established

  - Project headquarters established in December 2016; Onsite pharmacy established January 2017; Regular restocking of medicine at onsite pharmacy; and Onsite health clinic built from January to March 2019.

- Number of Mosquito Nets Distributed
  - Future Activity – CarbonCo and Carbon Securities spoke at length with Nagila Deni Sarah, a nurse in Cruzeiro do Sul about tropical diseases and inquired about the best way to buy mosquito nets in Acre. The Project Proponents looked into getting free mosquito nets from Acre's Department of Health, but the program is no longer offered. Next, CarbonCo looked into purchasing mosquito nets from Alibaba, but the minimum quantity was quite high (i.e., minimum purchase of 1,000 units).
- Number of Local Communities Attending Health Center
  - Ongoing – In addition, JR Agropecuária e Empreendimentos EIRELI's urban headquarters helps facilitate the local communities' access to hospitals in Rio Branco.
- Trend of Mosquito-Borne Illnesses in Project Zone
  - Future Impact

Climate Change Adaptation Incorporated into Agricultural Extension Courses

The Project Proponents will continue to monitor the following indicators to assess whether the Project effectively incorporated climate change adaptation into the agricultural extension courses and whether the lessons are being practiced by the local communities:

- Number of Families Surveyed About Desired Agricultural Extension Courses
  - 41 families surveyed from May to June 2014.
- Number of Agricultural Extension Courses Taught
  - Future Activity – Agronomist consulted from September to December 2018, and then contracted to assist with Envira Amazonia Project in January 2019.
- Number of Agricultural Extensions Courses Taught Which Incorporated Climate Change Adaptation Measures
  - Future Activity – Incorporating climate change adaptation measures into agricultural extension courses was discussed with agronomist in March 2019.
- Number of Lessons Learned (Related to Climate Change Adaptation) and Incorporated by Local Families in Project Zone
  - Future Outcome.

Improving with Transportation Networks

The Project Proponents will continue to monitor the following indicators to assess whether the Project is effectively improving transportation networks that would otherwise be hindered by climate change:

- Number of Boats Purchased by JR Agropecuária e Empreendimentos EIRELI to Assist with Transportation of Community Goods (e.g., Açaí, Rubber, and Medicinal Plants)
    - Future Activity - 1 boat was to be purchased, however design was inadequate due to low water levels.
- Number of Shipments Via JR Agropecuária e Empreendimentos EIRELI's Road Transportation Network
    - Future Activity
- Number of Shipments Disrupted Due to Impact of Increased Flooding, Heavy Rainfalls, and Lower River Levels
    - Future Activity

Establishing Facilities Far from River Banks

The Project Proponents will continue to monitor the following indicators to assess whether the Project is effectively establishing facilities far from river banks:

- Number of Facilities Built Along Envira River
    - Future Activity
- Number of Facilities Built Along Jurupari River
    - Headquarters built in December 2016; Onsite pharmacy established January 2017; and Onsite health clinic built January to December 2019.
- Number of Flooding Events and Heavy Rainfall Damaging Health Centers
- Number of Flooding Events and Heavy Rainfall Damaging Headquarters

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CM2.1)

The following tables describe impacts on community groups within the Envira Amazonia Project resulting from Project activities under the with-project scenario:

Community Group	All communities living in the Project Zone
Impact	Agricultural extension training.
Ty pe of Benefit/Cost/Risk	These are predicted benefits which will provide benefits to local communities in the near future.
Change in Well-being	Agricultural extension training will lead to diversified crops, increased yields, crops more adaptable to climate change, and increased community incomes.

Community Group	All communities living in the Project Zone
Impact	Increased access to health and dental services
Type of Benefit/Cost/Risk	These are actual benefits that have been delivered to local communities. Ongoing health and dental services are being provided.
Change in Well-being	Increased access to health and dental services have come in the form of onsite pharmacy (established January 2017), dental services (provided January to May 2017), ongoing distribution of medicine, and the establishment of an onsite health center (accomplished January to March 2019).

Community Group	All communities living in the Project Zone
Impact	Increased employment opportunities
Type of Benefit/Cost/Risk	These are actual benefits that have been delivered to local communities. Additional employment opportunities will be provided in the future.
Change in Well-being	Diversified and increased incomes to local communities have been provided through hiring local communities for a variety of services (i.e., building headquarters, building health clinic, assisting with site visits of Project Proponents, assisting with biodiversity and community impact monitoring plans, etc.)

Community Group	Communities living in Project Area
Impact	Granting of land titles
Type of Benefit/Cost/Risk	These are predicted benefits which will provide benefits to local communities in the future.
Change in Well-being	Granting land titles to local communities with formalize and strengthen official land tenure rights.

Community Group	Communities living in Project Zone
Impact	Establishing infrastructure for the collection, distribution and sale of medicinal plants, rubber, and açaí.
Type of Benefit/Cost/Risk	These are predicted benefits which will provide benefits to local communities in the future.
Change in Well-being	Similar to agricultural extension training, the establishment of the infrastructure for the collection, distribution and sale of medicinal plants, rubber, and açaí should lead to diversified incomes and increased community incomes.

4.1.2 Negative Community Impact Mitigation (CM2.2)

The Project Proponents have incorporated adaptive management and will exercise the precautionary principle in order to mitigate any negative impacts on community groups that are later discovered. Currently, the measures needed to mitigate any negative well-being impacts on the local community include:

- Regular, open communication with, and feedback from, the local families; and
- Monitoring and measurement of Project's impact on local families via the Basic Necessity Survey and Participatory Rural Assessment.

To the best of the Project Proponents' knowledge, there have been no negative community impacts.

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

The Envira Amazonia Project was designed and implemented to produce net positive well-being impacts on all local communities vis-à-vis the "without-Project land-use" scenario.

Although the local communities would possibly receive benefits in the "without-Project" land use scenario such as employment opportunities at JR Agropecuária e Empreendimentos EIRELI's large-scale cattle ranch, the "without-Project" land use scenario would result in the communities being relocated. In addition, no health clinics or schools would be built in the "without-Project" land use scenario. Furthermore, High Conservation Values – such as clean water and biodiversity – would be significantly degraded in the "without-Project" land use scenario.

In contrast, the "with-Project" land use scenario will result in greater well-being impacts on the local communities. These expected net well-being impacts on Community Groups include, but are not limited to: receiving official land title which strengthens land tenure rights; participation in agricultural extension courses and participation in açaí, medicinal plants and rubber projects which increases and diversifies local incomes; access to local health clinic which improves health; transfer of technical knowledge and cultural exchange; and local employment opportunities such as hiring local project managers and support staff. The Project Proponents, in consultation with local communities, do not expect any negative well-being impacts.

These net well-being impacts on Community Groups shall be demonstrated over time by the Basic Necessity Survey and the Participatory Rural Assessment, along with regular independent assessments of the Project against the Verified Carbon Standard and the Climate, Community and Biodiversity Standard.

Furthermore, climate change adaptation measures (e.g., citing facilities further away from river banks, incorporating lessons into agricultural extension courses, etc.) would likely not have occurred in the without-project scenario.

4.1.4 Protection of High Conservation Values (CM2.4)

No High Conservation Values (HCVs) were negatively affected from 2012 to 2018 as a result of the Envira Amazonia Project. This claim shall be demonstrated over time by the Basic Necessity Survey, the Participatory Rural Assessment, and by the review of satellite imagery to determine the extent of deforestation within the Project Area, along with regular independent assessments of the Project against the Verified Carbon Standard and the Climate, Community and Biodiversity Standard.

4.2 Other Stakeholder Impacts

The Envira Amazonia Project, being a forest conservation project, shall "do no harm" to Other Stakeholders. Other Stakeholders that were identified from 2012 to 2014 include, but are not limited to:

- Communities Living Outside the Project Zone and Along the Property's Border on the Envira River:
    - Manoel Pereira do Nacimento;
    - Francisco Rodrigo de Melo;
    - Francisco Mendes Pinto;
    - José Ribamar de Moura;
    - Antônio Floriano da Silva Filho;
    - Antônio Portela Pontes;
    - Antônio Lopes da Silva;
    - Francisco Chagas Silva de Araújo;
    - Sebastião de Araújo Albuquerque;
    - Francisco Osmildo de Sousa Lima;
    - Antônio de Lima de Melo;
    - Ronaldo de Souza Melo;

  - Joaquim de Oliveira da Silva;
  - Antônio Geovan de Sousa Rodrigues;
  - José Bento de Paula;
  - Claudenir Ferreira de Amorim;
  - Espedito da Silva Menezes;
  - Maria do Carmo;
  - Antônio Jones Ferro de Castro;
  - José Mariano de Oliveira da Silva;
  - João Elias do Nascimento de Castro;
  - Raimundo Fortino da Silva;
  - Francisco Elias Araújo de Castro;
  - José Souza Lima;
  - Francisco Mário Gomes da Silva;
  - Maria José Martins de Paiva;
  - Antônio Ferro de Araújo;
  - José Luís Castro de Araújo;
  - Luiz Francisco de Aguiar Dimas;
  - Jeandro Castro de Araújo; and
  - Manoel Joaquim Gomes da Silva (Manoel Abreu).
- Adjacent Landowners and Other Communities
  - Seringal Riachuelo;
  - Seringal Santana;
  - Fazenda São Jerônimo;
  - Fazenda Foz do Jurupari;
  - Ser. Veneza S. Braz e Boa Vista;
  - Seringal Cruzeiro;
  - Seringal Sobral, owned by Benedito Oliveira Filho; and
  - Fazenda Porongaba and Seringal São Francisco II.
- The State of Acre, particularly the Climate Change Institute

In November 2015, meetings were held with Felipe Francio and also with Antonio Viveiros, who are two owners of land near the Envira Amazonia Project. Each visit to the Envira Amazonia Project involves periodic meetings with communities living in the leakage areas alongside the Jurupari River. Furthermore, meetings with Other Stakeholders in Rio Branco are frequently done with IMC, the Ministry of Environment, etc.

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

The potential positive impacts of the Envira Amazonia Project on Other Stakeholders which were identified from 2012 to 2014 include, but are not limited, to the following impacts:

- Health center on the Jurupari River has been established and will be made available to Other Stakeholders. Agricultural extension trainings will also be offered.

- Increased learning curve for future REDD+ projects amongst private landowners in Acre.
- Sharing of knowledge, best practices, lessons learned, and cultural exchange with Other Stakeholders including the State of Acre.

The Project Proponents have identified the following potential negative impacts on Other Stakeholders as a result of the Envira Amazonia Project from 2012 to 2014:

- Increased cost of land; for example, if the Envira Amazonia Project increases neighboring property values for future land purchases;
- Decreased value of land; for example, if the Envira Amazonia Project prevents adjacent properties from accessing markets by constructing roads;
- In-migration to areas adjacent to the Project Zone;
- If communities migrate out of the Project Zone (i.e., due to forced relocation or lack of Project success) and into primary forests adjacent to the Project Zone;
- If the Project Proponents are unable to eliminate deforestation and the community continues to expand into the forest, including forests outside the Project Zone; and
- Wealth in Project Zone creates conflict in surrounding areas due to jealousy, a rise in illicit activities, alcoholism, elite capture, etc.

These potential negative impacts were reviewed again through 2015, 2016, 2017 and 2018.

There are numerous measures needed and which will be continuously implemented to mitigate the potential negative impacts on Other Stakeholders. It is important to note that the communities in and near the Envira Amazonia Project have good relationships and no major conflicts have been identified through stakeholder consultations.

Regarding the increased cost of land, the Envira Amazonia Project will have less an impact on rising costs of land than the completion of the paving of Highway BR-364. In contrast, the Envira Amazonia Project might decrease the value of surrounding properties. The Project is a forest conservation project and might prevent surrounding properties from accessing markets because the Project will not allow road construction through the property. Nevertheless, the Project Proponents will engage adjacent landowners to offer expanding forest conservation projects beyond the boundaries of the Project. Maintaining forest cover, at the expense of road construction or the establishment of additional large-scale cattle-ranches has produced positive climate, community and biodiversity benefits.

In-migration to areas adjacent to the Project Zone could occur. However, Acre's State System of Incentive for Environmental Services (SISA) seeks to improve rural livelihoods which should reduce in-migration into the both the Project Zone and areas adjacent to the Project Zone. Furthermore, the Project Proponents monitored deforestation throughout the Project Zone and have sought to minimize deforestation within the Project Zone. Similarly, there is a possibility of out-migration from the Envira

Amazonia Project and into the surrounding forests. To mitigate out-migration, the Project Proponents will seek to implement a variety of social projects and programs.

With respect to increased conflict, illicit activities, alcoholism, and elite capture, the Project Proponents have closely monitored community benefits throughout the Project Zone. Children from surrounding communities will be allowed to attend school at the Project, while surrounding communities will be allowed to visit the dental and health center at the Project.

4.2.2 Net Impacts on Other Stakeholders (CM3.3)

The Envira Amazonia Project has not resulted in net negative impacts on Other Stakeholders. Such stakeholders have been identified, consulted, and were allowed to participate in the Project. For example, Other Stakeholders along the Envira River will be able to participate in the Project activities such as receiving official land title and attending agricultural extension training courses.

4.3 Community Impact Monitoring

Community impact monitoring has assessed changes in well-being resulting from the Project activities for Community Groups and Other Stakeholders.

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

The activities, outputs, outcomes and community impacts of the Project on all the families living throughout the Project Zone were monitored to ensure net positive benefits. The monitoring plan consists of measuring the both qualitative and quantitative indicators derived from the Participatory Rural Assessment (PRA), along with the ongoing results of the Basic Necessity Survey (BNS). The Theory of Change methodology has also been applied to the use of the Basic Necessity Survey (BNS) and the Participatory Rural Assessment (PRA).

