

CO₂Bio P₄ Carbono del Orinoco

Document prepared by FUNDACIÓN CATARUBEN

<i>Name of the project</i>	CO ₂ Bio P ₄ Carbono del Orinoco
<i>Project holder</i>	Fundación Cataruben
<i>Account holder</i>	Fundación Cataruben
<i>Legal representative</i>	María Fernanda Wilches
<i>Project holder's contact information</i>	María Fernanda Wilches gerente general gerencia@Cataruben.org Teléfono 3102137763 / 3204998729 Carrera 20 #36-04 Yopal, Casanare, Colombia José Luis Rodríguez Súper líder en carbono operativa@Cataruben.org Sara Daniela Rodríguez Líder del proyecto orinoco@cataruben.org

Other project participants	Multiple landowners of private properties
Versión	2.0
Date	10/10/2025
Project type	Activities in the AFOLU sector, other than REDD+ REDD+ Activities
Grouped project	Yes
Applied Methodology (ies)	-BCR0005 Quantification of GHG Emissions Reduction. Activities that prevent land use change in natural savannas. Version 1.1. August 20,2024. -BCR 0002 Methodology for Quantifying GHG Emission Reductions from Avoided Unplanned Deforestation and Forest Degradation. Version 5.0. July 23, 2025.
Project location (City, Region, Country)	Colombia Departments of Casanare, Meta and Vichada
Starting date	(01/02/2020)
Quantification period of GHG emissions reduction	(01/02/2020 to 31/12/2030)
Estimated total and average annual GHG emission reduction/removals amount	Total: 1.707.464 average : 184.591
Sustainable Development Goals	SDG 5 SDG 6 SDG 13 SDG 15

<i>Special category, related to co-benefits</i>	<i>Orchid</i>
---	---------------

Table of contents

1 Project type and eligibility	6
1.1 Scope in the BCR Standard	6
1.2 Project type	7
1.3 Project scale	7
2 General description of the project	7
2.1 GHG project name	8
2.2 Objectives	8
2.3 Project activities	9
2.3.1 Activities to reduce emissions from deforestation and forest degradation	10
2.3.2 Activities that prevent land use change in natural savannas	16
2.4 Project location	19
2.5 Additional information about the GHG Project	27
3 Quantification of GHG emission reduction	27
3.1 Quantification methodology	27
3.1.1 Applicability Conditions of the methodology	27
3.1.1.1 Applicability Conditions of the methodology BCR 0005	27
3.1.1.2 Applicability Conditions of the methodology BCR 0002	29
3.1.2 Methodology deviations (if applicable)	32
3.2 Project boundaries, sources and GHGs	33
3.2.1 Spatial limits of the project	33
3.2.1.1 Límites espaciales Sabanas Naturales	33
3.2.1.2 Límites espaciales REDD+	34
3.2.2 Carbon reservoirs and GHG sources	42
3.2.3 Time Limits and Analysis Periods	44
3.2.3.1 Project start date	44
3.2.3.2 Quantification period of GHG emission reductions/removals	45
3.2.3.3 Monitoring periods	45
3.3 Identification and description of the baseline or reference scenario	45
3.3.1 Identification and description of the baseline scenario activities BCR 0005	45
3.3.1.1 Step 1 Identification of alternative scenarios	45
3.3.1.2 Step 2 Barrier Analysis BCR 0005	48
3.3.1.3 Step 4 Analysis of Common Practices BCR 0005	56
3.3.1.4 Step 5 Selection of the base scenario BCR 0005	59
3.3.2 Identification and description of the base or reference scenario activities BCR 0002 0002	60
3.3.2.1 Step 1 Identification of land use alternatives BCR 0002.	60
3.3.2.2 Step 2 barrier analysis BCR 0002	62

3.3.2.3 Step 4 Analysis of Common Practices BCR 0002	70
3.3.2.4 Step 5 Selection of the base scenario BCR 0002	72
3.4 Additionality	73
3.5 Uncertainty management	73
3.6 <i>Leakage and non-permanence</i>	76
3.6.1 Leakages	76
3.6.2 Non permanence	76
3.7 <i>Mitigation results</i>	77
3.7.1 Eligible areas within the GHG project boundaries	77
3.7.1.1 Eligible areas for BCR 0005 activities	77
3.7.1.2 Eligible areas for BCR 0002 activities	78
3.7.2 Stratification	79
3.7.2.1 Estratificación Bosques - Deforestación	79
3.7.2.2 Forest Stratification - Degradation	81
3.7.3 GHG baseline emissions	82
3.7.3.1 Reference emissions from BCR 0005 Activities - Natural Savannah	82
3.7.3.2 Reference emissions of BCR 0002 Activities	89
3.7.4 GHG Project Emissions	96
3.7.4.1 Emisiones de Actividades BCR 0005 - ex ante	96
3.7.4.2 Emissions of Activities BCR 0002 - ex ante	97
Table 42. Annual emissions from forest degradation in the project scenario	100
3.7.5 GHG Leakages	100
3.7.5.1 Emisiones fugas - Actividades BCR 0005 - ex ante	101
3.7.5.2 Leakage emissions - BCR 0002 activities - ex ante	103
3.7.6 Ex ante project emissions quantification	108
3.7.6.1 Ex ante missions Natural Savannas	108
3.7.6.2 Ex ante Emissions Deforestation	109
3.7.6.3 Emissions Ex ante Forest Degradation	109
4 Compliance with Laws, Statutes and Other Regulatory Frameworks	110
5 Carbon ownership and rights	123
5.1 <i>Project Holder</i>	123
5.2 <i>Otros participantes del proyecto</i>	123
5.3 <i>Agreements related to carbon rights</i>	135
5.3.1 No Origin of the Prior Consultation	136
5.4 <i>Land tenure (Projects in the AFOLU sector)</i>	137
6 Climate change Adaptation	138
7 Risk Management	142
7.1 <i>Reversal risk</i>	143
7.1.1 Loss Event Report	144

8 Sustainable Development Safeguards (SDS)	145
9 Stakeholder engagement and consultation	145
<i>9.1 Summary of comments received</i>	<i>147</i>
<i>9.2 Consideration of comments received</i>	<i>147</i>
10 Sustainable Development Goals (SDGs)	148
11 REDD+ Safeguards (For REDD+ projects)	151
12 Special categories, related to co-benefits (optiDemonstrated ecological improvements over time.onal)	155
13 Grouped projects (if applicable)	158
14 Other GHG program	158
15 Double Counting avoidance	159
16 Monitoring plan	159
<i>16.1 Description of the monitoring plan</i>	<i>159</i>
16.1.1 Monitoring project boundaries and quantifying project emissions reductions/removals	159
16.1.1.1 Project Area and Leakage Data Monitoring - Natural Savannas	160
16.1.1.2 Emission Reduction Monitoring - Natural Savannas	161
16.1.1.3 Monitoring project areas and leakage - Deforestation	161
16.1.1.4 Emission Reduction Monitoring - Deforestation	162
16.1.1.5 Monitoreo de reducción de emisiones - Degradación Forestal	163
16.1.2 Monitoring the execution of project activities and Co-Benefits	165
16.1.3 Procedures, criteria and indicators to evaluate the project's contribution to the Sustainable Development Goals (SDGs)	166
16.1.4 Monitoring REDD+ safeguards	166
16.1.5 Monitoring Sustainable Development Safeguards	167
16.1.6 Monitoring the permanence of the project	167
16.1.7 Quality control and assurance procedures	168
16.1.8 Review of information processing	173
16.1.9 Data recording and archiving system	177
<i>16.2 Data and parameters determined in the record and not monitored during the quantification period, including predetermined values and factors.</i>	<i>181</i>
<i>16.3 Data and parameters monitored</i>	<i>191</i>

1 Project type and eligibility

1.1 Scope in the BCR Standard

The scope of the BCR Standard is limited to:	
The following greenhouse gases, included in the Kyoto Protocol: Carbon Dioxide (CO ₂), Methane (CH ₄) and Nitrous Oxide (N ₂ O).	X
GHG projects using a methodology developed or approved by BioCarbon, applicable to GHG removal activities and REDD+ activities (AFOLU Sector).	X
Quantifiable reductions in GHG emissions and/or removals generated through the implementation of GHG removal activities and/or REDD+ activities (AFOLU Sector).	X
GHG projects using a methodology developed or approved by BioCarbon, applicable to activities in the energy, transportation, and waste sectors.	
Quantifiable reductions in GHG emissions generated through the implementation of activities in the energy, transportation, and waste sectors.	

CO₂Bio P4 Carbono del Orinoco project is designed and executed in compliance with the requirements defined in BCR STANDARD Version 4.0 of July 14, 2025, and the BIOCARBON methodological documents, guides, and tools, encompassing AFOLU sector activities including emission reduction from deforestation and forest degradation, as well as emission reduction by preventing land-use change in natural savannas. The methodologies used for project design, implementation, and monitoring are defined below:

- BCR0005 Quantification of GHG Emissions Reduction. Activities that prevent land use change in natural savannas. Version 1.1. August 20, 2024.
- BCR 0002 Methodology for Quantifying GHG Emission Reductions from Avoided Unplanned Deforestation and Forest Degradation. Version 5.0. July 23, 2025.
- BCR TooL. Sustainable Development Goals (SDG). Version 1.0. July 13, 2023
- BCR TooL. Tool to demonstrate compliance with the REDD+ safeguards. Version 1.1. January 26, 2023.
- BCR TooL. Avoidance of double counting (ADC). Version 3.0. April 2025.
- BCR TooL. Monitoring, reporting and verification(MRV). Version 2.0. June 23, 2025.
- BCR TooL. Sustainable Development Safeguards. Version 2.0. June, 2025.

- BCR Tool. Identification of a baseline scenario and demonstration of additionality. Version 1.0. July 25, 2025.
- BCR Tool. Permanence and risk management. Version 2.0. June 3, 2025.
- BCR Tool. Special categories exceptional benefits label. Version 1.0. July 15, 2025.
- BCR Tool. Conservative approach and uncertainty management. Version 1.0. July 23, 2025.

1.2 Project type

In agreement with the provisions of section 11.10 of the BCR standard. It is established that the project implements activities in the AFOLU sector, in this case activities that prevent land use change in natural savannas and REDD+ activities.

<i>Activities in the AFOLU sector, other than REDD+</i>	<i>X</i>
<i>REDD+ Activities</i>	<i>X</i>
<i>Activities in the energy sector.</i>	
<i>Activities in the transport sector.</i>	
<i>Activities related to waste handling and disposal</i>	

1.3 Project scale

N/A

2 General description of the project

CO2Bio P4 Carbono del Orinoco, hereinafter the Project, is a climate change mitigation initiative in the AFOLU sector (Agriculture, Forestry and Other Land Uses), focused on reducing emissions from deforestation, forest degradation, and land-use change in the Orinoquía region of Colombia. Its implementation covers the departments of Casanare, Meta, and Vichada, one of the country's main livestock and agricultural areas..

The Project addresses the main causes of deforestation, ecosystem degradation, and land-use change in strategic areas such as riparian forests and natural savannas. These factors include agricultural expansion and forest fires, both natural and human-induced. To counteract these impacts, the Project strengthens forest conservation and sustainable

use of savannas, implementing strategies aimed at reducing pressure on forests, reducing the risk of forest fires, and promoting sustainable production models that avoid land conversion.

Recognizing that local communities are key players in landscape transformation, the Project adopts a payment-for-results (PRR) mechanism as its main strategy. Through economic incentives, it seeks to strengthen conservation actions and ensure the sustainability of the initiatives implemented.

Additionally, the Project encourages the participation of private landowners and strengthens women's capacity, generating benefits aligned with the Orchid category of the BCR (BioCarbon Registry) standard. Its actions directly contribute to the Sustainable Development Goals (SDGs), particularly SDG 13 (Climate Action) and SDG 15 (Life on Land). The Project's impact on these SDGs is assessed and verified using BCR's specialized tool.

The Cataruben Foundation leads the Project as the owner, while the landowners participate as key stakeholders in its implementation. Cataruben establishes the necessary conditions for the Project's development, leading the monitoring, validation, verification, carbon credit trading, and benefit sharing processes. The landowners carry out activities on their properties, fostering effective collaboration among the various stakeholders, ensuring transparency, and promoting active participation. This model optimizes environmental and social benefits, strengthens sustainable ecosystem management, and contributes significantly to climate change mitigation.

Thus, the project will generate social and environmental benefits, achieving an estimated annual emission reduction of 163,013 tCO₂eq.

2.1 GHG project name

CO₂Bio P4 Carbono del Orinoco

2.2 Objectives

- *Reduce greenhouse gas (GHG) emissions in the Colombian Orinoquia region by conserving riparian forests and natural savannas, mitigating deforestation and forest degradation, and promoting sustainable production models that prevent land-use change.*
- *Strengthen the participation of landowners and local communities through a payment-for-results (PPR) mechanism, incentivizing the implementation of*

sustainable practices, ensuring equitable distribution of benefits, and fostering transparency and collaboration among stakeholders.

- Generate positive impacts and co-benefits in biodiversity conservation, the protection of strategic ecosystems, and the strengthening of the capacities of local communities, with a special focus on social inclusion.

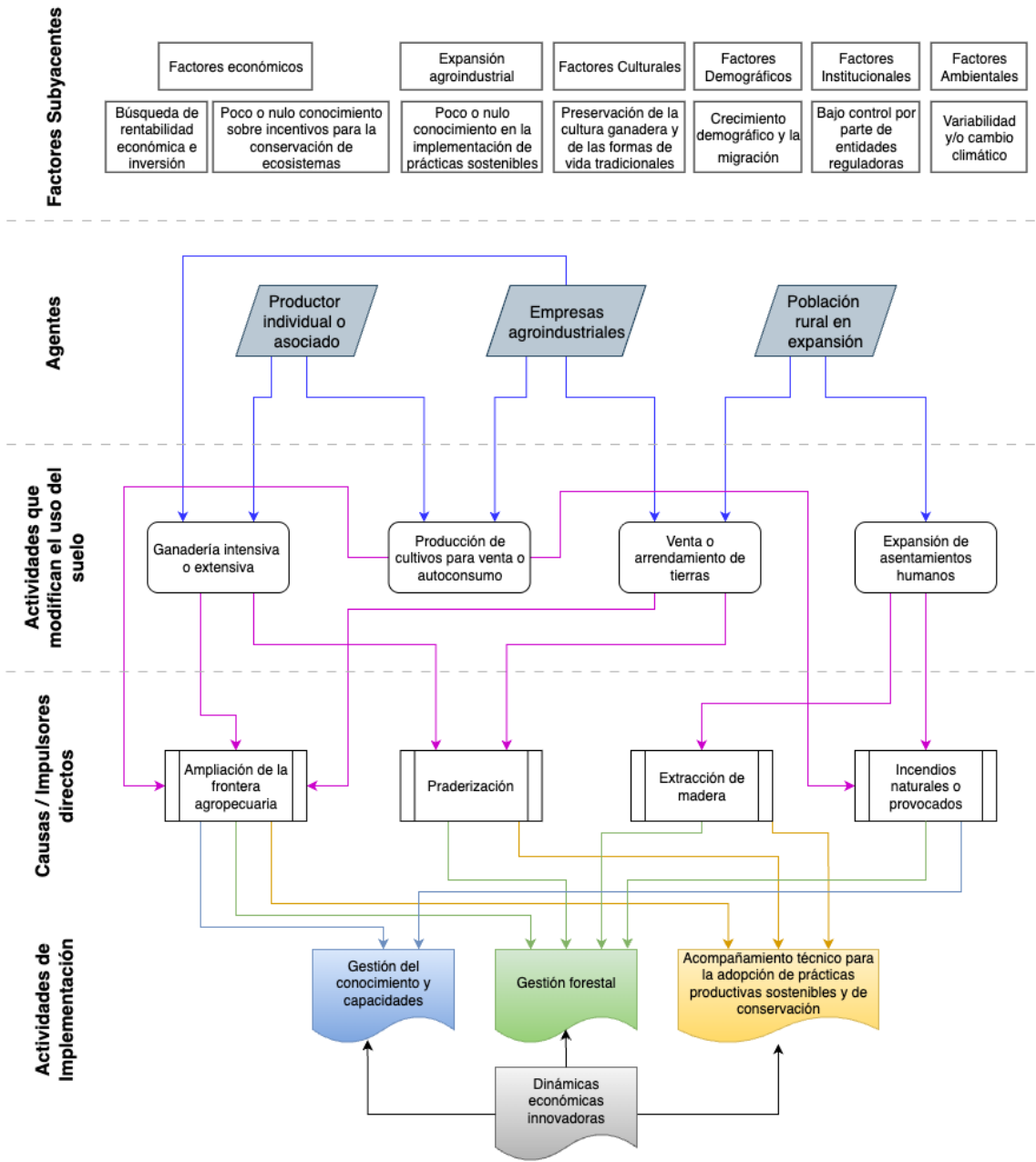
2.3 Project activities

Deforestation in the Colombian Orinoquia is the result of multiple economic, social, and cultural factors that have accelerated the transformation of natural ecosystems. In the study area, the main agents responsible for this process are individual or associated producers, agro-industrial companies, and settled communities. These actors, motivated by the need for productive expansion, the search for economic profitability, and, in some cases, misinformation, have driven the conversion of forests into new land covers and uses.

The main direct causes of deforestation include the expansion of the agricultural frontier, which converts forested areas into land for livestock and crops; the creation of pastures, driven by both livestock production and land speculation and appreciation; uncontrolled timber extraction, mostly for self-consumption, which fragments ecosystems and facilitates their degradation; and forest fires, which can be natural or human-caused, exacerbated by climate change and traditional agricultural practices. To mitigate these impacts, it is crucial to implement strategies that reduce pressure on forests, promote sustainable resource use, and provide sustainable economic alternatives to local communities.

To address these causes and agents of deforestation, a series of strategic activities have been designed and implemented to reduce pressure on forests and promote sustainable development in the region. These initiatives include economic incentives through the sale of carbon credits, prevention and mitigation of forest fires, promotion of sustainable forestry practices, recognition of conservation areas, and strengthening of low-emission productive landscapes, among others. Each of these activities has been evaluated based on its relationship with the causes of deforestation, its alignment with the interests of rural communities, the consultation mechanisms used for its design, and the roles of the actors responsible for its implementation. In this way, the aim is to ensure that actions are effective, participatory, and sustainable over time, contributing to the conservation of ecosystems and the well-being of local communities ([See Annex 1 Project Description/1.1 Causes and agents of deforestation and land-use changes](#)).

Figure 1. Chain of events and identification of causes and agents



2.3.1 Activities to reduce emissions from deforestation and forest degradation

Table 1. Actividad R1 del componente REDD+

ID	R1
Component	REDD+
Description	Improving landowners' incomes by transferring economic incentives derived from the sale of carbon credits obtained from the implementation of REDD+ activities.
Relationship with direct or underlying cause	It helps reduce the expansion of the agricultural frontier and the conversion of forests into pastures by generating alternative income for landowners.
Compliance with life plans, ethnodevelopment plans or the interests of rural communities	It responds to the need to generate income without resorting to deforestation, ensuring the preservation of ecosystems and the services they provide to communities. This project not only seeks to generate income and economic benefits, but is also based on a sustainable and environmentally friendly approach. It seeks innovative solutions that enable local communities to prosper economically without relying on deforestation, thus ensuring the conservation of ecosystems and biodiversity. At the same time, this project recognizes the importance of the ecosystem services provided by forests and other natural environments and seeks to preserve them for the benefit of present and future generations.
Consultation mechanism for identifying objectives and defining activities	It is based on the environmental, social, and productive characterization of the property, the manager's characterization, and the Property Implementation Plan. It includes socialization meetings, voluntary agreements, and bonding contracts with the owners.
Responsibility and role of the actors involved in the implementation of the activity	Cataruben Foundation: Organization responsible for planning and coordinating the monitoring, reporting, and verification stages, as well as the marketing of verified carbon certificates and the transfer of economic benefits to project participants. Project participants: They are the owners of the properties and their responsibility is to actively participate in the activities established in the project, ensure the conservation of the different strategic ecosystems present in their territories, and provide the

	necessary information to carry out the transfer of economic resources in a transparent manner.			
Implementation schedule	Annually after the first marketing of certificates			
Indicators to report the progress of the activity				
Name	Type	Meta	Unit of measurement	Responsible for measurement
Percentage of owners receiving 70% of their income from carbon credits, obtained from the implementation of REDD+ activities	Impact	100%	Percentage	Cataruben Foundation

Table 2. Actividad R2 del componente REDD+

ID	R2
Component	REDD+
Description	Promote the implementation of sustainable forestry practices and conservation actions to reduce deforestation and forest degradation and maintain carbon stocks.
Relationship with direct or underlying cause	Unregulated logging fragments forests and facilitates their conversion to other forest cover. Promoting sustainable forest practices reduces degradation and allows communities to reap benefits without compromising ecosystem stability.
Compliance with life plans, ethnodevelopment plans or the interests of rural communities	Rural communities depend on forest resources for their livelihoods. By implementing sustainable management practices, they ensure continued access to timber, fruits, and other products without depleting resources.
Consultation mechanism for identifying objectives and defining activities	It supports the environmental and productive characterization of the property. Workshops, forest management plans, and conservation agreements are developed with the owners. These plans not only serve as a monitoring tool between Cataruben and the landowners, but can also be adjusted in a participatory manner during each monitoring period, within the context of adaptive management in response to the specific conditions of each period.

Responsibility and role of the actors involved in the implementation of the activity	Cataruben Foundation: Organization responsible for planning and coordinating the monitoring, reporting, and verification stages, as well as the marketing of verified carbon certificates and the transfer of economic benefits to project participants. Project participants: They are the owners of the properties and their responsibility is to actively participate in the activities established in the project, ensure the conservation of the different strategic ecosystems present in their territories, and provide the necessary information to carry out the transfer of economic resources in a transparent manner.			
Implementation schedule	Indicator 1: Annual Indicator 2: Every two (2) years			
Indicators to report the progress of the activity				
Name	Type	Meta	Unit of measurement	Responsible for measurement
Number of properties implementing practices to prevent forest fires	Result	140	Number of properties	Cataruben Foundation
Satellite monitoring of the proportion of area covered by natural forest	Product	19	Number of satellite monitoring reports	Cataruben Foundation
Satellite monitoring to identify thermal anomalies and fires in forest cover	Product	19	Number of satellite monitoring reports	Cataruben Foundation
Satellite monitoring of changes in the extent of water-related ecosystems	Product	19	Number of satellite monitoring reports	Cataruben Foundation

Table 3. Actividad R3 del componente REDD+

ID	R3
-----------	----

Component	REDD+			
Description	Promote the implementation of sustainable forestry practices and conservation actions to reduce deforestation and forest degradation and maintain carbon stocks.			
Relationship with direct or underlying cause	Unregulated logging fragments forests and facilitates their conversion to other forest cover. Promoting sustainable forest practices reduces degradation and allows communities to reap benefits without compromising ecosystem stability.			
Compliance with life plans, ethnodevelopment plans or the interests of rural communities	Rural communities depend on forest resources for their livelihoods. By implementing sustainable management practices, they ensure continued access to timber, fruits, and other products without depleting resources.			
Consultation mechanism for identifying objectives and defining activities	It supports the environmental and productive characterization of the property. Workshops, forest management plans, and conservation agreements are developed with the owners. These plans not only serve as a monitoring tool between Cataruben and the landowners, but can also be adjusted in a participatory manner during each monitoring period, within the context of adaptive management in response to the specific conditions of each period.			
Responsibility and role of the actors involved in the implementation of the activity	Cataruben Foundation: Organization responsible for planning and coordinating the monitoring, reporting, and verification stages, as well as the marketing of verified carbon certificates and the transfer of economic benefits to project participants. Project participants: They are the owners of the properties and their responsibility is to actively participate in the activities established in the project, ensure the conservation of the different strategic ecosystems present in their territories, and provide the necessary information to carry out the transfer of economic resources in a transparent manner.			
Implementation schedule	Indicator 1: Annual Indicator 2: Every two (2) years			
Indicators to report the progress of the activity				
Name	Type	Meta	Unit of measurement	Responsible for measurement

Progress in the implementation of the Training Plan aimed at strengthening community capacities in ecosystem services and forest conservation	Product	100	Percentage	Cataruben Foundation
Number of properties that implement sustainable forestry practices, forest conservation actions and strategies	Result	140	Result	Cataruben Foundation

Table 4. Actividad R4 del componente REDD+

ID	R4
Component	REDD+
Description	Promote the recognition of conservation areas and figures for the sustainable management of ecosystems
Relationship with direct or underlying cause	Identifying and protecting key areas within land helps conserve biological corridors, preventing landscape fragmentation and the conversion of forests into cropland or pasture. Protecting key areas within properties is essential to maintaining biological corridors that connect flora and fauna populations, promoting ecosystem resilience.
Compliance with life plans, ethnodevelopment plans or the interests of rural communities	The conservation of strategic ecosystems provides long-term benefits, including water regulation, biodiversity, and sustainable tourism. Communities recognize these areas as essential to their well-being.
Consultation mechanism for identifying objectives and defining activities	It is based on the environmental characterization of the property and the Property Implementation Plan. Areas of high ecological value are identified in collaboration with the owners, and conservation agreements are established. These plans not only serve as a monitoring tool between Cataruben and the landowners, but can also be adjusted in a participatory manner during each monitoring period, within the context of adaptive management in response to the specific conditions of each period.

Responsibility and role of the actors involved in the implementation of the activity	Cataruben Foundation: Organization responsible for planning and coordinating the monitoring, reporting, and verification stages, as well as the marketing of verified carbon certificates and the transfer of economic benefits to project participants. Project participants: They are the owners of the properties and their responsibility is to actively participate in the activities established in the project, ensure the conservation of the different strategic ecosystems present in their territories, and provide the necessary information to carry out the transfer of economic resources in a transparent manner.			
Implementation schedule	Annually after the first marketing of certificates			
Indicators to report the progress of the activity				
Name	Type	Meta	Unit of measurement	Responsible for measurement
Number of properties with declared conservation areas and/or figures	Impact	15	Number of properties	Cataruben Foundation Owners of the properties

2.3.2 Activities that prevent land use change in natural savannas

Table 5. Activity S₁ of the natural savannah component

ID	S ₁
Component	Natural savannas
Description	Improving landowners' incomes by transferring economic incentives derived from the sale of carbon credits, obtained by avoiding the transformation and change of land use in savannas.
Relationship with direct or underlying cause	The transformation of savannas into agricultural land reduces biodiversity and disrupts ecosystem services. By creating incentives for their conservation, their degradation is prevented and conservation values are reinforced among landowners.
Compliance with life plans, ethnodevelopment plans or	It aligns with the landowners' interest in generating income without affecting the region's ecological balance. It provides economic

the interests of rural communities	benefits without the need to convert the land into intensive production areas.			
Consultation mechanism for identifying objectives and defining activities	It is based on the environmental characterization of the property and the Property Implementation Plan. Areas of high ecological value are identified in conjunction with the landowners, and conservation agreements are established. These plans not only serve as a monitoring tool between Cataruben and the landowners, but can also be adjusted through participatory processes during each monitoring period, within the context of adaptive management in response to the specific conditions of each period.			
Responsibility and role of the actors involved in the implementation of the activity	Cataruben Foundation:Organization responsible for planning and coordinating the monitoring, reporting, and verification stages, as well as the marketing of verified carbon certificates and the transfer of economic benefits to project participants. Project participants:They are the owners of the properties and their responsibility is to actively participate in the activities established in the project, ensure the conservation of the different strategic ecosystems present in their territories, and provide the necessary information to carry out the transfer of economic resources in a transparent manner.			
Implementation schedule	Annually after the first marketing of certificates			
Indicators to report the progress of the activity				
Name	Type	Meta	Unit of measurement	Responsible for measurement
Percentage of owners receiving 70% of their income from carbon credits, by avoiding the transformation and change of land use in savannas	Impact	100	Percentage	Cataruben Foundation

Table 6 Activity S2 of the natural savannah component

ID	S2
Component	Natural Savannas

Description	Implementation of integrated strategies for sustainable, low-carbon productive landscapes in natural savannas.			
Relationship with direct or underlying cause	The conversion of forests and savannas to conventional crops and livestock increases carbon emissions and decreases biodiversity. This approach promotes sustainable production without degrading the ecosystem.			
Compliance with life plans, ethnodevelopment plans or the interests of rural communities	It provides sustainable productive alternatives, ensuring a balance between conservation and rural production, which is key to food security and community well-being.			
Consultation mechanism for identifying objectives and defining activities	It is based on the environmental characterization of the property and the Property Implementation Plan. Areas of high ecological value are identified in conjunction with the landowners, and conservation agreements are established. These plans not only serve as a monitoring tool between Cataruben and the landowners, but can also be adjusted through participatory processes during each monitoring period, within the context of adaptive management in response to the specific conditions of each period.			
Responsibility and role of the actors involved in the implementation of the activity	Cataruben Foundation: Organization responsible for planning and coordinating the monitoring, reporting, and verification stages, as well as the marketing of verified carbon certificates and the transfer of economic benefits to project participants. Project participants: They are the owners of the properties and their responsibility is to actively participate in the activities established in the project, ensure the conservation of the different strategic ecosystems present in their territories, and provide the necessary information to carry out the transfer of economic resources in a transparent manner.			
Implementation schedule	Indicator 1: Annual Indicator 2: Every two (2) years			
Indicators to report the progress of the activity				
Name	Type	Meta	Unit of measurement	Responsible for measurement
Progress on the training plan for the management of natural	Product	100	Percentage	Cataruben Foundation

The next table presents the geographic distribution of the 194 properties comprising the project. Of these, 50 properties (26.0%) are located in the department of Casanare, 38 properties (19.0%) in the department of Meta, and the remaining 106 properties (54.0%) are located in the department of Vichada.

Table 7 lista de los predios vinculados al proyecto

Pedio	Departamento	Municipio	Vereda	X	Y
Acapulco	Casanare	Orocue	Agua Verde	5187420	2118059
Alejandria	Vichada	Cumaribo	El Tapón Sur	5398026	2119704
Altamira	Meta	Puerto Lopez	Chiviva	5100614	2044954
Barinas	Vichada	Primavera	Buena Vista	5401016	2136005
Belcaire	Casanare	Paz De Ariporo	La Hermosa	5194508	2195550
Bethesda	Vichada	La Primavera	Canta Claro	5411632	2154911
Buena Vista	Meta	Puerto Gaitan	Arebe	5157356	2069543
Buenos Aires	Vichada	Santa Rosalia	Guacacias	5268962	2113403
Canaguay	Casanare	Maní	Belgrado	5071607	2088109
Canarias 1	Meta	San Martin	Serrania Del Camoa	4981080	1946485
Canarias 3	Meta	San Martin	Serrania Del Camoa	4981336	1940011
Casiquiare	Meta	Mapiripan	Merecure	5043978	1916371
Chiras	Meta	Puerto Lopez	La Serrania	5008505	1971706
Circasia	Meta	San Martin	Aribas	4948993	1962927
Circasia Dos	Meta	San Martin	Aribas	4947927	1963691
Cs Brava	Casanare	Paz De Ariporo	Caño Chiquito	5189783	2179426
Don Fernando La Cristalina	Meta	Puerto Lopez	Yurimena	5032693	2023580
El Baiben	Vichada	Cumaribo	El Placer	5444096	2088029
El Boral 1	Vichada	Santa Rosalia	Guacacias	5265108	2111490
El Campo	Casanare	Paz De Ariporo	La Hermosa	5192175	2194440
El Control	Casanare	Paz De Ariporo	Caño Chiquito	5195860	2186640

<i>El Darien</i>	<i>Vichada</i>	<i>Santa Rosalia</i>	<i>Pavanay</i>	5247989	2132238
<i>El Delirio</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Matiyure</i>	5348275	2165347
<i>El Desafio</i>	<i>Vichada</i>	<i>Puerto Carreño</i>	<i>El Placer</i>	5504211	2229914
<i>El Desafio</i>	<i>Vichada</i>	<i>Cumaribo</i>	<i>Malicia</i>	5324858	2062553
<i>El Diamante</i>	<i>Vichada</i>	<i>Cumaribo</i>	<i>El Placer</i>	5427609	2096663
<i>El Espiritual</i>	<i>Casanare</i>	<i>Paz De Ariporo</i>	<i>La Hermosa</i>	5205143	2192465
<i>El Mana</i>	<i>Vichada</i>	<i>Puerto Carreño</i>	<i>Yurimena</i>	5476886	2216986
<i>El Manantial</i>	<i>Vichada</i>	<i>Cumaribo</i>	<i>Chaparral</i>	5449580	2071992
<i>El Medano</i>	<i>Casanare</i>	<i>Mani</i>	<i>Guayanas</i>	5128520	2065902
<i>El Nilo</i>	<i>Meta</i>	<i>Puerto Gaitan</i>	<i>Nuevas Fundaciones</i>	5129232	2017405
<i>El Oasis</i>	<i>Vichada</i>	<i>Cumaribo</i>	<i>Camareta</i>	5449861	2104225
<i>El Palmar</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Santa Cecilia</i>	5397442	2147379
<i>El Paraiso</i>	<i>Casanare</i>	<i>Trinidad</i>	<i>San Pedro De Guachira</i>	5146829	2167919
<i>El Piedrito</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Santa Cecilia</i>	5400206	2155318
<i>El Progreso</i>	<i>Vichada</i>	<i>Santa Rosalia</i>	<i>La Ladera</i>	5255562	2111031
<i>El Raton</i>	<i>Casanare</i>	<i>Paz De Ariporo</i>	<i>La Hermosa</i>	5190544	2198479
<i>El Reencuentro</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Santa Cecilia</i>	5411906	2149193
<i>El Reposo</i>	<i>Meta</i>	<i>Puerto Gaitan</i>	<i>Yucac</i>	5093878	2036047
<i>El Reposo</i>	<i>Meta</i>	<i>Puerto Lopez</i>	<i>Navajas</i>	5012174	2007400
<i>El Resguardo</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Canta Claro</i>	5395587	2146884
<i>El Rincon</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Pavanay</i>	5259436	2121437
<i>El Saman</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>San Teodoro</i>	5316183	2107116
<i>El Saman</i>	<i>Casanare</i>	<i>Paz De Ariporo</i>	<i>Montañas Del Totumo</i>	5200541	2215108
<i>El Sinai</i>	<i>Casanare</i>	<i>Paz De Ariporo</i>	<i>La Hermosa</i>	5276743	2178101
<i>El Sinai</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Matiyure</i>	5310587	2152691
<i>El Zafiro</i>	<i>Vichada</i>	<i>Puerto Carreño</i>	<i>La Venturosa</i>	5445725	2215193
<i>Emaus</i>	<i>Meta</i>	<i>Puerto Lopez</i>	<i>Yucac</i>	5089871	2033525