Basic Necessities Survey

CarbonCo hired Ayri Rando to conduct the initial Basic Necessities Survey (BNS) at the Envira Amazonia Project. Essentially, a focus group was created and the community was asked to identify the top assets or services which were believed to be basic necessities or things that no one in the community should have to live without. The aggregated results of the BNS among surveyed communities living inside the Envira Amazonia Project Zone are as follows:

	Asset or Service	Item	Have Now? (Yes = 1, No = 0)	Are Basic Necessities? (Yes = 1, No = 0)	How Many Have?	Community Price per Item	Total Value of Assets
1	Asset	Machete	1	1	12	R$25.00	R$300
2	Asset	Weedwacker	0	1	0	R$3,000	R$0
3	Asset	Ax	1	1	3	R$60	R$180

4	Asset	Hoe	1	1	7	R$40	R$280
5	Asset	Bulb Planting Tool	1	1	4	R$80	R$320
6	Asset	Plow Machine	0	0	0	_____	N/A
7	Asset	Plow Machine for Planting Corn	0	1	0	R$80	R$0
8	Asset	Pair of Boots	1	1	8	R$50	R$400
9	Asset	Wire Fence	0	1	0	_____	N/A
10	Asset	Flour Mill Kit (motor, ball, furnace and water tank)	0	1	0	R$2,355	R$0
11	Asset	Cookware	0	0	0	R$280	R$0
12	Asset	Motor / Pump and 1,000 Liters Water Tank	0	1	0	R$2,500	R$0
13	Asset	Water Tank (1,000 liters)	0	1	0	R$1,000	R$0
14	Asset	Solar Panels	0	1	0	R$14,000	R$0
15	Asset	Artesian Well	0	1	0	R$3,500	R$0
16	Asset	Washing Machine with Tank	0	1	0	R$1,400	R$0
17	Asset	Gas Stove with Cylinder	1	0	7	R$955	$6,685
18	Asset	Mill to Give Rations to Chickens	1	1	1	R$200	R$200
19	Asset	Sewing Machine	1	0	3	R$1,200	R$3,600
20	Service	Rural Communication via Phone	0	1	0	R$1,000	R$0
21	Asset	Mill with Motor, for Grinding Sugar Cane	0	1	0	_____	N/A
22	Asset	Full Bathroom for Every Home	0	1	0	_____	N/A
23	Service	Education until Completion of Elementary and Middle School	0	1	0	R$16,000	R$0
24	Service	Health Center	0	1	0	R$7,000	R$0
25	Service	Extension of Transportation (Approximately 40 Km)	0	1	0	_____	N/A
26	Asset	Boat and Engine with Capacity for 3,000kg	0	1	0	R$16,000	R$0
27	Asset	Fast Boat to Attend to Emergencies at the Health Center	0	1	0	R$15,000	R$0

						TOTAL	**R$11,965**

Figure 4.1: Basic Necessity Survey at the Project Area (Credit: Ayri Rando)

The Basic Necessity Survey establishes a baseline for the communities' access to basic necessities and shall serve as a measurement against which the Project will be compared. The Basic Necessity Survey will be administered every four years, with the initial BNS administered from May 20 to June 11, 2014.

The second BNS was administered from May 2-5, 2018 and revealed the communities' local needs remained essentially the same as May to June 2014. The aggregated results of this second BNS among the nine communities living inside the Envira Amazonia Project, were as follows:

Aggegated Data from Basic Necessities Survey (Communities Inside Envira Amazonia Project)							
	Total Surveys: 9						
	Asset or Service	**Item**	**Are Basic Necessities? (Total Number of No Responses)**	**Are Basic Necessities? (Total Percentage of No Responses)**	**Are Basic Necessities? (Total Number of Yes Responses)**	**Are Basic Necessities? (Total Percentage of Yes Responses)**	**Weighting (Fraction)**
1	Asset	Machete	0	0.00%	9	100.0%	1.000
2	Asset	Weedwacker	2	22.22%	7	77.8%	0.778
3	Asset	Ax	2	22.22%	7	77.8%	0.778
4	Asset	Hoe	0	0.00%	9	100.0%	1.000
5	Asset	Bulb Planting Tool	0	0.00%	9	100.0%	1.000
6	Asset	Plow Machine	3	33.33%	6	66.7%	0.667
7	Asset	Plow Machine for Planting Corn	2	22.22%	7	77.8%	0.778
8	Asset	Pair of Boots	0	0.00%	9	100.0%	1.000
9	Asset	Wire Fence	0	0.00%	9	100.0%	1.000
10	Asset	Flour Mill Kit (Motor, Ball, Furnance, and Water Tank)	0	0.00%	9	100.0%	1.000
11	Asset	Cookware	2	22.22%	7	77.8%	0.778
12	Asset	Motor / Pump and 1,000 Liters Water Tank	0	0.00%	9	100.0%	1.000
13	Asset	Water Tank (1,000 Liters)	0	0.00%	9	100.0%	1.000
14	Asset	Solar Panels	0	0.00%	9	100.0%	1.000
15	Asset	Artesian Well	3	33.33%	6	66.7%	0.667
16	Asset	Washing Machine with Tank	1	11.11%	8	88.9%	0.889
17	Asset	Gas Stove with Cylinder	1	11.11%	8	88.9%	0.889
18	Asset	Mill to Give Rations to Chickens	0	0.00%	9	100.0%	1.000
19	Asset	Sewing Machine	0	0.00%	9	100.0%	1.000
20	Asset	Rural Communication via Phone	2	22.22%	7	77.8%	0.778
21	Asset	Mill with Motor, for Grinding Sugar Cane	1	11.11%	8	88.9%	0.889
22	Asset	Full Bathroom for Every House	0	0.00%	9	100.0%	1.000
23	Service	Education Until Completion of Elementary and Middle School	0	0.00%	9	100.0%	1.000
24	Service	Health Center	0	0.00%	9	100.0%	1.000
25	Service	Extension of Transportation (Approximately 40 Km)	3	33.33%	6	66.7%	0.667
26	Service	Boat and Engine with Capacity for 3,000 Kg	5	55.56%	4	44.4%	0.444
27	Service	Fast Boat to Attend to Emergencies at the Health Center	0	0.00%	9	100.0%	1.000
	***Yellow Highlighted Indicates Item is Not a Basic Necessity**						

Figure 4.2: Aggregated Results of 2018 Basic Necessity Survey at the Envira Amazonia Project (Credit: Brian McFarland)

Rearranging the data from above, the top 15 Basic Necessities among the communities living within the Envira Amazonia Project were as follows:

Top 15 Basic Necessities at Envira Amazonia Project						
	Item	Are Basic Necessities? (Total Number of Yes Responses)	Are Basic Necessities? (Total Percentage of Yes Responses)	Weighting (Fraction)	Have Basic Necessities? (Total Number of Yes)	Have Basic Necessities? (Total Percentage of Yes)
1	Machete	9	100.0%	1.000	9	100.00%
2	Hoe	9	100.0%	1.000	7	77.78%
3	Bulb Planting Tool	9	100.0%	1.000	8	88.89%
4	Pair of Boots	9	100.0%	1.000	9	100.00%
5	Wire Fence	9	100.0%	1.000	3	33.33%
6	Flour Mill Kit (Motor, Ball, Furnance, and Water Tank)	9	100.0%	1.000	5	55.56%
7	Motor / Pump and 1,000 Liters Water Tank	9	100.0%	1.000	0	0.00%
8	Water Tank (1,000 Liters)	9	100.0%	1.000	4	44.44%
9	Solar Panels	9	100.0%	1.000	2	22.22%
10	Mill to Give Rations to Chickens	9	100.0%	1.000	3	33.33%
11	Sewing Machine	9	100.0%	1.000	5	55.56%
12	Full Bathroom for Every House	9	100.0%	1.000	1	11.11%
13	Education Until Completion of Elementary and Middle School	9	100.0%	1.000	8	88.89%
14	Health Center	9	100.0%	1.000	0	0.00%
15	Fast Boat to Attend to Emergencies at the Health Center	9	100.0%	1.000	0	0.00%

Figure 4.3: Top 15 Basic Necessities in 2018 at the Envira Amazonia Project (Credit: Brian McFarland)

The assets or services which have a higher percentage of communities considering them a basic necessity than the number of communities actually possessing those assets or services shall be considered higher priority social projects or programs. For example, this includes access to electricity via solar panels (i.e., a future project), full bathroom for every house (i.e., installed in early 2019), access to a health center (i.e., headquarters with onsite pharmacy established January 2017; onsite health center established January to March 2019), access to a fast boat to attend to emergencies (i.e., a future project), and a motor/pump with a water tank (i.e., water pumps and plumping were installed in early 2019 with the full bathrooms).

For analytical and comparative purposes, the following are the aggregated summary statistics for the communities living within the Envira Amazonia Project as of May 2018:

Summary Statistics for Inside Envira Amazonia Project			Summary Statistics for Inside Envira Amazonia Project	
Highest Total Value of Owned Assets	R$ 22,045.00		Highest Total Value of Owned Assets Per Capita	R$ 7,348.33
Lowest Total Value of Owned Assets	R$ 4,060.00		Lowest Total Value of Owned Assets Per Capita	R$ 406.00
Total Value of Owned Assets Range	R$ 17,985.00		Total Value of Owned Assets Per Capita Range	R$ 6,942.33
Average Total Value of Owned Assets	R$ 10,268.78		Average Total Value of Owned Assets Per Capita	R$ 1,973.01
% Above Total Value of Owned Assets Ave.	44.00%		% Above Total Vale of Assets Per Capita Average	33.00%
% Below Total Value of Owned Assets Ave.	56.00%		% Below Total Value of Assets Per Capita Average	67.00%

Figure 4.4: Summary Statistics of the 2018 Basic Necessities Survey at the Envira Amazonia Project (Credit: Brian McFarland)

The third BNS is tentatively scheduled for May 2022.

The following Theory of Change model is for the Basic Necessities Survey (BNS):

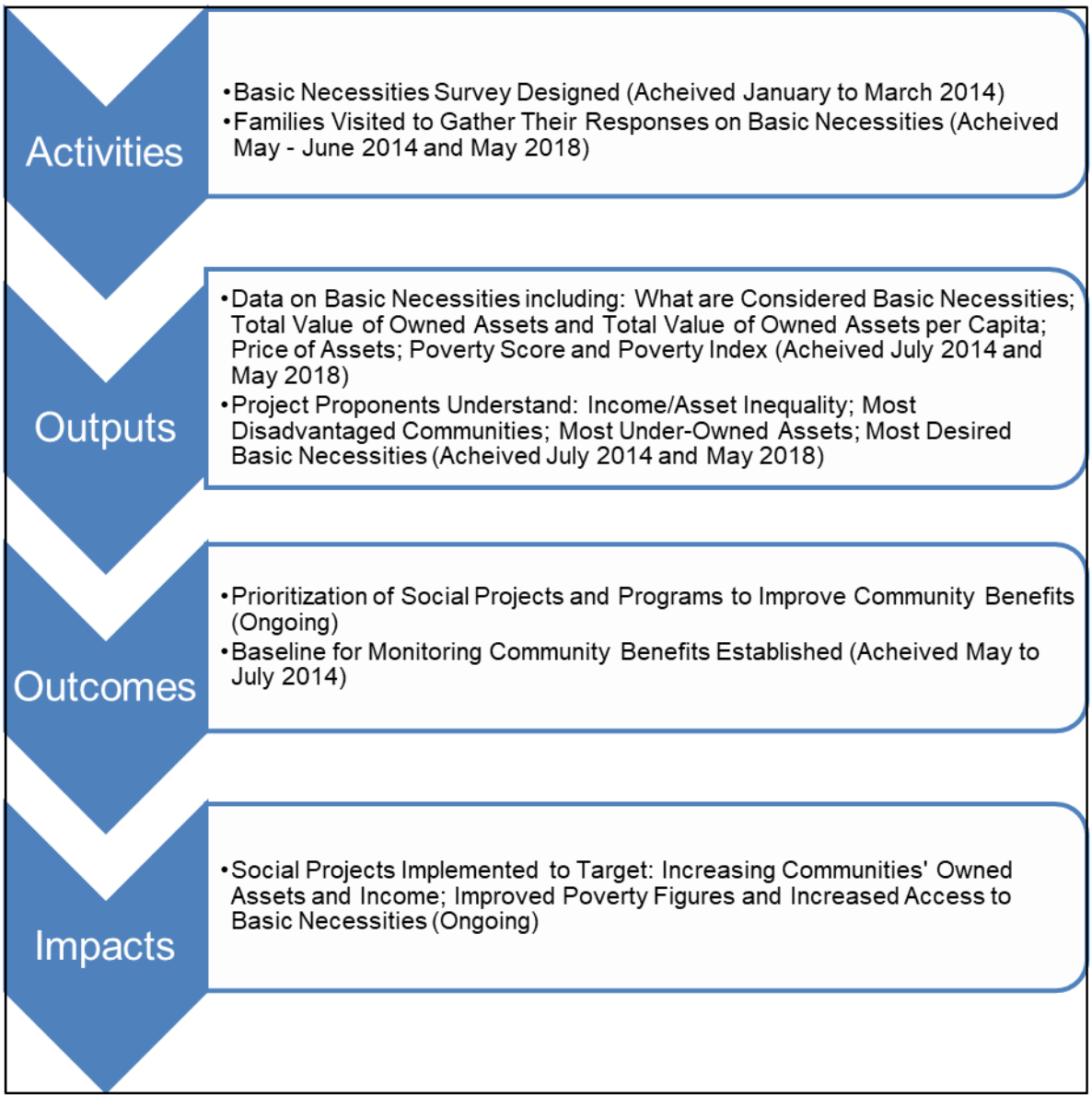


Figure 4.5: Activities, Outputs, Outcomes and Impacts of Basic Necessities Survey

IF, THEN Statements

The BNS was designed and families were surveyed, the Project Proponents now have data on basic necessities, community assets and poverty, which has enabled the Project Proponents to understand: asset inequality; which communities are most disadvantaged; which are the most under-owned assets; and which are the most desired basic necessities. With this data collected and understood by the Project Proponents, social projects and programs are now prioritized for improving community benefits and a baseline for monitoring benefits was established. If social projects and programs are prioritized, then social projects can be implemented which specifically target increasing community's owned assets and income, along with to improve poverty figures and access to basic necessities.