<i>Fi Casuarito</i>	<i>Casanare</i>	<i>Paz De Ariporo</i>	<i>La Palmita</i>	<i>5197314</i>	<i>2209759</i>
<i>Fi Hato Campo Alegre</i>	<i>Casanare</i>	<i>Hato Corozal</i>	<i>La Chapa</i>	<i>5170428</i>	<i>2211608</i>
<i>Fi La Esperanza</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Santa Cecilia</i>	<i>5399890</i>	<i>2153860</i>
<i>Fi Villa Milena</i>	<i>Meta</i>	<i>San Martin</i>	<i>Manacacias</i>	<i>5038952</i>	<i>1924384</i>
<i>Fundo Nuevo</i>	<i>Casanare</i>	<i>Paz De Ariporo</i>	<i>La Hermosa</i>	<i>5279850</i>	<i>2179536</i>
<i>Goshen</i>	<i>Casanare</i>	<i>Paz De Ariporo</i>	<i>Caño Chiquito</i>	<i>5198728</i>	<i>2182683</i>
<i>Guanarito</i>	<i>Casanare</i>	<i>Hato Corozal</i>	<i>La Chapa</i>	<i>5186108</i>	<i>2220316</i>
<i>Guaratarito</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>La Pascua</i>	<i>5263700</i>	<i>2113137</i>
<i>Guayabal</i>	<i>Meta</i>	<i>Puerto Gaitan</i>	<i>Melua</i>	<i>5096179</i>	<i>2021582</i>
<i>Hacienda Alexandra</i>	<i>Casanare</i>	<i>San Luis De Palenque</i>	<i>San Francisco</i>	<i>5166548</i>	<i>2137937</i>
<i>Hacienda Herli</i>	<i>Meta</i>	<i>Puerto Lopez</i>	<i>Chaviva</i>	<i>5075227</i>	<i>2016510</i>
<i>Handal</i>	<i>Meta</i>	<i>Puerto Lopez</i>	<i>Yucabo</i>	<i>5090774</i>	<i>2034551</i>
<i>Hato El Solitario</i>	<i>Casanare</i>	<i>Hato Corazal</i>	<i>San Nicolas</i>	<i>5171943</i>	<i>2237167</i>
<i>Huasteca</i>	<i>Meta</i>	<i>Puerto Gaitan</i>	<i>Nuevas Fundaciones</i>	<i>5125765</i>	<i>2018207</i>
<i>Jamaica</i>	<i>Vichada</i>	<i>Santa Rosalia</i>	<i>Rio Tomo</i>	<i>5276693</i>	<i>2097781</i>
<i>La Amistad</i>	<i>Vichada</i>	<i>Puerto Carreño</i>	<i>La Venturosa</i>	<i>5469138</i>	<i>2235742</i>
<i>La Arboleda</i>	<i>Vichada</i>	<i>Cumaribo</i>	<i>El Tapón Sur</i>	<i>5397759</i>	<i>2130329</i>
<i>La Argelia</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Santa Barbara</i>	<i>5351129</i>	<i>2208552</i>
<i>La Argelia La Lorena</i>	<i>Vichada</i>	<i>Cumaribo</i>	<i>Churruvay</i>	<i>5214944</i>	<i>2054028</i>
<i>La Calandria</i>	<i>Casanare</i>	<i>Paz De Ariporo</i>	<i>Caño Chiquito</i>	<i>5185749</i>	<i>2174728</i>
<i>La Come Hombre</i>	<i>Vichada</i>	<i>Puerto Carreño</i>	<i>Dagua</i>	<i>5585779</i>	<i>2208452</i>
<i>La Consulta</i>	<i>Vichada</i>	<i>Cumaribo</i>	<i>Tres Matas</i>	<i>5249954</i>	<i>2054012</i>
<i>La Correa</i>	<i>Casanare</i>	<i>Hato Corazal</i>	<i>San Nicolas</i>	<i>5227571</i>	<i>2233615</i>
<i>La Cristalina</i>	<i>Vichada</i>	<i>Puerto Carreño</i>	<i>Caño Negro</i>	<i>5586725</i>	<i>2218697</i>
<i>La Defensora</i>	<i>Vichada</i>	<i>La Primavera</i>	<i>Pajure</i>	<i>5302029</i>	<i>2172106</i>
<i>La Despensa</i>	<i>Vichada</i>	<i>Santa Rosalia</i>	<i>Nazareth</i>	<i>5269980</i>	<i>2087856</i>
<i>La Diana</i>	<i>Vichada</i>	<i>Cumaribo</i>	<i>Churruvay</i>	<i>5213108</i>	<i>2052731</i>
<i>La Emma</i>	<i>Meta</i>	<i>Puerto Lopez</i>	<i>Chaviva</i>	<i>5086682</i>	<i>2032371</i>

La Española	Meta	Puerto Lopez	Melua	5023707	1981805
La Esperanza	Vichada	La Primavera	Matiyure	5394497	2161755
La Esperanza	Meta	San Martin	Aribas	4951702	1963495
La Florida	Meta	San Martin	Brisas Del Manacacias	4987552	1957264
La Fortuna	Vichada	La Primavera	Canta Claro	5410944	2155746
La Garita	Casanare	Paz De Ariporo	Montañas Del Totumo	5189763	2177514
La Geraldin	Vichada	Serrania Del Camoa	Cumaribo	5472403	2106346
La Gloria	Vichada	Cumaribo	El Tapón Sur	5399078	2123636
La Herradura	Vichada	Cumaribo	Periquera	5438124	2089176
La Holanda	Casanare	Mani	Montañas Del Totumo	5077514	2089692
La Idea li	Meta	Puerto Lopez	Barranca De Upia	5069747	1983926
La Ilusion	Meta	Puerto Gaitan	Nuevas Fundaciones	5130023	2019337
La Macarena	Vichada	La Primavera	La Macarena	5313361	2150949
La Orquidea	Vichada	La Primavera	San Teodoro	5319291	2107828
La Palmita	Casanare	Paz De Ariporo	Los Morichales	5265483	2210925
La Palmita	Vichada	Santa Rosalia	Guacacias	5259309	2088417
La Palomera	Meta	Puerto Lopez	Remolino	5048332	2028349
La Patagonia	Vichada	Cumaribo	Tres Matas	5303796	2075713
La Porfia	Meta	Mapiripan	Merecure	5048689	1903169
La Providencia	Vichada	La Primavera	San Teodoro	5294530	2096131
La Provincia	Casanare	Paz De Ariporo	La Hermosa	5321713	2189938
La Reforma	Casanare	Orocue	Agua Verde	5190429	2117130
La Revancha	Vichada	Cumaribo	Santa Catalina	5228930	2008562
La Roca	Casanare	Paz De Ariporo	Normandia	5224599	2185079
La Sabana	Meta	Puerto Lopez	Chaviva	5088512	2030195
La Serrana	Vichada	Cumaribo	Merey	5233052	2054811
La Soledad	Vichada	La Primavera	Nueva Antioquia	5457620	2213039

La Union	Meta	Puerto Gaitan	Nuevas Fundaciones	5127564	2018508
La Vejez Maria Alejandra	Vichada	Cumaribo	El Santuario	5231130	2002439
Las Brisas	Vichada	La Primavera	Santa Cecilia	5412896	2154048
Las Brisas De Los Esteros	Vichada	Santa Rosalia	Santa Rosalia	5276583	2104378
Las Camelias	Vichada	La Primavera	El Retiro	5340445	2179890
Las Canarias	Meta	San Martin	La Serrania	4981617	1941847
Las Delicias	Vichada	La Primavera	Pajure	5299043	2165193
Las Delicias	Meta	San Carlos De Guaroa	San Carlos De Guaroa	4963628	1978727
Las Mulas	Casanare	San Luis De Palenque	San Francisco	5169012	2144190
Las Plumas Ii	Casanare	Trinidad	Los Chochos	5172861	2162043
Las Plumas Iii	Casanare	Trinidad	Los Chochos	5173987	2161996
Las Violetas	Vichada	La Primavera	Caño Muco	5454569	2225959
Lejanias	Vichada	La Primavera	San Teodoro	5333313	2128154
Limal	Casanare	Trinidad	Porvenir De Guaichiria	5232988	2151187
Limoncitos	Vichada	Santa Rosalia	La Ladera	5245865	2109862
Lomitas	Vichada	Cumaribo	Tres Matas	5258406	2051309
Los Acacios	Vichada	La Primavera	Canta Claro	5417100	2159206
Los Arucos	Casanare	San Luis De Palenque	Palmarito	5150954	2143839
Los Botalones	Vichada	Cumaribo	Camareta	5466075	2108110
Los Eucaliptos	Vichada	Cumaribo	La Pradera	5315325	2040398
Los Naranjos	Meta	Cumaral	La Cristalina	4974802	2021696
Los Olivos	Vichada	La Primavera	La Soledad	5393435	2163977
Los Trompillos	Vichada	Santa Rosalia	Guacacias	5247773	2102246
Lote 1	Meta	San Martin	Castañeda	4934076	1959341
Lt 1 Gaviotas	Casanare	San Luis De Palenque	San Francisco	5168261	2138173
Lt 2	Casanare	Orocue	La Pradera	5130985	2074358
Lt 2	Meta	Puerto Lopez	El Triunfo	5002790	1970259

Lt 2 Barinas	Casanare	San Luis De Palenque	San Francisco	5168351	2137516
Lt El Terecay	Vichada	La Primavera	La Soledad	5392699	2168445
Lt La Cristalina	Vichada	Puerto Carreño	Caño Negro	5586036	2218474
Lt La Fortuna	Vichada	La Primavera	La Soledad	5325868	2113157
Lt La Momposina	Vichada	La Primavera	Matiyure	5376294	2144346
Lt La Palmita	Vichada	Puerto Carreño	La Venturosa	5457778	2215992
Lt Las Ideas	Vichada	La Primavera	Iraca	5344900	2189950
Lt Los Santos Lt 1	Meta	Puerto Gaitan	Santuario	5161679	2019872
Manacal	Meta	Puerto Gaitan	Cooperativa	5170777	2077147
Mararay	Vichada	La Primavera	San Teodoro	5333030	2131009
Matapalito	Vichada	La Primavera	Matiyure	5313986	2153986
Mirallano	Vichada	La Primavera	Matiyure	5355296	2167100
Monteralo	Vichada	Cumaribo	Inspeccion Catorce La	5428062	2106534
Morichal	Vichada	La Primavera	Matiyure	5361871	2169358
Nairobi	Vichada	La Primavera	Nazareth	5285372	2113085
Novilleros	Meta	Puerto Lopez	Remolino	5043324	2027612
Pajonales	Vichada	Santa Rosalia	Guacacias	5249638	2101904
Pajonales	Meta	San Martin	Brisas Del Manacacias	5016924	1923748
Patio Bonito	Vichada	Cumaribo	Camareta	5436459	2092446
Pd El Futuro	Vichada	La Primavera	Nueva Antioquia	5448955	2213471
Pd El Triangulo Lote 1	Casanare	Paz De Ariporo	La Hermosa	5279103	2168606
Pd El Triangulo Lote 2	Casanare	Paz De Ariporo	La Hermosa	5278577	2169927
Pd El Triangulo Lote 3	Casanare	Paz De Ariporo	La Hermosa	5277797	2171013
Pd El Triangulo Lote 4	Casanare	Paz De Ariporo	La Hermosa	5276870	2172022
Pd El Triangulo Lote 6	Casanare	Paz De Ariporo	La Hermosa	5276006	2173638
Pd La Martuja	Vichada	La Primavera	La Soledad	5314051	2110336
Pd La Victoria	Vichada	La Primavera	Nueva Antioquia	5438461	2208714

Playa Alta	Vichada	Puerto Carreño	El Merey	5600917	2243602
Playa Blanca	Vichada	La Primavera	Matiyure	5376725	2140872
Purple Dos	Casanare	Mani	Limal	5117167	2051646
Rincon De Anel	Vichada	Puerto Carreño	Marandua	5533068	2199072
Rnsc Palomas	Casanare	San Luis De Palenque	San Francisco	5168608	2139788
Saladillos	Casanare	Paz De Ariporo	San Esteban	5253826	2164451
San Camilo La Toscana	Vichada	Cumaribo	Churravay	5216228	2052852
San Fernando	Casanare	San Luis De Palenque	El Tigre	5196874	2123922
San Jesu li	Casanare	Paz De Ariporo	Maniotes	5183909	2165274
San Joaquin	Casanare	Trinidad	San Nicolas	5188385	2158849
San Marcos	Casanare	Hato Corozal	Villa Nueva	5280543	2245469
San Miguel	Vichada	La Primavera	San Teodoro	5324433	2109987
San Pablo Lote 1 Remanente	Casanare	Orocue	Limal	5155380	2089125
San Sebastian	Vichada	Cumaribo	El Tapón Sur	5399865	2126480
Santa Barbara	Vichada	La Primavera	Nueva Antioquia	5362492	2205022
Santa Barbara 2	Vichada	La Primavera	Nueva Antioquia	5363668	2205296
Santa Barbara 3	Vichada	La Primavera	Nueva Antioquia	5364825	2205509
Santa Barbara I	Vichada	La Primavera	Nueva Antioquia	5361444	2204540
Santa Lucia	Vichada	Cumaribo	Mata Grande	5393971	2112209
Santa Maria	Vichada	Santa Rosalia	Guacacias	5245071	2109157
Simran	Vichada	Santa Rosalia	Rio Tomo	5265601	2092853
Sopla Viento	Vichada	Cumaribo	El Placer	5432000	2094725
Surtolima	Vichada	La Primavera	La Union	5297587	2096462
Tanzania	Vichada	La Primavera	Canta Claro	5416083	2157882
Tierra Mia	Meta	Puerto Lopez	Yucao	5088403	2033079
Tolemaida	Vichada	Puerto Carreño	La Venturosa	5470459	2228746
Valle De Tensa	Vichada	Cumaribo	Inspeccion La Catorce	5304894	2054046

Valle La Paz	Vichada	Puerto Carreño	Caño Bachaco	5594255	2214500
Villa Carolina	Casanare	Paz De Ariporo	Guamas	5210811	2210384
Villa Claudia	Vichada	La Primavera	Inspeccion De Santa Barbara	5346659	2212282
Villa Dalia	Casanare	Hato Corozal	Villa Julia	5280199	2248221
Villa Erika	Vichada	Cumaribo	Mata Grande	5360517	2077260
Villa Las Peña	Vichada	Cumaribo	Asocortomo	5325278	2075881
Villa Luz	Vichada	Santa Rosalia	Santa Catalina	5254290	2137850
Villa Maleidy	Vichada	La Primavera	Inspección De Puerto Oriente	5344906	2188210
Villa Yeni	Vichada	Cumaribo	Inspeccion La Catorce	5305344	2070571
Villanova	Vichada	Santa Rosalia	Nazareth	5301377	2095907

2.5 Additional information about the GHG Project

N/A

3 Quantification of GHG emission reduction

3.1 Quantification methodology

The project employs two quantification methodologies, BCR 0002 V 4.0 and BCR 0005 V1.1, with the aim of reducing emissions from deforestation, forest degradation, and avoiding the conversion of natural savannas.

3.1.1 Applicability Conditions of the methodology

The compliance with each applicability condition is presented below, broken down by methodology.

3.1.1.1 Applicability Conditions of the methodology BCR 0005

Condition	Compliance
-----------	------------

The areas within the geographical boundaries of the project correspond to natural savannas	Savannas comprising grasslands and shrublands are considered eligible areas, according to Corine Land Cover. (See section 3.2.1.1.1)
The project's activities prevent land use change in natural savannas.	The project promotes sustainable practices and production systems that do not change land use to avoid the conversion of natural savannas to other uses. It also creates economic incentives for conservation by commercializing the project's mitigation results. (See section 2.3.2).
Project activities include biodiversity conservation actions that integrate efforts to preserve, restore, and/or manage and sustainably use savannas.	The project activities, detailed in section 2.3.2. They focus on the conservation, restoration and sustainable use of savannas.
The causes of land use changes identified may include, among others: expansion of the agricultural frontier, mining, extraction, and loss of vegetation cover.	Property owners are primarily responsible for the expansion of the agricultural frontier, which is the main cause identified. <i>(See Annex 1 Project Description/1.1 Causes and agents of deforestation and land-use changes).</i>
In areas within the project boundaries, carbon stocks in soil organic matter, leaf litter, and dead wood may decline or remain stable.	Carbon stocks are expected to remain stable or increase in the project scenario, while they will decrease due to the influence of land use change drivers in the baseline scenario.

The amount of nitrogen-fixing species used in the project activities is not significant, so GHG emissions from denitrification can be considered negligible.	Since the planting of species will be carried out in a scattered manner in savanna and restoration areas with multiple native species, the resulting GHG emissions will not be significant.
--	---

3.1.1.2 *Applicability Conditions of the methodology BCR 0002*

Condition	Compliance
Forest condition and land eligibility	
(a) The project area shall qualify as “forest” according to the national forest definition adopted under the UNFCCC and shall have maintained continuous forest cover for at least 10 years prior to the project start date	The project areas correspond to stable forests. And they meet the national definition of forest. See section: 3.7.1.2 Eligible areas for BCR 0002 activities.
(b) Project areas shall not fall under the wetlands or peatlands category, nor contain organic soils as defined by the IPCC (2104);	Referring to the “Terms and Definitions” section of BCR 0002 and the IPCC definition of wetland, it was verified that the project areas are forest lands and not wetlands. Therefore, they are not classified in category 4 (Wetlands) of Corine Land Cover for Colombia, specifically 411 (Swampy areas), 412 (Peatlands) and 413 (Aquatic vegetation on water bodies). This classification is consistent with Article 1 of the Ramsar Convention for the Protection of Wetlands and the IPCC guidelines. The spatial data validating this information are located in the REDD+ Geodatabase under the

	Feature Class "Validation of Eligible Areas." (see section 3.7.1.2) The semi-structured soil surveys conducted by IGAC, which serve as the basis for soil carbon maps in Colombia, were reviewed. The soils were found to have organic carbon percentages between 1.02% and 7.64%, confirming that they are not organic soils. This information was obtained from the Latin American Soil Information System (SISLAC), where IGAC actively collaborates.
(c) Lands under active forest concessions or legally sanctioned planned deforestation are not eligible under this methodology.	Compliant, the project area does not include any planned or legal forest harvesting areas.
Deforestation and degradation dynamics	
(a) The direct and underlying causes of unplanned deforestation and/or degradation shall be demonstrably present within or near the project area, and shall be shown to exert historical or current pressure on forest cover within the project boundaries(a) The direct and underlying causes of unplanned deforestation and/or degradation must be demonstrably present within or near the project area, and must be shown to exert historical or current pressure on forest cover within the project boundaries.	The analysis of causes and agents reveals that the identified direct and underlying causes are present in the reference region and in the project areas. This is attributed to the form of land ownership and the existing environmental and social conditions. (<u>See Annex 1 Project Description/1.1 Causes and agents of deforestation and land-use changes</u>).

(b) No reduction in deforestation or degradation would reasonably occur in the absence of the project, as determined using the Additionality Tool	Baseline and additionality analysis (see section 3.3.2). It shows that current trends of deforestation and forest degradation will continue due to a lack of financial incentives for conservation, the profitability of other activities, and the absence of effective control measures.
(c) The forest carbon stock in litter, deadwood, or soil organic carbon may be excluded only if such exclusion is conservative and justified and does not lead to overestimation of mitigation results	The forest carbon stock in litter, deadwood, or soil organic carbon are not excluded.
Project boundaries and permanence	
(a) The project area shall be clearly demarcated using georeferenced boundaries in a GIS platform and shall not overlap with any other registered GHG mitigation project	The project's geographic boundaries are located in the project's geodatabase and do not overlap with the areas of other GHG projects. (See section 2.4)
(b) The project shall implement measures to mitigate risk of non-permanence and shall apply the BioCarbon Permanence and Risk Management Tool;	The project uses the risk and permanence management tool and implements measures to reduce and mitigate non-permanence risks. (See section 7)
(c) The project holder shall have demonstrable control or legal right to manage the land and to claim GHG mitigation outcomes (carbon rights), supported by appropriate documentation(c) The project owner must have demonstrable control or	The Project owner demonstrates control over carbon rights through legal agreements with participating property owners. These agreements also stipulate the distribution of economic benefits derived from the commercialization of mitigation results. For more details. (See section 5)

legal right to manage the land and claim GHG mitigation results (carbon rights), supported by appropriate documentation.	
Additional safeguards and legal compliance	
(a) The project shall not involve any displacement of deforestation to other areas under the same control unless such leakage is monitored and compensated as per this Methodology	The conservation of forests in private areas of the project avoids the displacement of deforestation thanks to the legal barrier of private property. However, a leak belt is established to monitor potential increases in emissions resulting from project activity. (See section 3.2.1.2.3)
(b) The project shall comply with all applicable national and local laws, including environmental, land tenure, and communities and/or indigenous rights regulations	The project strictly complies with all applicable local, regional, and national laws and regulations, including those on land use, environmental conservation, natural resource management, land use planning, and greenhouse gas reduction. (See section 4)
(c) Where applicable, the project shall demonstrate that it has obtained Free, Prior and Informed Consent (FPIC) from affected indigenous peoples or local communities.	Since the project is being carried out on private property, free, prior and informed consent is not required.since it does not develop within areas of collective property. (See section 5.3.1)

3.1.2 Methodology deviations (if applicable)

No methodological deviation was applied

3.2 Project boundaries, sources and GHGs

3.2.1 Spatial limits of the project

The project area covers 120,891.6 ha, which include natural forests and natural savannas within the boundaries of the properties linked to the project. The project areas, reference region and leakage area corresponding to each methodology used are specified below, as well as the criteria for the definition of these areas.

3.2.1.1 Spatial Limits of Natural Savannas

3.2.1.1.1 Project Areas Activities BCR 0005

The project areas correspond to 99,532.6 ha of eligible natural savannas distributed across 165 private properties in the departments of Meta, Casanare, and Vichada that are part of the project. This figure also shows that the project boundaries are within the savanna biome and the Llanos ecoregion, according to the WWF classification, as well as the reference region and the leakage area. Relevant cartographic data are available in component-specific geospatial databases, in Annex 2.2.2.1 Natural Savannas Geodatabase, "Project Areas", "Leakage Area", "Reference Region", and "Biome Ecoregion" feature dataset.

3.2.1.1.2 Eligible Areas BCR 0005

To identify eligible savanna areas, it is necessary to demonstrate that the project's geographic boundaries correspond to the savanna biome and are part of the Llanos Ecoregion, according to the WWF classification (2.2.2.1. Savanna Geodatabase/Feature Dataset Biome Ecoregion).

To identify eligible savanna areas, land cover maps using the Corine Land Cover methodology for 2014 and 2020 (scale 1:100,000) are used. These maps, generated by IDEAM, are official tools for land cover monitoring.

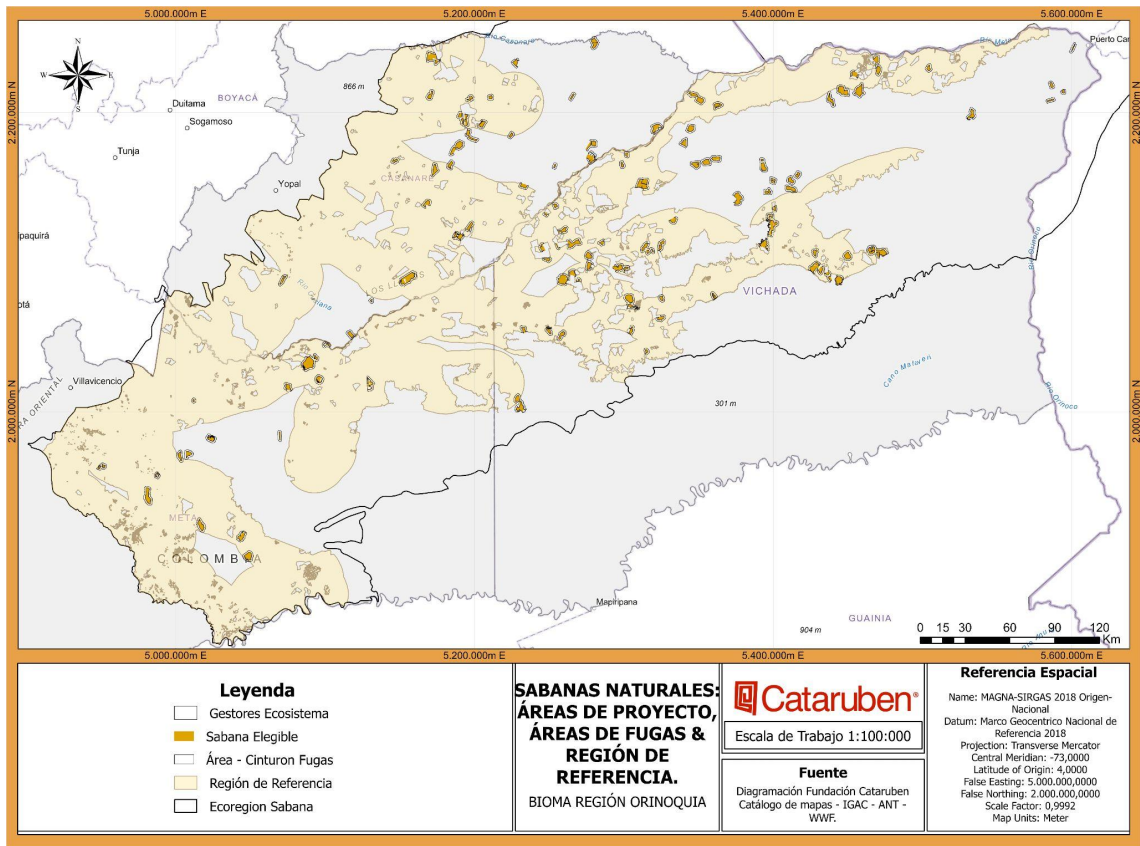
Vector information on land cover for 2015 and 2020 for the project area is available at: /2.2.2.2. Savanna Geodatabase/ Corine Land Cover Interpretation/ Land Covers 2015, 2020, 2024.

To determine land cover for the years 2015 and 2020, 2.2.2.4.6. National Land Cover Legend. Corine Land Cover Methodology adapted for Colombia. Scale 1:100,000. The procedure is described in Annex 2.2.2.4.5. FC-GOG-29. Corine Land Cover Interpretation Instructions, Scale 1:100, along with Annex 2.2.2.4.4. Characterization of cartographic inputs for generating Corine Land Cover - Orinoco p2.

The accuracy of the results for land cover classification in 2015 was 95.1%, using information from 2.2.2.2.4. Geodatabase Validation Matrix/Validation/Validation Set 2015.shp; Mapbiomas 2015.tif. The accuracy for 2020 reached 96.67%, based on the Geodatabase Matrix validation/Validation/Validation Set 2020.shp information; Mapbiomas 2015.tif. This process is detailed in Annex 2.2.2.2.1. CLC Classification Model Validation Technical Document.

According to BCR0005, natural land covers 3.2.1 Grasslands and 3.2.2 Shrubs from the Corine Land Cover legend are considered. Eligibility for the 2015-2020 period was determined by the spatial intersection between the land covers mapped in 2015 and the land covers in force as of 01/01/2020. That is, only the areas that remained as natural savannas in both years were declared eligible (2.2.2.1. Geodatabase Sabanas/Feature dataset Project Areas/ Sabanas Eligibles.shp).

Figure 3 Carbon ownership and rights



Fuente: Fundación Cataruben

3.2.1.1.3 *Región de Referencia Actividades BCR 0005*

The reference region has been established in compliance with the requirements of BCR 0005 methodology

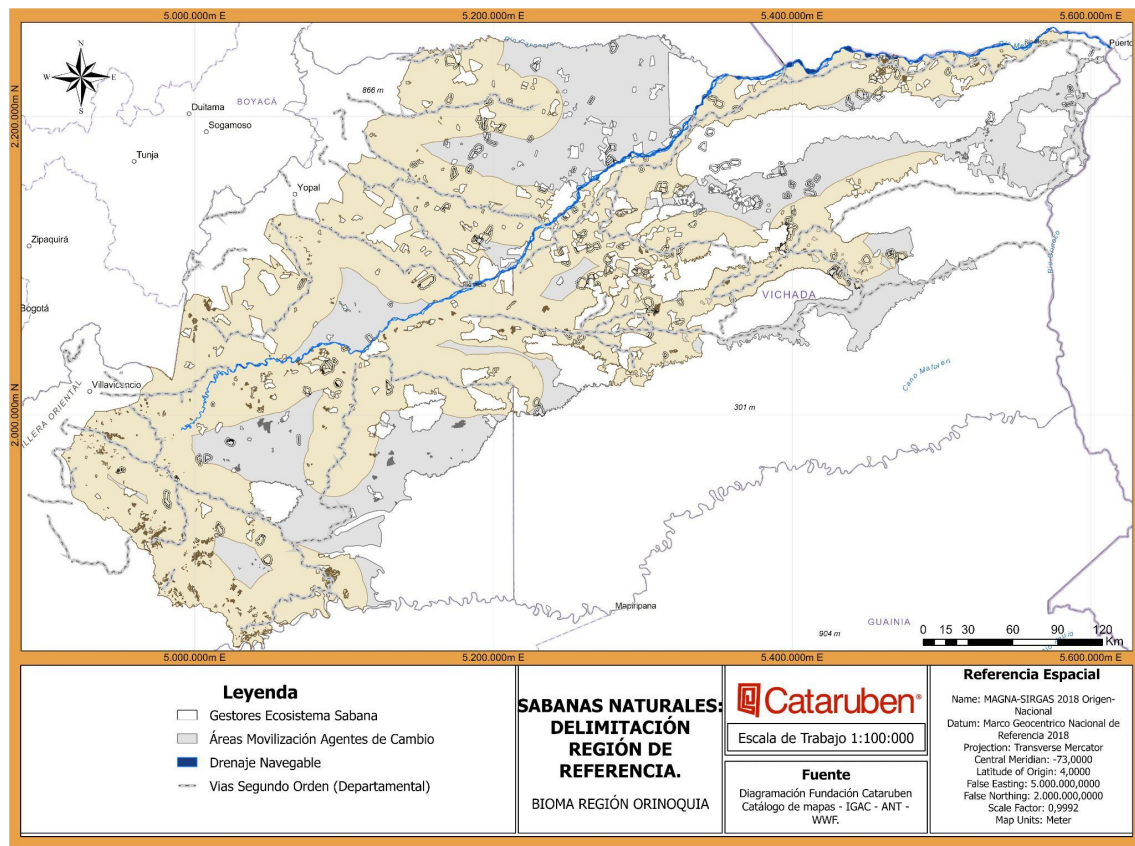
Criterion	Compliance
The drivers of land use change identified in the reference region can access the project area.	Compliant. Given that the project areas, like the reference region, include private landowners with similar interests in generating subsistence economic resources within regulated markets. (See Annex 2.2.2.1. Sabanas Geodatabase/Feature dataset Drivers of Change/Agent Mobilization Area, Coverage 2012.)

<i>The project area is of interest to the stakeholders identified in paragraph b above.</i>	<i>Compliant. The project areas have access to natural resources and are road networks and different natural resource extraction routes. (See Annex 2.2.2.1. Sabanas Geodatabase/Feature dataset Biophysical Factors)</i>
<i>The land tenure and land use rights patterns in the reference region are similar to those in the project areas.</i>	<i>Compliant. Land tenure conditions are similar in the region; this only includes areas of private land, whose land tenure is similar to that of the project areas (Ownership, Possession, Tenure). Collective properties are excluded. Annex 2.2.2.1. Geodatabase Sabanas/Feature dataset Land Tenure/Property Informality Index, 2020).</i>

La Región de Referencia (RR) se ubica en el bioma Orinoquia, donde se localizan las áreas del proyecto, y en la ecorregión de sabanas (2.2.2.1. Geodatabase Sabanas/ Feature Dataset “Bioma Ecorregion”). Su delimitación se fundamentó en el “/2.2.2.1. Geodatabase Sabanas/ Feature Dataset Impulsores de Cambio, Área movilización agentes.shp”, insumo definido en el Anexo: Evaluación de causas y agentes de la deforestación, degradación y cambios en el uso del suelo, y diseño de las actividades de proyecto. Este enfoque asegura coherencia con la dinámica territorial y los impulsores de cambio identificados para el proyecto.

La RR se trazó empleando el río Meta —navegable y límite funcional entre Casanare y los departamentos de Meta y Vichada— y las vías principales de carácter departamental como referencias de accesibilidad; sobre estas últimas se aplicó un buffer de 20 km para capturar su zona de influencia. Como resultado, la RR contiene el 70,0 % de las áreas de proyecto (115 de 165 predios), evidenciando su representatividad espacial y la comparabilidad de condiciones con las áreas del proyecto.

Figure 4 Delimitation of the Natural Savannah Reference Region



Fuente: Fundación Cataruben

3.2.1.1.4 Leakage Area For BCR 0005

The leakage area is delimited on the basis of the following criteria:

a) all areas of herbaceous and shrubland that are within the mobility range of the agents identified in section 9 (below) should be included.

b) exclude areas of restricted access to agents that generate changes in land use.

The project areas are located within the boundaries of each private property; therefore, these actions are not expected to displace emissions beyond their boundaries, given that the primary drivers are the landowners through their management decisions.

However, a leakage area is established according to the criteria established in the BCR 0005 methodology:

- All grassland and shrubland areas within the mobility range of the identified drivers must be included.

- Exclude areas with restricted access to drivers that generate land use changes.

To delimit the potential leakage belt or area on each property, we integrated maps of land cover change, road network, deforestation and fire hotspots, and topographical factors. It was defined by analyzing the areas where the greatest changes in land cover transformation, access roads, deforestation hotspots, and vegetation cover fires occur.

Based on these inputs, we estimated the distance to the density of recent events in 1,000 meters. A 1-km buffer was created from the property boundary. From this buffer, restricted access areas (RUNAP categories, Collective Territories, special management areas), offsets, and carbon projects were excluded. Finally, the leakage belt was established, where the areas corresponding exclusively to natural savanna cover were calculated. The leakage belt covers 187,589.21 ha; of these, 125,148.1 ha correspond to natural savanna (66.7%). The eligible project areas total 99,532.6 ha, equivalent to 53.1% of the belt's size. Overall, the savanna area within the belt is 1.26 times the eligible project area.

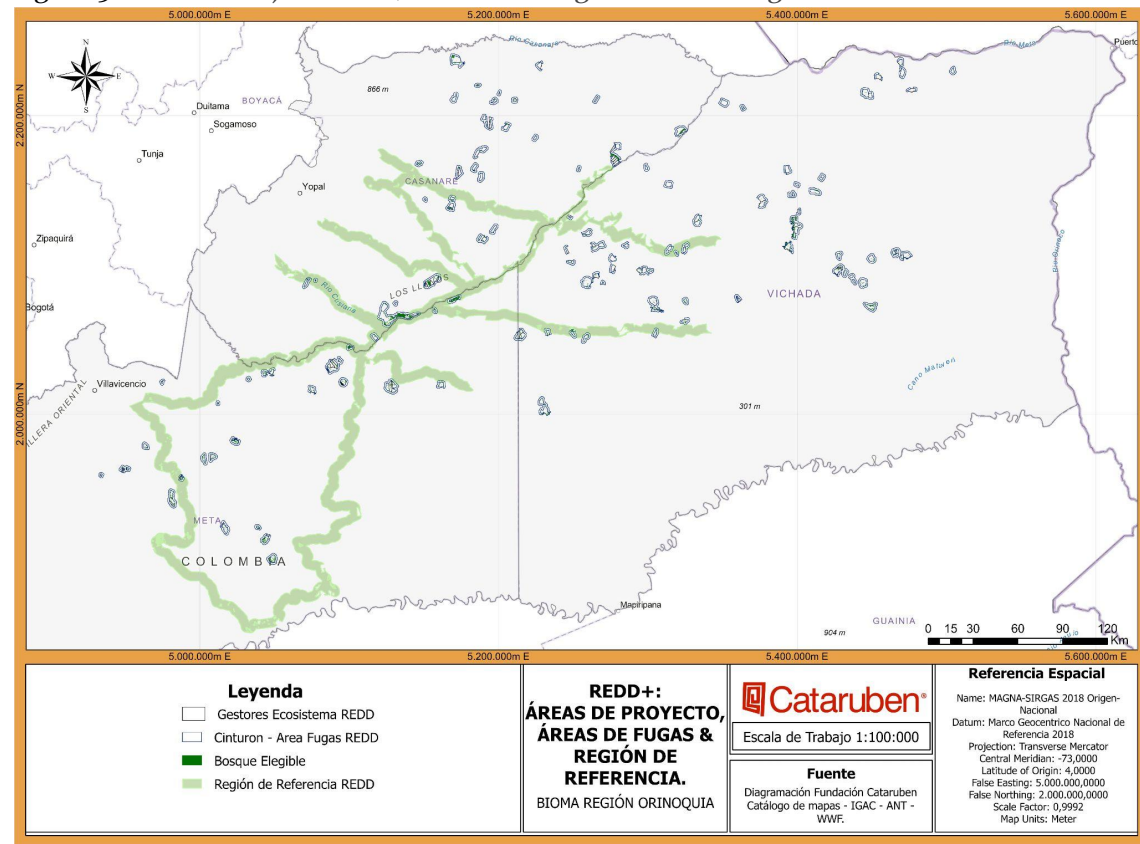
The geographic information is in 2.2.2.1. Geodatabase Savannas/Feature Dataset Leakage Area; for the data used 2.2.2.1. Geodatabase Savannas/ Feature Dataset Restricted Access; Feature Dataset Offsets; Feature Dataset Drivers of Change; Feature Dataset; Leak Belt Analysis; Feature Dataset Standard Project Double Accounting.