Participatory Rural Assessment

A Participatory Rural Assessment (PRA, also known as a Participatory Rural Appraisal) with the communities throughout the Project Zone was conducted by Ayri Rando from May 20 to June 11, 2014. Ayri Rando attempted to sample each community living within the Project Area's section of the Jurupari River. A total of ten families in the Project Area and 31 families outside the Project Zone were interviewed as part of the PRA.

This PRA helped to, among many things, establish a baseline of economic activities and land-use practices that the local families practice, along with a mechanism to assess leakage. Furthermore, the PRA will be utilized to monitor and report progress on several project activities such as the collection, transportation, and commercialization of açaí, medicinal plants and rubber, along with the implementation of agricultural extension courses.

The Participatory Rural Appraisal will be administered every four years, with the initial PRA administered from May 20 to June 11, 2014.

In May 2018, the Project Proponents administered a follow-up PRA that focused on fuel-wood consumption, charcoal consumption, and leakage to better understand if degradation was occurring throughout the Project Area. A total of eleven people were surveyed from within the Project Area and within the Project's leakage areas. Similar to the May to June 2014 survey, the May 2018 PRA survey found that there is little, if any, leakage occurring as a result of the Envira Amazonia Project and the majority of communities produce charcoal for subsistence, while no communities collect fuelwood. In addition, the communities collect timber for personal usage (i.e., primarily to build houses and boats) and none of the communities reported selling timber.

The third PRA is tentatively scheduled for May 2022.

The following Theory of Change model is for Participatory Rural Appraisals (PRAs):

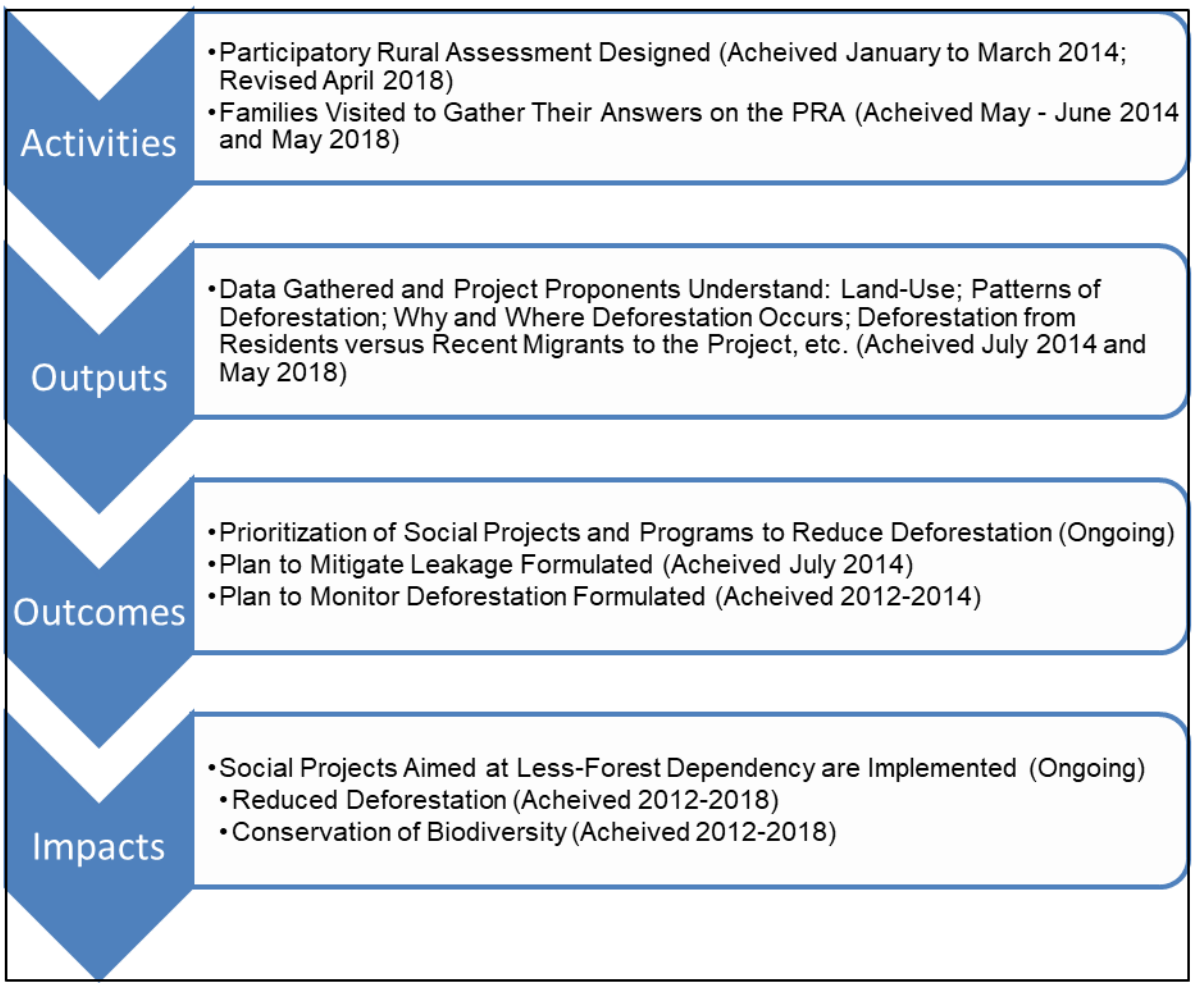


Figure 4.6: Activities, Outputs, Outcomes and Impacts of Participatory Rural Appraisal

IF, THEN Statements

With the PRAs designed and local families surveyed, data was gathered and the Project Proponents now understand: Land-Use; Patterns of Deforestation; Why and Where Deforestation Occurs; Deforestation from Residents versus Recent Migrants to the Project. With this data collected and deforestation patterns understood by the Project Proponents, social projects and programs aimed at reducing deforestation can now be prioritized and plans for mitigating leakage and monitoring deforestation were formulated. If social projects and programs are prioritized, then deforestation will be reduced and biodiversity will be conserved.

Ultimately, the Project Proponents shall continue to monitor the following indicators as part of the community impact monitoring plan and shall regularly have such indicators independently audited:

Indicators of Activities

- Signed Tri-Party Agreement between Project Proponents (Signed on August 2, 2012);
- Completion of Forest Carbon Inventory (Validated in April 2015);

- Completion of Regional Deforestation and Land-Use Modeling (Validated in April 2015);
- Completion of VCS Project Description and CCBS Project Design Document (Validated in April 2015); and
- Completion of Basic Necessities Survey and Participatory Rural Assessment (Completed in June 2014).

Indicators of Outputs

- Validation Statement for VCS Project Description and CCBS Project Design Document (Received in April 2015);
- Spreadsheet with Top Agricultural Extension Courses Identified (Completed July – August 2014);
- Agricultural Extension Courses Conducted (Including Climate Change Adaptation) (Future Activity with Agronomist Consulted from September to December 2018 and Contracted in January 2019);
- Structure Developed for the Collection, Processing, Transportation and Sales of Açaí, Rubber Trees, and Medicinal Plants (Future Activity; Preliminary Work Done 2012 - 2018);
- Spreadsheet Compiling Data on Basic Necessities including: What are Considered Basic Necessities; Total Value of Owned Assets and Total Value of Owned Assets per Capita; Community Price of Assets; Poverty Score and Poverty Index (Completed July 2014 and May 2018);
- Summary Statistics on: Income/Asset Inequality; Most Disadvantaged Communities; Most Under-Owned Assets; Most Desired Basic Necessities (Completed July 2014 and May 2018); and
- Qualitative Surveys and Spreadsheet Compiling Data on: Land-Use; Patterns of Deforestation and Yearly Cycle of Deforestation; Why and Where Deforestation Occurs; Deforestation from Residents vs. Recent Migrants (Surveys Administered May – June 2014 and May 2018; Data Compiled July 2014 and May 2018).

Indicators of Outcomes

- Value of Carbon Finance Generated (Ongoing Activity);
- Communities Gain New Knowledge, Practices and Skills About Sustainable Agriculture (Future Activity with Agronomist Consulted from September to December 2018 and Contracted in January 2019);
- Communities Gain New Knowledge, Practices and Skills for Collection, Processing, Transportation and Sales of Açaí, Rubber Trees, and Medicinal Plants (Future Activity);
- Prioritization and Implementation Plan for Social Projects and Programs to Reduce Deforestation and Improve Community Benefits (Developed from 2012 – 2018);

- Baseline for Monitoring Community Benefits (Validated April 2015);
- Formulation of Plan to Mitigate Leakage (Validated April 2015); and
- Formulation of Plan to Monitor Deforestation (Validated April 2015).

Indicators of Impacts

- Community Income Diversified (Ongoing Activity; For Example Local Project Manager and Several Local Assistants Were Hired Throughout 2012 - 2018);
- Increased Income Generation (Ongoing Activity);
- Reduced Deforestation (Achieved 2012 – 2018);
- Intensified Agricultural Practices (Future Activity with Agronomist Consulted from September to December 2018 and Contracted in January 2019);
- Diversified Crops (Future Activity with Agronomist Consulted from September to December 2018 and Contracted in January 2019);
- Increasing Community's Owned Assets and Owned Assets per Capita (Ongoing Activity);
- Improved Poverty Figures and Poverty Scores (Ongoing Activity);
- Increased Access to Basic Necessities (Ongoing Activity – For Instance, Medicines, Machetes and Planting Tools Distributed from January 2017 to December 2018); and
- Improvement in Health and Dental Clinic (Ongoing Activity – Headquarters Built December 2016, Onsite Pharmacy Established January 2017, and Onsite Health Center Built January to March 2019).

The specific variables that will be monitored and reported every four years with the BNS and PRA are as follows:

- Community's Access to Basic Necessities;
- Value of Owned Assets;
- Value of Owned Assets per Capita;
- Poverty Score;
- Poverty Index;
- Inequality of Owned Assets; and
- Inequality of Owned Assets per Capita.

An initial baseline of these aforementioned variables was developed throughout 2014, validated in April 2015, and verified in February 2016 and then again in November 2017. The follow up BNS, with an assessment of these variables, was conducted in May 2018.

Develop and Implement High Conservation Values Monitoring Plan

The Envira Amazonia Project has developed and is implementing a community impact monitoring plan that incorporates the Project's impact on the community High Conservation Values (HCVs) of areas with critical ecosystem services, areas fundamental for livelihoods, and areas critical for traditional cultural identity.

The initial Participatory Rural Assessment (PRAs) revealed the community's HCVs and subsequent PRAs will assess whether HCVs have been maintained or enhanced. Furthermore, the Envira Amazonia Project's climate monitoring plan monitored deforestation and forest cover throughout 2012 - 2018.

4.3.2 Monitoring Plan Dissemination (CM4.3)

As previously mentioned, monitoring results are incorporated into the Summary Documents (both in English and in Portuguese) and shared with stakeholders, including the local communities. Links are available online at the VCS Project Database and on the IHS-Markit Environmental Registry. Links to the Envira Amazonia Project is also publicly distributed during the CCBS Public Comment Period via Carbonfund.org's newsletter.

More specifically, the Project Proponents made the full community monitoring plan and the results of the initial community monitoring plan publicly available via the internet at the beginning of the CCBS Public Comment Period which started on October 31, 2014. The Project Proponents also made summaries available, which included the monitoring plans, to both the local families and Other Stakeholders during the initial CCBS Public Comment Period which ran from October 31, 2014 to November 30, 2014 as well as the second Public Comment Period from October 7, 2015 to November 6, 2015, and the third Public Comment Period from December 14, 2016 to January 13, 2017. The fourth Public Comment Period will tentatively take place in April 2019.

4.4 Optional Criterion: Exceptional Community Benefits

The Envira Amazonia Project is targeting both short-term and long-term benefits to globally poor communities located throughout the Project Zone. Such benefits will be shared equitably, including amongst the more marginalized or vulnerable households, and local governance structures will be developed to maximize the benefits.

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

The Envira Amazonia Project has both short-term and long-term net positive benefits for local families throughout the Project Zone. A few of the short-term community benefits that took place from August 2012 to December 2014 included community consultations about Project design, hiring Mazinho as the local project manager, hiring local communities as guides, boat drivers, and cooks, and distributing soccer balls to children at the Project. Throughout 2015, community consultations about the Project

continued, Mazinho remained as the local project manager, local communities were hired to assist with the bird study, and the Project Proponents distributed both machetes and dental kits. From January 2016 to December 2018, the Project headquarters with an onsite pharmacy was built, dental kits were distributed and dentures were given to community members by a dentist, an agronomist was consulted about teaching agricultural extension courses to the local communities, and numerous supplies (e.g., boots, machetes, grinding file, hoes, boat propellers, soccer balls, planting tools with sharpeners, and approximately 200 liters of gasoline) were donated to local community members.

Activities that will have long-term net positive benefits for local communities including helping the communities obtain official land title, teaching agricultural extension courses (scheduled for 2019), and establishing a local health center (accomplished January to March 2019).

Indicators of the well-being impacts from these short-term and long-term activities were incorporated into the community impact monitoring plan's Basic Necessity Survey and Participatory Rural Assessment.

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

All of the communities in the Project Zone are relatively marginalized and vulnerable due to having limited health care services, being located relatively far from Feijó, and by not having official land title. Data from the initial Participatory Rural Assessment – particularly with respect to the number of cattle owned by each family – served as an approximation for which families are considered the most marginalized. Going forward, the Basic Necessity Survey will be used to identify the most marginalized families and to monitor whether such families are receiving net positive impacts. Ultimately, the Project is designed and shall be implemented to generate net positive impacts for all families living throughout the Project Zone.