3.2.1.2 REDD+ BCR 0002 Spatial Boundaries

3.2.1.2.1 REDD+ project areas

21,359 ha of eligible forests located on 154 private properties in the departments of Meta, Casanare, and Vichada are part of the project. The project areas: The reference region and the leakage area are shown in the following figure. Relevant geographic data are available in component-specific geospatial databases, in Annex 1.1.2. REDD+, "Project Areas" Feature Dataset; Reference Region Feature Dataset; Project Area Feature Dataset; Leakage Area Feature Dataset.

Figure 5. REDD+ Project Areas, Reference Region and Leakage Area



Fuente: Fundación Cataruben

3.2.1.2.2 Eligible Areas BCR 0002

REDD+ Eligible Areas. The project's eligible areas correspond to stable natural forest located entirely within the land boundaries of the intervention area and that have remained forested, uninterrupted, for at least ten (10) years prior to the project start date.

The project start date is February 1, 2020. The definition of an eligible area corresponds to a multi-temporal analysis for the years 2010 and 2019, which analyzes only areas that fall under the forest category according to the national definition.

The forest maps for the years 2010 and 2019 (cut-off date: December 31, 2019) were generated using image collections from Landsat 5, 7, and 8 satellites using the Google Earth Engine (GEE) platform (Annex 2.2.1.2.3. SCRIPT Forest Model Development) and following the methodological procedure of Galindo et al. (2014) Annex 2.2.1.2.6. During the

construction of the mosaics, the project start date was taken into account, establishing specific filters for each year.

The information search process through the filters aims to ensure the selection of images free of ambient noise such as clouds or distortions and with minimal cloud cover. This guarantees the acquisition of images in optimal conditions, reducing uncertainty in digital processing. If clouds are present, masking is performed to eliminate them, including their shadows, thus ensuring a clear representation of the Earth's surface.

Once the different satellite images are obtained, they are merged to create a mosaic, which will be used for analysis (preliminary analysis, harmonization coefficient processing, radiometric normalization, etc.). The algorithm used for forest classification is Random Forest; for this, training samples and observations are required to distinguish between forest and non-forest areas. To this end, training areas verified through field observations, high-resolution images assisted by the artificial intelligence-assisted satellite image refinement algorithm such as Annex 2.2.1.5.: S2DR3T-infer-20240430.ipynb and visual interpretation are provided. Tree height is also taken into account using Annex 2.2.1.2.4. Script Canopy Height. The information is based on (2.2.1.1. REDD Geodatabase/ Feature Dataset "Training Models"/ Training set; validation set). The classification used 4,399 samples (70% training, 30% validation) distributed into the Forest, Water, Sapland, and Crops classes. The predictor variables used were the blue, green, red, NIR, Swir1, and Swir2 bands, along with the NDVI, MSAVI, EVI, NDWI, SVVI, brightness, greenest, and wetness indices.

Subsequently, to ensure the thematic quality of the generated products, a supervised review and adjustment process was implemented through visual interpretation. This process is carried out using the Procedure for Computer-Aided Interpretation (PIAO), complemented by the use of the "Imagery" module in ArcGIS Pro v3.3 software. These measures are adopted to improve the classification results obtained in GEE. This comprehensive approach of supervised review and adjustment ensures greater accuracy and reliability in the thematic aspects of the products, thus contributing to the generation of more robust data.

Finally, after the supervised review and adjustment, the model is validated for each year using the AcATaMa plugin in QGIS software (2.2.1.3. AcATaMa). Validation through the AcATaMa plugin is a fundamental measure for verifying the consistency and accuracy of the classification, reinforcing the integrity of the results obtained during the process.

La precisión de los resultados para la clasificación de bosque y no bosque en 2010 fue del 97,0 %, utilizando como soporte la información (Anexo 2.2. Geoespacial / 2.2.1. REDD /

2.2.1.3. AcATaMa / 2.2.1.3.3. Validaciones / 2.2.1.3.3.1. Validaciones AP – AF / Validación BNB 2010). En 2019 (corte 31/12/2019), la precisión alcanzó el 93,0 %, con base en la información (Anexo 2.2. Geoespacial / 2.2.1. REDD / 2.2.1.3. AcATaMa / 2.2.1.3.3. Validaciones / 2.2.1.3.3.1. Validaciones AP – AF / Validación BNB 2020). Este proceso se detalla en el anexo informe (Anexo 2.2. Geoespacial / 2.2.1. REDD / 2.2.1.3. AcATaMa / 2.2.1.3.4. Validación del Modelo BNB ORINOCO P2- AcATaMa).

Project area eligibility was defined based on the stable natural forest contained within property boundaries. Forest maps from 2010 and 2019 (as of December 31, 2019) were used, and the Eligible Forest 2010–2019 layer (2.2.1.1. REDD Geodatabase/ Feature Dataset "Project Area"/ Eligible Forest AP 2010–2019) was generated by spatially intersecting both sources. This means that only pixels/plots classified as forest in 2010 and maintained as forest in 2019 were considered eligible.

3.2.1.2.3 REDD+ Reference Region

The reference region has been established in compliance with the requirements of the BCR 0002 methodology.

The connection between the project area and the reference region is based on their shared location within the Orinoquía biome. This alignment is consistent with the regional projections of the national reference levels.

The regional delimitation to the departments of Casanare, Meta, and Vichada facilitates the analysis' alignment with the causes and agents, thus ensuring the functional representation of drivers and agents in both the project areas and the reference region. It should be noted that the reference region exclusively covers privately owned land, ensuring its consistency with the project areas.

The delimitation of the reference region is based on the "Feature Dataset Drivers of Change, Area Mobilization Agents.shp," an input defined in the Annex: Assessment of causes and agents of deforestation, degradation, and land-use change, and design of project activities.

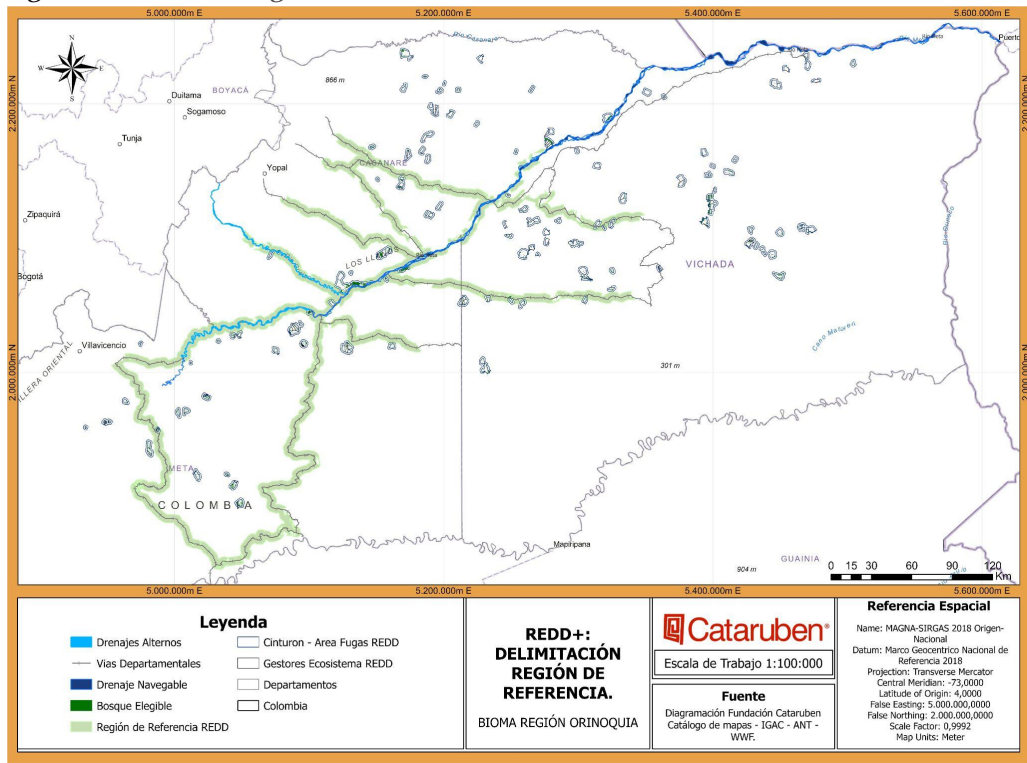
The approach adopted ensures that the Reference Region (RR) faithfully represents the operational context of the agents responsible for deforestation and degradation in the territory. The delimitation was based on objective, traceable, and verifiable spatial information, articulated with the analysis of drivers of change. Specifically, the Meta River—navigable and the functional boundary between Casanare and the departments of Meta and Vichada—was used as the hydrographic reference axis, and the main departmental roads were used as a proxy for accessibility and anthropogenic pressure

(/2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region Delimitation"/ Navigable Drainage, Alternate Drainage, Access Roads).

A 4-km buffer was applied on both sides of the departmental road network to identify the forest strip potentially susceptible to deforestation, and the RR was cut to the intersection of these criteria with the fluvial boundary defined by the Meta River. To prevent bias, the project areas and the leakage belt (leakage area) are explicitly excluded from the RR, i.e., the RR is geographically distinct from the project areas. /2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region"/ REDD Reference Region; Feature Dataset "Project Area"/ Eligible Forest; Feature Dataset "Leakage Area"/ Leakage Belt Area.

Thus, the RR replicates biophysical conditions (savannah matrix and water regime), socioeconomic/legal conditions (property regime and subnational regulations), and accessibility conditions (proximity to the road network and river axis) comparable to those of the PA.

Figure 6 Reference region, delimitation criteria.



Fuente: Fundación Cataruben

The following table presents the criteria and evidence related to the delimitation of the reference region. (2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation")

The similarity analysis between the reference region and the project area showed the following similarities:

- Land tenure: 100% concordance (private lands).
- Forest types: 100% concordance (riparian forests of the Orinoquía region).
- Accessibility: 80% similarity (density of roads and rivers).
- Socioeconomic conditions: Described for private areas of Meta, Casanare, and Vichada (compatibility guaranteed).

The deforestation rate in the reference region, broken down by forest category (core and edge), is detailed in section 3.7.1.2. The following table, along with the GDB metadata, provides a list of inputs, data sources, and software tools.

Table 8. REDD+ Reference Region Inputs

Item	Description - source
General Selection Criteria	
Geographically distinct from the project area, but subject to biophysical, socioeconomic, legal and accessibility conditions similar to those of the project area	Compliant: The Reference Region is geographically distinct from the Project Area and is delimited within the Orinoquia savannas in Casanare, Meta, and Vichada, restricted to privately owned properties to maintain legal and tenure equivalence. The Project Areas and the Leak Belt are explicitly excluded, ensuring zero spatial intersection between the RR and these layers. /2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region"/ REDD Reference Region; Feature Dataset "Project Area"/ Eligible Forest; Feature Dataset "Leak Area"/ Leak Belt Area. Thus, the RR replicates biophysical conditions (savannah matrix and water regime), socioeconomic/legal conditions

	(property regime and subnational regulations), and accessibility conditions (proximity to the road network and river axis) comparable to those of the PA. 2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region Delimitation"
Delimited by objective, credible and verifiable spatial data (e.g. land cover, infrastructure, administrative boundaries) that support its representativeness and integrity	Compliant: Its design is based on the "Drivers of Change Feature Dataset, Agent Mobilization Area.shp" (Causes and Agents Annex) and uses objective and verifiable inputs. The Meta River serves as a functional hydrographic boundary and departmental roads serve as a proxy for accessibility and anthropogenic pressure. A 4 km buffer is applied to both sides of these to capture the forest strip most susceptible to deforestation. 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation"
Composed primarily of forested lands, excluding areas that are systematically unrepresentative of the factors affecting the project area	Compliant: The reference region is primarily composed of natural savannas, grasslands, and forests, the latter covering an area of 169,310.7 hectares. /2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region Delimitation". Attribute "Detailed Indicator"
Greater than the project area, and no more than ten times its size	Compliant. The eligible project areas total 21,359 ha, while the forest in the Reference

	Region amounts to 169,310.7 ha. Consequently, the Reference Region is 7.93 times larger than the project areas ($169,310.7 / 21,359 = 7.93$), providing a broad comparative basis for analysis. This information is reproducible and auditable in the REDD Geodatabase at the following locations: Project areas: /2.2.1.1. REDD Geodatabase/ Feature Dataset "Project Area"/ "Eligible Forest" Reference Region: /2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region Delimitation"/ "Reference Land Covers Corine"
The reference region should be located in reasonable geographical proximity to the project area, within the same deforestation boundary, administrative unit or socio-ecological landscape.	Compliant: The Reference Region is geographically distinct from the Project Area and is delimited within the Orinoquia savannas in Casanare, Meta, and Vichada, restricted to privately owned properties to maintain legal and tenure equivalence. It remains on the frontier of deforestation due to the expansion of the agricultural frontier. /2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region Delimitation"/ "Departmental Administrative Boundary" /2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region Delimitation"/ "Agricultural Boundary Delimitation"

Criteria of spatial and landscape similarity														
Forest types: At least 80% of the forest classes present in the project area must also be present in the reference region.	Compliant. There are 25,810.97 hectares of forest in the project areas, while the reference region has 169,310.7 hectares.													
	Project Area: 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation"/Forest Types AProject 2020.													
	Reference Region: 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation"/Forest Types RReference 2020.													
	<table><tr><td>Class</td><td>Project Areas - ha</td><td>Reference Region - ha</td></tr><tr><td>3.1.1. Dense forest</td><td>10.961,2</td><td>71.133,4</td></tr><tr><td>3.1.2. Open forest</td><td>0</td><td>2.608,5</td></tr><tr><td>3.1.4. Gallery and riparian forest</td><td>14.849,78</td><td>95.568,7</td></tr></table>		Class	Project Areas - ha	Reference Region - ha	3.1.1. Dense forest	10.961,2	71.133,4	3.1.2. Open forest	0	2.608,5	3.1.4. Gallery and riparian forest	14.849,78	95.568,7
	Class	Project Areas - ha	Reference Region - ha											
3.1.1. Dense forest	10.961,2	71.133,4												
3.1.2. Open forest	0	2.608,5												
3.1.4. Gallery and riparian forest	14.849,78	95.568,7												
Based on the table, the project area presents two forest classes: 3.1.1 Dense forest (10,961.2 ha) and 3.1.4 Gallery and riparian forest (14,849.78 ha), both also present in the reference region with 71,133.4 ha and 95,568.7 ha, respectively; therefore, 100% (2/2) of the forest classes present in the project are represented in														

	the reference region.						
Soil types and slopes: at least 50% similarity in dominant soil categories and slope classes	The similarity analysis between slope and soils, both in the reference region and in the project areas, is 100%. This is because both correspond to riparian forests within the Orinoquía biome. The slope requirement is met ($\geq 50\%$ similarity). Considering the three largest slope classes in each zone as "dominant," the slopes in the Project Area are Flat (85,723.28 ha), Slightly Sloped, and Moderately Sloped (21,589.9 ha); in the Reference Region, the slopes in the Reference Region are Flat (786,556.57 ha), Steeply Sloped (105,605.74 ha), and Moderately Sloped (94,131.8 ha). The intersection between dominant sets is two classes—Flat and Moderately Sloped—equivalent to 66.7% (2/3) of coincidence, exceeding the required 50% threshold. Geographic Information: Project Area: 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation"/Project Slope Reference Region: 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation"/Reference Slope <table> <tr> <th>Slope Class</th> <th>Project Area - ha</th> <th>Reference Region - ha</th> </tr> <tr> <td>Flat (a)</td> <td>85.723,28</td> <td>786.556,57</td> </tr> </table>	Slope Class	Project Area - ha	Reference Region - ha	Flat (a)	85.723,28	786.556,57
Slope Class	Project Area - ha	Reference Region - ha					
Flat (a)	85.723,28	786.556,57					

	Slightly Sloped (b)	48.77,6	53.119,25
	Moderately Sloped (c)	21.589,9	94.131,8
	Steeply Sloped (d)	16.965,08	105.605,74
	The soil class similarity requirement is met. All categories present in the Project Area—Waterbodies (814.17 ha), III (0.93 ha), IV (21,223.12 ha), V (35,354.52 ha), VI (28,736.49 ha), VII (27,106.21 ha), and VIII (15,802.88 ha)—are also present in the Reference Region—13,677.14; 17,825.93; 195,721.97; 249,663.46; 310,687.30; 185,563.06; 52,114.27 ha, respectively—, which is equivalent to a 100% (7/7) match and far exceeds the required threshold of ≥50%. The Urban Zone (514.53 ha) only appears in the reference region, without affecting compliance, since the criterion evaluates that the project categories are represented in the reference region		
	Soil Type	Project Area - ha	Reference Region - ha
	Bodies of Water	814,17	13.677,14
	III	0,93	17.825,93
	IV	21.223,12	195.721,97
	V	35.354,52	249.663,46
	VI	28.736,49	310.687,3

	VII	27.106,21	185.563,06
	VIII	15.802,88	52.114,27
	Urban Zone	0	514,53
	Project Area: 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation"/Project Land Type Reference Region: 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation"/Reference Land Type		
Access conditions: The density of roads and the density of navigable rivers (measured in m/km², with a margin of 2 km) must not differ by more than 30% from those existing in the project area at the beginning of the reference period.	A 2-kilometer buffer zone was delimited around the project areas and compared with the density in the reference region.		
Socioeconomic and Legal Similarity Criteria			
Socioeconomic, cultural and land use conditions, as well as applicable laws and policies related to land status, land use and land tenure, should be comparable between the reference region and the project area.;	The project areas and the reference region are limited exclusively to private properties in the departments of Meta, Vichada, and Casanare, within the Orinoquía region. This delimitation ensures comparability between both areas in terms of socioeconomic, cultural, land use, and legal aspects related to land tenure. 2.2.1.1. REDD Geodatabase/Feature Dataset "Land Tenure"/Property Informality.		

Any differences in land tenure or legal status between the reference region and the project area will not have a material impact on the dynamics of forest loss and will not affect the underlying drivers, responsible agents, or temporal patterns of deforestation and forest degradation	The project and reference region areas comprise exclusively privately owned land. Collectively owned areas have been excluded from the analysis for consistency. (Section. 5. Carbon ownership and rights)
Functional representativeness of drivers and agents	
Los mismos factores directos y subyacentes de deforestación o degradación identificados en el área del proyecto (según la Sección 11), y sus agentes asociados, deberán estar presentes y activos en la región de referencia. Esto incluye evidencia de: a. La presencia histórica de dichos conductores en la región b. Superposición espacial o proximidad entre las áreas de influencia del agente y la región de referencia c. Accesibilidad documentada de los agentes a ambas regiones, respaldada por datos de campo o teledetección	The analysis of the causes and drivers was carried out in the Orinoquía region, specifically in the departments of Casanare, Meta, and Vichada. This area encompasses both the project areas and the reference region, ensuring consistency of the driving factors across all private properties in the aforementioned departments. Historically, the main drivers have been landowners and forest fires. Indirect causes are related to a lack of knowledge of conservation mechanisms and insufficient financial resources to mitigate pressure on forest ecosystems. The spatial proximity between the reference region and the project areas is geographically proven, and they do not overlap (Annex 2.2.1.1. REDD Geodatabase/Feature Dataset "Drivers of Change"; Leak Belt Analysis). Finally, the drivers' access to both regions is evidenced by documented analyses and spatial analyses of land cover changes in the departments of Casanare, Meta, and Vichada.

Fragmented or multi-unit reference regions	
Fragmented or multi-unit reference regions	Since the forests in both the project area and the reference region are riparian forests within private properties in the departments of Meta, Casanare, and Vichada, and once the general criteria and necessary exclusions were met, the resulting polygon of the reference region was adjusted to a single polygon, joining it with the roads or rivers. In this way, all the criteria were met and a single polygon was obtained (Annex 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region"/REDD Reference).
Criterios de exclusión	
The reference region does not include:	- Areas formally designated for legal harvesting. - Areas with restricted access to deforestation/degradation drivers. - Areas under legal protection. - Lands under the jurisdiction or geographic boundaries of other GHG mitigation projects. The information excluded from the reference region and driver analysis corresponds to: 2.2.1.1. REDD Geodatabase/Feature Dataset "Restricted Access"; Feature Dataset "Offsets"; Feature Dataset "Standard Double Accounting Project"
Exceptions for land tenure and legal status differences	

Exceptions for land tenure and legal status differences	The project and reference areas exclusively comprise private land. Collective ownership areas have been excluded from the analysis to maintain consistency. 2.2.1.1. REDD Geodatabase/Feature Dataset "Restricted access".
---	--

3.2.1.2.4 Leakage areas for BCR 0002

The leakage area is established in absolute compliance with the criteria set forth in section 9.3 of the BCR 0002 methodology.

To delimit the leakage belt or potential leakage area on each property, maps of land cover change, road network, deforestation and fire hotspots were integrated. It was defined by analyzing the zone where the greatest changes in deforestation, access roads, deforestation and fire hotspots of vegetation covers occur.

Based on these inputs, we estimated the distance to the density of recent events at 1000 meters. An influence area (buffer) of 1 km was created from the property boundary. From this buffer, restricted access areas (RUNAP categories, Collective Territories, special management areas), compensations, and carbon projects were excluded. With the remaining area, the leakage belt was established, where the areas corresponding exclusively to the forest category within the project's temporal limits were calculated. The geographical information is located in: 2.2.1.1. Geodatabase REDD/ Feature Dataset "Leakage belt analysis"; Dataset "Leakage area". The leakage belt covers 186,019.1 ha; within it, 31,886 ha correspond to forest ($\approx 17.1\%$). Project areas total 21,359 ha ($\approx 11.5\%$ of the belt), so the forested area in the belt is equivalent to about 1.5 times the size of the project areas, demonstrating its relevance for managing potential leakages. The leakage area is determined in strict compliance with the criteria established in section 9.3 of the BCR 0002 methodology.

To delimit the potential leakage area on each property, maps of land cover change, road network, and deforestation and fire hotspots were integrated. The delimitation was based on the analysis of areas with the greatest changes in deforestation, access roads, and the presence of deforestation and fire hotspots in the vegetation.

Based on these inputs, the distance to the density of recent events was estimated at 1000 meters. An influence area (buffer) of 1 km was established from the property boundary. From this buffer, restricted access areas (RUNAP categories, Collective Territories, special management areas), compensations, and carbon projects were excluded. With the remaining area, the leakage belt was defined, where the areas corresponding exclusively to the forest category within the project's temporal limits were calculated. The geographical information is located in: 2.2.1.1. Geodatabase REDD/ Feature Dataset "Leakage belt analysis"; Dataset "Leakage area". The leakage belt covers 186,019.1 ha, of which 31,886 ha correspond to forest (approximately 17.1%). Project areas total 21,359 ha (approximately 11.5% of the belt), which means that the forested area in the belt is equivalent to about 1.5 times the size of the project areas, which underlines its importance for managing potential leakages.

Table 9 REDD+ Leakage Region Criteria

General Criteria	Justificación
<i>a) The area shall be defined according to the expected or demonstrated mobility of deforestation and degradation agents identified in the baseline scenario;</i>	<i>The established requirements are met. The leakage belt is explicitly defined based on the expected and demonstrated mobility of the agents identified in the reference scenario. For its delimitation, this is anchored to the "Change Agent Mobilization Area" polygon of the Change Drivers Feature Dataset (2.2.1.1. REDD Geodatabase), which integrates spatial evidence of displacement and anthropic pressure. In this way, the belt is spatially limited to the real operational scope of the agents, avoiding the inclusion of areas without a reasonable probability of incursion, and fulfills the premise: "The area will be defined according to the expected or demonstrated mobility of the deforestation and degradation agents identified in the reference scenario."</i>
<i>It shall be spatially distinct from the project area but located within the broader socio- ecological context where the agents operate;</i>	<i>Complies. The leakage area is especially distinct from the project areas and is delimited by an external buffer of 1 km drawn from the perimeter boundary of the intervened properties. This strip does not overlap with the project and is located within the same socio-ecological context in which deforestation and degradation agents operate—with</i>

	comparable access conditions, anthropogenic pressures, and tenure arrangements. 2.2.1.1. REDD Geodatabase / Project Area / REDD Ecosystem Managers; 2.2.1.1. REDD Geodatabase / Leakage Area / Leakage Belt.
The area shall not overlap with the project area or other emission reduction interventions, unless those interventions are accounted for separately and transparently;	Complies: The leakage belt does not overlap with the project area or with other emission reduction interventions. To ensure this, spatial exclusion was executed for the project polygon and all carbon project polygons registered in the REDD Geodatabase / Project Area / Standard Double Accounting Project / Carbon Projects, applying topological rules of non-overlap and contiguity verification.
The extent of the leakage area shall be determined based on the scale of the project, the behavior of the agents, and the local landscape dynamics. While no fixed size is required, the project holder shall demonstrate that the area is sufficiently representative to capture potential leakage effects.	Complies. The determination of the leakage belt extension was based on the project's scale, agent behavior, and local landscape dynamics, ensuring it is sufficiently representative to capture potential leakage effects. Specifically, the belt covers 186,019.1 ha (≈ 8.7 times the project area), within which 31,886 ha are forest (17.1%). The project areas sum 21,359 ha (11.5% of the belt), thus the available forested area in the belt is ≈ 1.5 times the size of the project area. 2.2.1.1. REDD Geodatabase/ Feature Dataset "Leakage belt analysis"; Dataset "Leakage area".
Landscape and accessibility similarity requirements	

<i>Forest type similarity: at least 80% of the forest classes present in the project area shall also exist in the leakage area;</i>	Complies. According to the annexed table, the forest classes present in the project area (3.1.1 Dense forest and 3.1.4 Gallery and riparian forest) are both also present in the leakage area. As a note, 3.1.2 Open forest appears only in the leakage area (20.53 ha), which does not affect compliance with the criterion. <table><tr><th>Class</th><th>Project Areas - ha</th><th>Leakage area - ha</th></tr><tr><td>3.1.1. Dense forest</td><td>10.961,2</td><td>13.643,03</td></tr><tr><td>3.1.2. Open forest</td><td>0</td><td>20,53</td></tr><tr><td>3.1.4. Gallery and riparian forest</td><td>14.849,78</td><td>24.817,79</td></tr></table> Project Area: 2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region Delimitation"/ Forest Types Project Area 2020.	Class	Project Areas - ha	Leakage area - ha	3.1.1. Dense forest	10.961,2	13.643,03	3.1.2. Open forest	0	20,53	3.1.4. Gallery and riparian forest	14.849,78	24.817,79
Class	Project Areas - ha	Leakage area - ha											
3.1.1. Dense forest	10.961,2	13.643,03											
3.1.2. Open forest	0	20,53											
3.1.4. Gallery and riparian forest	14.849,78	24.817,79											
<i>Soil and topographic conditions: at least 50% similarity in dominant soil types and slope categories;</i>	Complies: the four slope categories present in the project area (flat, slightly sloped, moderately sloped, and steeply sloped) also exist in the leakage area. Geographical information: Project Area: 2.2.1.1. REDD Geodatabase/ Feature Dataset "Reference Region Delimitation"/ Project pending Leakage area: 2.2.1.1. REDD Geodatabase/ Feature Dataset "Leakage belt analysis"/ leakage												

	area pending.		
	Slope Class	Project Area - ha	Leakage Area - ha
	Flat (a)	85.723,28	131.348,38
	Slightly Inclined (b)	48.77,6	5.089,19
	Moderately Inclined (c)	21.589,9	29.010,79
	Steeply Inclined (d)	16.965,08	20.570,76
	All units present in the project area— III, IV, V, VI, VII, and VIII (and <i>water bodies</i> as a hydromorphological reference unit)— also exist in the leakage area.		
	Soil Type	Project Area	Leakage Area - ha
	Bodies of Water	814,17	2.210,2
	III	0,93	275,31
	IV	21.223,12	34.530,44
	V	35.354,52	46.738,73
	VI	28.736,49	38.531,93
	VII	27.106,21	32.832,79
	VIII	15.802,88	28.425,07
	Project Area: 2.2.1.1. REDD Geodatabase/Feature Dataset "Reference Region Delimitation"/Project Soil Type		

	<i>Leakage Region: 2.2.1.1. REDD Geodatabase/Feature Dataset "Leakage Belt Analysis"/Soil Types</i>
<i>Accessibility indicators: access road density and navigable river density (including a 2 km buffer) shall each be at least 50% similar to those observed in the project area at the start of the reference period</i>	<i>A 2-kilometer buffer zone was delimited around the project areas and compared with the density in the reference region.</i>
Exclusions Criteria	The leakage area does not include: 1. Territories under special management or permanent legal protection. 2. Areas subject to other GHG mitigation projects. 3. Zones with access restrictions that prevent the operation of deforestation or degradation agents. The information that has been excluded from the belt and, consequently, from the leakage area corresponds to: 2.2.1.1. REDD Geodatabase/Feature Dataset "Restricted access"; Feature Dataset "Compensations"; Feature Dataset "Double Accounting Standard Project".

3.2.2 Carbon reservoirs and GHG sources

Emission sources and associated GHGs were selected taking into account the guidelines of the BCR 0002 V4.0 (section 8) and BCR 0005 V1.1 (section 7.2) methodologies based on the characteristics of the project areas and activities, in the next tables, the identified GHG reservoirs and sources are described..

Table 10. Reservoirs and Sources of GHG Natural savannas

Source or reservoir	GEI	Includin g	Justification
----------------------------	------------	-----------------------	----------------------

Aboveground biomass	CO ₂	YES	The change in carbon content in this reservoir is significant according to the IPCC and is highly affected by the loss of natural cover, land use change and temperature increase (Bond-Lamberty et al., 2018, FAO. 2017, Kauffman et al.) ¹ . Therefore, it is relevant for quantifying GHG emissions in project and non-project scenarios.
Underground Biomass	CO ₂	YES	The change in carbon content in this reservoir is significant according to the IPCC.
Dead wood and leaf litter	CO ₂	YES	A decrease in carbon content is expected in the baseline scenario. However, the emissions estimate is based solely on the deadwood reservoir, due to the availability of official data applicable to the project.
Soil organic carbon	CO ₂	YES	It is considered to be one of the main carbon reservoirs in natural savannah ecosystems, and can also be highly affected by the loss of natural cover, change in land use and increase in temperature (Bond-Lamberty et al., FAO. 2017, Kauffman et al 2016)
Combustion of woody biomass	CO ₂	NO	According to the BCR 0002 V4.0 methodology, CO emissions from woody biomass combustion are not quantified.
	CH ₄	YES	In the event of fire events in the tree component (burning of woody biomass in shrublands) during the monitoring period, the affected area will be identified and CH emissions will be quantified. Non-woody aboveground biomass is generally burned or decomposed within a year of production and is therefore considered to be in equilibrium with CO ₂ uptake, plant respiration, and annual decomposition. IPCC, Grasslands, in <i>Guidelines for greenhouse gas inventories</i> . 2006, IPCC. pag. 1-49.

Table 11. REDD+ GHG Reservoirs and Sources

Source or reservoir	GEI	Including	Justification
----------------------------	------------	------------------	----------------------

¹<https://openknowledge.fao.org/server/api/core/bitstreams/6fooca3a-90ae-432b-8124-d748533b277a/content>

Aboveground biomass	CO ₂	YES	The change in carbon content in this deposit is significant according to the IPCC and is greatly affected by the loss of natural cover, land-use change, and increased temperature (FAO. 2017, Kauffman et al. 2016). Furthermore, the loss of forest cover and the consequent release of CO ₂ can have a considerable impact on the global carbon balance (Brown et al., 1996). ²
Underground Biomass	CO ₂	YES	The change in carbon content in this reservoir, according to the IPCC, is considerable and can be significantly affected by land-use changes (Kauffman et al. 2016). In addition, official country information applicable to the project is available.
Dead wood and leaf litter	CO ₂	YES	A decrease in carbon content is expected in the baseline scenario. However, the emissions estimate is based solely on the deadwood reservoir, due to the availability of official data applicable to the project.
Soil organic carbon	CO ₂	YES	El depósito es susceptible a pérdidas considerables de The deposit is susceptible to considerable carbon losses in the baseline scenario, so the change in carbon content is significant according to the IPCC. Yepes et al. (2011) recommend its inclusion in REDD+ projects. Furthermore, official information applicable to the project exists.
Combustion of woody biomass	CO ₂	NO	According to the BCR 0002 methodology, CO emissions from woody biomass combustion are not quantified, as they are accounted for as deforestation.
	CH ₄	YES	In the event of fire events in the arboreal component (combustion of woody biomass) during the monitoring period, the affected area will be identified and CH ₄ emissions quantified.
	NO ₂	YES	In the event of fire events in the arboreal component (combustion of woody biomass) during the monitoring period, the affected area will be identified and CH ₄ emissions will be quantified.

² (Brown et al., 1996)) <https://www.jstor.org/stable/42607270>

3.2.3 Time Limits and Analysis Periods

Project timelines correspond to the periods during which GHG emission reductions/absorptions are quantified.

3.2.3.1 Project start date

The CO₂Bio P₄ Carbono del Orinoco project is scheduled to start on February 1, 2020. To define this date, it was essential to establish a common goal with each landowner: the conservation of the strategic ecosystems present on their land. Landowners are the primary agents of transformation and, at the same time, primarily responsible for the conservation and protection of forests and savannas from threats such as wildfires. In this sense, expressing their intention to conserve and incorporate part of their land into a mitigation project represents an essential step toward generating the change the project seeks to promote (See annex o. Project inscription/five years extension) .

The purpose of the letters of intent signed by the landowners is to generate a clear and shared agreement on ecosystem conservation, which is the central axis of the project. These documents not only reflect the voluntary commitment of the participants, but also allow for an objective and verifiable establishment of the date on which the agreement was consolidated. Therefore, they constitute a key input for accurately determining the project's start date. ([Annex 4.3.1 Letters of Intent](#)).

3.2.3.2 Quantification period of GHG emission reductions/removals

Considering that the project implements REDD+ activities and activities that prevent land-use change in natural savannas, the following project duration periods and quantifications are established:

- a. Project Duration: 40 years from the project start date (February 1, 2020)*
- b. Quantification periods: Renewable quantification periods for REDD+ activities every 10 years and for natural savannah activities every 20 years with a renewal of equal duration.*

3.2.3.3 Monitoring periods

An initial follow-up period of 4 years and 11 months is established, and subsequently every 2 years.. However, it may be modified and carried out annually or at least once every 5 years.

3.3 Identification and description of the baseline or reference scenario

According to the tool "Identification of scenario and demonstration of additionality. Version 1.0. July 25, 2025", the analysis of REDD+ activities and activities that prevent land use change in natural savannas is carried out in a sequential manner essential but independent. In the following sections, the implementation of the tool will be developed step by step for each applied methodology.

3.3.1 Identification and description of the baseline scenario activities BCR 0005

3.3.1.1 Step 1 Identification of alternative scenarios

Land-use alternatives are identified based on an analysis of potential activities and their compatibility with relevant regulations and legislation, taking into account the conditions of the project area and the reference region, as well as relevant national and/or regional policies and circumstances, such as historical land uses, practices, and economic trends. The following activities and scenarios were identified.

Table 12 Step 1a. Identify credible alternative land-use scenarios for the proposed project activities.

Scenario	Description
Continuation of the pre-project land use scenario	This alternative represents a likely scenario where landowners seek their livelihoods and maximum financial returns per hectare through economic activities, primarily agriculture, resulting in the transformation of natural savannas and the expansion of the agricultural frontier. The trends observed in the reference region support the likelihood of this scenario, with crops such as corn, rice, and clean pastures being the most likely alternatives within this scenario. See appendix for causes and agents of sheet transformation.
Reduction of land use change in the Natural Savannah within the project boundary, carried out without being registered as a BCR project activity	This alternative establishes the voluntary participation of landowners in activities that reduce the transformation of natural savannas within their properties. It also encourages the establishment of new agricultural systems that do not damage the natural cover of savannas, without the need for financial incentives.

The result of the List of Credible Alternative Land Use Scenarios that would have occurred on the land within the boundary of the BCR 0005 project activity is:

- Continuation of the pre-project land use scenario
- Reduction of land use change in the Natural Savannah within the project boundary, carried out without being registered as a BCR project activity

The following table shows an analysis of the consistency of the alternatives with the relevant regulations.

Table 13 Step 1.b Consistency of credible alternative land use scenarios with applicable mandatory laws and regulations

Scenario	Justification for BCR 0005 Activities
Continuation of the pre-project scenario in natural savannah lands	It is consistent and aligned with all applicable laws, statutes, regulatory frameworks, or policies in savannah areas. It represents a typical state of many lands in the plains of the departments of Casanare, Meta and Vichada, where vegetation is preserved to some degree, before conversion to agricultural use. The Orinoquia region presents a favorable environment for the implementation of agricultural programs, as the majority of private land is located within the agricultural frontier, making the conversion of natural savannas viable. Furthermore, this historic conversion could be accelerated in accordance with national policies that define the Orinoquia region as a Colombian agricultural breadbasket. Decree 2369 of 2010, which regulates Law 1152 of 2007 (Rural Development Statute), empowers the National Government to plan and manage land use in agricultural frontier areas, including the Orinoquia region. This decree seeks to promote agricultural production in underutilized or unexploited areas.. Resolution 128 of the Ministry of Agriculture and Rural Development establishes the criteria for the expansion of the agricultural frontier. This resolution allows for the change of land use from non-forested areas to commercial agricultural, livestock, and forestry activities, provided that special management areas are respected and nature reserve zones are not violated. Therefore, land use change is permitted in areas of the Orinoquia. In conclusion, the current legal framework in the Orinoquia region allows for land use changes, which supports the additionality of projects

	seeking to conserve or restore areas that could be converted to agriculture or livestock. Therefore, it is assumed that this scenario is likely and may continue in the future..
Reduction of land use change in the Natural Savannah within the project boundary, carried out without being registered as a BCR project activity	The natural savannas of the Colombian Orinoquia are strategic ecosystems that require management based on conservation and sustainable use, according to Law 99 of 1993, which establishes the country's environmental framework. This law requires that any intervention in these areas be planned to preserve their biodiversity and ecosystem services, particularly those related to water regulation and carbon storage. Decree 2372 of 2010, which regulates areas for the protection and sustainable use of biodiversity in Colombia, establishes that savannas, although susceptible to intervention for productive activities, must be managed under management plans that ensure their long-term sustainability. This decree highlights the importance of integrating productive activities such as livestock farming and agroforestry with practices that prevent soil degradation and the loss of biodiversity in savannas. Thus, land-use changes are permitted in these areas, provided that sustainable management practices are applied that do not compromise the structure and function of the ecosystem. Law 1930 of 2018 promotes the comprehensive and sustainable management of strategic ecosystems, including natural savannas, and establishes guidelines for their use. This law recommends that any activity carried out in these territories should be oriented toward conservation, ecological restoration, and rational use of natural resources. In the specific case of natural savannas, it is recommended that agricultural activities incorporate measures to reduce soil pressure and maintain vegetation cover, promoting systems such as silvopastoralism that balance production with ecosystem conservation. In conclusion, current legislation allows the use of natural savannas, including the implementation of management strategies that guarantee their conservation and the maintenance of their ecological functions. This scenario is legal and complies with current environmental regulations, but in practice its application is limited and depends on individual property owners' decisions. Although it is not prevalent, it is not excluded as an alternative, as it is likely to occur on some properties.

The result of the List of credible alternative land use scenarios that comply with mandatory legislation and regulations taking into account their application in the region or country for BCR 0005 activities is.

- Continuation of the pre-project land use scenario
- Reduction of land use change in the Natural Savannah within the project boundary, carried out without being registered as a BCR project activity

3.3.1.2 Step 2 Barrier Analysis BCR 0005

This step serves to identify barriers and assess which of the land use scenarios identified in substep 1b are not impeded by these barriers:

Table 14. Substeps 2a and 2b. Identification and analysis of barriers BCR 0005

Scenario	Reduction of land use change in the Natural Savannah within the project boundary, carried out without being registered as a BCR project activity
Barrier	Financial Barriers
Barrier to financing There is no access to capital markets due to real or perceived risks associated with domestic or foreign direct investment in the country where the project will be implemented: In Colombia, access to capital for voluntary environmental initiatives is limited and highly risky, which constitutes a barrier to land conservation projects in the Orinoquía. According to the National Planning Department (2022), only 8% of the General Royalties System was allocated to the Ministry of Environment and 10% to the Ministry of Agriculture, resources that are diluted across multiple programs without ensuring direct support for private landowners. Likewise, reports from the Bank of the Republic (2021) show the absence of foreign direct investment in environmental issues, in contrast to the strong injection of capital into the agricultural and extractive sectors, which promote the transformation of natural savannas. While mechanisms such as green bonds exist, access to them is restricted. Between 2016 and 2022, only 20 environmentally designated bonds were issued (BVC, 2022), focused on large-scale projects with high technological requirements, unattainable for private conservation initiatives. At the territorial level, Payment for Environmental Services (PES) programs in the Orinoquía region have demonstrated the fragility of financing: for example, in Meta, PES contracts financed by Visión Amazonía or international cooperation resources have been temporary and small-scale (less than 500 hectares per property), ceasing once the flow of resources ends, leaving landowners without	

stable mechanisms to sustain conservation. This precedent confirms that the lack of access to capital prevents landowners from maintaining savannas in conservation without additional incentives.

In contrast, the BAU scenario activities—extensive livestock expansion and mechanized agriculture—receive constant national and international funding, reinforcing the trend toward savanna conversion. Consequently, the alternative scenario of "carbon-free intervention reduction" is financially unviable. Only revenues from the carbon market can overcome this investment barrier and guarantee the continued existence of conservation on private lands in the Orinoquia region.

Barrier to liquidity

The conservation of natural savannas on private lands in the Orinoquia region faces a liquidity barrier, as landowners lack regular income to cover the initial and recurring costs of the activity (fencing, fire control, passive restoration, and monitoring). In contrast, BAU scenario activities (extensive livestock farming and mechanized agriculture) generate regular cash inflows from the sale of meat, milk, or crops, ensuring their operational and financial continuity. (Contexto ganadero, 2022)³

The lack of consistent cash flow for conservation projects makes it difficult to respond to emergencies, sustain basic management efforts, or ensure long-term sustainability, even if some initial funding were available. Experience with voluntary conservation and PES programs in the region confirms that, when external resources are exhausted, landowners abandon conservation practices due to insufficient liquidity to sustain them. (DNP, 2022)⁴

Thus, the liquidity barrier constitutes a structural obstacle that makes the alternative conservation scenario without carbon credits unviable. Periodic payments from the carbon market are the only stable source of income that can overcome this limitation and make conservation on private lands viable.

Barrier	<i>Social and cultural barriers</i>
---------	-------------------------------------

Laws and customs (historical trend)

The Orinoquia region has been prioritized by recent governments and the private sector as a new frontier for agroindustrial development. In recent decades, exotic grasses and other crops such as rice and soybeans have grown at an accelerated pace. With the growing demand for food and agricultural products, this trend of land use change is expected to continue and intensify in the

³ Livestock context, 2022. <https://www.contextoganadero.com/ganaderia-sostenible/aprenda-a-gestionar-el-flujo-de-caja-y-tendra-exito-en-su-ganaderia>

⁴ National Planning Department (2022). General Royalties System Report. <https://www.dnp.gov.co/programas/regalias/Paginas/Inicio.aspx>

coming years.

Planning for agroindustrial expansion, while ensuring the maintenance of ecosystem services and biodiversity conservation, is an urgent task for the government, the private sector, and the region's inhabitants. This requires understanding recent land-use changes, as well as potential future trajectories and their socio-environmental implications, to inform decision-makers. However, public and open-access information on agroindustrial expansion is very limited for this region of the country, especially for natural savanna ecosystems.

To understand these change processes, land cover and use (LULC) maps were generated in 2014 and 2020 by training neural network models to predict land cover and use from Landsat 8 satellite imagery, using the IDEAM 2015 land cover map as training data. During the 2014–2020 period, more than 545,000 ha of natural savannas were transformed into agricultural land cover.

Likewise, the transformation of natural savannas to human uses during the 2009–2018 period in the department of Meta amounts to 425,314.1 hectares and 346,200.2 hectares in the department of Vichada. (*See Annex 1 Project Description/1.1 Causes and agents of deforestation and land-use changes*).

- Widespread illegal practices (e.g. illicit crops, extraction of non-timber products, logging):

There are several illegal practices present in the country that can represent significant barriers to these types of ecosystem conservation and restoration projects, but one of the most significant is illicit coca crops. And Colombia, for more than 40 years, has held the sad honor of being one of the world's leading producers of coca leaf, according to data provided by the Illicit Crop Monitoring System (SIMCI, 2021).

In particular, the Orinoquia region, as a border zone with constant changes in both land ownership and use, is a territory with a relatively high density of these types of crops. The departments of Meta, Casanare, Meta, and Vichada are the most representative. However, the obvious consequence of the implementation of these crops (coca and marijuana) has direct consequences for natural ecosystems, such as deforestation. This, in turn, is closely linked to poverty in rural areas, armed conflict, and little or no interest in the conservation of the area's animal and plant species.

Despite the above, for several years now, a steady process of agroindustrial strengthening has been underway in the eastern plains, which has led to the gradual adoption of legal alternatives for agricultural production. This is a response from the National Government, providing options for families who relied economically on these crops. One example is the commitment to cocoa, introduced as a gateway to legality for the most remote farmers in the eastern plains.

According to data from the monitoring of territories affected by illicit crops (2020), carried out by

the United Nations Office on Drugs and Crime (UNODC)⁵Coca crops and their subsequent transition to cocaine have shown a progressive decline in the Orinoquia region. In 2005, around 9,709 hectares of these crops were reported, but by 2020, a staggering 121 hectares were cultivated. This represents a 99% decrease, meaning that since 2018, the territories included in the eastern plains contain less than 0.5% of the entire country's cocaine crops.

Lack of organization of local communities

The Orinoquía region is characterized by being a heterogeneous territory, both in its geography and its cultural richness. Taking this into account, the communities present in the project's area of influence—that is, the departments of Vichada and Meta—combine the presence of Indigenous populations or communities, Afro-descendants, and Creole Llaneros or Original Llaneros (Piñeros, 2019).⁶The latter represent the target population of the projects as they are, and this is so because they involve a private acquisition of land legitimized by the documentation they possess.

Depending on the organization of these families, groups of families (mostly settlers) or companies that can demonstrate rights over certain territories, the organizational strategies promoted by the national government stand out. The first to consider is CONPES 3797: Policy for the Comprehensive Development of the Orinoquía: Altillanura – Phase I (2014), which was translated within the provisions of the 2010-2014 National Development Plan: Prosperity for All. This document focused on an analysis of the Orinoquía plateau, addressing its social, cultural, geographic, and economic aspects. The data obtained from this analysis raised alarms due to the evident mismanagement of the public sector, which entailed indifference to the management of public and natural resources, the environmental fragility of the territory, and social stability. These aspects, of course, are closely linked to the sustainability and direct growth of the region's productive practices. Among the main objectives of this CONPES was to create the economic and social conditions that would enable equitable and inclusive development, which would level the playing field for achieving sustainable development.

However, CONPES is not the only tool identified that would aim to improve the land use and its inhabitants. A second strategy is the Orinoquia Master Plan, which ran from 2014 to 2018, which was based on a regional strategy called "Environment, Agriculture, and Human Development: Growth and Well-being for the Llanos" from the 2014-2018 National Development Plan (PND).⁷This document was prepared based primarily on the information provided during the presentation of the regional dialogues that are intended to shape it.

In particular, the aforementioned National Development Plan focused on four crucial aspects for the territory, including: sustainable productive development, water resources and the environment,

⁵ UNODC. (2020). Colombia: Monitoring of territories affected by illicit crops 2020.https://www.unodc.org/documents/crop-monitoring/Colombia/Colombia_Monitoreo_de_territorios_afectados_por_cultivos_ilicitos_2020.pdf

⁶ Piñeros, R. (2019). The Other New Llaneros: Migration, Race, and Gender in the Oil Palm Labor Market in the Colombian Orinoquia Region. *Culture and Work*, (94), 93–103.

⁷ *National Development Plan 2014-2018* Departamento Nacional of Planning <https://colaboracion.dnp.gov.co/CDT/PND>

infrastructure and logistics, and territorial planning (PND, 2016).⁸. In this way, we seek to create a bridge between legal certainty and potential investments in the region, which includes tourism, transportation, agriculture, and, of course, the environment and water resources.

Likewise, a third strategy was implemented in 2017 when the “Comprehensive Regional Climate Change Plan for the Orinoquia” (PRICCO) was established.⁹, developed in Arauca, Casanare, and of course in Vichada and Meta. This document reinforced the urgency of achieving integration between climate change and the potential relationship between management processes and the development of the region and environmental disasters. Similarly, a fourth is the 2018-2022 National Development Plan (PND), which established twenty goals within the framework of commitments known as “pacts for the productivity and equity of the regions,” among which is precisely the “Llanos-Orinoquía Region Pact: Connecting and Strengthening the Sustainable Food Supply of the Region with the Country and the World.” Basically, the aforementioned document made clear the relationship of this pact with the pact of productivity, legality, equity for ethnic communities (in the area of opportunities), and of course, environmental, economic, and social sustainability (DNP, 2019).

The most obvious barrier identified is the lack of precise and decisive implementation of the strategies and agreements summarized above, whether due to bureaucratic inefficiency or corruption itself. However, the influence they have had in elevating concerns about issues such as climate change, ecosystem conservation, and the relationship between sustainable development and environmental protection in the collective imagination of its residents is evident. In other words, there is still a long way to go.

Barrier	<i>Institutional Barriers</i>
---------	-------------------------------

Lack of adequate evidence and documentation on land tenure to support security of tenure

In the Colombian Orinoquia region, approximately 46% of properties are presumed to be informal, indicating that they meet at least one of the criteria established for their identification. At the departmental level, the department of Vichada has the highest presumption of informality, ranging from 50% to 75%, while the other three departments range from 25% to 50%.¹⁰

- Lack of adequate land tenure legislation and regulations to support security of tenure:

Inequality in land tenure is a major problem in Colombia, especially in the departments of Casanare, Meta, and Vichada, where the project is being implemented. A minority of citizens hold title to their land, while the majority of the population occupies it illegally. For almost 40 years, the National Government has attempted to implement agrarian strategies and reforms to address this

⁸ [National Development Plan 2018-2022DepartamentoNational ofPlanning https://colaboracion.dnp.gov.co/ CDT > Press](https://colaboracion.dnp.gov.co/CDT/Press)

⁹ [The Orinoquia region now has a Comprehensive Regional Plan for... Ministry of Environment and DevelopmentSustainable https://archivo.minambiente.gov.co/index.php/285...](https://archivo.minambiente.gov.co/index.php/285...)

¹⁰Summary of the diagnosis of the distribution and ownership of rural land in the ORINOQUIA regionhttps://upra.gov.co/Kit_Territorial/2-%20Informaci%C3%B3n%20por%20Departamentos/ARAUCA/Diagnostico%20distribucion%20tenencia%20tierra%20rural%20Orinoquia%20-%20ARAUCA.pdf

inequality and provide resources that allow communities to access land ownership. However, this process has slowed, resulting in irregular land tenure becoming common in these territories.

The legal regulation of real estate in Colombia originates in constitutional provisions that initially recognize the fundamental rights to private and collective property for a social purpose, namely, to improve the quality of life of Colombian citizens. In the departments of Vichada and Meta, the right to property has been violated and infringed over the years, primarily due to the armed conflict, resulting in displacement and a lack of government control over land. This process has subsequently been addressed by the competent authorities with reparation strategies, which has allowed numerous citizens to regain ownership and occupation of their lands.

In addition to the above, the Colombian Civil Code contains provisions related to the ownership of real estate for both individuals and legal entities. This compilation of norms classifies land ownership into ownership, possession, and/or tenure, establishing guidelines that guarantee the quality of each person's rights according to their status in the property. Addressing this inequality in land ownership and promoting the formalization of property ownership is essential to guarantee legal security for citizens and the sustainable development of the region. This situation will require ongoing collaboration between the government, the involved entities, and the local community.

Table 15. Elimination of land use scenarios that are impeded by the identified barriers of BCR 0005

Land use alternatives	Barriers	Result of the barrier analysis
Continuation of the pre-project land scenario	NO	Considering the description of the barriers, and comparing it with theIn the previously identified land use scenarios, one of the most likely alternatives for defining the project baseline (other than the project activity) is the continuation of the previous land use.This is because none of the barriers prevent the continuation of the activities that have historically taken place in the territory, i.e., constant degradation. Results: Continue

Reduction of land use change in the Natural Savannah within the project boundary, carried out without being registered as a BCR project activity	YES	Investment: Without the availability of investment capital, the transition from current productive activities to those that do not affect natural cover does not occur. Social: Considering the economic dependence of current population groups, which promotes the development of activities that transform areas, if the population does not have a financial mechanism to counteract this dependence, it is unlikely that economic alternatives will be developed that offer income opportunities and mitigate the negative environmental impact. Results: Delete
--	-----	--

Table 16. Substep 2c. Demonstration that BCR 0005 alternatives are not prevented

Scenarios that are not impeded by any barriers	
Continuation of the pre-project land use scenario	This scenario corresponds to the predominant historical pattern in the Orinoquia region: extensive livestock farming and agroindustrial expansion into natural savannas. It does not face significant barriers because: Available financing: There are agricultural credit lines (Banco Agrario, Finagro, ICR) with subsidized rates and state guarantees that facilitate access to capital for livestock and agricultural activities. This contrasts with the lack of equivalent financial instruments for carbon-neutral conservation. Institutional support: Policy documents such as the Orinoquia Master Plan (DNP, 2014) and CONPES 3982 of 2020 explicitly promote agricultural expansion in the region, under the narrative of a “national agricultural pantry.” Social and cultural legitimacy: Local tradition recognizes land as a productive asset; conserving it without income is perceived as unproductive. Livestock farming in Meta, Vichada, and Casanare has union (Fedegán) and political support, which reinforces this scenario as socially viable.

- Substep 2d. Demonstration that carbon credit revenues are decisive BCR 0005

The implementation of a natural savanna conservation scheme in the Colombian Orinoquia region faces structural limitations that make its sustainability unviable in the absence of carbon market revenues. In economic terms, the conservation scenario generates direct costs (monitoring, early fire warnings, active restoration, administrative management) and opportunity costs for landowners (giving up extensive livestock farming or expansionist agriculture, activities with immediate returns).

In Colombia, instruments such as payments for environmental services (PES) and sector-specific financial incentives exist; however, these mechanisms are insufficient to cover the costs associated with comprehensive conservation management. Independent evaluations (Banco de la República, 2021; National Planning Department, 2022)¹¹ They have pointed out that public and private investment is concentrated in extractive and agro-industrial sectors, while capital flows toward the conservation of strategic ecosystems are marginal. This reality confirms that, without an additional source of income, the autonomous conservation of natural savannas is not viable for rural landowners.

Revenues derived from carbon credits represent the only mechanism capable of simultaneously offsetting implementation costs and providing incentives for the permanence of conservation activities and sustainable uses. Unlike traditional PES, carbon credits generate a sustainable financial flow over time, which allows not only covering the project's operational expenses but also offering landowners an extra incentive. Consequently, carbon credits are the decisive factor that unlocks investment barriers and enables the implementation of the conservation activities planned in the Project. Their absence would imply the impossibility of sustaining the conservation model, while their availability ensures the continuity of actions and the permanence of the projected environmental and social benefits. ([See Annex 1. Project Description/1.2 Financial Model](#))

3.3.1.3 Step 4 Analysis of Common Practices BCR 0005

- Substep 4a. Definition of applicable measure and scope of comparison

¹¹ National Planning Department (2022). General Royalty System Report. <https://www.dnp.gov.co/programas/regalias/Paginas/Inicio.aspx>

Bank of the Republic (2021). Foreign direct investment by sector. <https://www.banrep.gov.co/es/estadisticas/inversion-extranjera-directa>

The measure implemented by the project involves preventing land-use change in natural savannas in the Colombian highlands through the implementation of conservation agreements with private landowners and the establishment of economic incentives derived from the generation of carbon credits. This action seeks to maintain the natural cover of savannas, preventing their conversion to agricultural or agro-industrial systems that generate emissions from biomass loss and soil degradation.

According to the BCR Tool, the applicable geographic area is initially defined as the entire host country (Colombia). However, in this case, delimiting it to the Orinoquía region, specifically the departments of Casanare, Meta, and Vichada, is justified, as the conditions faced by the natural savannas in this region differ significantly from those of the rest of the country:

- *Differential transformation pressure: The Orinoquía has been declared by the National Government as Colombia's new agro-industrial frontier (CONPES 3982 of 2020; Orinoquía Master Plan, DNP 2014). This generates a specific incentive for the conversion of savannas into exotic pastures, rice, soybeans, among others, a pressure that is not present with the same intensity in other regions of the country.*
- *Unique biophysical characteristics: The natural savannas of the Orinoquía present unique edaphoclimatic conditions, marked by water seasonality. These conditions mean that land use changes imply intensive investment in inputs and are highly dependent on agricultural expansion policies.*
- *Socioeconomic and cultural context: The region has a strong tradition of extensive livestock farming on natural savannas, which has historically configured a land use pattern that differs from the predominant agricultural practices in other regions of the country, such as the Andean or Caribbean.*
- *Limited infrastructure and connectivity: The low road density and high transport costs condition the type of productive activities that are implemented, reinforcing the pressure on natural savannas for large-scale uses.*

For these reasons, and in coherence with the work carried out in steps 1 to 3, the most appropriate applicable geographical area for the evaluation of common practices and additionality is the Orinoquía (Casanare, Meta and Vichada), where the threat of conversion of natural savannas is most evident and where the project seeks to encourage avoiding land use change through financial mechanisms derived from carbon credits.

- *Substep 4b. Identification of similar activities and market penetration*

The measure analyzed consists of avoiding land-use change in natural savannas in the Colombian Orinoquia region, through voluntary conservation schemes financially supported by carbon credit revenues. To determine whether this measure constitutes a common practice, those activities that meet the conditions established by the BCR Tool (BioCarbon v1.0, July 2025) are identified and included as comparable activities: they must provide equivalent environmental services, be implemented under similar institutional and market conditions, and have been developed prior to the project's public disclosure ([See Anex 2.2.1.1.1 Common practices](#)).

In the Colombian context and the reference geographic region, the most relevant comparable activities are the following:

- *Civil Society Nature Reserves (RSNRs) or other protection declarations: These are areas voluntarily declared by private landowners under Law 99 of 1993 and regulated by Decree 1996 of 1999. Several of these reserves in the departments of Casanare, Meta, and Vichada include natural savanna cover. They constitute an institutional and legal precedent for private conservation, but their scope is limited: the total number of RSNRs registered in Colombia covers less than 0.5% of the total savanna area of the Orinoquia region, reflecting a marginal scale compared to the pressure of land transformation in the region.*
- *Ramsar category: The Bitá River Ramsar site and other environmental management systems (e.g., Integrated Management Districts) protect fragments of natural savannas. However, these designations are rare and restricted to specific areas, and are not a widespread practice in the Orinoquia region. Furthermore, the levels of oversight and funding associated with these management categories are insufficient to curb the current rates of conversion to agricultural uses.*
- *Payments for Environmental Services (PES) pilot programs: In Colombia, specific PES initiatives have been implemented that include savannas and forests in the Orinoquia region (for example, programs run by the Ministry of Environment and international cooperation agencies). However, coverage and resource availability have been marginal compared to the scale of agroindustrial pressure. These programs have not generated sufficient incentives to sustainably prevent the conversion of natural savannas.*
- *Environmental Compensations: In the departments of Casanare, Meta, and Vichada, environmental compensations are mainly focused on the restoration and conservation of strategic ecosystems such as natural savannas, gallery forests, morichales, and wetlands, in line with Colombian regulations on biodiversity loss*

and natural resource use. These compensations may include ecological restoration, the protection of connectivity corridors, the implementation of agroforestry systems, and fire prevention measures, which not only fulfill legal requirements but also create opportunities to align with conservation and climate mitigation projects in the region.

Table 17. Comparable areas in the natural savannah ecosystem in the reference region

Comparable actions	Area (hectares)
Protected areas	696.982,7
RAMSAR	582.127,2
Payments for Environmental Services (PES) pilot programs:	181.155,2
Environmental Compensations:	48,1

Based on this prior analysis, the common practice factor is calculated:

$$F = 1 - \frac{M_{diff}}{M_{all}}$$

Where:

M_{diff}: Aggregate magnitude of similar activities with essential differences (*Protected areas, RAMSAR, Environmental Compensations*)

M_{all}: Aggregate magnitude of all comparable activities (*Protected areas, RAMSAR, Environmental Compensations, Payments for Environmental Services (PES) pilot programs*)

$$F = 1 - \frac{1.279.158,00}{1.460.313,20}$$

$$F = 0,12$$

$$F = 12\%$$

Consequently, with $F < 20\%$, applying the common practice statistical test (comparison between *M_{all}* and *M_{diff}*) leads to the conclusion that the conservation of natural savannas is not a common practice in the Orinoquía region (Casanare, Meta, and Vichada). The

project introduces an additional measure that overcomes structural barriers and is only viable through financing from carbon credits

3.3.1.4 Step 5 Selection of the base scenario BCR 0005

Table 18. Step 5. Selecting the base scenario BCR 0005

Scenarios that are not impeded by any barriers	Baseline scenario?
Continuation of the pre-project land use scenario	Yes: Since the list of likely scenarios does not include the implementation of activities to reduce deforestation and forest degradation without being registered as BCR 0005 activity and there is only one scenario that is not impeded by any barriers, then this is considered a baseline scenario.

3.3.2 Identification and description of the base or reference scenario activities BCR 0002 0002

3.3.2.1 Step 1 Identification of land use alternatives BCR 0002.

Land-use alternatives are identified based on an analysis of potential activities and their compatibility with relevant regulations and legislation, taking into account the conditions of the project area and the reference region, as well as relevant national and/or regional policies and circumstances, such as historical land uses, practices, and economic trends. The following activities and scenarios were identified.

Table 19 Step 1a. Identify alternative land use scenarios BCR 00022

Scenery	Description
Continuation of the pre-project land use scenario	This alternative corresponds to the deforestation and forest degradation scenario, as landowners seek out natural resources for their subsistence and the satisfaction of their basic needs. This alternative establishes that the scenario within the project areas corresponds to the trends that occur in the reference region.(which includes the project areas), regarding the increase in deforestation and forest degradation. (See Annex 1 Project Description/1.1 Causes and agents of deforestation and land-use changes).

Reduction of deforestation and forest degradation within the project boundaries carried out without being registered as a BCR project activity.	This alternative highlights the active and voluntary participation of landowners in controlling activities that cause deforestation and forest degradation on their properties. Through environmental awareness and a vision of sustainable development, property owners take specific measures to prevent the expansion of agricultural land, prevent forest fires, and reduce logging.
---	--

The result of the List of credible alternative land use scenarios that would have occurred on the land within the boundary of the BCR 0002 project activity is.

- Continuation of the pre-project land use scenario
- Reduction of deforestation and forest degradation within the project boundaries carried out without being registered as a BCR project activity.

The following table shows an analysis of the consistency of the alternatives with the relevant regulations.

Table 20 Step 1.b Consistency of credible alternative land use scenarios with applicable mandatory laws and regulations BCR 0002

Scenario	Description
Continuation of the pre-project scenario In forest lands	Regarding forest areas in the Colombian Orinoquia region, national legislation establishes clear restrictions on land-use changes, protecting these ecosystems due to their environmental importance. Law 99 of 1993, which created the Ministry of the Environment, establishes that natural forest areas must be conserved and that land-use changes for agricultural, livestock, or infrastructure activities are prohibited, except in exceptional circumstances and with the express authorization of the competent environmental authorities. Decree 1791 of 1996, which regulates forest use in Colombia, reinforces this protection by stipulating that natural forests are subject to a sustainable management regime. This means that forested areas may only be intervened under a controlled use scheme and for specific purposes such as conservation, restoration, or the sustainable use of forest products. In this context, land use change in forested areas to convert them into agricultural or urban areas is explicitly prohibited without an approved forest management plan and the corresponding

	environmental license. In the case of REDD+ areas, although deforestation and forest degradation do not comply with current regulations, the population living in the project area and the reference region engages in them extensively and regularly, as evidenced in the analysis of causes and agents. Furthermore, forest fires are commonly caused by natural or human activities. This is referred to as unplanned deforestation and forest degradation. As evidence that this phenomenon of unplanned deforestation and degradation exists in Colombia, the Government of Colombia, through the Ministry of Environment and Sustainable Development, presents to the country "Forests Territories of Life" Comprehensive Strategy for the Control of Deforestation and Forest Management, as an intersectoral policy instrument that involves the co-responsibility of the different sectors of the Colombian State, with the purpose of stopping deforestation and forest degradation, addressing the complexity of the causes that generate it, based on the recognition of the strategic significance of these ecosystems for the country, due to their sociocultural, economic and environmental importance, for their potential as a development option within the framework of the peacebuilding process, and for their contribution to mitigation and adaptation to climate change. For all the above reasons, it is assumed that this scenario can be maintained over time and constitutes a probable scenario.
Reduction of deforestation and forest degradation within the project boundaries carried out without being registered as a BCR project activity.	Regarding forest areas in the Colombian Orinoquia region, national legislation establishes clear restrictions on land-use changes, protecting these ecosystems due to their environmental importance. Law 99 of 1993, which created the Ministry of the Environment, establishes that natural forest areas must be conserved and that land-use changes for agricultural, livestock, or infrastructure activities are prohibited, except in exceptional circumstances and with the express authorization of the competent environmental authorities. Decree 1791 of 1996, which regulates forest use in Colombia, reinforces this protection by stipulating that natural forests are subject to a sustainable management regime. This means that forested areas may only be intervened under a controlled use scheme and for specific purposes such as conservation, restoration, or the sustainable use of forest products. In this context, land use change in forested areas to convert them into agricultural or urban areas is explicitly prohibited without an approved forest management plan and the corresponding environmental license.

3.3.2.2 Step 2 barrier analysis BCR 0002

Table 21. Substeps 2a and 2b. Identification and analysis of barriers BCR 0002

Scenario	Reduction of deforestation and forest degradation within the project boundaries carried out without being registered as a BCR project activity.
Barrier	Financial Barriers
Barrier to debt financing One of the main barriers to implementing climate change mitigation projects to reduce deforestation and forest degradation is the limited access to Colombian financial markets for leverage, which represents limited opportunities for their implementation. This is because projects in the environmental sector behave differently than projects in the agricultural, manufacturing, livestock, or hydrocarbon sectors. To support this, it is necessary to evaluate the main means of seeking funding for climate change mitigation projects. These are public or private sources, and, especially for GHG projects, suggest a critical role in their scope. To this end, it is important to note that public entities do not provide stable, governable, and direct financing for the implementation of GHG project activities. This is due to institutional weakness caused in part by the country's balance of payments deficit. This is evidenced by the reports on the performance of Colombia's balance of payments published quarterly by the Bank of the Republic (Banco de la República de Colombia, 2021).¹²; and the lack of political will, which is reflected in the public's view by the high level of institutional distrust, as confirmed by the methodology and protection of the Social Capital Barometer (BARCAS) in its fourth and most recent study.¹³, which shows that 79.6% of respondents have little or no confidence in the national government (CONTRIAL, 2017); however, the Colombian government, through the Ministry of Environment and Sustainable Development and the Ministry of Finance, has implemented different programs and mechanisms, such as the PSA (Payment for Environmental Services Program) to manage and incentivize conservation and restoration actions for various strategic ecosystems, where the beneficiary can become a creditor of the resource directly or indirectly, in cash or in kind. However, this program does not guarantee the allocation of these exclusive resources to the reduction of greenhouse gas emissions, the marketing of carbon certificates, and the offsetting of the carbon footprint of individuals and legal entities; and the national carbon tax, which, while responding to the need to "have economic instruments to incentivize compliance with greenhouse gas (GHG) mitigation goals at the national level" (Ministry of Environment and Sustainable Development, 2022).¹⁴, there only 30% of the resources obtained are allocated to conservation areas and strategies, of which 25% are for the management of coastal erosion where the reference area of the project is not included and the	

¹² Bank of the Republic of Colombia. (2021, 09 01). Report on the behavior of Colombia's balance of payments. REPORT ON THE BEHAVIOR OF COLOMBIA'S BALANCE OF PAYMENTS. Retrieved April 19, 2023, from <https://www.banrep.gov.co/es/informe-comportamiento-balanza-pagos-colombia>

¹³ The Social Capital Barometer (Barcas) is a measurement that identifies where there is Social Capital and its level in Colombia.

¹⁴ Ministry of Environment and Sustainable Development (Ed.). (2022). ABC DECREE 926 OF 2017 [Frequently asked questions about the national carbon tax and non-causality tax treatment for carbon neutrality]. Frequently asked questions about the national carbon tax and non-causality tax treatment for carbon neutrality. Retrieved on 06 09, 2023, from https://www.minambiente.gov.co/wp-content/uploads/2022/01/ABC_DECRETO_926_de_2017.pdf

other 5% to strengthen the National System of Protected Areas, which does not ensure the availability and possibility of access to this financing for the properties of the linked Ecosystem Managers and does not determine tools that ensure and monitor the correct allocation of money and implementation of actions in specific cases.

Likewise, there is no evidence at the national level of specific financing strategies for forestry activities "appropriate for sustainable forest management, because existing local resources cannot be applied to the management of native forests, due to the lack of operating mechanisms such as a forest bank or fund" (United Nations Development Programme and Viteri, 2010).¹⁵, as reflected in the analysis document of the forestry sector in the context of adaptation and mitigation to land use change, soil change and afforestation (forestry) in Ecuador, but which largely reflects the Latin American context and is not far from the national reality.