According to the United Nations Development Programme's International Human Development Index (HDI), Brazil is considered a high human development country.[82] However, it can be demonstrated that at least 50% of the population in the Project Zone are below the national poverty line. According to a World Bank study[83], the national poverty line per capita per month in Brazil is 180.14 (2005 PPP$) while the "nominal value of the median monthly income per capita of rural, permanent households" in the municipality of Feijó is R$28.00.[84]

A revised estimate of the national poverty line per capita per month in Brazil is $5.50 per day (2011 PPP$),[85] which translates into approximately PPP$165 per month.[86] In contrast, the nominal median

[82] UNDP, "Table 1: Human Development Index and its components," Available: https://data.undp.org/dataset/Table-1-Human-Development-Index-and-its-components/wxub-qc5k
[83] Martin Ravallion et al., "Dollar a Day Revisited," Available: http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2008/09/02/000158349_20080902095754/Rendered/PDF/wps4620.pdf
[84] IBGE, "Acre: Feijó," Available: http://cidades.ibge.gov.br/xtras/temas.php?lang=&codmun=120030&idtema=16&search=acre|feijo|sintese-das-informacoes-
[85] World Bank, "Poverty & Equity Brief: Brazil, April 2018." Available: http://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_BRA.pdf
[86] $5.50 per day 2011 PPP$) x 30 days per month = PPP$165 per month. Per the OECD PPP$1 = R$1.471 in 2011. This translates into a poverty line of PPP$165 per month or approximately R$242.72 per month. See OECD, "Purchasing power parities (PPP)," Available: https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm

household per capita monthly income of a rural household in the municipality of Feijó was R$53.00 in 2010 according to the latest census in Brazil.[87]

Community Group	Community Members of Bottom Quartile (Based off per Capita Assets), as Identified via Basic Necessities Survey
Net positive impacts	As identified by the 2014 and 2018 Basic Necessities Survey, the following basic necessities were the most sought after and the least owned by the bottom quartile of the communities living at the Envira Amazonia Project: • Plow machine; • Tool for planting corn; • Motor/pump and 1,000 liters water tank; • Solar panels; • Artesian well; • Washing machine with tank; • Mill to give rations to chickens; • Mill with motor for grinding sugar cane; • Health center; • Boat and engine with capacity for 3,000 kilograms; and • Fast boat for emergencies. The Project has begun to deliver on these basic necessities. For instance, the Project built a headquarters in December 2016, established an onsite pharmacy in January 2017, provided dental services, and built an onsite health center from January to March 2019. The Project has also engaged an agronomist, distributed planting tools, and built 12 community toilets with running water (i.e., motor/pump).
Benefit access	The Project Proponents identified scenarios which might prevent the poorest quartile of communities to benefit substantially from the Project and this includes: • Poorer families might live further away from the Project headquarters; • Less tools to produce agriculture; • Might not have boat, motor or diesel to travel; • Communities might have poorer soil quality where they live; and • Poorer health and less nutrition.

[87] IBGE, "Feijó: Censo: Universo – Indicadores sociais municipais," Available: https://cidades.ibge.gov.br/brasil/ac/feijo/pesquisa/23/25124

	<u>Poorer Families might live further away from the Project Headquarters</u> The Project Proponents recognize that accessibility is important. Some activities – such as agricultural extension courses and building toilets – will occur throughout the communities. Some activities – such as granting official land titles – will be done on a house-by-house basis. Some activities – such as building the headquarters and the health clinic – will be done in one specific location. To ensure, for instance, the headquarters and health clinic are accessible to all, the Project Proponents will provide gas for their canoes, food while at staying at the headquarters and for their return canoe ride, and lodging at the headquarters (e.g., there are spare hammocks) to anyone who needs such assistance, especially for poorer communities. Similarly, the Project Proponents will pay for the diesel, assuming these families have working boats and motors, to allow further communities to participate in the Project and attend meetings and agricultural courses. For example, approximately 200 liters of diesel was donated to the communities in May 2018. <u>Fewer Tools to Produce Agriculture</u> The Project will provide free agricultural extension courses for the communities to learn new techniques in 2019. In addition, the Project Proponents have donated planting tools for the communities. <u>Might not have Boat, Motor or Diesel to Travel</u> While this could be a barrier, it does not appear to be a significant barrier for the communities at the Envira Amazonia Project. <u>Might Have Poorer Soil Quality Where They Live</u> The future agricultural extension courses will teach new techniques to take into account potentially poorer soil. For example, the soil might be bad for bananas but might be good for manioc and this is something the agricultural courses will help to teach. JR Agropecuária e Empreendimentos EIRELI engaged an agronomist from September to December 2018, contracted the agronomist in January 2019, and the agronomist's first visit to the Project was in March 2019. <u>Poorer Health and Less Nutrition</u> The agricultural courses will seek to increase the productivity and hence, improve the nutrition of local communities. In addition, an onsite pharmacy was established in January 2017, a health clinic was built from January to March 2019, and doctor visits to the community will increase in the future. The doctors will visit all communities, including poorer

	communities. Furthermore, the doctor visits will be free, which will most benefit the poorer communities who would otherwise be less able to pay for such doctor visits.
Negative impacts	There are two negative impacts that may particularly harm marginalized and/or vulnerable community members. 1. Granting a fixed plot of land may negatively impact those families with more children because over time, there will be smaller plots of land available for the children. The Project Proponents, in the future, will hire a trained professional in rural titles, to assist with the title measurements and to explain the process to all local community members. 2. With a focus on reducing deforestation (along with preserving biodiversity and improving the lives of local communities), the traditional livelihoods of poor families might be most impacted if they are not allowed to deforest as much as they were doing in the past. Agricultural extension courses should particularly help poorer communities.

The Project Proponents will frequently review the challenges faced by the poorer communities and will utilize adaptive management when necessary. Furthermore, the Project Proponents will utilize the community impact monitoring to identify new challenges.

4.4.3 Net Impacts on Women (GL2.5)

As part of the community engagement, Ayri Rando interviewed women and allowed all community members – including women – to share their insights.

The PRA asked what activities are most important to women and what can be done to increase the participation of women. Two valuable insights were shared and was incorporated into the Project to help ensure the Project generates net positive impacts for women. The first insight is that the Project should allow children to attend any courses (assuming children are out of school) in order to allow women to participate in the courses. The second, related insight is that the Project should offer to compensate a few women to look after the community's children in order to allow women to participate more fully in the courses.

In addition, Maria Sueli de Souza e Souza was trained as a volunteer to maintain the onsite pharmacy, several women participate in the adult education classes at the Project headquarters, and women are hired during each visit by the Project Proponents to assist with cooking and cleaning.

In the future, the PRAs shall inquire about the specific impacts the Project has had on women.

4.4.4 Benefit Sharing Mechanisms (GL2.6)

The Project Proponents, based off their experience in Acre and based off the other REDD+ projects implemented by CarbonCo and Carbon Securities, designed an initial list of activities aimed at sharing benefits with the local community. CarbonCo then hired Ayri Rando to visit the communities to explain, among other things, the proposed list of activities and to solicit their feedback. This process was participatory and resulted in additional activities being incorporated into the Project and a restructuring of the implementation schedule.

All benefits described in section, *Project Activities, Outputs, Outcomes, and Impacts*, will be available (i.e., distributed) to local communities throughout the Project Zone. This includes employment opportunities (e.g., support staff and local project manager), participation in the collection, processing and sales of açaí and medicinal plants, participation in reestablishing rubber tree collection, receiving agriculture extension courses, and ability to use the local health clinic which was built at the Project. The only benefit that will not be distributed to all local communities is the granting of land title. The reason is because JR Agropecuária e Empreendimentos EIRELI can only grant land title to local families living on JR Agropecuária e Empreendimentos EIRELI's property. Similarly, JR Agropecuária e Empreendimentos EIRELI cannot grant land title to local families living in the Project Zone but outside the Project Area and on someone else's property.

4.4.5 Governance and Implementation Structures (GL2.8)

During Ayri Rando's visit, the families living at the Envira Amazonia Project were asked if there was a history of collective decision-making. There is no such tradition of community-wide decisions or community elders making decisions on behalf of the community. Instead, many decisions are made at the household-level.

The Project is being collectively governed by JR Agropecuária e Empreendimentos EIRELI, Carbon Securities and CarbonCo. JR Agropecuária e Empreendimentos EIRELI is primarily responsible for the implementation of the local social projects and programs, and for direct engagement with the local community members. To decentralize decision-making and to empower the local communities, JR Agropecuária e Empreendimentos EIRELI will establish sub-divisions for the açaí, rubber and medicinal plant projects throughout the Project Zone.

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

The Participatory Rural Assessment conducted by Ayri Rando asked the local communities whether there were any local organizations or institutions. The only local institution, which does not visit the Project Zone on a regular occasion, is the Union of Rural Workers of the municipality of Feijo (STR-Feijo). The Project Proponents have engaged STR-Feijó to inform them about the Envira Amazonia Project and to explore whether there are opportunities for collaboration. For instance, as previously mentioned, in December 2015, Duarte Jose do Couto Neto ("Duarte") spoke over the phone with Mr. Cesonir Paiva Freitas, then-President of STR-Feijó to present the Envira Amazonia Project. Both agreed to meet in person in the future to strengthen the relationship and to further explore potential areas of assistance from STR-Feijo. Then in May 2017, Mazinho and Rege from JR Agropecuária e Empreendimentos

EIRELI held a meeting with Mr. Antônio José da Conceição, the President of STR-Feijo. The Project team discussed all matters relating to the conditions of the residents and families living in the Project Area. This includes information about the actions undertaken to conserve the forests, social situations, and local biodiversity. In addition, the meeting discussed the legalization of the communities' land tenure through the donation of areas where residents already reside within the Project. The talks with STR were very useful, the Project team delivered to the President of the Union a physical copy and the digital archive of the PDD summary, and the meeting ended with a certainty of future partnerships.

Also in May 2017, Mr. Mateus of the Republic of Açaí, an industrial açaí wine producer based in Feijó, visited the Project headquarters and met with the Project Proponents and the local communities to have a conversation about açaí collection. With over 15 years of business experience, Mr. Mateus was able to provide lessons on local conditions for the production, marketing and storage of açaí.

The Project Proponents met with Mr. Wenderson of SOS Amazonia and Mr. Tabot of SEAPROF (Secretaria de Extensão Agro-florestal e Produção Familiar do Estado do Acre in Portuguese or The Agroforestry and Family Production Extension Secretariat of the State of Acre in English), who visited the Envira Amazonia Project in May 2018. Mr. Wenderson and Mr. Tabot were conducting a registry of the families who would like to collect rubber and would need sales support. Mr. Wenderson and Mr. Tabot also met with the Project Proponents at the headquarters during their visit.

In addition to engaging STR-Feijó, the Republic of Açaí, SOS Amazonia, SEAPROF, and Jose Dazio Bayma ("Dazio"), the Project Proponents are directly engaging the local community to develop local capacity in the design, implementation and ongoing management of the Project. Such local capacity includes, but is not limited to: the participatory process of designing the Project; developing the structure to collect, process, transport and sell açaí, rubber and medicinal plants; and learning new techniques via the agricultural extension courses. It is also important to note the Project will work to build this local capacity with all families, including women and marginalized families.

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (B2.1)

The Amazon Rainforest is the largest contiguous rainforest in the world and home to an extraordinary diversity of life. The Amazon River, and its many tributaries, contain one-fifth of the world's freshwater while stretching nearly 4,000 miles (approximately 6,437 kilometers) from the Andes Mountains to the Atlantic Ocean port city of Macapá.

There are also an estimated one to two million animal species including howler monkeys, freshwater dolphins, scarlet macaws, and jaguars. With nearly 1/3rd of all known species and the largest network of freshwater, the Amazon Rainforest - and specifically Acre's remaining forests and biodiversity - is in a delicate balance.

While still providing refuge to 30,000 endemic plants and hundreds of indigenous communities and forest-dependent communities, the Amazon is facing threats from infrastructure development projects (e.g., road construction and paving, power plants, etc.), cattle ranches, slash-and-burn agriculture, and commercial agriculture (i.e., particularly sugarcane, soybeans, coffee, and oranges).[88]

Specific to Acre, the State Government of Acre noted:

> The majority of the deforestation in Acre occurs along primary and secondary roads as well as rivers. The main deforestation driver in Acre is cattle breeding (70% of deforested area in 1989 and 81% in 2004). Factors such as land speculation, lack of zoning and destination of public lands, profitability of cattle breeding and subsidized credit loans have incentivized deforestation in the Amazon. Deforestation agents were historically mid and large landowner / farmers, although in the last years small household farmers have contributed significantly with the deforested area in Acre. The conclusion of the pavement of BR 317 in 2007 and BR 364 (2011) will connect the southwest Amazon to the Peruvian harbors and will definitely increase business as usual deforestation. The threat will be more intense mainly along BR 364 from Sena Madureira to Cruzeiro do Sol {i.e., the location of the Envira Amazonia Project}.[89]

The Envira Amazonia Project is specifically facing deforestation pressures as a result of JR Agropecuária e Empreendimentos EIRELI's desire to establish a large-scale cattle ranch, along with local subsistence agriculture and cattle breeding within the Project Area. These deforestation pressures were witnessed via firsthand observations as well as using the Verified Carbon Standard's methodology to model future deforestation.

[88] Conservation International, "Brazil," Available: http://www.conservation.org/where/south_america/brazil/pages/brazil.aspx
[89] State of Acre and GCF, "Acre GCF Database," Available: http://www.gcftaskforce.org/documents/Final_db_versions/GCF%20Acre%20Database%20(November%202010).pdf, Page 2

Regional studies in the Southwestern Amazon and particularly within the Envira-Jurupari-Purus River Basins in Acre have demonstrated some of the highest levels of biodiversity in the world. For example, the World Wildlife Fund (WWF) notes for the Southwestern Amazon region that:

> (…) Tree species variability reaches upwards to 300 species in a single hectare. There are a few exceptions to this high diversity, mainly where stands dominated by one or several species occur. The first are vast areas (more than 180,000 km^2) dominated by the highly competitive arborescent bamboos *Guadua sarcocarpa* and *G. weberbaueri* near Acre, Brazil extending into Peru and Bolivia (Daly and Mitchell 2000). Other monodominant stands include swamp forests of the economically important palms *Mauritia flexuosa* and *Jessenia bataua*.
>
> (…) What is distinctive about this region is the diversity of habitats created by edaphic, topographic and climatic variability. Habitat heterogeneity, along with a complex geological and climatic history has led to a high cumulative biotic richness. Endemism and overall richness is high in vascular plants, invertebrates and vertebrate animals. This is the Amazon Basin's center of diversity for palms (Henderson 1995). The rare palm *Itaya amicorum* is found on the Upper Javari River. This ecoregion has the highest number of mammals recorded for the Amazonian biogeographic realm: 257 with 11 endemics. Bird richness is also highest here with 782 species and 17 endemics. In the southern part of the Tambopata Reserve, one area that is 50 km^2 holds the record for bird species: 554. On the white sand areas in the north, plants endemic to this soil type include *Jacqueshuberia loretensis*, *Ambelania occidentalis*, *Spathelia terminalioides*, and *Hirtella revillae*.
>
> Many widespread Amazonian mammals and reptiles find a home in this region. These include tapirs (*Tapirus terrestris*), jaguars (*Panthera onca*), the world's largest living rodents, capybaras (*Hydrochoeris hydrochaeris*), kinkajous (*Potos flavus*), and white-lipped peccaries (*Tayassu pecari*). Some of the globally threatened animals found in this region include black caimans (*Melanosuchus niger*) and spectacled caimans (*Caiman crocodilus crocodilus*), woolly monkeys (*Lagothrix lagotricha*), giant otters (*Pteronura brasiliensis*), giant anteaters (*Myrmecophaga tridactyla*), and ocelots (*Leopardus pardalis*).
>
> Pygmy marmosets (*Cebuella pygmaea*), Goeldi marmosets (*Callimico goeldii*), pacaranas (*Dinomys branickii*), and olingos (*Bassaricyon gabbii*) are found here, but not in regions to the east (Peres 1999). Other primates present include tamarins (*Saguinus fuscicollis* and *S. imperator*), brown pale-fronted capuchins (*Cebus albifrons*), squirrel monkeys (*Saimiri sciureus*), white-faced sakis (*Pithecia irrorata*), and black spider monkeys (*Ateles paniscus*) (Ergueta S. and Sarmiento T. 1992). The rare red uakari monkeys (*Cacajao calvus*) are found in the north in swamp forests. Nocturnal two-toed sloths (*Choloepus hoffmanni*) are well distributed throughout this region along with the widespread three-toed sloths (*Bradypus variegatus*). The Amazon River is a barrier to a number of animals such as the tamarins *Saguinus nigricollis*, which occur on the north

side, and *Saguinus mystax*, which occurs on the southwest side of the Amazon-Ucayali system.

In the region of Manu, 68 species of reptiles and 68 species of amphibians have been reported for the lowland areas while 113 species of amphibians and 118 species of reptiles are reported from Madre de Dios, including the rare and interesting pit-vipers (*Bothriopsis bilineata*, *Bothrops brazili*), and frogs such as *Dendrophidion* sp., *Rhadinaea occipitalis*, and *Xenopholis scalaris* (Pacheco and Vivar 1996).[90]

There have been no negative changes in biodiversity observed. Rather, the intact primary forests of the Envira Amazonia Project are being maintained:

Change in Biodiversity	The intact primary forests of the Envira Amazonia Project have been largely maintained since the Project's start date in August 2012.
Monitored Change	Over the Project Lifetime, 39,045 hectares of reduced forest loss in the Project Area have been achieved when measured against the without-project scenario and approximately 15,137 hectares of reduced forest loss in the Project Area have been achieved when measured against the without-project scenario during the monitoring period.
Justification of Change	A review of remote sensing and satellite imagery were used to monitor and report on these changes.

5.1.2 Mitigation Actions (B2.3)

In order to mitigate negative impacts on biodiversity and to maintain or enhance the High Conservation Values of threatened species, endemic species, and threatened or rare ecosystems in both the "with-Project" and "without-Project" land-use scenarios, the Project primarily needs to mitigate deforestation. The measures needed to mitigate such deforestation include JR Agropecuária e Empreendimentos EIRELI willingly foregoing the conversion of the Project's primary forests to a large-scale cattle ranch (i.e., the "without-Project" land-use scenario) and working with local families to reduce their pressure on the Project's primary forests (i.e., the "with-Project" land-use scenario). The Project Proponents, in consultation with the local families, have developed several social projects and programs (e.g., agricultural extension courses and titling land) to reduce the local community's deforestation and to mitigate its negative impact on biodiversity. JR Agropecuária e Empreendimentos EIRELI continued to willingly forego the conversion of the forests throughout 2012 to 2018.

Demonstrate No High Conservation Values Negatively Affected

No High Conservation Values (HCVs) – whether with respect to communities or biodiversity – were negatively affected by the Envira Amazonia Project from 2012 to 2018. Regarding the biodiversity HCVs,

[90] World Wildlife Fund, "Upper Amazon basin of Peru, Brazil and Bolivia - Neotropic (NT0166)," Available: http://worldwildlife.org/ecoregions/nt0166

the Envira Amazonia Project has several qualifying attributes and this includes threatened species, endemic species, and threatened or rare ecosystems.

To demonstrate that such HCVs were not negatively affected by the Project, one can observe via satellite imagery or firsthand observations that the Envira Amazonia Project's tropical rainforest (i.e. a threatened or rare ecosystem), and its associated ecosystem services, were maintained as intact forest cover from 2012 to 2018. In addition, the Envira Amazonia Project developed a full biodiversity monitoring plan which monitored threatened tree species and endemic bird species throughout the Project Area.

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

The Envira Amazonia Project shall generate net positive biodiversity impacts within the Project Zone over the Project Lifetime and the Project generated net positive biodiversity impacts from 2012 to 2018. Furthermore, the Project shall maintain or enhance any High Conservation Values present in the Project Zone, utilize only native species, and shall not use any genetically modified organisms (GMOs).

Methodology and Assessment of Impacts on Biodiversity

The Project Proponents used the Avoided Deforestation Partners VCS REDD Methodology, entitled, "VM0007: REDD Methodology Modules (REDD-MF), v1.5." and the VCS Monitoring Plan to estimate the changes in forest cover.

In conjunction with the VCS VM0007 methodology to monitor changes in forest cover, the Project Proponents utilized the island biogeography methodology to estimate changes in biodiversity as a result of the project. The biodiversity concept of island biogeography was originally developed by Robert MacArthur and E.O. Wilson and was extrapolated to theorize that habitat area is related to species diversity and species abundance.

Island biogeography in the Brazilian Amazon was demonstrated by the "Biological Dynamics of Forest Fragments Project (BDFFP, also known as the Minimum Critical Size of Ecosystems Project) {… which concluded that} censuses of beetles, birds, and primates in 1-, 10-, and 100- hectare reserves indicate that the number of species, and in some cases population sizes, in these groups varies with the size of the reserve."[91]

The contracted ornithologist Tomaz Nascimento de Melo utilized a Food and Agriculture Organization of the United Nations (FAO) methodology known as strip transects during the initial bird study.[92] Other aspects of the method validated in the Envira Amazonia Project's Project Design Document (PDD) such as the location of the study, along with the field guides and vocalization guides used to identify any unknown species, were also used during the initial study.

The Envira Amazonia Project's impact on biodiversity is expected to be overwhelmingly positive when compared to the "without-Project" land-use scenario. In contrast to deforesting nearly 40,000 hectares and establishing a large-scale cattle ranch, the "with-Project" land-use scenario is a forest conservation

[91] Richard O. Bierregaard Jr. et. al., "The Biological Dynamics of Tropical Rainforest Fragments," pages 859-866.
[92] FAO, "Wild Birds and Avian Influenza: An introduction to applied field research and disease sampling techniques," Chapter 6.

project. As assessed by Andre Botelho, a local biologist in Acre, there are animals that eat some of the medicinal plants and açaí that will be collected in the "with-Project" land-use scenario, however the impact of this small-scale collection will be far less than the "without-Project" land-use scenario.

Demonstrate Project's Net Impact on Biodiversity

The Envira Amazonia Project is a forest conservation project and thus, shall have a direct and net positive impact on the Project Zone's biodiversity as opposed to the "without-Project" land-use scenario that would have resulted in nearly 40,000 hectares converted to cattle pasture. Demonstration of the Project's net impact on biodiversity was done via monitoring, reporting and verifying the satellite imagery of forest cover, along with the results of the vulnerable, endangered and critically endangered flora species study and the results of the endemic and threatened bird species study. This occurred from 2012 to 2018.

With respect to how the Project activities assist the biodiversity adapt to the probable impacts of climate change, it is important to note that the Project is helping to mitigate climate change. In addition, the Project is a large scale conservation project that is preserving a large, intact habitat for species, particularly fauna, to move in order to adapt to climate change.

5.1.4 High Conservation Values Protected (B2.4)

The Project has several qualifying attributes of High Conservation Values (HCV) for biodiversity and this includes threatened species, endemic species, and threatened or rare ecosystems.

Threatened Species

The International Union for Conservation of Nature (IUCN) identified the following 23 species in Acre as Vulnerable, Endangered, and Critically Endangered:[93]

[93] The IUCN Red List of Threatened Species. Version 2014.2. <www.iucnredlist.org>. Downloaded on 31 July 2014.

	Kingdom	Genus	Species	Common Names (English)	Red List Status	Year Assessed	Population Trend
1	ANIMALIA	Allobates	subfolionidificans	N/A	Vulnerable	2008	stable
2	PLANTAE	Amburana	acreana	N/A	Vulnerable	1998	-
3	ANIMALIA	Ateles	chamek	Black-faced Black Spider Monkey, Chamek Spider Monkey, Peruvian Black Spider Monkey	Endangered	2008	decreasing
4	PLANTAE	Bertholletia	excelsa	Brazil-nut Tree, Para Nut	Vulnerable	1998	-
5	ANIMALIA	Callimico	goeldii	Goeldi's Monkey, Callimico, Goeldi's Tamarin, Goeldi's Marmoset	Vulnerable	2008	decreasing
6	PLANTAE	Chrysophyllum	acreanum	N/A	Vulnerable	1998	-
7	PLANTAE	Couratari	guianensis	Fine-leaf Wadara	Vulnerable	1998	-
8	PLANTAE	Couratari	prancei	N/A	tically Endanger	1998	-
9	PLANTAE	Ficus	ramiflora	N/A	Endangered	1998	-
10	PLANTAE	Ficus	ursina	N/A	Endangered	1998	-
11	PLANTAE	Guarea	juglandiformis	N/A	Vulnerable	1998	-
12	ANIMALIA	Lagothrix	cana	Peruvian Woolly Monkey, Geoffroy's Woolly Monkey	Endangered	2008	decreasing
13	ANIMALIA	Lagothrix	poeppigii	Poeppig's Woolly Monkey, Red Woolly Monkey, Silvery Woolly Monkey	Vulnerable	2008	decreasing
14	ANIMALIA	Myrmecophaga	tridactyla	Giant Anteater	Vulnerable	2014	decreasing
15	PLANTAE	Pouteria	krukovii	N/A	Vulnerable	1998	-
16	ANIMALIA	Priodontes	maximus	Giant Armadillo	Vulnerable	2014	decreasing
17	PLANTAE	Rinorea	longistipulata	N/A	Vulnerable	1998	-
18	PLANTAE	Rollinia	calcarata	N/A	Endangered	1998	-
19	PLANTAE	Sarcaulus	vestitus	N/A	Vulnerable	1998	-
20	PLANTAE	Swietenia	macrophylla	Big Leaf Mahogany, Brazilian Mahogany, Honduras Mahogany, Large-leaved Mahogany	Vulnerable	1998	-
21	PLANTAE	Trichilia	elsae	N/A	Endangered	1998	-
22	PLANTAE	Trichilia	emarginata	N/A	Vulnerable	1998	-
23	PLANTAE	Trichilia	fasciculata	N/A	Vulnerable	1998	-

Figure 5.1: IUCN Red Listed Species in Acre (Credit: IUCN Red List)

At the Envira Amazonia Project, a total of 376 individuals were found amongst the following four vulnerable species during TECMAN's forest carbon inventory which took place from May to July 2014.[94]

	Kingdom	Genus	Species	Common Names (English)	Nome Vernacular (Common Portuguese Name)	Red List Status	Number of Individuals Identified
1	PLANTAE	Amburana	acreana	N/A	Cerejeira	Vulnerable	15
2	PLANTAE	Cedrela	odorata	Spanish Cedar, Cigar-box Wood, Red Cedar	Cedro rosa	Vulnerable	39
3	PLANTAE	Rinorea	longistipulata*	N/A	Canela de Velho	Vulnerable	297
4	PLANTAE	Swietenia	macrophylla	Big Leaf Mahogany, Brazilian Mahogany, Large-leaved Mahogany	Mogno	Vulnerable	25

Figure 5.2: IUCN Red Listed Species Identified in Project Area (Credit: TECMAN)

[94] Rinorea longistipulata and Rinorea viridifolia are generally distinguished due to their growth form, where R. longistipulata is a larger tree and R. viridifolia is a small tree/ shrub. This growth form distinction makes identification of small R. longistipulata near impossible in the field.

Rinorea longistipulata and Swietenia macrophylla (Photo Credit: TECMAN)

Cedrela odorata and Amburana acreana (Photo Credit: TECMAN)

Tomaz Nascimento de Melo's bird study in 2015 identified two near threatened bird species – which were the Harpy Eagle (*Harpia harpyja*) and the Crested Eagle (*Morphnus guianensis*) - at the Envira Amazonia Project. There is a high likelihood of additional threatened and endangered bird species present.