Therefore, this perception underlies a lack of resource management, partnerships, and ecosystem managers. On the other hand, private funding sources require strong financial and administrative muscle for both the project implementing organization and the landowners. This forces potential implementers of REDD+ greenhouse gas (GHG) projects that do not meet the financial backing requirement to refrain from carrying out environmentally beneficial actions. This forces the project implementer to segment the community, benefiting them based on their economic capacity rather than the environmental impact they mitigate. Furthermore, the conservation activities carried out by the owners of these properties to ensure the reduction and/or removal of CO₂ emissions and the protection of the biodiversity they harbor do not provide cash flow. Therefore, they do not represent a future profit and, therefore, a return with which they can economically sustain their properties solely through the implementation of these actions. These activities do not represent an income but rather an outflow of money. In other words, there is no internal rate of return, which reduces the possibility of financial leverage with a third party. Therefore, the alternative of implementing other types of activities other than GHG projects that represent profitability in pursuit of financial governance remains open.

Barrier of access to credit

While Colombia offers special lines of credit with government-mandated interest rate subsidies geared toward agricultural sustainability and green businesses, their financing does not address the implementation of GHG project activities such as REDD+, nor does it address the characteristics of all associated properties that do not carry out productive activities in parallel with preservation. Therefore, the protection of biodiversity in these ecosystems does not take precedence over productivity indicators and economic profitability forecasts. Furthermore, because financial institutions seek to reduce the risk of their financial capital, they do not support applications that do not demonstrate sufficient solidity to meet the medium- and long-term collection obligations, even when subsidized rates are available, thus avoiding a

¹⁵ United Nations Development Programme & Viteri, A. (2010, August). FOREST SECTOR ANALYSIS PAPER IN THE CONTEXT OF CLIMATE CHANGE ADAPTATION AND MITIGATION IN THE LAND USE, LAND CHANGE AND FORESTRY SECTOR (FORESTRY) IN ECUADOR. 05_ecuador_nip_forestry_mitigation-libre.pdf. Retrieved 2022, from https://dwqtxts1x7le7.cloudfront.net/30236413/05_ecuador_nip_forestry_mitigation-libre.pdf?1390881517=&response-content-disposition=inline%3B+filename%3DSECTOR+FORESTAL+EN+EL+CONTEXTO+DE+ADAPT.pdf&Expires=1686360152&Signature=CuXdaBSqeNoNgF2QaAvrUWHYEAuon

negative portfolio. Therefore, they seek financial instruments to support the loan, such as a co-signer, credit history, gross assets, cash flow, financial projections based on modeling, title documents, among others, which in most cases are not available to the property owner.

Furthermore, the rise in usury rates in Colombia has led to an increase of up to 58.8% in the interest rate on microcredits for the first quarter of 2023, compared to the Current Banking Interest stipulated by the Financial Superintendency in Resolution 1968 of 2022, multiplied by 1.5, reducing the ranges of financial sustainability for borrowers in the short term. Likewise, a lack of proper financial assessment can lead to poor borrowing decisions and, therefore, fail to provide sustainability to property owners who wish to finance their conservation activities.

It is evident that discrimination in access to credit exists due to systemic barriers within the banking system. Furthermore, the timing, conditions, and behavior of projects in terms of operational capacity and guaranteeing the permanence of conservation areas hinder the implementation of conservation activities from an economic perspective. This is despite the fact that these activities require a significant increase in income to ensure the conservation of the ecosystems and biodiversity that reside there. Additionally, banking represents a high level of institutional distrust among Colombians, with a percentage of 69.6% according to the latest BARCAS report (CONTRIAL, 2017). This indicates that citizens cannot access these financial products and services due to a widespread negative perception of this type of offering.

Barrier	Institutional barriers
---------	-------------------------------

Lack of enforcement of land use legislation

Although deforestation and forest degradation are not permitted in the region, according to the analysis of land-use changes, 271,184.5 hectares of forest were lost in the department of Meta and 48,191.2 hectares in the department of Vichada between 2009 and 2019. See section 2.3.5. Direct and indirect impacts.

This demonstrates that even with regulations, deforestation and forest degradation occur and cannot be controlled by state institutions.

As evidence that this phenomenon of unplanned deforestation and degradation exists in Colombia, the Government of Colombia, through the Ministry of Environment and Sustainable Development, presents to the country "Forests Territories of Life" Comprehensive Strategy for the Control of Deforestation and Forest Management, as an intersectoral policy instrument that involves the co-responsibility of the different sectors of the Colombian State, with the purpose of stopping deforestation and forest degradation, addressing the complexity of the causes that generate it, based on the recognition of the strategic significance of these ecosystems for the country, due to their sociocultural, economic and environmental importance, for their potential as a development option within the framework of the peacebuilding process, and for their contribution to mitigation and adaptation to climate change.

Barrier	Barriers due to local ecological conditions
---------	---

Natural and/or human-induced catastrophic events

Due to the natural conditions of the Orinoquia highlands, forest fires are a significant barrier to maintaining intact forest areas.¹⁶To corroborate the risk, hotspot monitoring was conducted using the "Satellite-Detected Surface Hotspot Monitoring System-IDEAM" for the period 2016-2020.

Barrier	Social barriers
---------	-----------------

Widespread illegal practices (illegal grazing and logging)

Although deforestation and forest degradation are not permitted in the region, according to the analysis of land-use changes, 271,184.5 hectares of forest were lost in the department of Meta and 48,191.2 hectares in the department of Vichada between 2009 and 2019. See section 2.3.5. Direct and indirect impacts.

Likewise, the transformation of natural savannas to human uses in the department of Meta amounts to 425,314.1 hectares and 346,200.2 hectares in the department of Vichada. See section 2.3.5. Direct and indirect impacts.

Lack of organization of local communities

The Orinoquía region is characterized by being a heterogeneous territory, both in its geography and its cultural richness. Taking this into account, the communities present in the project's area of influence—that is, the departments of Vichada and Meta—combine the presence of Indigenous populations or communities, Afro-descendants, and Creole Llaneros or Original Llaneros (Piñeros, 2019).¹⁷The latter represent the target population of the projects as they are, and this is so because they involve a private acquisition of land legitimized by the documentation they possess.

Depending on the organization of these families, groups of families (mostly settlers) or companies that can demonstrate rights over certain territories, the organizational strategies promoted by the national government stand out. The first to consider is CONPES 3797: Policy for the Comprehensive Development of the Orinoquía: Altillanura – Phase I (2014), which was translated within the provisions of the 2010-2014 National Development Plan: Prosperity for All. This document focused on an analysis of the Orinoquía plateau, addressing its social, cultural, geographic, and economic aspects. The data obtained from this analysis raised alarms due to the evident mismanagement of the public sector, which entailed indifference to the management of public and natural resources, the environmental fragility of the territory, and social stability. These aspects, of course, are closely linked to the sustainability and direct growth of the region's productive practices. Among the main objectives of this CONPES was to create the economic and social conditions that would enable equitable and inclusive development, which would level the playing field for achieving sustainable development.

¹⁶Fires threaten the diversity and structure of tropical gallery forests.<https://doi.org/10.1002/ecs2.3347>

¹⁷ Piñeros, R. (2019). The Other New Llaneros: Migration, Race, and Gender in the Oil Palm Labor Market in the Colombian Orinoquia Region. *Culture and Work*, (94), 93–103.

However, CONPES is not the only tool identified that would aim to improve the land use and its inhabitants. A second strategy is the Orinoquia Master Plan, which ran from 2014 to 2018, which was based on a regional strategy called "Environment, Agriculture, and Human Development: Growth and Well-being for the Llanos" from the 2014-2018 National Development Plan (PND).¹⁸This document was prepared using as its main input the information provided during the presentation of the regional dialogues that formed its basis.

In particular, the aforementioned National Development Plan focused on four crucial aspects for the territory, including: sustainable productive development, water resources and the environment, infrastructure and logistics, and territorial planning (PND, 2016).¹⁹. In this way, we seek to create a bridge between legal certainty and potential investments in the region, which includes tourism, transportation, agriculture, and, of course, the environment and water resources.

Likewise, a third strategy was implemented in 2017 when the "Comprehensive Regional Climate Change Plan for the Orinoquia" (PRICCO) was established.²⁰, developed in Arauca, Casanare, and of course in Vichada and Meta. This document reinforced the urgency of achieving integration between climate change and the potential relationship between management processes and the development of the region and environmental disasters. Similarly, a fourth is the 2018-2022 National Development Plan (PND), which established twenty goals within the framework of commitments known as "pacts for the productivity and equity of the regions," among which is precisely the "Llanos-Orinoquía Region Pact: Connecting and Strengthening the Sustainable Food Supply of the Region with the Country and the World." Basically, the aforementioned document made clear the relationship of this pact with the pact of productivity, legality, equity for ethnic communities (in the area of opportunities), and of course, environmental, economic, and social sustainability (DNP, 2019).

The most obvious barrier identified is the lack of precise and decisive implementation of the strategies and agreements summarized above, whether due to bureaucratic inefficiency or corruption itself. However, the influence they have had in elevating concerns about issues such as climate change, ecosystem conservation, and the relationship between sustainable development and environmental protection in the collective imagination of its residents is evident. In other words, there is still a long way to go.

<i>Barrier</i>	<i>Institutional and property access barriers</i>
<i>Lack of adequate evidence and documentation on land tenure to support security of tenure</i>	
In the Colombian Orinoquia region, approximately 46% of properties are presumed to be informal, indicating that they meet at least one of the criteria established for their identification. At the departmental level, the department of Vichada has the highest presumption of informality, ranging from 50% to 75%, while the other three departments range	

¹⁸ [National Development Plan 2014-2019 National Planning Department https://colaboracion.dnp.gov.co/CDT/PND](https://colaboracion.dnp.gov.co/CDT/PND)

¹⁹ [National Development Plan 2018-2022 National Planning Department https://colaboracion.dnp.gov.co/CDT/Press](https://colaboracion.dnp.gov.co/CDT/Press)

²⁰ [The Orinoquia region now has a Comprehensive Regional Plan for... Ministry of Environment and Sustainable Development https://archivo.minambiente.gov.co/index.php/285...](https://archivo.minambiente.gov.co/index.php/285...)

from 25% to 50%.²¹

Table 22. Elimination of land use scenarios that are impeded by the identified barriers

Land use alternatives	Barriers	Result of the barrier analysis
<i>Continuation of the pre-project land use scenario</i>	NO	Considering the description of the barriers mentioned above, in comparison with the land use scenarios identified in sub-step 1a, one of the most likely land use alternatives to define the project baseline (different from the project activity) is the continuation of the previous land use, given that none of the barriers prevents the continuity of the activities that have historically been developed in the territory, that is, constant degradation. Result: Continue
Reduction of deforestation and forest degradation within the project boundaries carried out without being registered as a BCR project activity.	YEAH	Investment: Without the availability of investment capital, the transition from current productive activities to those that do not affect natural cover does not occur. Social: Considering the economic dependence of current population groups, which promotes the development of activities that transform areas, if the population does not have a financial mechanism to counteract this dependence, it is unlikely that economic alternatives will be developed that offer income opportunities and mitigate the negative environmental impact. Results: Delete

Table 23. Substep 2c. Demonstration that BCR 0002 alternatives are not prevented

Scenarios that are not impeded by any barriers	
Continuation of the pre-project land use scenario	The scenario is not impeded by barriers because it reflects the historical and current trend in the reference region, which develops spontaneously under existing socioeconomic conditions. In this scenario, landowners and users find timber extraction, the conversion of

²¹Summary of the diagnosis of the distribution and ownership of rural land in the ORINOQUIA region https://upra.gov.co/Kit_Territorial/2-%20Informaci%C3%B3n%20por%20Departamentos/ARAUCA/Diagnostico%20distribucion%20tenencia%20tierra%20rural%20Orinoquia%20-%20ARAUCA.pdf

	forests to grasslands, and the use of natural resources a subsistence strategy or a way to meet basic needs, without the need to overcome additional constraints. Unlike the project scenarios, which require the implementation of conservation and sustainable production measures, the continuation scenario does not require capital investments, technology transfer, access to differentiated markets, institutional support, or local capacity building. Instead, it is based on easily accessible and low-cost practices that have been maintained in the region for decades and that local actors can implement with the resources at their disposal. This analysis leads us to conclude that the deforestation and degradation scenario constitutes the viable baseline alternative without external intervention, as it is not limited by obstacles that restrict its implementation. However, this very absence of barriers to the expansion of the agricultural and extractive frontier is what makes it a critical scenario for the forests in the project area, given that it facilitates the continuation of processes of forest cover loss and environmental degradation in the absence of conservation actions such as those promoted by the project.
--	--

- Substep 2d. Demonstrating that carbon credit revenues are decisiveBCR 0002

The analysis for the Project shows that, in the absence of income from the sale of carbon credits, forest conservation activities and the transition to sustainable land use systems are not financially viable for participating private landowners. This is because traditional land use alternatives in the region (mainly extensive cattle ranching and, in some cases, monoculture agriculture) offer immediate and secure income for producers, while conservation practices generate environmental and social benefits but not sufficient direct economic returns to cover implementation and opportunity costs.

Income derived from carbon credits plays a decisive role, as it constitutes the financing source that allows landowners to be compensated for keeping forests standing against short-term options, such as deforestation for agricultural frontier expansion. Furthermore, these incomes are the mechanism that makes it possible to finance the implementation costs of complementary project activities, such as technical assistance, community capacity building, environmental monitoring, contractual management and the establishment of sustainable productive models, and preventive forest fire management.

Without these financial flows, the project's actions would face significant financial and institutional barriers: landowners would lack sufficient economic incentives to opt for conservation practices instead of deforestation, and the Cataruben Foundation would lack the necessary resources to sustain a long-term technical support and independent monitoring program. Thus, carbon performance payments constitute the enabling condition that transforms the scenario of deforestation and degradation—projected as a trend without the project—into an additional scenario of conservation and sustainable management with verifiable climate benefits.

Based on the above, it is concluded that carbon credit revenues are essential and crucial for the financial viability of the Project and, therefore, for generating additional emission reductions within the framework of the BCR 0002 standard.

3.3.2.3 Step 4 Analysis of Common Practices BCR 0002

- Substep 4a. Definition of applicable measure and scope of comparison

The measure applicable to the Project corresponds to the implementation of activities of Reducing deforestation and degradation of native forests through conservation of native forests and implementation of sustainable practices leveraged by economic incentives derived from carbon certificates. This measure is realized through the protection of forest areas from deforestation and degradation, the adoption of sustainable production practices that reduce pressure on ecosystems, and the provision of technical assistance, environmental monitoring, and contractual support that ensure the sustainability and effectiveness of these actions.

The scope of the comparison is established by considering the plausible alternatives that could occur in the absence of the project. These alternatives primarily include the continuation of the deforestation and degradation trends observed in the reference region, driven by landowners' need to access natural resources for subsistence and basic needs, as well as the expansion of the agricultural frontier. Other forms of land use are also considered, which, while economically attractive, do not include financial incentives or technical support that would guarantee sustainable results over time.

Defining the applicable measure and the scope of comparison clearly establishes the basis for demonstrating additionality. Within this framework, the project scenario represents an intervention that introduces incentives and institutional mechanisms that would not arise spontaneously, in contrast to the reference scenario, characterized by progressive loss of forest cover and ecosystem degradation.

- Substep 4b. Identification of similar activities and market penetration

In order to establish the penetration of the applicable measure in the reference region, an analysis was carried out of the initiatives that present comparable characteristics to the Project. This survey identified a total for similar activities in the region, demonstrating a history of projects and practices aimed at forest conservation and sustainable land use. However, these activities differ in scale, level of structuring, and financial sustainability mechanisms compared to the project proposed here. ([See Annex 2.2.1.1.1 Common practices](#))

Similar activities include:

- *Civil Society Nature Reserves (RNSC): Private properties registered in the National Registry of Protected Areas that have voluntarily declared the conservation of forests and natural savannas. These initiatives have allowed the maintenance of fragments of strategic ecosystems, although they do not have long-term financial incentives.*
- *Protected areas and official designations (Ramsar and management districts): The Bitá River Ramsar site and other environmental planning figures (e.g., Integrated Management Districts) protect riparian forests. However, these designations are exceptional and restricted to specific areas, without constituting a generalized pattern in the Orinoquia. Furthermore, the levels of control and financing associated with these management categories are insufficient, and the trend of deforestation continues.*
- *Pilot Payment for Environmental Services (PES) programs: In Colombia, specific PES initiatives have been carried out that include savannas and forests of the Orinoquia (for example, programs of the Ministry of Environment and international cooperation). However, the coverage and availability of resources have been marginal compared to the scale of pressure from the identified causes and agents.*
- *Environmental Compensations: In the departments of Casanare, Meta, and Vichada, environmental compensations are mainly focused on the restoration and conservation of strategic ecosystems such as natural savannas, gallery forests,*

morichales, and wetlands, in line with Colombian regulations on biodiversity loss and natural resource use. These compensations may include ecological restoration, the protection of connectivity corridors, the implementation of agroforestry systems, and fire prevention measures, which not only fulfill legal requirements but also create opportunities to align with conservation and climate mitigation projects in the region.

[Table x.](#) Comparable areas in the forest ecosystem in the reference region

Comparable areas	Area (hectares)
Protected areas	1.103.594,00
RAMSAR	71682
Payments for Environmental Services (PES) pilot programs:	181.155,2
Environmental Compensations:	803

Based on this prior analysis, the common practice factor is calculated:

$$F = 1 - \frac{Mdiff}{Mall}$$

Where:

Mdiff: Aggregate magnitude of similar activities with essential differences (Protected areas, RAMSAR, Environmental Compensations)

Mall: Aggregate magnitude of all comparable activities (Protected areas, RAMSAR, Environmental Compensations, Payments for Environmental Services (PES) pilot programs)

$$F = 1 - \frac{1.176.079}{1.357.234,20}$$

$$F = 0,13$$

$$F = 13\%$$

Consequently, with $F < 20\%$, applying the common practice statistical test (comparison between Mall and Mdiff) leads to the conclusion that the conservation of natural savannas

is not a common practice in the Orinoquía region (Casanare, Meta, and Vichada). The project introduces an additional measure that overcomes structural barriers and is only viable through financing from carbon credits

3.3.2.4 Step 5 Selection of the base scenario BCR 0002

Table 24. Step 5. Selecting the base scenario BCR 0002

Scenarios that are not impeded by any barriers	Baseline scenario?
Continuation of the pre-project land use scenario	Yes: Since the list of likely scenarios does not include the implementation of activities to reduce deforestation and forest degradation without being registered as BCR 0002 activity and there is only one scenario that is not impeded by any barriers, then this is considered a baseline scenario.

3.4 Additionality

Given that the baseline and additionality tool presents the analysis jointly in section 3.3, an exhaustive analysis was carried out to define the baseline scenario and demonstrate additionality.

3.5 Uncertainty management

In line with the principle of conservativeness, the project has established and applied mechanisms to manage uncertainty in the quantification of baseline, ensuring that GHG emission reductions are not overestimated. The entire analysis was conducted in mandatory compliance with the Biocarbon Tool Conservative Approach And Uncertainty Management Version 1.0.

Baseline uncertainty has been quantified for each project component, as well as total baseline uncertainty.

For baseline the uncertainty assessment was performed using the

Tier 1: Error Propagation Method , which combines the uncertainties of individual parameters using simplified statistical rules for sums (Rule A) and products (Rule B). All uncertainties are expressed with a 90% confidence interval.

The primary sources of uncertainty identified for this hybrid project include:

- *Activity Data: Uncertainty associated with the remote sensing classification of land use for both the forest areas (unplanned deforestation and degradation, BCR0002) and the natural savanna areas (land use change, BCR0005).*
- *Emission Factors: Uncertainty derived from the statistical sampling error of field measurements for carbon stocks in the different pools considered: aboveground and belowground biomass, soil organic carbon in savannas, For Deforestation and Forest degradation de values was taken from National Reference Level, thus no uncertainty was calculated according to tool section*

table 25

1.1. Savannas Uncertainty- BaseLine								
#	Parameter	Symbol	Units	Value	Relative Uncertainty (%)	Uncertainty Type	Source of data	Used in Baseline/project/Both
1	Data Activity: Land use Change in analysis period Baseline	A_1 (ha)	Ha	4.038.843,90	6,7%	Input	Confusion Matrix Result	Baseline
2	Data Activity: Land use Change in analysis period Baseline	A_2 (ha)	Ha	2.855.488,70	9,7%	Input	Confusion Matrix Result	Baseline
3	Data Activity: Project area	A_p (ha)	ha	99.532,60	3,3%	Input	Confusion Matrix Result	Baseline
4	Above Ground Biomass	Aboveground Biomass tCO_2 eq/ha	tCO ₂ eq/ha	4,07	9,9%	Input	Field Sampling	Both
5	Below ground Biomass	Belowground Biomass tCO_2 eq/ha	tCO ₂ eq/ha	6,51	12,0%	Input	Field Sampling	Both
6	Soil Organic Carbon	CO_{Seq} (tCO_2 e/ha) 20 years	tCO ₂ eq/ha	14,65	11,0%	Input	IPCC: https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_06	Both

							_Ch6_Grassl and.pdf Table 6.2 Factor :"manageme nt", Level: "moderate degraded grassland", Climate region :"tropical"	
1.2. Deforestation Uncertainty Baseline								
#	Parameter	Symbol	Units	Value	Relative Uncertai nty (%)	Uncertai nty Type	Source of data	Used in Baseline/pr oject/Both
1	Data Activity: Land use Change in analysis period Baseline	AR_1 (ha)	Ha	151.97 1,00	10,0%	Input	Acatama Result	Baseline
2	Data Activity: Land use Change in analysis period Baseline	AR_2 (ha)	Ha	139.34 5,00	10,0%	Input	Acatama Result	Baseline
3	Data Activity: Project area	AA_t	ha	21.359 ,00	7,0%	Input	Acatama Result	Baseline
4	Above Ground Biomass Core	C_{Beq} (tCO _{2e} /ha)	tCO ₂ eq/ha	159,58	0,0%	Input	Nref Colombia	Both
5	Above Ground Biomass edge	C_{Beq} (tCO _{2e} /ha)	tCO ₂ eq/ha	104,35	0,0%	Input	NRef Colombia	Both
6	Soil Organic Carbon	CO_{Seq} (tCO _{2e} /ha)	tCO ₂ eq/ha	6,37	0,0%	Input	NRef Colombia	Both
1.3. Forest Degradation Uncertainty Baseline								
#	Parameter	Symbol	Units	Value	Relative Uncertai nty (%)	Uncertai nty Type	Source of data	Used in Baseline/pr oject/Both
1	Data Activity: Land use Change in analysis period Baseline	A_1 (ha)	Ha	151.97 1,00	10,0%	Input	Acatama Result	Baseline
2	Data Activity: Land use Change in	A_2 (ha)	Ha	139.34 5,00	10,0%	Input	Acatama Result	Baseline

	analysis period							
3	Emission Factor	EFi (tCO ₂ e/ha)	tCO ₂ eq/ha	98,75	0,0%	Input	NRef Colombia	Both

The combined uncertainty of baseline was calculated sequentially. First, for each project component (Savanna, Deforestation, and Forest degradation), the uncertainties of the respective activity data and emission factors were combined. Subsequently, the resulting uncertainties of both components were aggregated to determine the total uncertainty for the project's baseline.

The results of this analysis are as follows:

Table 26. Uncertainty of baseline

Component	Uncertainty Calculation	Rule Applied
Savaanas Baseline Emission	14,85%	B
Deforestation Baseline Emission	6,61%	B
Degradation Baseline Emission	7,08%	B
Total Combine Uncertainty of Project Baseline	10,00%	A

According to the BioCarbon Standard's requirements, a conservative adjustment must be applied if the total uncertainty exceeds the 30% threshold. As the calculated total is below this threshold, no conservative deduction is required for the project baseline.

In addition, it is important to highlight that the project for determining the baseline uses cartographic inputs and emission factors to establish national reference levels. Therefore, according to the tool, conservative adjustments would not be necessary if the uncertainty exceeded 30%.

The final estimated net GHG emission reductions are rounded down to the nearest whole metric ton of CO₂ equivalent, in accordance with the program's rounding rule. All calculations, data sources, and assumptions used in this uncertainty assessment are detailed in the supporting annexes. (Annex 2.1.1 ER_ORI_P2/Sheet 5 Uncertainty Management Validation)

3.6 Leakage and non-permanence

3.6.1 Leakages

The leak area was defined as a buffer zone.²² 1 km from the edge of properties and boundaries of eligible areas. (ver section 3.2.1.1.3 Leakage area for BCR 0005 and section 3.2.1.2.3 leakage areas por BCR 0002)

Forest, shrubland, and grassland areas are monitored to quantify the increase in emissions that could occur outside the project area. These emissions will be subtracted from the project results according to the criteria of the methodologies. Leakage quantification is detailed in section 3.9. Mitigation Results.

On the other hand, to reduce the risk of leaks, The project designed an early warning activity for potential forest fires, as well as a knowledge management plan that educates stakeholders (private landowners) on sustainable natural resource management and the non-displacement of emissions outside of project areas.

3.6.2 Non permanence

Project permanence risks were identified, and a monitoring plan was designed, including mitigation measures, monitoring indicators and results, and a reporting procedure. Biophysical and socioeconomic risks were assessed, including fires, floods, land tenure disputes, conflicts among project stakeholders, lack of ownership over project activities, and governance deficits.

The Project has comprehensively applied the BCR Tool: Permanence and Risk Management, version 2.0, to identify, assess, and manage reversal risks. The process included the following steps:

- Risk Identification and Classification:: A comprehensive risk matrix was developed in alignment with the categories defined by the tool: legal/land tenure risks, natural/environmental risks, financial/operational risks, governance/political risks, and community/stakeholder-related risks. Each risk was clearly described and classified according to its probability and potential impact.*
- Quantification and Assessment: Each risk was assigned a severity score following the methodology set out in the tool, and an aggregated non-permanence risk rating for the project was calculated.*
- Mitigation Plans: Specific mitigation actions were defined for each identified risk, including: Long-term contractual agreements with landowners, Fire prevention and*

²² It is an area that surrounds the reference areas of the project.

disaster response plans, Strategies for economic diversification and long-term financial sustainability, Stakeholder participation mechanisms and conflict resolution procedures, Ethical compliance and anti-corruption protocols.

- *Risk Buffer Contribution:* Based on the resulting risk rating, the project will allocate the required percentage of Verified Carbon Credits (VCCs) to the common buffer pool, in line with the environmental insurance mechanism established in the tool.
- *Monitoring and Updates:* The risk matrix will be reviewed and updated during each verification cycle to incorporate contextual changes (e.g., regulatory updates, emerging natural threats, carbon market price fluctuations) and ensure that the risk rating and buffer contribution remain consistent.

3.7 Mitigation results

The mitigation results obtained as a result of the project's activities are demonstrated below and are verifiable within the framework of ISO 14064-3:2019. In this regard, the guidelines and criteria established in the BCR 0002 and BCR 0005 methodology are strictly followed.

3.7.1 Eligible areas within the GHG project boundaries

3.7.1.1 Eligible areas for BCR 0005 activities

Para la identificación de las áreas elegibles de sabana, se verificó que los límites geográficos del proyecto se inscriben en el bioma de sabanas naturales de la Ecorregión de los Llanos conforme a la clasificación de WWF (2.2.2.1. Geodatabase Sabanas/Feature dataset Bioma Ecorregión). La delimitación temática utilizó los mapas oficiales de coberturas del IDEAM bajo la metodología CORINE Land Cover a escala 1:100.000 para 2014 y 2020; para el ámbito del proyecto se empleó la información vectorial 2015 y 2020 disponible en /2.2.2.2. Geodatabase Sabana/Interpretación Corine Land Cover/Coberturas 2015, 2020, 2024, aplicando la Leyenda Nacional CLC (2.2.2.4.6) y el procedimiento descrito en los anexos 2.2.2.4.5. FC-GOG-29 Instructivo Interpretación CLC y 2.2.2.4.4. Caracterización de insumos cartográficos – Orinoco p2. La precisión de la clasificación alcanzó 95,1 % (2015) y 96,67 % (2020), soportada en 2.2.2.2.4. Geodatabase Matriz validación/Validación/Set validación 2015.shp, Set validación 2020.shp y Mapbiomas 2015.tif, conforme al 2.2.2.2.1. Documento Técnico de Validación del Modelo de Clasificación de CLC. De acuerdo con BCR0005, se reconocen como sábanas naturales las coberturas 3.2.1 Herbazales y 3.2.2 Arbustales; la elegibilidad 2015–2020 se determinó mediante intersección espacial entre las sábanas mapeadas en 2015 y las vigentes al 01/01/2020, declarando elegibles únicamente las áreas que se mantuvieron como sábanas en ambos años (2.2.2.1. Geodatabase Sabanas/Feature dataset Áreas de proyecto/Sabanas Elegibles.shp).

3.7.1.2 Eligible areas for BCR 0002 activities

The REDD+ eligible areas correspond to stable natural forest located entirely within the project's property boundaries and demonstrably forested, without interruption, for at least ten (10) years prior to the project start date (February 1, 2020); eligibility was determined through a multi-temporal analysis of forest maps for 2010 and 2019 (cut-off: December 31, 2019) generated on Google Earth Engine from Landsat 5/7/8 imagery following Galindo et al. (2014) (Annexes 2.2.1.2.3 and 2.2.1.2.6), with rigorous cloud/shadow masking, annual mosaicking, radiometric harmonization, and a Random Forest classifier trained on 4,399 samples (70% training, 30% validation) across Forest, Water, "Sapland" (per project legend), and Crops classes using bands (Blue, Green, Red, NIR, SWIR₁, SWIR₂) and indices (NDVI, MSAVI, EVI, NDWI, SVVI, Tasseled Cap brightness/greenness/wetness), complemented by canopy-height inputs (Annex 2.2.1.2.4) and training/validation sets stored in 2.2.1.1 (Feature Dataset "Training Models"); thematic quality was enhanced via supervised review and adjustment (PIAO and ArcGIS Pro v3.3 "Imagery") and independently validated in QGIS with AcATaMa (2.2.1.3), achieving overall accuracies of 97.0% (2010) and 93.0% (2019) as detailed in the cited validation annexes; finally, the Eligible Forest 2010–2019 layer (2.2.1.1, Feature Dataset "Project Area" / *Eligible Forest AP 2010–2019*) was produced by spatially intersecting the 2010 and 2019 forest maps and clipping to property limits, so only pixels classified as forest in both years were deemed eligible.

3.7.2 Stratification

The project is divided into two components according to the methodologies and coverage to be managed for forest and natural savannah, respectively: 1. Natural savannah, 2. Natural forests. Natural savannas are not stratified and forests are stratified according to the national reference level between Edge Forest and Core Forest

3.7.2.1 Estratificación Bosques - Deforestación

The Forest is stratified according to the methodology included in the NREF for the period 2023-2027²³ (2.2.1.2.7. Propuesta del NREF Colombia para el periodo 2023 - 2027). An approach based on morphological analysis using Morphological Spatial Pattern Analysis (MSPA) algorithms is used.

To establish the baseline in the reference region, forest layers from the years 2010 and 2019, of national origin (Forest and Carbon Monitoring System). For the project areas, maps

²³https://redd.unfccc.int/media/colombia_submission_nref_2023_-_2027_vf.pdf

of the area covered by natural forest generated through PDE and Google Earth Engine were used. These layers were adjusted for processing in the MSPA algorithm as follows:

- a. **Recoding:**They were recoded so that forest areas are represented in the first bit and non-forest areas in the second bit.
- b. **Data type settings:**The layers were set so that the data type was 4 bits.

The algorithm was run on the Debian/Ubuntu operating system using the Guido Toolbox Workbench platform (Guido Toolbox Workbench). Installation was performed following the instructions available in the Guido Toolbox Workbench Installation Guide. In addition, the GuidoToolbox Workbench: Spatial Analysis of Raster Maps for Ecological Applications (GuidoToolbox Workbench Procedure) resource was used, which describes how to run the software on Linux.

The MSPA algorithm was run with the following parameters:

- **Connectivity:**8
- **Border width:** 4 pixels (100 meters)
- **Transition:**1
- **In the background:**1

The result was a forest configured in seven morphological categories (Original MSPA Class), which were then post-stratified into two categories:

Table 27. MSPA Post Stratification

Original MSPA Class	Post Stratification
Núcleo	Core Forest
island	Edge Forest
Bucle	Edge Forest
Bridge	Edge Forest
Drilling	Edge Forest
Edge	Edge Forest
Rama	Edge Forest

Source: Fundación Cataruben, 2025.

In this way, the natural forest or forest area is stratified thanks to the MSPA algorithm into Core Forest and Edge Forest. The cartographic information is found in 2.2.1.1. Geodatabase REDD/ Feature Dataset "área de proyecto"/ bosque elegible fragmentación; fragmentación del monitoreo forestal.; Feature Dataset Laeks /..fragmentacion. 2010 and 2019 national forest inputs and stratification by MSPA are included. 2.2.1.5. MSPA Stratification. In each folder are the parameters and a folder called bnb_2010_ttb_mspa that contains the stratification.

3.7.2.2 Forest Stratification - Degradation

After stratifying the core and edge forest areas using the Morphological Spatial Pattern Analysis (MSPA) algorithm, a multitemporal analysis was performed in both the reference region and the project areas for the period in question, with the aim of quantifying forest degradation. This analysis made it possible to precisely identify the areas where the core forest transformed into edge forest, indicating forest degradation processes. Furthermore, areas where the core or edge forest transitioned to the "non-forest" category were identified as deforested.

The analysis carried out in the reference region allowed us to project the degradation rate in the core forest areas within the project.

Although both processes share certain characteristics, the key difference lies in the measurement methodology: forest degradation is defined when an area of core forest transforms into edge forest, but is still classified as "forest" according to "forest-non-forest" maps. However, when forest cover is completely lost, the area is classified as deforested.

To quantify degradation, when a core forest area becomes an edge, an emission factor of 98.747 tCO₂e/ha. If the same area subsequently suffers deforestation (becomes "non-forest"), the deforestation emission factor for core forests is applied, discounting the value corresponding to the previous degradation (98.747 tCO₂e/ha), which corresponds to the emission factor of a forest edge or degraded forest. This distinction is crucial for accurate accounting of the emissions generated

3.7.3 GHG baseline emissions

To determine baseline emissions, data on deforestation, forest degradation, and land-use change in natural savannas were first established. This was done following the guidelines of the methodological documents BCR 0002 version 5.0, sections 12.1 and 12.2, and BCR 0005 version 1.1, sections 11.2.2, and 11.2.4.

Emission factors were then calculated for each activity, according to the selected carbon pools (section 3.2.2) and the procedures established in methodologies BCR 0002, section 12.4, and BCR 0005, section 11.3.

Finally, to calculate the GHG emissions resulting from the relationship between the activity data and the defined emission factors, the procedures established in sections 13.5 of methodology BCR 0002 and 11.4 of BCR 0005 were followed.

3.7.3.1 Reference emissions from BCR 0005 Activities - Natural Savannah

3.7.3.1.1 Activity Data - Natural Savannah

To record changes in savanna vegetation cover (Grasslands - Shrubs) identified in 2020, national land cover maps for the period 2012-2020 were used. This was carried out in accordance with the BCR 0005 methodology, item 11.2 Activity data, and from this a coverage change matrix was developed. This matrix is crucial for assessing and quantifying land use and vegetation transformations, as it allows for accurate and detailed tracking of land cover changes, enabling a comprehensive assessment of the associated environmental and carbon impacts..

In order to generate a land use classification for each land cover, the land covers and their uses are classified in the reference region area, as shown in the table below:

Table 28. Land use classes by cover.

LAND USE BY LAND COVER		
LEGEND	LAND USE	
1.1.1. Continuous urban fabric	URBAN	F ₁
1.1.2. Discontinuous urban fabric	URBAN	
1.2.2. Road, railway and associated land network	INFRASTRUCTURE	F ₂
1.2.4. Airports	INFRASTRUCTURE	
1.3.1. Mining extraction areas	INFRASTRUCTURE	
2.1.1 Other transition crops	AGRICULTURAL	F ₃
2.1.2.1. Rice	AGRICULTURAL	
2.2.1.1 Other permanent herbaceous crops	AGRICULTURAL	
2.2.3.2. Oil palm	AGRICULTURAL	
2.3.1 Clean pastures	MEAL	F ₄
2.3.2 Wooded grasslands	MEAL	
2.3.3 Weeded pastures	MEAL	
2.4.1. Crop mosaic	AGRICULTURAL	F ₃

LAND USE BY LAND COVER		
LEGEND	LAND USE	
2.4.2. Grassland and crop mosaic	AGRICULTURAL	
2.4.3. Mosaic of crops, pastures and natural spaces	AGRICULTURAL	
2.4.4. Grassland mosaic with natural spaces	AGRICULTURAL	
2.4.5. Mosaic of crops with natural spaces	AGRICULTURAL	
3.1.1.1.1. Tall and dense continental forest	FORESTRY	F5
3.1.1.1.2. Dense floodplain forest	FORESTRY	
3.1.1.1.2.1. Dense tall forest Heterogeneous flooding	FORESTRY	
3.1.1.2.1 Dense lowland forest	FORESTRY	
3.1.1.2.2. Dense low alluvial plain forest	FORESTRY	
3.1.2.1.1. Open and tall continental forest	FORESTRY	
3.1.2.1.2. High floodplain open forest	FORESTRY	
3.1.2.2.2. Low and open floodplain forest	FORESTRY	
3.1.3 Fragmented forest	FORESTRY	
3.1.3.1 Fragmented forest with grasslands and crops	FORESTRY	
3.1.3.2 Fragmented forest with secondary vegetation	FORESTRY	
3.1.4. Gallery and riparian forest	FORESTRY	
3.1.5. Forest plantation	PRODUCTION	F7
3.2.1.1.1. Dense terra firme grasslands	NATURAL SAVVANA	F6
3.2.1.1.1.1. Dense treeless upland grassland	NATURAL SAVVANA	
3.2.1.1.2. Dense floodplain grasslands	NATURAL SAVVANA	
3.2.1.1.2.1. Dense flooded grassland without trees	NATURAL SAVVANA	
3.2.1.1.2.2. Dense and wooded floodplain grasslands	NATURAL SAVVANA	
3.2.1.2.1. Open sandy grassland	NATURAL SAVVANA	
3.2.1.2.2. Rocky open grassland	NATURAL SAVVANA	
3.2.2.1. Dense scrubland	NATURAL SAVVANA	
3.2.2.2. Open scrubland	NATURAL SAVVANA	
3.2.3. Secondary or transitional vegetation	RESTORATION	F8
3.3.1. Natural sandy areas	RESTORATION	
3.3.3. Bare and degraded lands	RESTORATION	
3.3.4. Burned areas	RESTORATION	
4.1.1. Swampy areas	BODIES OF WATER	F9
4.1.3. Aquatic vegetation in water bodies	BODIES OF WATER	
5.1.1. Rivers (50 m)	BODIES OF WATER	
5.1.2 Natural lagoons, lakes and swamps	BODIES OF WATER	

Fountain: Cataruben Foundation, 2025.

Once the land covers have been classified by each land use code for the years 2012 and 2020, an intersection of both layers is performed to determine the change in use in the reference region during that period, as shown below: After classifying land cover by land-use code for 2012 and 2020, both layers are cross-referenced to determine land-use change in the reference region during that period.

Table 29 Land cover and land use change matrix

2012/2020	Agrícola	Agropecuaria Mixtos	Áreas con Infraestructura	Arenales y Rocas	Bosques	Bosques Fragmentados	Cuerpos de Agua Artificiales	Cuerpos de Agua Naturales	Erosión	Humedales	Minería	Pastos	Quebradas	Sabanas Naturales	Veg. Secundaria	TOTAL 2010	PERDIDAS
Agrícola	210.691,30	2.877,90	402,40	14,10	7.218,60	16,00	117,60	1.170,00	0,00	132,10	31,00	30.404,10	0,00	9.260,10	1.623,90	263.959,10	53.267,80
Agropecuaria Mixtos	144.733,00	46.165,80	1.068,00	453,60	27.456,70	1.653,40	141,40	5.261,30	0,00	1.084,40	128,00	148.182,50	86,70	51.979,00	8.329,90	436.723,70	390.557,90
Áreas con Infraestructura	364,30	162,40	3.995,90	0,20	62,80	0,00	75,40	12,80	0,00	0,00	83,40	273,40	11,60	1.261,10	4,80	6.308,10	2.312,20
Arenales y Rocas	604,50	2.214,50	3,60	4.774,90	694,80	25,10	0,00	4.479,90	0,00	17,30	0,00	62,60	0,00	7.660,80	860,60	21.398,60	16.623,70
Bosques	34.252,50	33.804,80	208,80	896,20	1.111.293,20	15.286,30	34,10	18.421,90	27,80	6.400,90	47,30	62.227,70	2.416,30	177.784,70	36.551,00	1.499.653,50	388.360,30
Bosques Fragmentados	3.090,20	7.244,70	13,70	18,20	24.401,40	5.221,20	0,00	557,40	0,00	308,00	0,00	8.274,80	44,60	4.579,30	6.339,40	60.929,00	54.871,70
Cuerpos de Agua Artificiales	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	46,50	0,00	85,60	0,00	132,10	132,10
Cuerpos de Agua	2.816,00	7.490,00	31,70	7.580,00	14.542,00	191,20	0,20	67.128,00	0,00	2.362,00	0,00	2.235,00	5,50	10.866,00	1.912,00	117.164,00	50.036,00

Naturales	90	60		80	,70			,20		80		90		,30	10	90	,70
Erosion	684,00	923,30	0,00	0,00	429,70	0,00	0,00	36,50	5,00	0,00	0,00	4.293,80	61,00	3.069,70	0,00	9.503,00	9.498,00
Humedales	2.135,90	877,80	0,00	26,30	2.090,90	6,10	0,00	2.137,30	0,00	17.906,40	0,00	1.861,90	200,90	15.184,10	650,80	43.078,40	25.172,00
Mineria	70,60	13,40	199,70	0,00	25,50	0,00	0,00	0,00	0,00	0,00	87,40	0,70	0,00	55,10	3,50	455,90	368,50
Pastos	164.227,90	45.770,90	2.052,40	164,40	41.351,60	1.459,00	168,10	3.981,80	104,30	1.927,10	101,00	451.183,30	1.528,60	166.018,90	6.420,40	886.459,70	435.276,40
Quemas	7.794,90	2.813,90	44,80	0,00	5.762,70	18,30	0,00	94,80	0,00	1.901,40	19,20	12.653,00	3.731,60	160.776,60	59,60	195.670,80	191.939,20
Sabanas Naturales	357.497,40	161.925,90	2.312,60	1.698,50	289.212,40	3.657,40	52,20	11.503,20	1.044,50	89.748,80	2.854,80	606.774,70	78.918,10	4.831.295,60	17.184,20	6.455.680,30	1.624.384,70
Vegetación Secundaria	8.738,10	11.325,70	11,50	286,70	12.030,30	1.135,20	0,00	2.483,50	0,00	931,90	0,00	12.879,00	9,40	9.509,10	11.006,30	70.346,70	59.340,40
TOTAL 2020	937.701,50	323.611,60	10.345,10	15.913,90	1.536.573,30	28.669,20	589,00	117.268,60	1.181,60	122.721,10	3.352,10	1.341.353,90	87.014,30	5.449.386,00	90.946,50	10.066.627,70	
GANANCIAS	727.010,20	277.445,80	6.349,20	11.139,00	425.280,10	23.448,00	589,00	50.140,40	1.176,60	104.814,70	3.264,70	890.170,60	83.282,70	618.090,40	79.940,20		

MATRIZ DE TRANSICION DE COBERTURAS 2012 - 2020

Fuente: Fundación Cataruben, 2024.

3.7.3.1.1.1 Historical land use change in the reference area

Multi-temporal analysis of classified savanna cover in the reference region between 2012 and 2020 was used to calculate projected annual historical change in the project areas. This was achieved by applying the following equation:

$$CSCN_{yr} = \left(\frac{1}{t_2 - t_1} \ln \frac{A_2}{A_1} \right) \times A_p$$

Where:

$CSCN_{yr}$	Change in the area under natural vegetation cover in the without project scenario; ha yr ⁻¹
t_1	Final year of the reference period, year
t_2	Initial year of the reference period, year
A_1	Area in natural vegetation cover of the reference area, t ₁ ; ha
A_2	Area in natural vegetation cover of the reference area, t ₂ ; ha
A_p	Eligible area; ha

Table 30. Change in the area under natural vegetation cover in the without project scenario

CSCNIb (ha/year)	t ₁	t ₂	A ₁ (ha)	A ₂ (ha)	A _p (ha)
4.313,69	2012	2020	4.038.843,90	2.855.488,70	99.532,60

3.7.3.1.2 Emission Factors - Natural Savannah

Due to the limited availability of values applicable to the project, our own data were used to define the total biomass emission factor in natural savannas. The methodology used is based on the National Forest Inventory of Colombia (Olarte et al. 2021).

The number and location of sampling points were selected according to procedure FC-GOP-23, "Inventory design for biomass growth monitoring", section 7.4. This procedure relates the size or area of each ecosystem with the variation in biomass content, established from reference data for the study region (Orozco et.al 2023), using the following equation:

$$n = \frac{S^2}{\frac{-2}{y_{IN}} cve^2 + \frac{S^2}{N}}$$

Where:

n Sample size

- S^2 Sample variance
- $\bar{y}$ Mean of the guiding variable
- cve Sampling error (%)
- N Population size. Total number of sampling points within the project boundaries.

Thus, a total of seven (7) sampling points were available for monitoring carbon reserves, which were randomly selected in eligible areas of the properties linked to the project .

Each sampling unit was established as a group of five circular subplots, organized in the shape of a cross and separated by 80 meters between their centers. This configuration follows the GPP-22 procedure. Cluster sampling for aboveground and soil biomass in grasslands and forests, and covers a total area of 3,535 square meters. In the savannas, biomass was calculated from herbaceous vegetation collected in four quadrants of 1 square meter, located 7.5 meters from the center of each subplot..

Collected herbaceous vegetation samples were sent to CIAT's Analytical Services Laboratory. The samples were prepared there, and their dry weight was analyzed gravimetrically. The results delivered by the laboratory are attached in the [Annex 2.1.2.3 Laboratory results](#).

The detailed description of the procedures developed is presented in Annex 2.1.2.2.2 Data Quality Control Report. For its part, the cartographic information is available at 2.2.2.1. Geodatabase Sabanas/Feature dataset Parcelas/Shapefile Parcelas.

To calculate aboveground biomass, a relationship between dry and wet weight data was established using information obtained in the field. This relationship was determined using an equation described by IDEAM in 2011.

Where:

- BS Dry biomass of the material harvested in the field
- PS_{sample} Dry weight of the sample taken to the laboratory
- PH_{sample} Wet weight of the sample taken to the laboratory

BH Biomass or wet weight of all the material harvested in the field

Belowground biomass was estimated using the default ratio of 1.6 for tropical grasslands established by the IPCC (2006). The total biomass emission factor was estimated using the mean aboveground and belowground biomass using the following equation. The results are presented in Table 31.

$$CBF_{eq} = BT \times FC \times \frac{44}{12}$$

Dónde:

CBF_{eq} Carbon dioxide equivalent contained in the total biomass; tCO₂e/ha/year

BT Total biomass; t/ha

FC Carbon fraction of dry matter (0.47)

$\frac{44}{12}$ Molecular weight conversion factor between carbon and carbon dioxide

Table 31. Carbon emission factor in total biomass savannas.

CBF_{eq} (tCO ₂ e/ha)	FC	BT (t/ha)	Aboveground Biomass tCo ₂ eq/ha	Belowground Biomass tCo ₂ eq/ha
18,24	0,47	10,58	4,07	6,512

Source:Fundación Cataruben, 2025

Considering the BCR 0005 methodology section 12.1 (Conservative selection of default values) the project found a relevant and accurate study within the region where the project is being developed, which can be used. The study by Costa et al. (2022) on the carbon storage potential of Colombian Orinoquia soils determined a SOC value of 79.9 tC/ha in native savannas at a depth of 0-30 cm. This value was used to define the soil organic carbon (SOC) emission factor.

Table 32. SOC Emission Factor

Artículo científico	Value	Cumplimiento BCR
---------------------	-------	------------------

Costa, C. Jr., Villegas, DM, Bastidas, M., Rubio, NM, Rao, I., y Arango, J. (2022). Reservas de carbono del suelo y emisiones de óxido nitroso de los sistemas de pastoreo en la región de la Orinoquía de Colombia: potencial para desarrollar proyectos de remoción de gases de efecto invernadero en tierra. Front. Clim. 4, 916068. Doi: 10.3389/fclim.2022.916068	79,9 tC/ha hasta 30 cm.	Datos adecuados, cumple con los principios BCR y la sección 12.1 del BCR 0005.
--	-------------------------	--

Table 33. Factor de emisión Suelos sábanas

COS_{eq} (tCO₂e/ha) 20 years	COS tCo₂ eq/ha	COS (tC/ha)
14,65	292,97	79,90

3.7.3.1.3 Calculation of Annual Reference Emissions Activities BCR 0005

The following equation is used to calculate annual emissions in natural savannas for the no-project scenario:

$$AE_{bl} = SCNC_{bl} \times (CFB_{eq} + SOC_{eq})$$

Dónde:

- AE_{bl} Annual emissions in the without-project scenario; tCO₂e/ha/year
 $SCNC_{bl}$ Historical land-use change in the without-project scenario; ha/year
 CFB_{eq} Carbon dioxide equivalent contained in total biomass; tCO₂e/ha
 SOC_{eq} Soil carbon content; tC/ha

Table 34. Annual emissions in the without-project scenario

EAlb (tCO₂e/year)	CSCNIb (ha/year)	CBF_{eq} + COS_{eq}

108.877	3.297,41	33,02
---------	----------	-------

The annual emissions calculations for the entire quantification period are found in Annex 2. Emission Reduction Quantification/2.1.1. ER_ORINOCO2_P2/ 1. Savvanas_Ex Ante

3.7.3.2 Reference emissions of BCR 0002 Activities

3.7.3.2.1 Activity Data - Deforestation

The activity data, based on the BCR 0002 methodology, reflect the changes in forest area within the project area and period. Following the guidelines of the BCR 0002 methodology, item 13.3, forest maps from the Forest and Carbon Monitoring System were used (2010-2020). These maps were stratified into Core Forest and Edge Forest using the MSPA algorithm (see section 3.7.2). To determine deforestation, the Core Forest and Edge Forest areas that became non-forest were identified while Forest degradation was established by the Core Forest areas that became Edge Forest.

An approach based on historical averages was applied to estimate deforestation activity.

3.7.3.2.1.1 Annual historical deforestation in the reference region

Given the stratification of the forest into Core and Edge areas, the analysis was carried out in the reference region considering this stratification and the annual historical deforestation was calculated as follows:

$$AD_{R,yr} = \left(\frac{1}{t_2 - t_1}\right) \times (A_{R1} - A_{R2})$$

Where:

$AD_{R,yr}$: Annual deforested area in the reference region; ha

t_2 : Final year of the reference period; year

t_1 : Initial year of the reference period; year

A_{R1} : Forest area in the reference region at the start of the reference period; ha

A_{R2} : Forest area in the reference region at the end of the reference period; ha

Subsequently, to estimate the annual historical deforestation rate in the project area, the following equation was applied in each stratum:

$$r_{R,yr} = \left(\frac{AD_{R,yr}}{A_{R1}} \right)$$

Where:

$r_{R,yr}$ Proportional annual deforestation rate in the reference region; 1/year (or %/year)

$AD_{R,yr}$ Annual deforestation in the reference region; ha/year

A_{R1} Forest area in the reference region at the start of the reference period, ha

Table 35. Annual deforestation in the reference region

Stratum	$AD_{R,yr}$	t_1	t_2	A_{R1} (ha)	A_{R2} (ha)	$r_{R,yr}$ Proportional annual deforestation rate in the reference region; 1/year (or %/year); h
Core	596,33	2010	2019	39.832	34.465	1,50%
Edge	806,56	2010	2019	112.139	104.880	0,72%

3.7.3.2.1.2 Annual historical deforestation in the baseline scenario

Considering that the project uses activity data and emissions factors from the national reference level, adjustments were made for established national conditions, and baseline deforestation is projected as follows:

$$r_{R,yr} = \left(\frac{AD_{R,yr}}{A_{R1}} \right) * (1 + \%CN)$$

Where:

$r_{R,yr}$ Proportional annual deforestation rate in the reference region; 1/year (or %/year)

$AD_{R,yr}$ Annual deforestation in the reference region; ha/year

A_{R1} Forest area in the reference region at the start of the reference period, ha

$\%CN$ Adjustment for national circumstances (%CN)

Table 36 Annual historical deforestation in the baseline Scenario

year	Stratum	$AD_{BL, yr}$	$A_{A, t}$	$r_{R, yr}$ Proportional annual deforestation rate in the reference region; 1/year (or %/year); h	Adjustment for national circumstances (%CN)
2020	Core	90,66	4188	1,50%	44,59%
	Edge	178,57	17.171	0,72%	44,59%
2021	Core	93,81			49,62%
	Edge	184,78			49,62%
2022	Core	96,27			53,55%
	Edge	189,64			53,55%
2023	Core	78,94			25,90%
	Edge	155,49			25,90%
2024	Core	81,45			29,90%
	Edge	160,43			29,90%
2025	Core	83,77			33,60%
	Edge	165,00			33,60%
2026	Core	85,90			37,00%
	Edge	169,20			37,00%
2027	Core	87,84			40,10%
	Edge	173,03			40,10%
2028	Core	87,84			40,10%
	Edge	173,03			40,10%
2029	Core	87,84			40,10%
	Edge	173,03			40,10%

3.7.3.2.2 Activity Data - Forest Degradation

The guidelines for defining forest degradation activity data were obtained from the NREF (Ministry of Environment and Sustainable Development - IDEAM, 2024). The process of determining forest degradation, which consists of determining the core forest areas that became Edge Forest, is carried out after the post-stratification process, in which only two categories (Core Forest and Edge Forest) are defined in the Reference Region and the leakage areas.

3.7.3.2.2.1 Historical annual forest degradation in the project area in the baseline scenario

The calculation of the annual historical degradation in the baseline is based on the fragmentation analysis for the 2010-2020 period. Furthermore, the equation applied is based on the BCR 0002 methodology for calculating degradation, adjusting for the transition between fragmentation classes (core areas that transition to edge areas.). For the project's case, considering that it applies the national Reference Level methods, only one degradation is quantified, which consists of determining the core area that transitions to edge..

$$PFD_{bl,yr} = \left(\frac{A_{core,bl} - A_{core \rightarrow edge,t2}}{t_2 - t_1} \right)$$

Dónde:

$PFD_{bl,yr}$	Annual historical primary forest degradation in baseline scenario; ha
t_1	Initial year of the reference period; year
t_2	Final year of the reference period; year
$A_{core,bl}$	Area in core class of the reference region, in the year of the start of the reference period; ha
$A_{core \rightarrow edge,t2}$	Reference region area that changes from the core to edge in the final year of the reference period; ha

However, to avoid overestimating emissions from degradation, the value of I_b was defined as the areas in the Core category at t_1 , minus the areas that transitioned from Core to Edge between periods t_1 and t_2 .

<i>PFD,lb,yr (ha)</i>	<i>t1</i>	<i>t2</i>	<i>Acore,t1 (ha)</i>	<i>Acore-edge,t2 (ha)</i>
47,11	2.010	2.019	4.706,00	4.282,0

3.7.3.2.3 Emission factors - Deforestation

For the project, deforestation emission factors were based on the NREF values for the Orinoquía biome, taking into account technical specifications such as stratification (Ministry of Environment and Sustainable Development – IDEAM, 2020, 2024). The 2024 NREF values were used.

Table 37. Emission factors from deforestation

<i>Stratum</i>	<i>EF TCeq (tCO2e/ha)</i>	<i>CBeq (tCO2e /ha)</i>	<i>CO2e in detritus (tCO2e/ha)</i>	<i>SOCEq (tCO2e /ha)</i>
Core	298,76	275,01	17,38	6,37
Edge	203,58	179,83	17,38	6,37

Fuente:Ministerio de Ambiente y Desarrollo Sostenible – IDEAM 2024.

3.7.3.2.4 Emission Factors - Forest Degradation

An emission factor was established for the transition from the core class (intact forest) to the edge class (degraded forest). This was achieved by using the total biomass loss (ΔBT_{bn-bb}), calculated by the National Forest Inventory (IFN) for the Orinoquía biome (Ministry of Environment and Sustainable Development – IDEAM, 2024). The carbon dioxide equivalent was then calculated by multiplying ΔBT_{bn-bb} by the carbon fraction (0.47) and the constant of the molecular ratio between carbon (C) and carbon dioxide (CO₂).

Table 38. Emission factor due to forest degradation.

Transition fragmentation classes	Average difference in total biomass (t/ha)	Difference in carbon content in total biomass (tC/ha)	Degradation emission factor (tCO2e/ha)
Core-edge	57,30	26,93	98,74

Fuente: Ministerio de Ambiente y Desarrollo Sostenible – IDEAM, 2025

3.7.3.2.5 Baseline emissions calculation BCR 0002 Activities

GHG emissions correspond to the amount of carbon dioxide (CO₂) that would be emitted as a result of deforestation and forest degradation in a no-project scenario. Thus, the procedures applied for their calculation are based on the guidelines of the BCR 0002 methodologies (section 13.5)

3.7.3.2.5.1 Annual Emission - Deforestation

The annual deforestation estimate in the baseline scenario is estimated taking into account the following equations:

$$AE_{proj,bl,yr} = (FSC_{proj,bl,yr} \times EF)$$

Dónde:

$AE_{proj,bl,yr}$ Annual emissions from deforestation in the project area under the baseline scenario; tCO₂ year⁻¹

$FSC_{proj,bl,yr}$ Annual forest loss in the project area under the baseline scenario; ha year⁻¹

EF Emission factor per hectare (tCO₂e ha⁻¹)

Table 39 Annual Emission in the baseline

$AE_{proj,bl,yr}$	$FSC_{proj,bl,yr}$ (AD _{BL,yr})	EF TC _{eq} (tCO ₂ e/ha)
27.084,4	90,66	298,76
36.353,0	178,57	203,58

Details of the annual emissions calculations for the entire quantification period can be found in the [Annex 2. Quantification of Emission Reduction/2.1.1. ER ORINOCO₂ P2/Deforestation ex ante.](#)

3.7.3.2.5.2 Annual Emission - Forest Degradation

To calculate annual emissions in the baseline scenario, the following equation is used

$$AE_{bl,deg,yr} = PFD_{bl,yr} \times EF_{prim}$$

Dónde:

- $AE_{bl,deg,yr}$

Annual emissions from forest degradation in the baseline scenario;
tCO₂year⁻¹
- $PFD_{bl,yr}$

Annual area of primary forest degradation in the baseline scenario; ha
year⁻¹
- EF_{prim}

Emission factor for primary forest degradation; tCO₂e ha⁻¹

Table 40. Annual emissions from forest degradation in the baseline scenario

year	(a) Baseline scenario <i>AE_{bl,deg,yr} = PFD_{bl,yr} x EF_{prim}</i>		
	<i>EA_{bl,yr}</i> (tCO ₂ e)	<i>PFD_{bl,yr}</i> (ha)	<i>EF_{prim}</i> <i>DCBT_{DP}</i> (tCO ₂ e)
2020	3,876,7	39,26	98,75
2021	4,652,1	47,11	98,75
2022	4,652,1	47,11	98,75
2023	4,652,1	47,11	98,75
2024	4,652,1	47,11	98,75
2025	4,652,1	47,11	98,75
2026	4,652,1	47,11	98,75
2027	4,652,1	47,11	98,75
2028	4,652,1	47,11	98,75
2029	4,652,1	47,11	98,75

The annual emissions calculations for the entire quantification period are found in the [Annex 2. Quantification of Emission Reductions/2.1.1. ER ORI P2](#)

3.7.4 GHG Project Emissions

To calculate the projected emissions reductions during the project, methodologies BCR 0002 and BCR 0005 were followed.

First, the project scenario activity data were calculated according to sections 13.3.1 and 13.3.2 of the BCR002 methodology, and sections 11.2.3 and 11.2.5 of BCR 0005.

The same emission factors detailed in section 3.7.3.2 of this document were then used to calculate GHG emissions in the baseline scenario.

Finally, GHG emissions were derived from the relationship between activity data and emission factors, following the procedures in sections 13.5 of methodology BCR 0002 and 11.4 of BCR 0005.

3.7.4.1 Emisiones de Actividades BCR 0005 - ex ante

The estimation of annual changes in savanna areas in the project scenario was based on the following equation:

$$CSCN_p = CSCN_{bl} \times (1 - \%PD_p)$$

Dónde

$CSCN_p$	Change in the area with natural vegetation cover in the scenario with Project; ha yr-1
$CSCN_{bl}$	Change in the area under natural vegetation cover in the without project scenario; ha yr-1
$\%PD_p$	Projection of the decrease in land use changes due to implementing project activities. ²⁴

²⁴Con base en las actividades del proyecto a implementar y de acuerdo al comportamiento observado durante el primer periodo de monitoreo, el titular del proyecto estima una disminución del 97.02% en los cambios de uso del suelo.

CSCNp (ha/year)	CSCNIb (ha/year)	%DC _{proy}
215,7	4313,69	95,00%

To calculate the annual emissions in the scenario with the project, the following equation is used:

$$AE_{project} = CSCN_{project} \times (CBF_{eq} + SOC_{eq})$$

Dónde:

$AE_{project}$	Annual emission in the project scenario; tCO ₂ ha ⁻¹ yr ⁻¹
$CSCN_{project}$	Historical changes in the without project scenario; ha yr ⁻¹
CBF_{eq}	Carbon dioxide equivalent in total biomass; tCO ₂ e ha ⁻¹
SOC_{eq}	Carbon dioxide equivalent in the soil; tC ha ⁻¹

Table 41. Annual emission in the project scenari

EAlb (tCO ₂ e/year)	CSCNIb (ha/year)	$CBF_{eq} + COS_{eq}$
141.854	4.313,69	32,88

3.7.4.2 Emissions of Activities BCR 0002 - ex ante

3.7.4.2.1 Activity Data - Deforestation

The projected annual deforestation, in the scenario with REDD+ project, was calculated by applying the following equation. It is important to clarify that the methodology does not propose a formula to establish an ex ante quantification for the scenario with project in the project areas, therefore the following is indicative:

$$FSC_{A,yr} = FSC_{bl,yr} \times (1 - \%DD)$$

Dónde:

- $FSC_{A, yr}$ Annual change in the surface covered by forest in the project scenario; ha
- $FSC_{bl, yr}$ Annual change in the surface covered by forest in the baseline scenario; ha
- $\%DD$ Projected decrease in deforestation due to the implementation of REDD+ activities

Table 42 Annual change in the surface covered by forest in the project scenario

$FSC_{REDD+project, yr}$ $AD_{proj, sc, yr}$ (ha/year)	$ADBL, yr$	$\%DD$
4,53	90,66	95,00%
8,93	178,57	95,00%

For the quantification period, a decrease in deforestation is expected.95.00%,According to the behavior observed during the first monitoring period and taking into account that the implementation of project activities promotes the conservation of all forest cover and seeks to strengthen technical capacities for the sustainable management of project areas.

3.7.4.2.2 Activity Data - Forest Degradation

The estimation of the projected degradation in the project area was carried out with the following equation:

$$PFD_{prj, yr} = PFD_{bl, yr} \times (1 - r_{PFD})$$

Dónde:

- $PFD_{prj, yr}$ Projected annual degradation in the project area, in the project scenario; ha year-1
- $PFD_{bl, yr}$ Historical annual degradation in the project area, from the baseline scenario; ha year-1
- r_{PFD} Proportional reduction expected due to REDD+ activities (e.g.,

0,25 for 25%)²⁵

Table 43. *Projected annual degradation in the project area, in the project scenario*

$PFD_{prj, yr}$	$PFD, lb, yr (ha)$	$rPFD$
3,93	39,26	90%

3.7.4.2.3 Annual Emission - Ex ante Deforestation

The annual emission from deforestation in the project scenario is calculated following the equation:

$$AE_{proj, yr} = (FSC_{proj, yr} \times EF)$$

Dónde:

$AE_{proj, yr}$ Annual emissions from deforestation in the project area under the project scenario; tCO₂e ha⁻¹

$FSC_{proj, yr}$ Annual forest loss in the project area under the project scenario; ha year⁻¹

EF Emission factor per hectare deforested (tCO₂e/ha)

Table 44 Annual emissions from deforestation in the project area under the project scenario

$AE_{proj, yr}(tCO_2e/ha)$	FSC $AD_{proj, yr} (ha/year)$	TC $EF (tCO_2e/ha)$
1.354,2	4,53	298,76
1.817,6	8,93	203,58

The calculation of the estimated annual emissions for the entire quantification period is found in the [Annex 2. Quantification of Emission Reduction/2.1.1. ER ORI P2.](#)

²⁵ A 90% decrease in degradation is projected, according to the behavior observed during the first monitoring period and taking into account that the project activities are aimed at conserving all eligible forest area.

3.7.4.2.4 Annual Emission - Forest Degradation - ex ante

In calculating the annual emissions in the project scenario, the following equation is used:

$$AE_{prj,deg,yr} = (PFD_{prj,yr} \times EF)$$

Dónde:

$AE_{prj,deg,yr}$	Annual emissions from forest degradation in the project scenario; tCO ₂ e ha ⁻¹
$PFD_{prj,yr}$	Annual area of primary forest degradation in the project scenario; ha year ⁻¹
EF	Emission factor for primary forest degradation; tCO ₂ e ha ⁻¹

Table 45. Annual emissions from forest degradation in the project scenario

AE proj,deg,yr (tCO ₂ e/year)	PFDprj,yr (ha)	EF (tCO ₂ e/ha)
387,7	3,93	98,75

The calculation of the estimated annual emissions for the entire quantification period is found in the [Annex 2.1.1. ER ORI P2/Degradation ex ante](#).

3.7.5 GHG Leakages

In accordance with the requirements of the BioCarbon Standard, the project has identified, assessed, and established a robust plan to monitor and quantify GHG emissions from leakage. Given the conservation nature of the project activities, the primary type of leakage identified is activity-shifting leakage, where agents or drivers of land-use change may be displaced outside the project boundaries.

To monitor and quantify this potential displacement, a leakage area (or leakage belt) has been delineated for both the forest (BCR0002) and savanna (BCR0005) components of the project. The delineation of this area complies strictly with the criteria established in Section 9.3 of methodology BCR0002 and Section 7.1.4 of methodology BCR0005. (see section 3.1.2 of this document)

The project employs a hybrid approach for quantifying leakage emissions, combining a conservative ex-ante projection for the PDD with a rigorous ex-post quantification during each monitoring period.

For the ex-ante estimation, First, historical emissions are quantified. Subsequently, emissions in the project scenario are quantified by applying a predetermined increase factor. Finally, the difference between both calculations is quantified as the emissions caused by leaks. A default leakage factor of 10% is applied to the historical emissions rate in the leakage area, as permitted by the methodologies. as follow

3.7.5.1 Emisiones fugas - Actividades BCR 0005 - ex ante

Historical land use change in the leakage area

Historical annual land use changes in the leakage area are estimated by multiplying the average rate of land cover change over the analysis period by the leakage areas within the leakage belt. Using the following formula.

$$SCNC_{lk,yr} = \left(\frac{1}{t_2 - t_1} \ln \frac{A_2}{A_1} \right) \times A_{lk}$$

Dónde:

$SCNC_{lk,yr}$	Annual change in the surface of natural vegetation cover in the leakage area; ha
t_1	Final year of the reference period; year
t_2	Initial year of the reference period; year
A_1	Natural vegetation-covered surface in the leakage area, at the start date; ha
A_2	Natural vegetation-covered surface in the leakage area, at the final date; ha
A_f	Leakage area; ha

Table 46 Annual change in the surface of natural vegetation cover in the leakage area

CSCNlb,f (ha/year)	t_1	t_2	A_1 (ha)	A_2 (ha)
2.496,62	2012	2020	125.965,0	103.944,1

The estimate of the changes in the annual leakage area changes in the scenario with the project is calculated as follows:

$$SCNC_{project, lk, yr} = CSCN_{lk, bl} \times (1 + \%E_{lk})$$

Dónde

$SCNC_{project, lk, yr}$	Annual change in the surface covered by natural covert in leakage area in the project scenario; ha
$CSCN_{lk, bl}$	Annual change in the surface covered by natural cover in leakage area in the baseline scenario; ha
$\%E_{lk}$	Percentage of emissions increase in the leakage area due to the implementation of project activities. The use of a default A value of 10% is allowed in this Methodology. ²⁶

Table 47. Annual change in the surface covered by natural covert in leakage area in the project scenario

CSCNproy,f,year (ha/year)	CSCNlb,f (ha/year)	$\%E_f$
2.746,28	2.496,62	10%

Annual emission in the leakage area - without project

Para calcular la Emisión anual en el área de fugas se utiliza la siguiente ecuación:

$$AE_{lk, year} = FSC_{lk, prj, yr} \times EF$$

Dónde:

$AE_{lk, year}$	Annual emissions from deforestation in the leakage area under the project scenario; tCO ₂ e ha ⁻¹
$FSC_{lk, prj, yr}$	Annual forest loss in the leakage area under the project scenario; ha year ⁻¹
EF	Emission factor per hectare deforested (tCO ₂ e/ha), as defined in Section 12.4

Table 48. Annual emissions from deforestation in the leakage area under the project scenario

²⁶El uso de un valor por defecto del 10% es aceptado por la metodología BCR 0005.

EAlb,f (tCO ₂ e/year)	CSCNlb,f (ha/year)	CBF _{eq} + COSeq
82.100,4	2.496,62	32,88

Annual Emission in the leakage area due to project

The annual emission due leakage is the difference between the annual emission with project and without project.