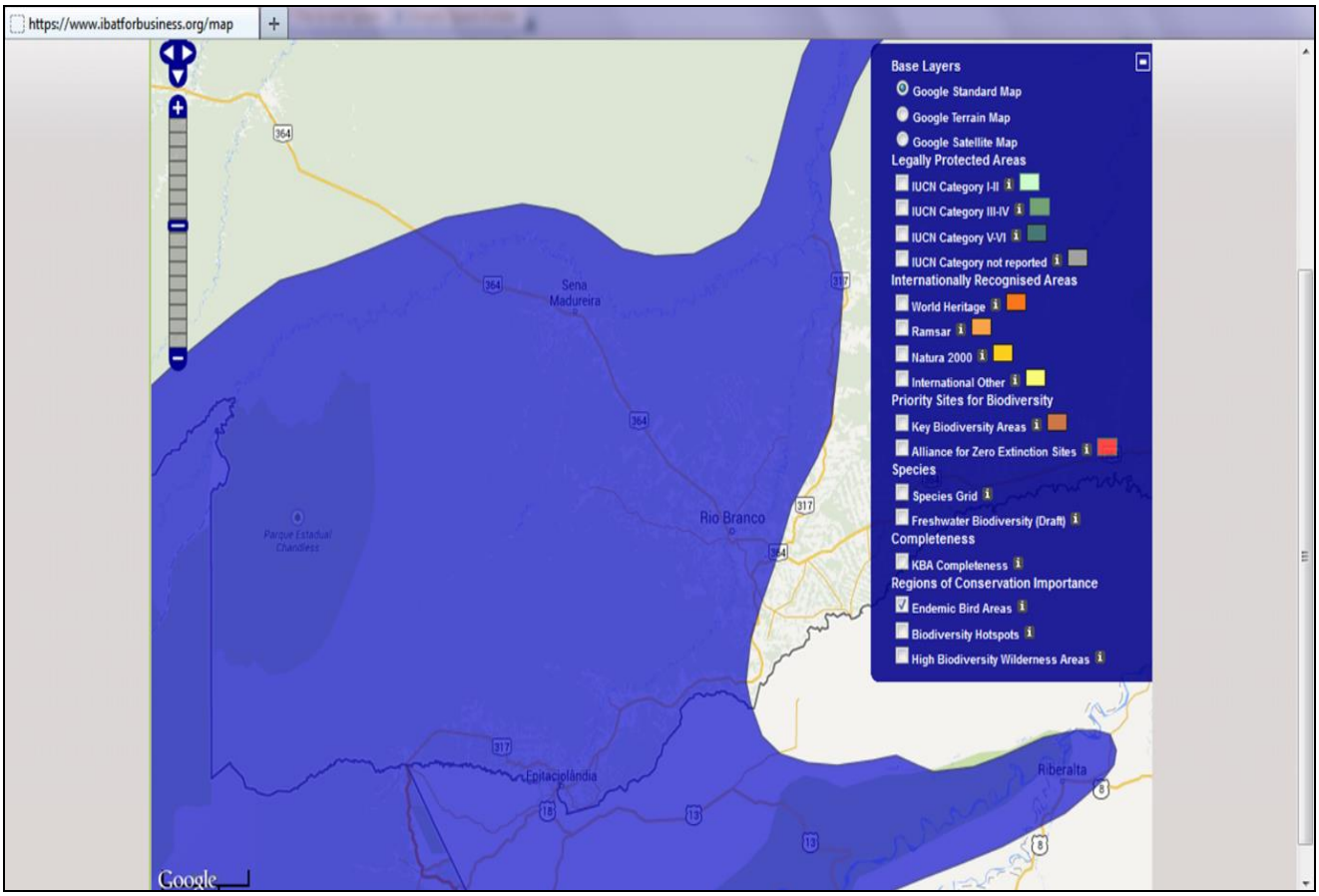
Endemic Species

Although endemic species were not identified from 2012 to 2014 in the Project as a qualifying High Conservation Value, it is important to note that the Southwestern Amazon (i.e., which includes Acre, Brazil and potentially the Project) is home to many endemic species. According to WWF, there are approximately 42 endemic species in the Southwestern Amazon[95]:

[95] World Wildlife Fund, "Southwest Amazon moist forests: Export Species," Available: http://www.worldwildlife.org/science/wildfinder/

	Common Name	Scientific Name	Class	Endemic
1	Eleutherodactylus skydmainos	Eleutherodactylus skydmainos	Amphibia	Yes
2	Eleutherodactylus buccinator	Eleutherodactylus buccinator	Amphibia	Yes
3	Manu Poison Frog	Epipedobates macero	Amphibia	Yes
4	Altigius alios	Altigius alios	Amphibia	Yes
5	Ruthven's Burrowing Snake	Apostolepis tenuis	Reptilia	Yes
6	Gray Wren	Thryothorus griseus	Aves	Yes
7	Peru Keelback	Helicops yacu	Reptilia	Yes
8	Peru Burrowing Snake	Apostolepis nigroterminata	Reptilia	Yes
9	Peruvian Fish-eating Rat	Neusticomys peruviensis	Mammalia	Yes
10	Stenocercus scapularis	Stenocercus scapularis	Reptilia	Yes
11	Scinax parkeri	Scinax parkeri	Amphibia	Yes
12	Neusticurus ocellatus	Neusticurus ocellatus	Reptilia	Yes
13	Neusticurus juruazensis	Neusticurus juruazensis	Reptilia	Yes
14	Scinax icterica	Scinax icterica	Amphibia	Yes
15	Black-headed Ground Snake	Atractus nigricaudus	Reptilia	Yes
16	Scarlet-hooded Barbet	Eubucco tucinkae	Aves	Yes
17	Selva Cacique	Cacicus koepckeae	Aves	Yes
18	Black-faced Cotinga	Conioptilon mcilhennyi	Aves	Yes
19	Rufous-fronted Antthrush	Formicarius rufifrons	Aves	Yes
20	Bolivian Recurvebill	Simoxenops striatus	Aves	Yes
21	Bolivian Lancehead	Bothrops sanctaecrucis	Reptilia	Yes
22	Black-backed Tody-Flycatcher	Todirostrum pulchellum	Aves	Yes
23	Leptodactylus didymus	Leptodactylus didymus	Amphibia	Yes
24	Hyla walfordi	Hyla walfordi	Amphibia	Yes
25	Micronycteris matses	Micronycteris matses	Mammalia	Yes
26	Pearson's Slender-legged Treefrog	Osteocephalus pearsoni	Amphibia	Yes
27	Para Toad	Bufo castaneoticus	Amphibia	Yes
28	Amazonian Parrotlet	Nannopsittaca dachilleae	Aves	Yes
29	Elusive Antpitta	Grallaria eludens	Aves	Yes
30	Fine-barred Piculet	Picumnus subtilis	Aves	Yes
31	Odd Anole	Anolis dissimilis	Reptilia	Yes
32	Cuzco Reserve Treefrog	Hyla allenorum	Amphibia	Yes
33	Epipedobates simulans	Epipedobates simulans	Amphibia	Yes
34	Anolis scapularis	Anolis scapularis	Reptilia	Yes
35	Long-crested Pygmy-Tyrant	Lophotriccus eulophotes	Aves	Yes
36	White-lined Antbird	Percnostola lophotes	Aves	Yes
37	Black Mabuya	Mabuya nigropalmata	Reptilia	Yes
38	Villa Tunari Caecilian	Caecilia marcusi	Amphibia	Yes
39	Henle's Snouted Treefrog	Scinax pedromedinai	Amphibia	Yes
40	Biolat Poison Frog	Dendrobates biolat	Amphibia	Yes
41	Ucayali Spiny Mouse	Scolomys ucayalensis	Mammalia	Yes
42	Goeldi's Antbird	Myrmeciza goeldii	Aves	Yes

Furthermore, according to the Integrated Biodiversity Assessment Tool (IBAT), the region where the Envira Amazonia Project is located is home to numerous endemic birds:



Map 5.1: Endemic Bird Areas (Credit: Integrated Biodiversity Assessment Tool)

In 2015, Tomaz Nascimento de Melo identified 18 endemic bird species at the Envira Amazonia Project according to the Inambari Center of Endemism. Below are pictures of a few of these endemic bird species:

Purus Jacamar (*Galbalcyrhynchus purusianus)* (Credit: Tomaz Nascimento de Melo)

Bluish-Fronted Jacamar (*Galbula cyanescens*) (Credit: Tomaz Nascimento de Melo)

Fulvous-Chinned Nunlet (*Nonnula sclateri*) (Credit: Tomaz Nascimento de Melo)

Green-Billed Toucanet (*Selenidera reinwardtii langsdorffii*)
(Credit: Tomaz Nascimento de Melo)

Threatened and Rare Ecosystems

Tropical rainforests are globally considered rare and threatened ecosystems. According to The Nature Conservancy, only 2% of the world's total surface area is home to rainforests while such rainforests are home to 50% of the world's plant and animals. However, "every second, a slice of rainforest the size of a football field is mowed down. That's 86,400 football fields of rainforest per day, or over 31 million football fields of rainforest each year."[96]

Furthermore, the Project Zone is within WWF's ecoregions. As described by WWF, "ecoregions that represented the most distinctive examples of biodiversity for a given major habitat type were identified within each biogeographic realm. They were chosen based on the following parameters:

- Species richness;
- Endemism;
- Higher taxonomic uniqueness (e.g., unique genera or families, relict species or communities, primitive lineages);
- Extraordinary ecological or evolutionary phenomena (e.g., extraordinary adaptive radiations, intact large vertebrate assemblages, presence of migrations of large vertebrates); and
- Global rarity of the major habitat type."[97]

One of these rare and threatened global ecoregions is the Southwestern Amazon moist forest and more specifically, "this Global ecoregion is made up of 4 terrestrial ecoregions: Juruá-Purus moist forests; Southwest Amazon moist forests; Purus-Madeira moist forests; and Madeira-Tapajós moist forests"[98] which encompasses the Project Zone.

The primary forests of the Envira Amazonia Project are considered tropical rainforests due to the Köppen classification of Acre as tropical[99] and the Food and Agricultural Organization of the United Nations' (FAO) designation of Acre as being within the tropical rainforest ecological zone.[100] Thus as a payment for ecosystem services forest conservation project, the Envira Amazonia Project preserved a rare and threatened tropical rainforest ecosystem within the Amazon Basin from 2012 to 2018.

If planned deforestation by the JR Agropecuária e Empreendimentos EIRELI was to occur, there would be reduction in habitat availability, a fragmented landscape, and potentially more threatened species.

[96] The Nature Conservancy, "Rainforests: Facts About Rainforests," Available: http://www.nature.org/ourinitiatives/urgentissues/rainforests/rainforests-facts.xml
[97] WWF, "Role of the Global Ecoregions and how they are selected," Available: http://wwf.panda.org/about_our_earth/ecoregions/about/role/
[98] WWF, "Southwestern Amazon Moist Forests," Available: http://wwf.panda.org/about_our_earth/ecoregions/swamazon_moist_forests.cfm
[99] Peel MC, Finlayson BL & McMahon TA (2007), Updated world map of the Köppen-Geiger climate classification, Hydrol. Earth Syst. Sci., 11, 1633-1644.
[100] FAO, "Ecological Zones: Brazil," Available: http://www.fao.org/forestry/country/19971/en/bra/

Habitat Availability

If planned conversion took place by JR Agropecuária e Empreendimentos EIRELI, the resulting open cattle pastures and cropland would provide a poor habitat for the region's biodiversity except for domesticated animals and wild species that exist in transitional forests and open grasslands. Thus, forest dependent species (such as endemic bird species), and especially flora, would have less available habitat.

Landscape Connectivity

If the 'without project," planned deforestation scenario occurred, there would be a negative impact on landscape connectivity between the Envira, Jurupari and Purus Rivers.

Threatened Species

There are several threatened flora species in the Project Area and there are likely several threatened fauna species in the Project Area. If the Envira Amazonia Project were converted to cattle pasture and cropland, these particular threatened species would likely disappear from the Project due to a reduction in habitat and due to commercial logging. These threatened species could move to a higher level of extinction risk according to the IUCN. In addition, species currently considered to be at a low level of risk could move into a threatened category if the additional deforestation pressures were placed on the surrounding landscape.

5.1.5 Invasive Species (B2.5)

No invasive species were used by the Project from 2012 to 2018. The Project Proponents reviewed the Global Invasive Species Database, which is managed by the Invasive Species Specialist Group of the International Union for Conservation of Nature's Species Survival Commission. This Database has identified 62 natural forest species which are either native to Brazil and act as an invasive species elsewhere or are native species elsewhere and are considered invasive species within Brazil.[101] Furthermore, three species native to Brazil (i.e., and which are considered invasive species elsewhere) are on the Global Invasive Species Database's 100 of the World's Worst Invasive Alien Species List.[102]

As of right now, the following species will be used by the Envira Amazonia Project:

- Açaí; and
- Rubber trees.

In the future, any additional use of native species will be documented in the CCB VCS Monitoring Report.

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

The Project will only use native species and thus, there will be no adverse effects of non-native species.

[101] Global Invasive Species Database, "Alien Species," Available: http://www.issg.org/database/species/search.asp?sts=sss&st=sss&fr=1&sn=&rn=brazil&hci=1&ei=-1&lang=EN&Image1.x=30&Image1.y=10
[102] Global Invasive Species Database, "100 of the World's Worst Invasive Alien Species List," Available: http://www.issg.org/database/species/search.asp?st=100ss&fr=1&str=&lang=EN

5.1.7 GMO Exclusion (B2.7)

The Project Proponents guarantee that no genetically modified organisms (GMOs) will be used in the Project to generate GHG emissions reductions or removals. No GMOs were used from 2012 to 2018.

5.1.8 Inputs Justification (B2.8)

The Envira Amazonia Project shall not use fertilizers, pesticides, biological control agents and other petroleum-based inputs. The Project did not use any such products from 2012 to 2018.