3.7.5.2 Leakage emissions - BCR 0002 activities - ex ante

Annual historical deforestation in the leakage area

The annual historical deforestation in the escape area was calculated by analyzing the change in forest cover for the period 2010 - 2019, with the following equation:

$$AD_{lk,yr} = \left(\frac{1}{t_2 - t_1}\right) \times (A_{lk,t1} - A_{lk,t2})$$

Dónde:

$AD_{lk,yr}$ Annual historical deforestation in the leakage area; ha/year

$A_{lk,t1}$ Forest area in the leakage area at the start of the historical reference period; ha

$A_{lk,t2}$ Forest area in the leakage area at the end of the historical reference period; ha

$t_2 - t_1$ Duration of the reference period; years

The calculation was performed considering the defined strata: core and edge. Presenting the following values

Table 49. Annual historical deforestation in the leakage area

$AD_{lk,yr}$	t_1	t_2	$Alk_{t1}(ha)$	$Alk_{t2}(ha)$
--------------	-------	-------	----------------	----------------

57,10	2010	2020	5.019,00	4.448,00
130,40	2010	2020	18.230,00	16.926,00

The estimate of the changes in the annual leakage area changes in the scenario with the project is calculated as follows:

$$AD_{lk,proj,yr} = AD_{lk,hist,yr} \times (1 + LF)$$

Where

$AD_{lk,proj,yr}$ Projected annual deforestation in the leakage area during the project scenario; ha/year

$AD_{lk,hist,yr}$ Historical annual deforestation in the leakage area; ha/year

LF Leakage factor (unitless), e.g., 0.1 = 10%

The calculation was performed considering the defined strata: core and edge. Presenting the following values

Table 50. Projected annual deforestation in the leakage area during the project scenario

$AD_{lk,proj,yr}$ (ha/year)	$AD_{lk,hist,yr}$ (ha/year)	%LF
62,81	57,10	10%
143,44	130,40	10%

The projected annual deforestation in the leakage area in the project scenario was estimated from the following equation:

$$AE_{lk,proj,yr} = FSC_{lk,hist,yr} \times (1 + EF)$$

Where:

$AE_{lk,proj,yr}$ Annual emissions from deforestation in the leakage area under the project

	scenario; tCO ₂ e ha ⁻¹
$FSC_{lk,hist,yr}$	Annual forest loss in the leakage area under the project scenario; ha year ⁻¹
EF	Emission factor per hectare deforested (tCO ₂ e/ha),

Historical annual forest degradation in leakage area in the baseline scenario

Para estimar la degradación histórica en el área de fuga, se aplicó la siguiente ecuación:

$$PFD_{lk,yr} = \left(\frac{A_{lk,core,t1} - A_{lk,core \rightarrow core,t2}}{t_2 - t_1} \right)$$

Dónde:

$PFD_{lk,yr}$	Annual primary forest degradation in leakage area; ha
t_1	Initial year of the reference period; year
t_2	Final year of the reference period; year
$A_{lk,core,t1}$	Area in core class in the leakage area, in the initial year of the reference period; ha
$A_{lk,core \rightarrow core,t2}$	Leakage area that changes from the core to patch in the final year of the reference period; ha

As in the previous section, the value of $A_{core-edge,lb}$ It was defined as the area in the Core category at t_1 minus the areas from Core to Edge between periods t_1 and t_2 , applying the equation as follows:

$$PFD_{lk,yr} = \left(\frac{A_{lk,core,t1} - A_{lk,core \rightarrow core,t2}}{t_2 - t_1} \right)$$

$$PFD_{lk,yr} = \left(\frac{A_{lk,core,t1} - A_{lk,core \rightarrow core,t2}}{t_2 - t_1} \right)$$

$PFD_{lk,core,t1}$ (ha)	t_1	t_2	$A_{core,lb,f}$ (ha)	$A_{core-edge,lb,f}$ (ha)
65,67	2.010	2.019	5.823,00	5.232,00

Projected annual forest degradation in the project scenario in the leakage area

To calculate the projected degradation in the leakage area, the following equations were used:

$$PFD_{lk,yr} = PFD_{bl,lk,yr} \times (1 + LF_{deg})$$

Dónde:

- $PFD_{lk,yr}$ Projected annual degradation in the leakage area, in the project scenario
- $PFD_{bl,lk,yr}$ Historical annual degradation in the leakage area (from the baseline)
- LF_{deg} Leakage factor for degradation (default: 0.10)

Table 51 Projected annual degradation in the leakage area, in the project scenario

$DFi, f, proy, year$ (ha)	$DFi, f lb(ha)$	$\%E_f$
72,23	65,67	10,0%

To calculate the annual emission in the leakage area the following equation is used:

$$AE_{lk,deg,yr} = (PFD_{lk,yr} \times EF_{prim})$$

Dónde:

- $AE_{lk,deg,yr}$ Annual emissions from forest degradation in the leakage area; tCO₂e ha⁻¹
- $PFD_{lk,yr}$ Annual area of primary forest degradation in the leakage area; ha year⁻¹

EF_{prim} Emission factor for primary forest degradation; tCO₂e ha

Leakage emissions - BCR 0002 Activities - Deforestation

The annual emissions from deforestation in the leakage area are calculated as follows:

$$AE_{lk,prj,yr} = FSC_{lk,prj,yr} \times EF$$

Dónde:

$AE_{lk,project,yr}$ Annual emissions from deforestation in the leakage area under the project scenario; tCO₂e ha⁻¹
 $FSC_{lk,project,yr}$ Annual forest loss in the leakage area under the project scenario; ha year⁻¹
 EF Emission factor per hectare deforested (tCO₂e/ha), as defined in Section 12.4

Emissions leaks - BCR 0002 Activities - Forest Degradation

The annual emissions from forest degradation in the leakage area are calculated as follows:

$$AE_{lk,bl,yr} = (FSC_{lk,bl,yr} \times EF)$$

Dónde:

$AE_{lk,bl,yr}$ Annual emissions from deforestation in the leakage area under the baseline scenario; tCO₂ year⁻¹
 $FSC_{lk,bl,yr}$ Annual forest loss in the leakage area under the baseline scenario; ha year⁻¹
 EF Emission factor per hectare (tCO₂e ha⁻¹)

The calculation of the annual emissions in the leak area estimated for the entire quantification period is found in the [Annex 2.1.1. ER ORI P2](#) Sheets 3. ForestDegradation_Ex ante and Sheet 2. Deforestation_Ex ante

3.7.6 Ex ante project emissions quantification

Table 52. Ex ante project calculations

Year	Year GHG emissions in the baseline scenario (tCO ₂ e)	GHG emissions in the scenario with Project (tCO ₂ e)	GHG emissions attributable to leakage (tCO ₂ e)" (tCO ₂ e)	Estimated Net GHG Reduction (tCO ₂ e)
2020	191.735,0	9.763,0	33.814,0	177.016,0
2021	212.149,0	10.838,0	36.295,0	195.849,0
2022	213.873,0	10.925,0	36.295,0	197.486,0
2023	201.742,0	10.318,0	36.295,0	185.962,0
2024	203.497,0	10.405,0	36.295,0	187.630,0
2025	205.120,0	10.487,0	36.295,0	189.171,0
2026	206.612,0	10.562,0	36.295,0	190.588,0
2027	207.973,0	10.630,0	36.295,0	191.881,0
2028	207.973,0	10.630,0	36.295,0	191.881,0
2029	207.973,0	10.630,0	36.295,0	191.881,0
Total	1.850.674,0	94.558,0	324.174,0	1.707.464,0
Annual Average	200.073	10.222	35.046	184.591

3.7.6.1 Ex ante missions Natural Savannas

Table 53. Ex ante missions Natural Savannas

Year	Year GHG emissions in the baseline scenario (tCO ₂ e)	GHG emissions in the scenario with Project (tCO ₂ e)	GHG emissions attributable to leakage (tCO ₂ e)" (tCO ₂ e)	Estimated Net GHG Reduction (tCO ₂ e)
2020	130.032,0	6.501,0	7.525,0	116.006,0
2021	141.854,0	7.092,0	8.210,0	126.552,0
2022	141.854,0	7.092,0	8.210,0	126.552,0
2023	141.854,0	7.092,0	8.210,0	126.552,0
2024	141.854,0	7.092,0	8.210,0	126.552,0
2025	141.854,0	7.092,0	8.210,0	126.552,0
2026	141.854,0	7.092,0	8.210,0	126.552,0
2027	141.854,0	7.092,0	8.210,0	126.552,0

2028	141.854,0	7.092,0	8.210,0	126.552,0
2029	141.854,0	7.092,0	8.210,0	126.552,0
Total	1.264.864,0	63.237,0	73.205,0	1.128.422,0
Annual Average	136.742,1	6.836,4	7.914,1	121.991,6

3.7.6.2 Ex ante Emissions Deforestation

Table 54. Ex ante Emissions Deforestation

Year	Year GHG emissions in the baseline scenario (tCO ₂ e)	GHG emissions in the scenario with Project (tCO ₂ e)	GHG emissions attributable to leakage (tCO ₂ e)" (tCO ₂ e)	Estimated Net GHG Reduction (tCO ₂ e)
2020	58.150	2.907	19.751	57.218
2021	65.643	3.281	21.547	64.516
2022	67.367	3.368	21.547	66.153
2023	55.236	2.761	21.547	54.629
2024	56.991	2.848	21.547	56.297
2025	58.614	2.930	21.547	57.838
2026	60.106	3.005	21.547	59.255
2027	61.467	3.073	21.547	60.548
2028	61.467	3.073	21.547	60.548
2029	61.467	3.073	21.547	60.548
Total	545.041,0	27.246,0	192.127,0	537.002,0
Annual Average	58.923,4	2.945,5	20.770,5	58.054,3

3.7.6.3 Emissions Ex ante Forest Degradation

Table 55. Emissions Ex ante Forest Degradation

Year	Year GHG emissions in the baseline scenario	GHG emissions in the scenario with Project (tCO ₂ e)	GHG emissions attributable to leakage (tCO ₂ e)" (tCO ₂ e)	Estimated Net GHG Reduction (tCO ₂ e)
------	---	---	--	--

	(tCO ₂ e)			
2020	3.553,0	355,0	6.538,0	3.792,0
2021	4.652,0	465,0	6.538,0	4.781,0
2022	4.652,0	465,0	6.538,0	4.781,0
2023	4.652,0	465,0	6.538,0	4.781,0
2024	4.652,0	465,0	6.538,0	4.781,0
2025	4.652,0	465,0	6.538,0	4.781,0
2026	4.652,0	465,0	6.538,0	4.781,0
2027	4.652,0	465,0	6.538,0	4.781,0
2028	4.652,0	465,0	6.538,0	4.781,0
2029	4.652,0	465,0	6.538,0	4.781,0
Total	40.769,0	4.075,0	58.842,0	42.040,0
Annual Average	4.407,5	440,5	6.361,3	4.544,9

4 Compliance with Laws, Statutes and Other Regulatory Frameworks

This project has been designed and is being implemented in strict compliance with all applicable local, regional, and national laws, statutes, and regulatory frameworks. This compliance includes, but is not limited to, regulations governing land use, environmental conservation, natural resource management, land use planning, and those directly or indirectly related to the reduction or elimination of greenhouse gases (GHG).

Regarding specific legislation on GHG mitigation activities, the project fully complies with the guidelines established by the national climate change framework and the international standards adopted by the country in the context of multilateral agreements, such as the Paris Agreement. Compliance will be verified through monitoring, control, and reporting mechanisms established by the project and the competent authorities.

Cataruben has established and implemented the FC-GJP-14.Procedure for Managing Legal and Other Requirements, debiFully registered in the SGI (Comprehensive Management System), designed to ensure the identification, access, registration, updating, monitoring, evaluation, communication and verification of the applicable legal, regulatory and guidelines requirementsat the local, regional, national, and international levels. This system is an integral part of the project's legal compliance approach and meets best practice standards in regulatory management.

This system has a Legal Matrix which centralizes current regulations, classified by application levels (local, national and international) and by subject matter (environmental, social, labor, financial, risks, among others), which allows for agile, controlled and updated access by the technical and legal team. The Legal Matrix is supported by a periodic update protocol, which includes the systematic review of official sources, regulatory bulletins, and communications from competent authorities. This process is handled by the organization's legal process, which ensures the timely incorporation of new provisions or regulatory modifications. [\(See Annex 3. Compliance with Laws, Statutes and Other Regulatory Frameworks/3.1.1. Orinoco P2 Compatibility Matrix\)](#)

Additionally, the procedure includes internal audits, obligation checklists, non-compliance risk analysis, and the development of corrective and preventive action plans when gaps or deviations are identified. This procedure not only reviews strict legal compliance but also assesses alignment with stipulated commitments and best practices.

Finally, within the framework of the review and update process of the legal framework applicable to the project, the Cataruben Foundation reaffirms its commitment to regulatory compliance and the comprehensive protection of the rights of property owners and other stakeholders who may be involved in the development of the Orinoco project.

This exercise is not limited solely to verifying compliance with current legal provisions, but also incorporates a preventive and safeguarding dimension aimed at avoiding any impact on collective rights. AND In this regard, in addition to strictly adhering to national legislation, Cataruben has implemented the Stakeholder Consultation process, as well as the Prior Consultation with the Ministry of the Interior, as a formal mechanism for said entity to determine whether any of the private properties linked to the project overlap with the territories of indigenous or Afro-descendant communities. (See folder: Annexes / Carbon Ownership and Rights / [No Origin of the Prior Consultation](#)).

This action aims to ensure that the territorial, cultural, and social rights of these communities are not violated and that any action is based on the principles of respect, informed consent, and non-infringement. This strengthens the project's legitimacy, minimizes social risks, and promotes implementation consistent with national and international human rights standards and social safeguards.

Table 56. Regulatory provisions of the project.

Scope	Application Level	Regulations	Description	Compliance
APPLICABLE LEGISLATION ON CLIMATE CHANGE	National	Decree 2811 of 1974 – Environmental Protection	By which the National Code of Renewable Natural Resources and Environmental Protection is issued	The Cataruben Foundation, in compliance with Decree 2811, which regulates comprehensive environmental management, has adopted a proactive and committed approach to the conservation of natural forest and savanna ecosystems as an integral part of the project, recognizing the fundamental importance of conserving the natural resources present in the areas linked to the project. It is committed to implementing effective measures to preserve biodiversity, soil quality, water, and other elements that make up local ecosystems.
	National	Law 164 of 1994 – Climate Change	United Nations Framework Convention on Climate Change Through which the commitment to adopt measures to reduce GHG emissions into the atmosphere is ratified.	The project's main objective is to develop activities aimed at achieving the goal of reducing deforestation and forest degradation, as well as preventing the transformation of land use into natural savannas. This initiative aims to achieve a significant reduction of 1,695,656 tons of CO ₂ equivalent during the 2019-2027 period. The implementation of these activities is aligned with the principles of Law 164 of 1994, reaffirming our commitment to the norms and standards established for environmental preservation and the sustainable management of natural resources.
	National	National Policy for the Integrated Management of Biodiversity and its Ecosystem Services of 1996	Prevent and control the accelerated loss and transformation of biodiversity, as well as reduce and mitigate the negative effects this has on the quality of life.	The implementation of monitoring of globally threatened species and the promotion of conservation actions within the framework of the project are concrete manifestations of prevention in the face of the accelerated loss

Scope	Application Level	Regulations	Description	Compliance
				of biodiversity, attributable to the very economic dynamics of the territory.
	National	Forest Policy - Conpes 2834 of 1996	Its overall objective is to achieve the sustainable use of forests, in order to conserve them, consolidate the incorporation of the forestry sector into the national economy, and contribute to improving the population's quality of life.	With the implementation of the project, conservation activities are being carried out on the forest areas identified on each of the private properties formally linked to the project, representing 33,960.9 hectares, to contribute to the joint effort between the project owner and the Ecosystem Manager to preserve these areas and their biodiversity.
	International /National	Law 629 of 2000 - Approval of the Kyoto Protocol in Colombia	Quantification and reduction of greenhouse gases, climate change mitigation strategies	The implementation of the project aims to reduce emissions by 1,695,656 tCO ₂ e and thus combine efforts through the purchase of carbon offsets generated by climate change mitigation projects in compliance with Law 629 of 2000.
	National	National Plan for the Prevention, Control of Forest Fires and Restoration of Affected Areas of 2002	Strengthen the global response to the threat of climate change by keeping the global temperature increase this century well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to further limit the temperature increase to 1.5 degrees Celsius. Furthermore, the agreement aims to increase countries' capacity to address the effects of climate change and ensure that financing flows are compatible with	The implementation of the project includes key activities aimed at strengthening the knowledge of private property owners. One of the key focuses of this strengthening is on forest fire prevention (controlled burning practices, firebreaks, and proper waste management). These actions aim to significantly contribute to the protection of the forests and savannas preserved within the framework of the project.

Scope	Application Level	Regulations	Description	Compliance
			low greenhouse gas (GHG) emissions and a climate-resilient trajectory.	
	National	National Policy on Climate Change, 2016	Strategies and actions to manage knowledge about climate change and its potential consequences for communities, biodiversity, ecosystem services, and the country's economy.	Within the framework of the project's implementation, climate change management strategies are proposed, including forest fire prevention, hotspot monitoring, the implementation of landscape management tools, biodiversity monitoring, and restoration actions for degraded ecosystems. All of these actions are consistently aligned with the national climate change policy.
	National	Decree 298 of 2016.- National Climate Change System - SISCLIMA.	Establish the National Climate Change System (SISCLIMA) in order to coordinate, articulate, formulate, monitor and evaluate policies, standards, strategies, plans, programs, projects, actions and measures for adaptation to climate change and mitigation of greenhouse gases, whose intersectoral and transversal nature implies the necessary participation and co-responsibility of national, departmental, municipal or district public entities, as well as private and non-profit entities.	The related regulations establish criteria for the management of climate change projects, which allow for impact not only on the environment but also on social and economic aspects related to the people directly involved in their implementation, with a common objective: greenhouse gas mitigation. The project aligns with this requirement and contributes to this goal by implementing forest and savanna conservation actions on private properties in the departments of Meta and Vichada.

Scope	Application Level	Regulations	Description	Compliance
	National	Decree 926 of 2017 - Carbon Tax	By which the heading of Part 5 is modified and Title 5 of Part 5 of Book 1 of Decree 1625 of 2016, the Single Regulatory Regime on Tax Matters, and Title 11 of Part 2 of Book 2 of Decree 1076 of 2015, the Single Regulatory Regime for the Environment and Sustainable Development Sector, is added, to regulate paragraph 3 of article 221 and paragraph 2 of article 222 of Law 1819 of 2016.	The national carbon tax was created through Article 221 of Law 1819 of 2016 (Structural Tax Reform) in response to the country's need for economic instruments to incentivize compliance with greenhouse gas (GHG) mitigation goals at the national level. The project aligns with this legal requirement, as it seeks to contribute to climate change through 146 private properties where activities will be carried out to contribute to meeting the objectives of reducing the effects of greenhouse gases (GHG), thus opening the possibility for all those who must incur the carbon tax to offset it in accordance with the law.
	National	Decree 298 of 2016 - National Climate Change System	Which establishes the organization and operation of the National Climate Change System and dictates other provisions	The project is aligned with the National Climate Change System (Sisclima) and guarantees compliance with the national climate change policy through the active and effective participation of civil society.
	National	Law 1844 of 2017 - Paris Agreement	Colombia adopts the Paris Agreement for all countries that are part of it	In line with the established goals for emissions reduction, the non-deforestation of 179,212.3 hectares contractually linked to the project, the empowerment of partner communities, and the impact on SDGs 6 and 15 clearly align with the Paris Agreement.
	National	Law 1447 of 2019 - System for monitoring, reporting, and verifying mitigation actions at the national level	Regulate the Monitoring, Reporting and Verification System for mitigation actions at the national level, in relation to the Accounting System	CO2Bio P4 Carbono del Orinoco is a project that seeks to mitigate the effects of greenhouse gas (GHG) emissions by developing activities that contribute to climate change goals and commitments. This joint work

Scope	Application Level	Regulations	Description	Compliance
			for the Reduction and Repopulation of Greenhouse Gas Emissions and the National Registry for the Reduction of Greenhouse Gas (GHG) Emissions, which includes the National Registry of Programs and Projects for actions to Reduce Emissions from Deforestation and Forest Degradation in Colombia (REDD+)	is carried out with property owners, private companies, and Ecopetrol as a strategic partner. The reference scenario is the offsets measured in tons of CO ₂ e that would be produced during the monitoring period. The project is aligned with the provisions of Law 1447, given that it aligns with the guidelines established therein regarding REDD initiatives and contributes to climate change goals and objectives. This initiative will be registered with RENARE once operational, through which all information regarding the development of these projects is controlled nationwide.
	National	Law 1931 of 2019 - Guidelines on Climate Change	It establishes guidelines, primarily for climate change adaptation actions and greenhouse gas mitigation, with the goal of reducing the vulnerability of the country's population and ecosystems to the effects of climate change and promoting the transition toward a competitive, sustainable economy and low-carbon development.	Considering that the project has 146 private landowners who guarantee emissions reductions on their properties, this complies with Law 1931, which establishes that all individuals and legal entities are responsible for participating in climate change management and developing their own actions to contribute to its management. These landowners, linked to the Cataruben Foundation, are carrying out greenhouse gas emission adaptation and mitigation actions.

Scope	Application Level	Regulations	Description	Compliance
	National	CONPES 3918 of 2019 - Strategy for the Implementation of the Sustainable Development Goals (SDGs) in Colombia	Consolidate sustainable alternatives for production, conservation, recovery of goods, ecosystem services and improve the management of information on the status and pressures of the resource. forestry, for the development of actions aimed at the administration and sustainable management of the country's forests.	The project complies with and is aligned with the guidelines established in the regulatory document for climate change, environmental, and Sustainable Development Goals (SDGs) targets in Colombia. This document, which establishes clear guidelines for achieving environmental and development objectives, serves as a fundamental reference for our approach and implementation of each of the project's activities.
	National	Law 2169 of 2021 - Carbon Neutrality	This regulation establishes minimum goals and measures to achieve carbon neutrality, climate resilience, and low-carbon development in the country in the short, medium, and long term, and establishes other provisions.	CO2Bio P4 Carbono del Orinoco during the development of the project activities implemented by the Cataruben Foundation and Ecopetrol as a strategic ally, contributes significantly to the fulfillment of the goal set in Law 2169 throughout the Colombian territory, according to which a 51% reduction in greenhouse gas emissions caused by different aspects including the consumption of fossil fuels, coal mining, electricity, etc. must be generated by the year 2030. These reduction activities must be measured and monitored, for which a system that allows it will be established.

Scope	Application Level	Regulations	Description	Compliance
	National	Resolution 849 of 2022 - Comprehensive Territorial Climate Change Management Plans - PIGCCT	Establish the “Guide for the formulation and implementation of Comprehensive Territorial Climate Change Management Plans – PIGCCT”	Resolution 849 addresses key aspects such as climate risk vulnerability analysis, strategies for achieving carbon neutrality in the short, medium, and long term, the development of mitigation scenarios, and the development of measures and actions to be implemented in the territory by each local authority. The project develops a matrix of environmental, social, and economic risks to measure and mitigate the impacts caused by the project on the territory, while also generating a baseline scenario based on the temporal and spatial history of the project.
	National	Resolution 418 of 2024-	Por which partially regulates article 175 of Law 1753 of 2015, modified by article 230 of Law 2294 of 2023, in relation to the definition of the administration of the National Registry for the Reduction of Emissions and Removals of Greenhouse Gases and other provisions are issued.	All GHG mitigation projects must be registered in the National Registry for the Reduction of Greenhouse Gas Emissions (RENARE), which will be administered by the Ministry of Environment and Sustainable Development under the coordination of the Directorate of Climate Change and Risk Management. This will prevent double counting of emissions reductions, facilitate the traceability and transparency of initiatives, and allow for the generation of certifications that exempt them from the carbon tax.

Scope	Application Level	Regulations	Description	Compliance
LEGISLATION ON ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.	National	Law 2294-2023 NATIONAL DEVELOPMENT PLAN 2022-2026 "COLOMBIA, WORLD POWER FOR LIFE"	Lay the foundations for the country to become a leader in the protection of life through the construction of a new social contract that promotes the overcoming of historical injustices and exclusions, the non-repetition of conflicts, a change in our relationship with the environment, and a productive transformation based on knowledge and in harmony with nature. This process must lead to total peace, understood as the search for an opportunity for all to live a dignified life, based on justice; that is, in a culture of peace that recognizes the sublime value of life in all its forms and guarantees the care of our common home.	During the first monitoring period (2019-2022), the Project implemented activities consistent with the established special protection and land use planning measures. These actions have been essential for advancing our conservation and sustainability goals. However, in order to remain aligned with the most recent standards and developments in territorial planning guidelines, the project has decided to consider updating its monitoring reports. These updates will primarily focus on changes or modifications to the municipal Development Plans and the CAR (Regional Autonomous Corporation) Action Plan, thus ensuring that our activities remain consistent with current policies and regulations. Thus, the project reaffirms its commitment to environmental management.

Scope	Application Level	Regulations	Description	Compliance
	National	Update of Colombia's Nationally Determined Contribution (NDC) - 2020	The NDC incorporates three components: i) Greenhouse Gas (GHG) mitigation, ii) adaptation to climate change, and iii) means of implementation as an instrumental component of policies and actions for low-carbon, climate-adapted and resilient development.	The NDC is a document in which countries assume roles and strategies to reduce greenhouse gas (GHG) emissions and address climate change. In the implementation of the project, its main function is to reduce greenhouse gas (GHG) emissions and promote carbon absorption, including activities or strategies in sectors such as renewable energy, energy efficiency, reforestation, sustainable forest management, strengthening forest governance, impact on local communities regarding the activities they carry out on their properties, and other efforts to reduce greenhouse gas emissions.
SUSTAINABLE FOREST MANAGEMENT	National	Territory of Life Forest Policy 2019	Comprehensive Strategy for Deforestation Control and Forest Management, as an intersectoral policy instrument that involves the joint responsibility of the different sectors of the Colombian State, with the purpose of halting deforestation and forest degradation, addressing the complexity of the causes that generate it, based on recognizing the strategic significance of these ecosystems for the country, due to their sociocultural, economic and	CO2Bio P4 Carbono del Orinoco is aligned with the forest territories of life strategy, and shares the general objective of contributing to the sustainable development and preservation of natural forests, in addition to strengthening the knowledge of the owners of the properties linked to project, on forest governance, environmentally sustainable activities, in order to conserve the existing ecosystems in each property and join efforts in the mitigation of Greenhouse Gases (GHG).

Scope	Application Level	Regulations	Description	Compliance
			environmental importance, for their potential as a development option within the framework of the peacebuilding process, and for their contribution to mitigating and adapting to climate change.	
HUMAN AND ETHNIC RIGHTS	International	United Nations Declaration on the Rights of Indigenous Peoples (2007)	Recognizes and protects the collective and individual rights of indigenous peoples.	Cataruben guarantees free, prior, and informed consent in ethnic communities regarding stakeholder consultations.

Scope	Application Level	Regulations	Description	Compliance
	International	ILO Convention 169 on Indigenous and Tribal Peoples.	Recognizes the rights of indigenous and tribal peoples throughout the world. It is key to guaranteeing territorial rights, prior consultation, and respect for diversity.	To this end, prior consultation processes are implemented to ensure the active, informed, and timely participation of Indigenous peoples, Afro-descendants, and other ethnic communities, respecting their organizational structures, customs, traditions, and languages. These processes are carried out before the implementation of any project activity that may impact their rights, territories, livelihoods, or worldview. Furthermore, Cataruben documents and archives all stages of the consultation process, including minutes, evidence of information disclosure, agreements reached, and follow-up on established commitments, thus ensuring the traceability and verifiability of compliance with FPIC within the framework of the project.

Scope	Application Level	Regulations	Description	Compliance
	National	Law 70 of 1993 and Law 21 of 1991 (ILO Convention 169)		Application of the differential, ethnic and territorial approach.
MANAGEMENT SYSTEM	National	ISO 14001 (Environmental Management System)	It establishes requirements for an effective Environmental Management System compatible with other management systems such as ISO 9001 or ISO 45001.	The Cataruben Foundation strengthens its strategic environmental focus, ensures regulatory compliance, and improves credibility with investors, authorities, and communities. This compliance is reflected in a) strategic environmental planning; b) legal and regulatory compliance; c) risk management and its monitoring.

Source: Fundación Cataruben, 2025.

5 Carbon ownership and rights

In order to guarantee ownership and rights over the Verified Carbon Credits (VCC), an evaluation of land tenure is carried out, highlighting that the project is developed exclusively on private properties. Thus, for each property, a legal analysis was conducted

through property title studies and other legal documents. ([ver Anexo 4. Propiedad y derechos del carbono/4.3. Monitoreo propiedad del carbono/4.3.2. Vinculación](#))

5.1 Project Holder

Table 57 Project holder information

Individual or organization	Fundación Cataruben
Contact person	María Fernanda Wilches Fonseca
Cargo	General manager
ADDRESS	Carrera 20 #36-04
Phone number	+57 3204690315
Email	orinoco2@cataruben.org gerencia@Cataruben.org

5.2 Other project participants

Table 58 Información de contacto de los participantes del Proyecto

Individual or organization	contac person	Rol	Addres	Phone Number	email
Angela Maria Fernandez Delgado	Adrian Fernando	Apoderado	Calle 49 N° 45 - 80 Santa Josefa Militar De Villavicencio	310 5851266	adriancho1982@gmail.com
Eduardo Fernandez Delgado					
Leonardo Fernandez Delgado					
Aura Marina Fernandez De Niño					
Carlos Francisco Fernandez Delgado					
Hector David Paraes Cristancho	Ramiro Efrain Paraes Cristancho	Propietario y Apoderado	Calle 10 No. 18 - 55 Pueblo Nuevo Santa Rosalía	3105503822	ramiroparaes7o@gmail.com
Ladys Yaneth Paraes Cristancho					
Luz Nelly Paraes Cristancho					
Lyda Zoraida Paraes Cristancho					
Pedro Luis Paraes Cristancho					

Elber Parales Cristancho					
Navia Jaramillo Y Cia S En C. S.	Monica Jaramillo Arango	Representante Legal	Calle 15 N° 122 - 151 Apartamento 201 E / Conjunto Palo Verde Cali	3206964036	mjaramillo1966@gmail.com
Monte Rojo S.A.S.	Jose Fernando Jaramillo Arango	Representante Legal	Carrera 100 No. 11 - 90 Oficina 305 / Cc Holguines Trade Center Cali	3206888160	revisor.fiscal@yanaconasmotor.com.co
Monte Verde S.A.S.					
Inversiones Perez Y Asociados S.A.S.	Carlos Alberto Perez Pelaez	Representante Legal	Calle 6 No. 8 - 75 Alcalá	3164472559	bilmateraza@gmail.com
Hld Sas	Doris Pinilla Acuña	Representante Legal	Calle 122 No. 7a - 18 Apartamento 404 Bogotá D.C.	7046809	info@hld.com.co
Agropecuaria Chiribico S.A.	Carlos Eduardo Aguilera	Representante Legal	Calle 74 # 6 - 11 Ap 602 Bogota D.C.	3124828522	cea1958@hotmail.com
Carlos Brito Garcia Ponare	German Zuleider García Guerrero	Apoderado	Vereda Puente Arimena Finca Manacal Puerto Gaitán	3218033752	llanoguerrero.o@gmail.com
Hector Julio Garcia Ruiz	Yury Janeth García Amaya	Apoderado	Vereda Nuevo Horizonte Cumaribo	3134269693	yurisneyg1298@gmail.com
Marina Perez Riaño	María Del Socorro Hernández Pérez	Apoderado	Carrera 54 No. 7 - 177 Manzana 3 Casa 7 El Buque Villavicencio	3114529987	mariahdezperez@hotmail.com
Marili Barragan Moreno	Argemiro Marta Barragan	Apoderado	Vereda El Tigre Finca San Fernando San Luis De Palenque	3106180374	argemiromartha@gmail.com
Janio Marta Becerra					
Inversiones Mararayes S.A.S.	Sylvia Reyes Pavia	Apoderado	Calle 81 N° 11 - 68 Oficina 406 Bogotá, D.C.	3214905922	reyessylvia096@gmail.com
Jesus Ovidio Perez Aza	Carlos Alberto Pérez Rodríguez	Apoderado	Calle 66 Sur No. 22 - 23 Bogotá D.C.	3228578865	calprz@gmail.com
Servicios Profesionales En Palma Sas	Diana Carolina Escobar Prada	Representante Legal	Calle 15 Sur No. 15 - 100 Este / Manzana I Villavicencio	3212025960	serpropan@gmail.com
Huasteca S.A. En Liquidación	Manuel Arturo Trujillo Palacio	Representante Legal	Via 40 No. 77 - 77 Barranquilla - Atlántico	3107023526	tesoreria@alfonsoeme.com
Mavalle S.A.S.	Francisco Bejarano Rodriguez	Representante Legal	Calle 64 B N° 70 D 82 La Cabaña Bogotá, D.C.	2656648	francisco.bejarano@pajonales.com
Plantaciones Unipalma De Los Llanos S.A.					
Edificio Calle Noventa Y Dos S.A. En Liquidación	José Enrique Romero Ocampo	Representante Legal	Calle 91 N° 8 - 29 Torre 4 Apartamento 201 Bogotá D.C	3108838792	joseromero77@yahoo.com
Agroindustria El Maraño S.A.S	Jorge Andrés Benavides Contreras	Representante Legal	Calle 181 No. 76 - 65 Casa 1 Bogotá D.C.	3108039835	jorgeandresbc@hotmail.com
Reforestadora Del Rio S.A.S.	Sergio Madero Arias	Representante Legal	Carrera 6 N° 125 - 35 / Torre 1 Apartamento 1401 Bogotá, D.C.	3142975452	inforodema@rodema.com.co

Witzara Agronegocios Sas	Jose Mauricio Arenas Porras	Representante Legal	Carrera 45 No. 24 A - 45 Bogotá D.C.	3115328372	mauricio.arenas@saat-ag.com
Silvia María Schulz Alvarado	Thomas Otto Schulz	Apoderado Y Propietario	Finca La Tigra, Vereda Matiyure La Primavera	3507099477	thomasotto06@hotmail.com
Agrogranadera La Ramada S.A.S.	Juan Camilo Sinisterra Cardona	Representante Legal	Calle 136 N° 13 - 52 Bogotá D.C	320806533	supracolsas@gmail.com
Martha Lucia Cardona Aguilar	N/A	Propietaria	Calle 136 N° 13 - 52 Bogotá D.C	3108150019	sinisterrajc@hotmail.com
Maria Catalina Puentes Velosa	N/A	Propietaria	Cr 70 No. 180 - 45 Ca 3 Bogotá D.C	3208993370	macapuve@gmail.com
Enrique Abdon Puentes Martin	N/A	Propietario	Cr 180 No. 45a - Ca 3 Bogotá D.C	222 9766	oicelda@gmail.com
Raul Trujillo Cabezas	N/A	Propietario	Calle 11 No. 10 - 58 La Primavera	6485347	juntaaribas@gmail.com
Rigoberto Rojas Aguirre	N/A	Propietario	Finca Villa Maleidy La Primavera	3005778058	rojasrogoberto09@gmail.com
Edith Milena Figueroa Masias	N/A	Propietaria	Finca Villa Maleidy / Vereda Santa Barbara La Primavera	3008345600	edithfigueroa986@gmail.com
Soledad Vargas Femayor	N/A	Propietaria	Calle 7 No. 9 - 73 Barrio Centro La Primavera	3143313841	soledadvargas420@gmail.com
Soledad Femayor De Vargas	N/A	Propietaria	Calle 7 No. 9 - 73 Barrio Centro La Primavera	3142354747	soledadfemayordevargas@gmail.com
Lourdes Alvarado De Schulz	N/A	Propietaria	Carrera 94 - 36 Centro La Primavera	3506203330	lourdessschulz025@gmail.com
Widalis Perez Oropeza	N/A	Propietaria	Carrera 4 No. 6 - 56 Centauros Paz De Ariporo	3142972171	lizperez161311@gmail.com
Luis Alberto Perez Rincon	N/A	Propietario	Carrera 4 No. 6 - 56 Centauros Paz De Ariporo	3214887883	facturafincaavictoria@gmail.com
Idida Lea Abril Fuentes	N/A	Propietaria	Calle 7 No. 25 -72 / Jardín La Primavera	316 6199694	ididaabril1981@gmail.com
Ulda Raquel Abril Fuentes	N/A	Propietaria	Vereda Santa Cecilia La Primavera	318 346 2026	uldararaquelabril Fuentes@gmail.com
Carlos Alberto Perez Pelaez	N/A	Propietario	Calle 6 No. 8 - 75 Alcalá - Valle Del Cauca	3155836766	bilmateraza@gmail.com
Adriana Orjuela Arroyave	N/A	Propietario	Carrera 13 No. 8 Norte - 49 / Casa 24 / Conjunto Tejares Del Parque Armenia -	3182391696	contabilidadcap@outlook.es
Luz Nelly Marquez Pulido	N/A	Propietaria	Cl 103 No. 68a - 53 Casa Bogotá D.C	310582 1313	repcion41606730@gmail.com
Beatriz Avella Gutierrez	N/A	Propietaria	Via Morichal Km 7 Yopal	3102381887	avellabeatriz@hotmail.com
Alexander Rivera Perez	N/A	Propietario	Calle 22 A No. 27 - 31 Yopal	3102388483	comita2000@hotmail.com
Francisco Javier Sinisterra Cardona	N/A	Propietario	Calle 136 N° 13 - 57 Bogotá D.C.	3108150032	fjsinisterra@gmail.com