5.2 Offsite Biodiversity Impacts

The Project Proponents have evaluated and shall mitigate any negative impacts on biodiversity that occur outside the Project Zone as a result of the Project's activities.

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

Due to the fact that the Envira Amazonia Project is a payment for ecosystem services forest conservation project, there is unlikely to be any negative offsite biodiversity impacts that the Project is likely to cause.

Negative Offsite Impact	Mitigation Measure(s)
The only identified major negative offsite biodiversity impacts that could potentially occur would be the result of leakage. For example, this activity shifting leakage could include families from within the Project Zone moving to outside the Project Zone.[103] This activity shifting leakage would result in an increase in deforestation, increase in GHG emissions, reduction of habitat availability and more forest fragmentation – all of which would have a negative impact on offsite biodiversity.	Although negative offsite biodiversity impacts are unlikely, the Project has leakage mitigation plans to minimize the likelihood of communities moving from within the Project Zone to outside the Project Zone which would result in negative offsite biodiversity impacts. In addition, the Project Proponents shall practice adaptive management and will collectively address any additional negative offsite biodiversity impacts that are later identified. There were a variety of activity-shifting leakage mitigation activities designed and this includes: • Discussing the Project with adjacent landowners to potentially expand the forest conservation efforts; • Alignment with the ongoing State of Acre's Payment for Ecosystem Services Scheme; and • Monitoring the leakage areas and offering social projects and programs to communities throughout the Project Zone. The State of Acre's Payment for Ecosystem Services Scheme (known as Sistema de Incentivo a Serviços Ambientais or "SISA" in Portuguese) is relevant to the mitigation of leakage; particularly the leakage attributed to families moving from outside the Project Zone to within the Project Zone. This is because the SISA is focusing on improving rural livelihoods through a Certification Program of Rural Production Units which shall "provide for the gradual abandonment

[103] Pitman, N. 2011. Social and Biodiversity Impact Assessment Manual for REDD+ Projects: Part 3 – Biodiversity Impact Assessment Toolbox. Forest Trends, Climate, Community & Biodiversity Alliance, Rainforest Alliance and Fauna & Flora International. Washington, DC., Page 9

	of burning; priority access to labor-saving technologies; access to incentives and financing; and inclusion in sustainable production chains to encourage the production and protection of environmental services."[104] Thus by improving rural livelihoods, families will have less incentive to migrate, which shall reduce deforestation in the leakage areas while maintaining forest cover and habitat availability. To help mitigate the leakage attributed to families moving from within the Project Zone to outside the Project Zone, Ayri Rando consulted families throughout the Project Zone and the Project Proponents will extend Project activities (such as agricultural extension training courses) to families throughout the Project Zone and not just to those living within the Project Area of the Envira Amazonia Project.

5.2.2 Net Offsite Biodiversity Benefits (B3.3)

The Envira Amazonia Project is conserving 39,300.6 hectares of tropical forests, while the unmitigated negative impacts on biodiversity outside the Project – which would result from activity-shifting leakage – shall be minimal.

5.3 Biodiversity Impact Monitoring

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

The Project Proponents shall use satellite imagery on a regular basis to monitor deforestation, forest cover, and thus habitat availability throughout the Project Zone. In 2015, the satellite imagery from 2012 to 2014 was reviewed and then in 2016, the satellite imagery from 2015 was reviewed. In 2019, the satellite imagery from 2016 to 2018 was reviewed.

The Project Proponents shall monitor vulnerable, endangered and critically endangered flora species throughout the Project Zone via onsite sampling every 10 years. The first assessment was conducted by TECMAN from May to July 2014, with the next assessment to be conducted in mid-2024. This initial onsite sampling included identifying, recording, photographing, and marking the location with a handheld GPS device the following trigger species: *Amburana acreana*, *Cedrela odorata* (red cedar), *Rinorea longistipulata* and *Swietenia macrophylla* (mahogany). Although relatively easy to identify, no *Couratari guianensis* or *Bertholetia excelsa* were identified. The following rare and endangered flora species (i.e., additional trigger species) are more difficult to identify and are believed to exist within Acre, but were not identified during the initial onsite sampling:

- Chrysophyllum acreanum;
- *Couratari prance*;

[104] Environmental Defense Fund, "Ready for REDD: Acre's State Programs for Sustainable Development and Deforestation Control," Page 8.

- *Ficus ramiflora* (Renaquinho);
- *Ficus ursina* (Coajinguba);
- *Guarea juglandiformis*;
- *Pouteria krukovii*;
- *Rollinia calcarata*;
- *Sarcaulus vestitus*; and
- *Trichilia elsae*, *Trichilia emarginata*, *Trichilia fasciculate*.

All of these aforementioned flora trigger species are expected to decrease in the "without-Project" land-use scenario which would have resulted in the establishment of a large-scale cattle ranch.

The Project Proponents shall also monitor endemic and threatened bird species within the Project Zone's portion of the Jurupari River via onsite sampling every 5 years. An initial, informal assessment of bird species in the Project Area was conducted by David Shoch of TerraCarbon who is a trained ornithologist.

The following species were identified by David Shoch on December 13, 2014 from approximately 8:30am to 5:30pm along the Jurupari River as the Project Proponents traveled to the Project Area. The number of individuals identified are in parentheses.

- Anhinga (1);
- Striated Heron (2);
- Black Vulture (40);
- Greater Yellow-Headed Vulture (20);
- King Vulture (3);
- Plumbeous Kite (20);
- Crane Hawk (1);
- Roadside Hawk (2);
- Hoatzin (15);
- Squirrel Cuckoo (3);
- Greater Ani (2);
- Smooth-Billed Ani (5);
- Chaetura sp. (30);

- Hermit sp. (1);
- New World Trogon sp. (1);
- Ringed Kingfisher (1);
- Green-and-Rufous Kingfisher (1);
- Black-Fronted Nunbird (8);
- Swallow-Winged Puffbird (15);
- Purus Jacamar (1);
- White-Throated Toucan (3);
- Black Caracara (1);
- Red-Throated Caracara (1);
- Falcon sp. (2 birds were perched along edge of Jurupari River. These birds were briefly seen by David Shoch. The birds appeared to be Orange-breasted Falcons, but also looked familiar with the smaller Bat Falcon);
- Red-and-Green Macaw (2);
- Drab Water Tyrant (4);
- Social Flycatcher (8);
- Masked Tityra (2);
- Violaceous Jay (2);
- White-Banded Swallow (2);
- Southern Rough-Winged Swallow (2);
- Barn Swallow (1);
- Yellow-Rumped Cacique (20); and
- Crested Oropendola (2).[105]

[105] Please visit the following hyperlink to view this checklist online: http://ebird.org/ebird/view/checklist?subID=S20949519

On the return trip back from the Project Area to BR-364, the following species were identified by David Shoch on December 18, 2014 from approximately 7:00am to 11:30am along the Jurupari River. The number of individuals identified are in parentheses.

- Rufescent Tiger-Heron (1);
- Cattle Egret (1);
- Striated Heron (1);
- Capped Heron (1);
- Black Vulture (40);
- Greater Yellow-Headed Vulture (10);
- King Vulture (1);
- Swallow-Tailed Kite (1);
- Slate-Colored Hawk (1);
- Ruddy Ground-Dove (1);
- Hoatzin (25);
- Greater Ani (40);
- Smooth-Billed Ani (2);
- Chaetura sp. (10);
- Amazon Kingfisher (2);
- Swallow-Winged Puffbird (5);
- Aracari sp. (1);
- White-Throated Toucan (1);
- Scarlet Macaw (2);
- Red-and-Green Macaw (3);
- Drab Water Tyrant (2);
- Violaceous Jay (1);
- White-Banded Swallow (10);
- Southern Rough-Winged Swallow (6); and

- Red-Capped Cardinal (2).[106]

Both of these reports were generated automatically by eBird v3 (http://ebird.org).

The first, formal assessment of bird species at the Envira Amazonia Project occurred in May 2015 by Tomaz Nascimento de Melo with the second assessment to be conducted in 2020. Brian McFarland of CarbonCo mapped out timing and estimated costs in 2018 for the follow up study in 2020, Brian then contacted Tomaz in March 2019 about his interest, and they both looked at a possible May or June 2020 trip for next bird study.

The May 2015 onsite sampling included photographing and vocalization recordings of all bird species and particularly focused on the following trigger species according to the Integrated Biodiversity Assessment Tool (IBAT):

- Grey Wren;
- White-Bellied Parrot;
- Blue-Headed Macaw;
- Fine-Barred Piculet;
- White-Lined Antbird;
- Amazonia Parrotlet;
- Long-Crested Pygmy-Tyrant;
- Goeldi's Antbird;
- Scarlet-Hooded Barbet;
- Black-Faced Cotinga; and
- Rufous-Fronted Antthrush.

The visual identification of bird species was done via photography, professional judgment by a trained ornithologist named Tomaz Nascimento de Melo, and with confirmation against a field guide when necessary. For example, *A Field Guide to the Birds of Brazil* by Ber Van Perlo is a widely-used field guide. Vocalization recordings were recorded and analyzed by Tomaz Nascimento de Melo, a trained ornithologist, who is currently a doctoral student at the Federal University of Amazonas (UFAM) in Brazil with a focus on the patterns of habitat use and the effect of permanent flooding on avifauna in lowland area on the Madeira River.[107] The website www.xeno-canto.org was used to confirm any unknown vocalization recordings. Furthermore, Tomaz Nascimento de Melo utilized a Food and Agriculture

[106] Please visit the following hyperlink to view this checklist online: http://ebird.org/ebird/view/checklist?subID=S20949554
[107] See: http://buscatextual.cnpq.br/buscatextual/visualizacv.do?id=K4321259J1

Organization of the United Nations (FAO) methodology known as strip transects during the initial bird study.[108]

The projected population trends of these aforementioned trigger species in the "without-Project" land-use scenario can be found in the following section, GL3: *Exceptional Biodiversity Benefits*.

The biodiversity impact monitoring plan was also designed to monitor the Project's High Conservation Values of threatened species, endemic species, and threatened or rare ecosystems. Thus, the use of satellite imagery to monitor deforestation and forest cover shall enable the Project Proponents to monitor the Project's rare and threatened ecosystem. As previously mentioned, the Project will monitor both endemic and threatened bird species along the Jurupari River and monitor threatened tree species throughout the Project Zone.

5.3.2 Biodiversity Monitoring Plan Dissemination (B4.3)

As previously mentioned, monitoring results are incorporated into the Summary Documents (both in English and in Portuguese) and shared with stakeholders, including the local communities. Links are available online at the VCS Project Database and on the IHS-Markit Environmental Registry. Links to the Envira Amazonia Project is also publicly distributed during the CCBS Public Comment Period via Carbonfund.org's newsletter. Furthermore, Tomaz Nascimento de Melo, the contracted local ornitholigst who undertook the rapid bird study at the Envira Amaoznia Project, published his results in: Atualidades Ornitológicas, 189, janeiro e fevereiro de 2016 (Ornithological News, 189, January and February 2016).

5.4 Optional Criterion: Exceptional Biodiversity Benefits

The Envira Amazonia Project is conserving a globally significant site of biodiversity on the basis of the Key Biodiversity Area (KBA) framework of vulnerability.

<u>Demonstrate Project Zone's High Biodiversity Conservation Priority</u>

The Envira Amazonia Project is a site of high biodiversity conservation priority due to the KBA framework of vulnerability. The two main trigger species are *Rinorea longistipulata* (known as Canela de Velho in Portuguese) and *Cedrela odorata* (known as Spanish Cedar, Cigar-box Wood, and Red Cedar in English or Cedro rosa in Portuguese).

The following chart demonstrates that more than 30 individuals of *Rinorea longistipulata* and *Cedrela odorata* were identified by TECMAN at the Envira Amazonia Project:

[108] FAO, "Wild Birds and Avian Influenza: An introduction to applied field research and disease sampling techniques," Chapter 6.

	Kingdom	Genus	Species	Common Names (English)	Nome Vernacular (Common Portuguese Name)	Red List Status	Number of Individuals Identified
1	PLANTAE	Amburana	acreana	N/A	Cerejeira	Vulnerable	15
2	PLANTAE	Cedrela	odorata	Spanish Cedar, Cigar-box Wood, Red Cedar	Cedro rosa	Vulnerable	39
3	PLANTAE	Rinorea	longistipulata*	N/A	Canela de Velho	Vulnerable	297
4	PLANTAE	Swietenia	macrophylla	Big Leaf Mahogany, Brazilian Mahogany, Large-leaved Mahogany	Mogno	Vulnerable	25

Figure 5.3: IUCN Red Listed Species Identified in Project Area (Credit: TECMAN)

Furthermore, according to the Integrated Biodiversity Assessment Tool (IBAT), the region where the Envira Amazonia Project is located has also been identified as a KBA due to the endemic and IUCN Red List bird species. The following chart is the IBAT trigger species:

	Taxonomic Group	Scientific Name	Common Names (English)	IUCN Red List	Endemic to Southwestern Amazon
1	Birds	Brachygalba albogularis	White-throated Jacamar	Least Concern	-
2	Birds	Cercomacra manu	Manu Antbird	Least Concern	-
3	Birds	Conioptilon mcilhennyi	Black-faced Cotinga	Least Concern	Endemic
4	Birds	Crypturellus atrocapillus	Black-capped Tinamou	Near Threatened	-
5	Birds	Cymbilaimus sanctaemariae	Bamboo Antshrike	Least Concern	-
6	Birds	Epinecrophylla leucophthalma	White-eyed Antwren	Least Concern	-
7	Birds	Eubucco tucinkae	Scarlet-hooded Barbet	Least Concern	Endemic
8	Birds	Formicarius rufifrons	Rufous-fronted Antthrush	Near Threatened	Endemic
9	Birds	Galbalcyrhynchus purusianus	Chestnut Jacamar	Least Concern	-
10	Birds	Galbula cyanescens	Bluish-fronted Jacamar	Least Concern	-
11	Birds	Gymnopithys salvini	White-throated Antbird	Least Concern	-
12	Birds	Hemitriccus flammulatus	Flammulated Bamboo-tyrant	Least Concern	-
13	Birds	Hylopezus berlepschi	Amazonian Antpitta	Least Concern	-
14	Birds	Hypocnemoides maculicauda	Band-tailed Antbird	Least Concern	-
15	Birds	Lanio versicolor	White-winged Shrike-tanager	Least Concern	-
16	Birds	Lophotriccus eulophotes	Long-crested Pygmy-tyrant	Least Concern	Endemic
17	Birds	Malacoptila semicincta	Semicollared Puffbird	Least Concern	-
18	Birds	Myrmeciza goeldii	Goeldi's Antbird	Least Concern	Endemic
19	Birds	Myrmotherula iheringi	Ihering's Antwren	Least Concern	-
20	Birds	Myrmotherula sclateri	Sclater's Antwren	Least Concern	-
21	Birds	Nannopsittaca dachilleae	Amazonian Parrotlet	Near Threatened	Endemic
22	Birds	Neopelma sulphureiventer	Sulphur-bellied Tyrant-manakin	Least Concern	-
23	Birds	Nonnula sclateri	Fulvous-chinned Nunlet	Least Concern	-
24	Birds	Percnostola lophotes	White-lined Antbird	Near Threatened	Endemic
25	Birds	Phaethornis philippii	Needle-billed Hermit	Least Concern	-
26	Birds	Picumnus subtilis	Fine-barred Piculet	Least Concern	Endemic
27	Birds	Pionites leucogaster	White-bellied Parrot	Endangered	-
28	Birds	Primolius couloni	Blue-headed Macaw	Vulnerable	-
29	Birds	Psophia leucoptera	Pale-winged Trumpeter	Least Concern	-
30	Birds	Pteroglossus beauharnaesii	Curl-crested Aracari	Least Concern	-
31	Birds	Pyrrhura rupicola	Black-capped Parakeet	Near Threatened	-
32	Birds	Simoxenops ucayalae	Peruvian Recurvebill	Near Threatened	-
33	Birds	Synallaxis cherriei	Chestnut-throated Spinetail	Near Threatened	-
34	Birds	Thamnomanes schistogynus	Bluish-slate Antshrike	Least Concern	-
35	Birds	Thryothorus griseus	Grey Wren	Least Concern	Endemic

Figure 5.4: IBAT Trigger Species (Credit: IBAT)

Many of these bird species were identified in 2015 by Tomaz Nascimento.

5.4.1 Trigger Species Population Trends (GL3.3)

The following analysis will focus on the nine trigger species which are endemic to the Southwestern Amazon, along with the four trigger species considered vulnerable or endangered by the International Union for the Conservation of Nature (IUCN).

Trigger Species	*Grey Wren*
With-project Scenario	According to research compiled by the IUCN, the population trend of the Grey Wren (*Thryothorus griseus*) is decreasing. Furthermore, the IUCN states the Grey Wren: > Has a very large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km2 combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). Despite the fact that the population trend appears to be decreasing, the decline is not believed to be sufficiently rapid to approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations). The population size has not been quantified, but it is not believed to approach the thresholds for Vulnerable under the population size criterion (<10,000 mature individuals with a continuing decline estimated to be >10% in ten years or three generations, or with a specified population structure). For these reasons the species is evaluated as Least Concern.[109] Although the Grey Wren has a large range, the Grey Wren's population within the Project Zone would likely further decrease in the without project land-use scenario.

Trigger Species	*White-bellied Parrot*
With-project Scenario	According to research compiled by the IUCN, the White-bellied Parrot is considered Endangered and the population trend of the White-bellied Parrot (*Pionites leucogaster*) is decreasing. The IUCN states that "based on a model of deforestation in the Amazon basin, and the potential susceptibility of this newly split species to hunting, it is suspected that its population will decline very rapidly over three generations from 2002, and it is therefore listed as Endangered."[110] If the Project Zone were to be clear-cut for cattle ranches, it is likely the population of the White-bellied Parrot would further decrease.

[109] IUCN, "Thryothorus griseus," Available: http://www.iucnredlist.org/details/22711479/0
[110] IUCN, "Pionites leucogaster," Available: http://www.iucnredlist.org/details/62181308/0

Trigger Species	*Blue-headed Macaw*
With-project Scenario	According to research compiled by the IUCN, the Blue-headed Macaw (*Primolius couloni*) is considered Vulnerable and the Blue-headed Macaws' population is decreasing. Furthermore, the population is "estimated at 9,200-46,000 mature individuals (roughly equivalent to 10,000-70,000 total individuals), based on conservative estimates of range size and density. (…) This species is listed as Vulnerable because it has a small population which is declining owing to exploitation for the cagebird trade and deforestation."[111] The population of the Blue-headed Macaw would likely decrease in the without-Project land-use scenario.

Trigger Species	*Fine-barred Piculet*
With-project Scenario	According to research compiled by the IUCN, the Fine-barred Piculet (*Picumnus subtilis*) is considered stable. The IUCN explains that this is because: > Although this species may have a restricted range, it is not believed to approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km2 combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). Despite the fact that the population trend appears to be decreasing, the decline is not believed to be sufficiently rapid to approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations). The population size has not been quantified, but it is not believed to approach the thresholds for Vulnerable under the population size criterion (<10,000 mature individuals with a continuing decline estimated to be >10% in ten years or three generations, or with a specified population structure). For these reasons the species is evaluated as Least Concern.[112] The Fine-barred Piculet, due to its restricted range, would possibly decrease in population from the without-Project land-use scenario.

Trigger Species	*White-lined Antbird*
With-project Scenario	According to research compiled by the IUCN, the White-lined Antbird (*Percnostola lophotes*) population is decreasing. The IUCN reasons that "based on a model of future deforestation in the Amazon basin, and its particular susceptibility to forest

[111] IUCN, "Primolius couloni," Available: http://www.iucnredlist.org/details/22685593/0
[112] IUCN, "Picumnus subtilis," Available: http://www.iucnredlist.org/details/22680771/0

	fragmentation, it is suspected that the population of this species will decline by 25-30% over the next three generations, and it has therefore been uplisted to Near Threatened."[113] The without-Project land-use scenario, which would result in deforestation and forest fragmentation, would likely further decrease the population of the White-lined Antbird.

Trigger Species	*Amazonia Parrotlet*
With-project Scenario	According to research compiled by the IUCN, the population trend of the Amazonia Parrotlet (Nannopsittaca dachilleae) is decreasing. The IUCN states that: > This species is currently classified as Near Threatened as it is thought to have a moderately small, declining population of which the majority of individuals are in one subpopulation. If the population is found to be considerably larger than previously thought it may be downlisted to Least Concern. (…) The species' population is suspected to number c.10,000 individuals, equivalent to c.6,700 mature individuals. This figure is applied here as a preliminary estimate; however, there are no data available and further research is needed.[114] The without-Project land-use scenario would likely further decrease the population of the Amazonia Parrotlet.

Trigger Species	*Long-crested Pygmy-tyrant*
With-project Scenario	According to research compiled by the IUCN, the Long-crested Pygmy-tyrant (*Lophotriccus eulophotes*) population is decreasing. In addition, the IUCN states that: > This species has a very large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km2 combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). Despite the fact that the population trend appears to be decreasing, the decline is not believed to be sufficiently rapid to approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations). The population size has not been quantified, but it is not believed to approach the thresholds for Vulnerable under

[113] IUCN, "Percnostola lophotes," Available: http://www.iucnredlist.org/details/22701776/0
[114] IUCN, "Nannopsittaca dachilleae," Available: http://www.iucnredlist.org/details/22686000/0

	the population size criterion (<10,000 mature individuals with a continuing decline estimated to be >10% in ten years or three generations, or with a specified population structure). For these reasons the species is evaluated as Least Concern.[115] Although the Long-crested Pygmy-tyrant has a large range, the Long-crested Pygmy-tyrant's population within the Project Zone would likely further decrease in the without project land-use scenario.

Trigger Species	*Goeldi's Antbird, Scarlet-hooded Barbet, and Black-faced Cotinga*
With-project Scenario	According to research compiled by the IUCN, the populations of the Goeldi's Antbird (*Myrmeciza goeldii*)[116], the Scarlet-hooded Barbet (*Eubucco tucinkae*)[117], and the Black-faced Cotinga (*Conioptilon mcilhennyi*)[118] are all stable. Each of the species: Has a very large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km2 combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). Despite the fact that the population trend appears to be decreasing, the decline is not believed to be sufficiently rapid to approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations). The population size has not been quantified, but it is not believed to approach the thresholds for Vulnerable under the population size criterion (<10,000 mature individuals with a continuing decline estimated to be >10% in ten years or three generations, or with a specified population structure). For these reasons the species is evaluated as Least Concern. Although the species each have a large range and staple population, the populations within the Project Zone would likely decrease in the without-Project land-use scenario.

Trigger Species	*Rufous-fronted Antthrush*
With-project Scenario	According to research compiled by the IUCN, the Rufous-fronted Antthrush (*Formicarius rufifrons*) population is decreasing. In addition, "this species is considered Near Threatened as it is

[115] IUCN, "Lophotriccus eulophotes," Available: http://www.iucnredlist.org/details/22699564/0
[116] IUCN, "Myrmeciza goeldii," Available: http://www.iucnredlist.org/details/22701838/0
[117] IUCN, "Eubucco tucinkae," Available: http://www.iucnredlist.org/details/22681942/0
[118] IUCN, "Conioptilon mcilhennyi," Available: http://www.iucnredlist.org/details/22700913/0

	known from only a small range, and is apparently rare and patchily distributed. However, the range is not yet severely fragmented or restricted to few locations (Collar *et al.* 1992). For these reasons, the species is classified as Near Threatened."[119] The without-Project land-use scenario, would further fragment the Rufous-fronted Antthrush's range, and thus likely lead to a decrease in the population.

Trigger Species	*Canela de Velho*
With-project Scenario	There is no population information on the Canela de Velho (*Rinorea longistipulata*) via the IUCN Red List,[120] the Encyclopedia of Life,[121] or the Global Biodiversity Information Facility.[122] However, the species is considered Vulnerable and the without-Project land-use scenario, which would be the creation of a large cattle-ranch, would likely result in a decrease in population.

Trigger Species	*Red Cedar*
With-project Scenario	According to research compiled by the IUCN, the Red Cedar (*Cedrela odorata*) is listed as Vulnerable and appears to be decreasing in population: > Exploitation has continued on a large scale over the past 200 years and the species is now widely threatened at the provenance level. Trees are often cut opportunistically while other species, such as mahogany, *Amburana* and *Machaerium*, are being sought-after. Natural regeneration is generally good, but there are reports of trees being felled before they reach maturity.[123] The without-Project land-use scenario would result in the Red Cedar being logged for commercial purposes and thus, the population of Red Cedar would surely decrease in the Project Area.

<u>Describe Measures to Maintain or Enhance Population of Trigger Species</u>

The essential measure needed and taken at the Envira Amazonia Project is forest conservation, which shall both maintain and enhance the population status of the aforementioned trigger species. This includes JR Agropecuária e Empreendimentos EIRELI foregoing the creation of a large cattle ranch, along with several social projects and programs (e.g., hiring local staff, medicinal plant and rubber tree projects, agricultural extension courses, etc.) aimed at improving the socio-economic status of local

[119] IUCN, "Formicarius rufifrons," Available: http://www.iucnredlist.org/details/22703203/0
[120] IUCN, "Rinorea longistipulata," Available: http://www.iucnredlist.org/details/35985/0
[121] Encyclopedia of Life, "Rinorea longistipulata," Available: http://eol.org/pages/5748360/overview
[122] Global Biodiversity Information Facility, "Species: *Rinorea longistipulata* W.H.A.Hekking, Available: http://data.gbif.org/species/4074938/
[123] IUCN, "Cedrela odorata," Available: http://www.iucnredlist.org/details/32292/0

families. Furthermore, the Project has climate, community and biodiversity impact monitoring plans in place to ensure the activities are leading to the desired impacts.

The greatest threat to the trigger species – both threatened tree species and endemic bird species - is deforestation. For birds, deforestation leads to a decrease in overall habitat availability, fragmented habitats, less food availability, greater chance of predation and hunting, and fewer potential mates. For trees – particularly Red Cedar – deforestation leads to easier access to the trees for commercial harvesting and degraded landscapes threaten the survival of trees species due to a reduced source of seeds and greater exposure to the elements (e.g., more direct sunlight, drying of soil, etc.).

For example, the IUCN states deforestation as the greatest threat to the white-bellied parrot:

> The primary threat to this species is accelerating rates of deforestation in the Amazon basin (Soares-Filho et al. 2006, Bird et al. 2011). Proposed changes to the Brazilian Forest Code reduce the percentage of land a private landowner is legally required to maintain as forest (including, critically, a reduction in the width of forest buffers alongside perennial steams) and include an amnesty for landowners who deforested before July 2008 (who would subsequently be absolved of the need to reforest illegally cleared land) (Bird et al. 2011). Despite being common in undisturbed landscapes, this species is not thought to be tolerant of secondary forest or agropastoral land and appears restricted to alluvial habitats. It may also be susceptible to hunting (A. Lees in litt. 2011).[124]

<u>Indications of Trigger Species' Population Trend</u>

The Project Proponents will monitor the number of individuals identified for threatened tree species, along with the number of individuals identified for endemic and threatened bird species. In addition, the greatest threat to these tree species and bird species is deforestation, which is regularly monitored via satellite imagery and via forest patrols to help maintain or enhance their population status.

6 ADDITIONAL PROJECT IMPLEMENTATION INFORMATION

N/A

7 ADDITONAL PROJECT IMPACT INFORMATION

N/A

[124] IUCN, "Pionites leucogaster," Available: http://www.iucnredlist.org/details/62181308/0