Francisco Sinisterra Pombo	N/A	Propietario	Calle 136 No. 13 - 52 Bogotá D.C.	3102862045	juan.sinisterra.j s@gmail.com
Paula Sinisterra Junguito	N/A	Propietaria	Carrera 1 A No. 75 -18 Oficina 402 Bogotá D.C.	3156022828	paulasinisterra.j @gmail.com
Juanita Sinisterra Junguito	N/A	Propietario	Carrera 7 No. 69 -29 Bogotá D.C.	3208351223	juanitasi@yaho o.com
Judith Morales Salgado	N/A	Propietaria	Carrera 17 A No. 17 D - 44 Stereo Villavicencio	3143353525	juditmoralessal @gmail.com
Carmen Cecilia Mantilla Guerrero	N/A	Propietaria	Finca La Cristalina Vereda Caño Negro Puerto Carreño	3502135465	elkin1713@gmai l.com
Beatriz Avella Gutierrez	N/A	Propietaria	Via Morichal Kilómetro 7 Yopal	3102381887	avellabeatriz@ hotmail.com
David Albarracin Pajon	N/A	Propietario	Edificio San Silvestre Manzana 3 / Apartamento 305 Bosques De Rosa Blanca De Villavicencio	3052394347	davidalbarracin p@gmail.com
Tulio Albarracin Pedroza	N/A	Propietario	Calle 87 No. 7a - 22 / Apartamento 102, La Cabrera De Bogotá D.C	3114770122	tap1928@gmail. com
Liliana Andrea Perez Marquez	N/A	Propietaria	Calle 97 N° 70 C - 89 Torre 6 / Apartamento 801 Bogotá, D.C.	3002093541	landre_perez@ yahoo.com
Diego Calderon Villanueva	N/A	Propietario	Vereda Santa Cecilia La Primavera	315 774 8058	diegocalderonv 664@gmail. com
Teodora Eulalia Abril Fuentes	N/A	Propietaria	Predio La Fortuna Vereda Santa Cecilia La Primavera	3026163741	eulaliaabril986 @gmail.com
Bernardo Garcia Gonzalez	N/A	Propietario	Bello Horizonte La Primavera -	317 291 7143	bernardo.gonza lez.6386@gmail .com
Rita Jimena Abril Fuentes	N/A	Propietaria	Diagonal 20 No. 19a - 13 Cantarrana 1 Villavicencio -	3007066456	abrilji17@gmail. com
Maria Patricia Mendoza De Galofre	N/A	Propietaria	Avenida Calle 145 No. 76 - 86 / Torre 1, Apartamento 401 Bogotá D.C	3102079654	pgalofre@arauj oibarra.com
Claudia Ines Mendoza De Acosta	N/A	Propietaria	Carrera 12 No. 140 - 42 / Casa 41 Bogotá D.C	3153899622	familia.mendoz a.e@gmail.com
Edgar Mendoza Estrada	N/A	Propietario	Calle 146 No. 11 - 52 Barrio Cedritos Bogotá D.C	3108588019	familia.mendoz a.e@gmail.com
Mauricio Mendoza Estrada	N/A	Propietario	Calle 146 No. 11 - 52 Barrio Cedritos Bogotá D.C	3108588019	familia.mendoz a.e@gmail.com
Esteban Eduardo Poveda Cespedes	N/A	Propietario	Diagonal 8 Sur No. 39 A - 138 / Torre 3 / Apto 302 Villavicencio	3115102711	esteban__25@h otmail.com
Fredy Ferley Aldana Arias	N/A	Propietario	Carrera 19 N° 28 - 09 Provivienda Yopal	312 3514628	ffaldana@hotm ail.com

Jose Fuentes Ferreira	N/A	Propietario	Finca La Esperanza La Primavera	3195034659 -	jf914265@gmail.com
Ingri Maritza Cristiano Caile	N/A	Propietaria	Calle 11 No. 4 - 22 Barrio Santander La Primavera	3164549590	cailecristianom aritza@gmail.com
Omandei Trujillo Galeano	N/A	Propietario	La Sirena / Sec San Agustín Casa 1 A Cali - Valle	3042475497	omantruji@gmail.com
Dumar Javier Guayacan Lopez	N/A	Propietario	Vereda La Esmeralda / Finca La Arboleda Cumaribo -	3114663385	j.gualopez@hotmail.com
Aldemar Guayacan Riveros	N/A	Propietario	Calle 29 A No. 14 - 11 / Manzana 1 / Casa 14 / Villa Encanto Villavicencio	3202013761	aldemarguayacan@hotmail.com
Yohan Sebastian Guayacan Lopez	N/A	Propietario	Finca San Sebastian / Vereda La Esmeralda Cumaribo -	3004399384	yguayacanlopez@gmail.com
Gloria Inelda Guayacan Riveros	N/A	Propietaria	Calle 22 Sur No. 20 - 24 Bogotá D.C.	3112254149	gloriaguayacan@hotmail.com
Noe Cruz Aguiar	N/A	Propietario	Vereda Argelia / Finca La Fortuna Uribe -	3142344139	noec.ag62@gmail.com
Lilia Maria Herrera De Beltran	N/A	Propietaria	Carrera 43 No. 15 104 / Casa 302 Villavicencio	3188565976	facturacionlbb30@outlook.com
Luis Carlos Beltran Beltran	N/A	Propietario	Carrera 43 No. 15 - 104 Manzana 3 Casa 2 Villavicencio -	3105654921	facturacionlbb30@outlook.com
Policarpa Perez Calderon	N/A	Propietaria	Calle 28 Interior 5 / Escudillas Puerto Carreño	3106496659	politaperez1974@gmail.com
Yonny Perez Calderon	N/A	Propietario	Carrera 14 B No. 30 - 116 La Esperanza	3118676955	yperezc@unal.edu.co
Jose Dolores Cordoba Buitrago	N/A	Propietario	Calle 28 No. 8 Barrio Escudillas Puerto Carreño	3124670750	josecordoba1806@hotmail.com
Miryan Perez Calderon	N/A	Propietaria	Calle 29 No. 12 - 35 Escudillas Puerto Carreño	3125746121	mipeca201575@hotmail.com
Alvaro Perez Calderon	N/A	Propietario	Calle 13 No. 24 - 66 Yopal	3102168496	alvaroperezc1978@gmail.com
Carlos Oswaldo Sanchez Hernandez	N/A	Propietario	Carrera 44 # 7 - 177 Apto 702 Torres De Montearroyo	3204953234	carlososwaldosanchez@hotmail.com
Giovanny Abril Fuentes	N/A	Propietario	La Florida La Primavera	3508865593	gvnyyabril2005@gmail.com
Noris Perez Perez	N/A	Propietaria	Calle 7 No. 26 - 32 El Jardín La Primavera	3507046051	noris2020perez@gmail.com
Rudy Angelica Granados Rivera	N/A	Propietaria	Calle 6 No. 9 - 48 Santa Rosalía	318692585	angelita.1527@hotmail.com
Carlos Julio Granados Rivera	N/A	Propietario	Carrera 10 No. 10 - 31 Veracruz La Primavera	3209396155	granadosriveracarlosjulio47@gmail.com
Jenny Marcela Granados Rivera	N/A	Propietaria	Calle 5 No. 08 - 08 Centro Santa Rosalía	3213331044	granadosriverajennymarcela@gmail.com

					mail.com
Rudy Rivera Tarache	N/A	Propietaria	Calle 5 No. 08 - 08 Centro Santa Rosalía	3105829546	riverataracheru dy@gmail.com
Lilia Milena Leyva Florez	N/A	Propietaria	Finca Rincon Del Anel, Inspección La Esmeralda Puerto Carreño	3214810591	reservaanelim1 991@gmail.co m
Alfonso Ponare	N/A	Propietario	Finca La Providencia - Vereda San Teodoro La Primavera	3137818215	ponarealfonso @gmail.com
Javier Heredia Cortes	N/A	Propietario	Calle 45 No 32 - 35 Villavicencio	3144433432	javierheredia31 6@hotmail.co m
Alfredo Antonio Aldana Pinilla	N/A	Propietario	Calle 70 A No. 17 - 63 Piso 3 Bogotá D.C.	3138487158	alfana31@yahoo .es
Jorge David Monroy Monroy	N/A	Propietario	Carrera 6 A No. 3 - 15 Piedecuesta - Santander	3213402749	juridicafernand a@gmail.com
Uriel Humberto Contreras Niño	N/A	Propietario	Diagonal 61 D No. 27 A - 03 El Campin Bogotá D.C.	3124404217	ucontrerasser@ gmail.com
Sandra Marcela Restrepo Montoya	N/A	Propietaria	Diagonal 61 D No. 27 A - 03 Bogotá D.C.	3124388527	sandmar32@ya hoo.com
Jorge Orlando Ortega Gonzalez	N/A	Propietario	Vereda Cupiagua Aguazul	3107668148	topoorgo@hot mail.com
Sandra Milena Cuevas Amaya	N/A	Propietaria	Calle 4 No. 5 - 17 Centro Trinidad	312 584 2258	sc70523@gmail. com
Nicolas Colina	N/A	Propietario	Vereda La Hermosa, Finca Fundo Nuevo Paz De Ariporo	3125586065	colinanicolas85 @gmail.com
Yoly Soraida Vera Ariza	N/A	Propietaria	Calle 8 # 11 - 41 Villanueva	3207407855	johneduardo-o 4@hotmail.co m
Hortencia Maria Adan De Vargas	N/A	Propietaria	Finca Canaguay Vereda Belgrado Maní	313 341 9727	techai81252@h otmail.com
Andres Felipe Gutierrez Sanchez	N/A	Propietario	Calle 127 A No. 5 C - 41 / Torre 3 / Apartamento 402 Bogotá D.C.	3125879710	andres_gutti_fi n@yahoo.com
Dalia Violeta Vivas Navarro	N/A	Propietaria	Calle 10 No. 14 - 37 El Progreso Hato Corozal	3118478568	daliavioletavn@ hotmail.com
Gislaine Anfardeny Buritica Giron	N/A	Propietaria	Calle 16 A No. 31 - 128 Yopal	3212191365	gislaineburitica @hotmail.com
Miller Leandro Ramos Cardenas	N/A	Propietario	Calle 13 No. 24 - 59 Acacias	3208028391	miller_amos_c ardenas@hotm ail.com
Justino Ramos Perez	N/A	Propietario	Calle 16 No. 16 - 47 Barrio Centro Acacias	3219295891	asfinseg@yaho o.com.mx

Rafaela Vargas Ruiz	N/A	Propietaria	Vereda Nueva Antioquia La Primavera	3245446300	rafaelavargas279@gmail.com
Alix Estela Plata Plata	N/A	Propietario	Calle 10 No. 14 - 37 El Progreso Hato Corozal	3118478568	daliavioletavn@hotmail.com
Amparo Amaya De Cuevas	N/A	Propietaria	Calle 9 No. 4 - 45 Trinidad	3112648853	amparoamaya878@gmail.com
Harlyn Tatiana Ruiz Carmona	N/A	Propietario	Calle 156 No. 7b - 89 Bogotá D.C	318 870 3086	htrco5@hotmail.com
Diana Marcela Cuevas Amaya	N/A	Propietaria	Calle 9 No. 4 - 45 Panorama Trinidad	3114792528	marceamaya332o@gmail.com
Hernan Tividor Rondon	N/A	Propietario	Vereda Nazareth Santa Rosalia	3134558956	tividorrondohernan@gmail.com
Aura Minis Avella Guacarapare	N/A	Propietaria	Carrera 21 D No. 20 33 / Barrio La Amistad Yopal	3212843017	rnsclimonal@yahoo.com
Inversiones Danatilo Y Cia Sca	N/A	Propietaria	Calle 160 No. 60 - 07 / Torre 3 / Apartamento 202 Bogotá D.C.	3108124242	castillocardona@yahoo.com
Elocadio Ortega Carvajal	N/A	Propietario	Carrera 25 No. 13 - 08 Los Helechos Yopal	311 262 7473	elocadioortega@gmail.com
Doris Sirley Ortega Carvajal	N/A	Propietaria	Calle 3 L No. 16-46 San Gregorio Orocué	3205693168	sirleyortega@gmail.com
Gladis Acosta Roa	N/A	Propietaria	Calle 3 No. 5 - 54 Paz De Ariporo	3102509285	gladismatjir@hotmail.com
Elmer Rincón Silva	N/A	Propietario	Los Centauros Paz De Ariporo	3123539119	erinconsilva@hotmail.com
Seudiel Satos Vega	N/A	Propietario	Carrera 7 No. 49 - 53 Bello Horizonte La Primavera	3138061114	seusantos16@yahoo.es
Lilia Diaz Martha	N/A	Propietaria	Carrera 7 No. 7 - 49 Bello Horizonte La Primavera	3138867567	seusantos16@yahoo.es
Dora Elia Bonilla Lopez	N/A	Propietaria	Calle 103 A No. 17 - 35 Apartamento 402 Bogotá D.C.	3102303133	dorabonilla@gmail.com
Rosmira Henandez Hernandez	N/A	Propietaria	Centro Comercial Primavera Urbana - Oficina 620 Villavicencio	3208379047	grh393@gmail.com
Atanael Vera Gonzalez	N/A	Propietaria	Vereda 15 No. 24 Vereda Buena Vista La Primavera -	3102302646	atanaelveragonzalez@gmail.com
Danilo Aldana Castañeda, Policarpa Aldana Gaitan	N/A	Propietario	Finca Los Eucaliptos, Vereda Guacamayas Cumaribo	3245659607	aldanacastanedadanilo@gmail.com
Marlio Sanchez Pastrana	N/A	Propietario	Diagonal 47 No. 26 - 25 Triángulo Villavicencio	3502978687	mariospm@hotmail.es
Rumaldo Escobar Paraless	N/A	Propietario	Finca Mirrallano La Primavera	3222124083	rumaldoescobar62@gmail.com

Hermencia Veintemillo Sandoval	N/A	Propietaria	Vereda Matiyure La Primavera	3118720441	hermensiaveintemillo@gmail.com
Cesar Enrrique Barragan Salcedo	N/A	Propietario	Carrera 18 N° 34 - 30 2o De Julio Yopal	3118307764	cebarsal@gmail.com
Juan Martin Jaramillo Saffon	N/A	Propietario	Carrera 4 Calle 67 / Casa 10 Manizales	3104229424	vacaatodaleche@hotmail.com
Gildardo De Jesus Lopez Garcia	N/A	Propietaria	Finca La Florida Vereda Santa Teresa Del Camoa San Martin	3138316941	gildardolopez1422@hotmail.com
Rosalba Martinez De Reyna	N/A	Propietaria	Calle 11 No. 8 - 10 Paz De Ariporo	314 4724269	martinezdereynarosalba@gmail.com
Jaime Espitia Alarcon	N/A	Propietario	Carrera 51 No. 38 - 36 Sur Bogotá D.C.	3108831782	jaimespitia73@hotmail.com
Luis Ernesto Alvarez Caicedo	N/A	Propietario	Finca La Consulta / Vereda Tres Matas Cumaribo	3052886821	luisernestoalvarezcaicedo@gmail.com
Alfredo Antonio Aldana Pinilla	N/A	Propietario	Calle 70 A N° 17- 63 Piso 3 Bogotá D.C.	3138487158	alfana31@yahoo.es
Jaime Arenas Caycedo	N/A	Propietario	Calle 95 No. 13 - 55 Oficina 311 / Chico Bogotá D.C	3103460060	jaimearenas@sau.com.co
Ana Maria Arenas Caicedo	N/A	Propietaria	Calle 80 No. 9 - 91 / Apartamento 601 Bogotá, D.C.	3115920391	anaarenas4@hotmail.com
Waldo Romero Joya	N/A	Propietario	Vereda Araguatos Cumaribo	3133859689	waldoromerojoya@gmail.com
Javier Humberto Cardenas Perilla	N/A	Propietario	Vereda Camareta Cumaribo	3008908629	blncaurrea1970@gmail.com
Blanca Nubia Fuentes Alvarado	N/A	Propietaria	Finca La Amistad / Inspección De La Venturosa Vichada	3008287418	contabilidadesleidynamirez2024@gmail.com
Ramon Dario Ramirez Caycedo	N/A	Propietario	Finca La Amistad Inspección La Venturosa Puerto Carreño	3008287418	contabilidadesleidynamirez2024@gmail.com
Tony Yelitze Tuay Reuto	N/A	Propietario	Inspección De Policía Municipal El Aceitico Puerto Carreño	3506339135	tonotuay@gmail.com
Yorleth Barragan Vargas	N/A	Propietaria	Inspección De Policía Municipal El Aceitico Puerto Carreño	3506339135	yorlethbarraganvargas@hotmail.com
Bayardo Cuevas Gomez	N/A	Propietario	Calle 5 No. 7 - 27 La Primavera	3102199520	bayardocuevas7@gmail.com
Luis Vageon Reuto	N/A	Propietario	Ip San Teodoro	3102064309	vageonluis8@gmail.com

Jose Arismedi Romero Alfonso	N/A	Propietario	Finca El Desafio / Vereda Chiguagua Cumaribo	3229467520	hamiltonromeromoreno@gmail.com
Nancy Yorlay Moreno Bernal	N/A	Propietaria	Calle 7 No. 8 - 44 Barrio Alcaraván Cumaribo	3213499991	yeyitomoreno12@gmail.com
Luis Armando Betancourt Arenas	N/A	Propietario	Finca San Joaquin Trinidad	3124320905	luisarmandobetancourtarenas@gmail.com
Mercedes Mancipe Avila	N/A	Propietaria	Vereda Los Chochos Finca San Joaquin Trinidad	3102355141	mercedesmancipe.a@hotmail.com
Vicente Guarupe Cely	N/A	Propietario	Carrera 5 Con Calle 8, Alcaravan La Primavera	322 9647187	vicenteguarupe.cely16@gmail.com
Hortencia Maria Adan De Vargas	N/A	Propietaria	Finca Canaguay Vereda Belgrado Maní	3133419727	techai81252@hotmail.com
Eduin Arley Ortega Carvajal	N/A	Propietario	Calle 54 Sur No. 32 - 60 Villavicencio	3157873813	eduinortega75@gmail.com
Carlos Manuel Puerta Correa	N/A	Propietario	Finca La Roca Paz De Ariporo	321 2124940	carlos.puerta1950@gmail.com
Carolina Castro Perez	N/A	Propietaria	Finca La Roca Paz De Ariporo	321 2124940	carlos.puerta1950@gmail.com
Graciela Parra De Ortiz	N/A	Propietaria	Calle 75 No. 7 - 21 Apartamento 504 El Nogal Bogotá D.C.	3002924568	graciela.ortizparra2021@gmail.com
Adelaida Colina Ponare	N/A	Propietaria	Inspección San Teodoro La Primavera	3142854362	haivajames423@hotmail.com
Cielo Astrid Chaves Gomez	N/A	Propietaria	Calle 155 No. 9 - 50 / Casa 42 Bogotá D.C.	3164900126	cielochaves@hotmail.com
Jose Manuel Chaves	N/A	Propietario	Calle 155 No. 9 - 50 / Casa 42 Bogotá D.C.	3104365131	j.manuelchaves@hotmail.com
Dorys Rojas Aguirre	N/A	Propietaria	Calle 12 No. 14 - 22 El Jardín La Primavera	3184926101	dorisrojasaguirre@gmail.com
Luis Enrique Garcia Gonzalez	N/A	Propietario	Vereda Santa Cecilia / Finca El Piedrito La Primavera	3188981791	garciagonzalezluisenrique841@gmail.com
Maria Ibañez Rey	N/A	Propietario	Calle 19 A No. 39 B - 63 Este / San Antonio Villavicencio	3208463148	brigitteperrilla21@gmail.com
Jose Willian Moises Herrera	N/A	Propietario	Carrera 27 No. 16 - 38 Osima Mateo Puerto Carreño	3504803311	asoagropc2020@gmail.com
Nayiber Linares Urrego	N/A	Propietario	Centro Cumaral - Meta	6871292	masierralinares@gmail.com
Ninzon Robinson Salcedo Salamanca	N/A	Propietario	Calle 35a No. 27 - 16 / 31 San Isidro Villavicencio	3112370122	ferrerobinsono822@hotmail.com
Juan Manuel Londoño Melo	N/A	Propietario	Carrera 7 No. 57 - 23 Apartamento 1502 Bogotá D.C.	3142067254	juanlon@yahoo.com

Raquel Londoño Melo	N/A	Propietario	Carrera 12 No. 119 - 25 Apartamento 602 Bogotá D.C.	6199389	kellylon70@gmail.com
Alba Cecilia Melo De Londoño	N/A	Propietario	Carrera 20 No. 61 - 10 Apartamento 102 Bogotá D.C.	3108122158	kellylon70@gmail.com
Yaneth Diaz Franco	N/A	Propietario	Calle 18 No. 11 - 61 / Apartamento 11 La Primavera	312 4807677	remolachoreina@hotmail.com
Audelina Cardenas Perilla	N/A	Propietario	Vereda Mata Grande Cumaribo	3223697951	dairosolano14@gmail.com
Libardo Antonio Urrego Beltran	N/A	Propietario	Finca Villa Erika / Vereda Mata Grande Cumaribo	3209105336	charleyurrego18@gmail.com
Wilfredo Vega Guarin	N/A	Propietario	Ip La Venturosa Adl Manga De Coleo Puerto Carreño	324498493	wildivega21@gmail.com
Joaquin Florez Reuto	N/A	Propietario	Calle 14b No. 28 - 27 Castillo Real Puerto Carreño	3103344305	joaquinflorez1@hotmail.com
Zoraida Mejia Pellaton	N/A	Propietario	Calle 14b No. 28 - 27 Castillo Real Puerto Carreño	3124988759	zoraidamejia13@gmail.com
Rosalba Cisneros Marrero	N/A	Propietario	Carrera 35 No. 34 B - 37 / Oficina 201 / Barrio Barzal Villavicencio	3124651158	mari_olaya@hotmail.com
Jaime Burgos Tuay	N/A	Propietario	Finca La Macarena La Primavera -Vichada	3112042644	nohoraburve34@gmail.com
Melida Castro Lima	N/A	Propietario	Cas San Teodoro La Primavera	3142130420	melidacastroli ma04@gmail.com
Uriel Moncada Infante	N/A	Propietario	Vereda San Teodoro La Primavera	3219601832	urielmoncadainfante10@gmail.com
Milciades Burgos Tuay	N/A	Propietario	Finca El Sinai La Primavera	3112042644	nohoraburve34@gmail.com
Virginia Gomez Chipiaje	N/A	Propietario	Finca Matapalito, Vereda Matiyure La Primavera	321 2434288	vigmore1973@gmail.com
Luis Guzman Burgos Tuay	N/A	Propietario	Vereda Matiyure - Inspección La Primavera	314 2434288	gloriabriyidburgos@gmail.com
Carlos Andres Rodriguez Rojas	N/A	Propietario	Carrera 37 No. 22 A - 22 Divino Niño Villavicencio	3233212693	criollosm21@gmail.com
Mabel Lopez Garaviz	N/A	Propietario	Alcaraván Calle 14 No. 04 - 08 La Primavera	3212064114	maluniseve@gmail.com
Juan Sebastian Vega Lopez	N/A	Propietario	La Primavera	3114703718	sebastianvega7625@gmail.com
Niver Andres Vega Lopez	N/A	Propietario	Carrera 14 No. 04 - 08 Alcaraván La Primavera	3118690761	niverandresvega28@gmail.com
Jeremias Escobar Paraless	N/A	Propietario	Vereda Matiyure La Primavera	3227094392	jeremiasescobarparaless13@gmail.com

Amalia Neiva Vasquez	N/A	Propietario	Vereda Matiyure La Primavera	3227094392	amelianeivavasquez@gmail.com
Alonso Caceres	N/A	Propietario	Inspección La Venturosa / Finca Tolemayda Puerto Carreño	3244941199	caceresalonsito72@gmail.com
Marisol Calderon Porras	N/A	Propietario	Vereda La Venturosa Puerto Carreño	3004397095	calderonmarisol30@hotmail.com
Oscar Clavijo Villalba	N/A	Propietario	Carrera 19 No. 13 - 35 Acacias	3152377344	zkpol@hotmail.com
Humberto Riaño Bohorquez	N/A	Propietario	Finca El Samán, Vereda El Triunfo La Primavera	3108128171	humbertoriano062@gmail.com
Claudia Paola Mendoza Moreno	N/A	Propietario	Finca El Samán, Vereda El Triunfo La Primavera	3108128171	humbertoriano062@gmail.com
Yolman Elaica Achagua	N/A	Propietario	Predio Los Saladillos Vereda San Esteban Paz De Ariporo	3107603719	solimpastrana@gmail.com
Solin Pastrana Balcarcel	N/A	Propietario	Predio Los Saladillos Vereda San Esteban Paz De Ariporo	3145245480	yolmanchaquea@gmail.com
Jose Gregorio Sogamoso Paraless	N/A	Propietario	Carrera 7a No. 5a - 21 La Floresta Puerto Rondon	3133749473	gregoritoiyoli@gmail.com
Bienvenida De Jesus Osorio Romero	N/A	Propietario	Finca El Diamante, vereda El Placer Inspección El Tuparro	3007180714	osorobienvendida@gmail.com
Ingrid Jineth Leiva Valencia	N/A	Propietario	Carrera 36 C No. 28 A Sur - 32 Villavicencio	3213520894	diegingo7@hotmail.com
Maria Belda Avella Gutierrez	N/A	Propietario	Calle 3 No. 14 A - 40 Nogal Yopal	3102383458	belda_bella@hotmail.com
Jose Francisco Soler Reyes	N/A	Propietario	Calle 3 No. 14 A - 40 El Nogal Yopal	3124208181	solerfrancisco556@gmail.com
Disley Avella Gutierrez	N/A	Propietario	Calle 19 A No. 27 A - 55 Yopal	3102389510	diavgu@hotmail.com
Dalia Violeta Vivas Navarro	N/A	Propietario	Calle 10 No. 14 - 37 El Progreso Hato Corozal	3118478568	daliavioletavn@hotmail.com
Eduwin Antonio Hincapie Peñaloza	N/A	Propietario	Carrera 29 No. 17 - 59 G 28 Yopal	3213728612	ehincapie@hotmail.com
Pablo Elias Garavito Beltran	N/A	Propietario	Calle 180 No. 12 A - 16 / Torre 3 / Apartamento 701 Bogotá D.C.	3108708972	pablogaravito055@gmail.com
Luis David Cepeda Alarcon	N/A	Propietario	Calle 47 No. 4 - 76 Yopal	3102093151	luisdavidcepeda57@gmail.com
Carlos Hernando Montenegro Escobar	N/A	Propietario	Calle 134 No. 7 B - 83 Oficina 620 Bogotá D.C.	3203064252	carloshmontenegro@gmail.com
Ofelmina Benavides Hernandez	N/A	Propietario	Calle 9 No. 3 - 46 Paz De Ariporo	310 3361962	ofel_123@hotmail.com

Astrid Gonzalez Hadad	N/A	Propietario	Carrera 48 No. 127-75 / Interior 1 / Apartamento 704 Bogotá D.C.	3114692500	astriqui@gmail.com
Ana Maria Gonzalez Hadad	N/A	Propietario	2127 Brickell Av Ap 2705 Miami Florida 33129 Estados Unidos	8222224	anamgonzalezh@gmail.com
Liliana Gonzalez Hadad	N/A	Propietario	Carrera 76 No. 175-50 Conjunto La Plazuela / Casa 3 Bogotá D.C.	3115321242	lgharko2@gmail.com
Pablo Martiniano Colina Ponare	N/A	Propietario	Finca Nairobi - Vereda Flor Amarillo Santa Rosalía	3124424544	dianacisneros1623@gmail.com
Lida María Pérez Pérez	N/A	Propietario	Calle 9 No. 2 - 45 Centauros Paz De Ariporo	312 392 4840	linagi63@hotmail.com
Orlando Omaña Garcia	N/A	Propietario	Calle 48 N° 33 - 96 Caudal Villavicencio	3118119165	oscarfervanegas@gmail.com
Oswaldo Omaña Garcia	N/A	Propietario	Calle 48 No. 33 - 96 Caudal Villavicencio	3164959354	oscarvanegas_m@hotmail.com
Ana Bertilde Guarín Abril	N/A	Propietario	Vereda La Venturosa Puerto Carreño	3044657054	wildivega21@gmail.com
Diego Gustavo Patiño Mariño	N/A	Propietario	Calle 129b No. 55 - 20 / Torre 3 / Apartamento 702 Bogotá D.C.	3132940634	dpatino1@hotmail.com
Juan Carlos Caicedo Mantilla	N/A	Propietario	Calle 146 D No. 79 - 20 Bogotá D.C.	3214430694	caicedojc@gmail.com
Luz Armira Silva Espitia	N/A	Propietario	Transversal 6 / Barrio Laguna La Primavera	3227040968	luzarmirase@gmail.com
Jairo Ernesto Solano Peña	N/A	Propietario	Calle 37 Bis No. 24 - 19 Santa Ines Villavicencio,	3145063038	jairosolano_1892@hotmail.com
Rafael Antonio Hernandez Castañeda	N/A	Propietario	Vereda Cupiagua Aguazul	3114814765	raheca1974@gmail.com
Luz Stella Murcia Parada	N/A	Propietario	Luz Stella Murcia Parada Dirección Vereda Cupiagua Aguazul -	3208362843	stellamurcia@hotmail.com
German Ricardo Ortiz Parra	N/A	Propietario	Carrera 46 No. 4a - 79 Local 17a Cali -	3155715215	germanricardo@grtrd.com
Manuel Tiberio Sanchez Rey	N/A	Propietario	Vereda La Ladera Finca Guaratarito Santa Rosalía	3143408964	manueltiberiosanchezrey248@gmail.com

5.3 Agreements related to carbon rights

The project , Developed by Cataruben, is carried out on private lands in the Orinoquía region of Colombia. Owner participation is formalized through the signing of Conservation

and Sustainable Production Agreements, ensuring clear and transparent management of carbon rights.

To this end, the Cataruben Foundation carries out a process of legal linking of properties, in accordance with the established procedure. (See folder: Annexes / Carbon Ownership and Rights / [Procedure for the Legal Linkage of Properties to GHG Projects](#)). This process includes a prior legal analysis, which reviews documents such as the Certificate of Tradition and Freedom, Public Deeds, and other documents proving ownership or possession of the property. The results of this analysis are documented in the Title Study.

Subsequently, Conservation and Sustainable Production Agreements are signed, through which the owners acquire the status of Ecosystem Managers. These agreements establish contractual terms and responsibilities, benefit sharing, and other key aspects. All information derived from this process is consolidated in databases, ensuring traceability and control of legal and technical documentation.

These Conservation and Sustainable Production Agreements contribute to achieving a fair and equitable distribution of benefits for Ecosystem Managers, based on accredited ownership. These agreements include:

- *Identification of the signing parties.*
- *Purpose and scope of the agreement.*
- *Project name.*
- *Responsibilities, obligations and rights of the parties.*
- *Equitable distribution of benefits.*
- *Period for quantifying GHG reductions and removals.*
- *Parameters established by the Biocarbon Standard.*
- *Notifications and communication mechanisms.*

The dissemination of these agreements is carried out both in person and virtually, ensuring that the terms and conditions are understood and accepted before signing. This process includes a detailed explanation of the parties' rights and obligations, as well as clear communication about the project's impacts and benefits.

Questions about the project can be raised during the socialization sessions. Participants also have access to the Requests, Complaints, Claims, Suggestions, and Congratulations system, as well as communication channels such as phone lines, WhatsApp, and email.

In this way, the project complies with the principles of transparency, equity, and respect for the rights of the parties involved, guaranteeing a solid legal framework..

5.3.1 No Origin of the Prior Consultation

The project is designed to be developed on private properties in the Eastern Plains region, where the population is predominantly rural. It will be implemented on duly titled private lands, without affecting or overlapping with collectively owned territories belonging to ethnic communities.

However, in compliance with the regulatory criteria established in ILO Convention 169, the National Constitution, and current legal rulings, a request for a determination of the appropriateness and timeliness of prior consultation is submitted to the Directorate of the National Authority for Prior Consultation (DNACP) of the Ministry of the Interior. This entity is the competent authority in Colombia to determine whether prior consultation is applicable to the project.

In response, the DNACP, through Resolution No. ST-0706 of May 20, 2025, determined that prior consultation with Indigenous, Black, Afro-Colombian, Raizal, Palenquera, and Rom communities is not appropriate for the project, located in the jurisdiction of the following municipalities: Hato Corozal, Maní, Orocué, Paz de Ariporo, San Luis de Palenque, and Trinidad, in the department of Casanare; in the jurisdiction of the municipalities of Cumaral, Mapiripán, Puerto López, Puerto Gaitán, San Carlos de Guaroa, and San Martín, in the department of Meta; and in the jurisdiction of the municipalities of Cumaribo, La Primavera, Puerto Carreño, and Santa Rosalía, in the department of Vichada.(See folder: Annexes / Carbon Ownership and Rights /[No Origin of the Prior Consultation](#)).

This ensures respect for the rights of ethnic communities to consultation and participation, should their application be required

5.4 Land tenure (Projects in the AFOLU sector)

Determining land tenure in the project area is essential to establishing ownership rights to the benefits derived from carbon sequestration. To achieve this, a thorough analysis is conducted in two stages: before formal engagement and during the contract period, ensuring clarity regarding tenure, strengthening land governance, and ensuring the long-term continuity of the project.

In Colombia, current legislation does not expressly regulate carbon ownership. However, Article 58 of the Colombian Constitution establishes the right to private property and its social and ecological function, which supports the ownership of benefits generated by environmental projects. Additionally, Law 160 of 1994, which regulates the allocation of vacant lands and agrarian reform, defines guidelines on land ownership and use in the rural sector, ensuring legal support for the land designated for these projects.

To verify ownership of the land where the project activities are carried out, rigorous documentary analysis is carried out, based on legally recognized documents, such as:

- *Certificates of Tradition and Freedom, in accordance with Article 740 of the Colombian Civil Code, which regulates the acquisition of ownership.*
- *Public Deeds, required by Article 1857 of the Civil Code for the transfer of property.*
- *Award Resolutions issued by the National Land Agency, in application of Law 160 of 1994.*
- *Purchase and sale contracts, regulated by Article 1871 of the Civil Code.*
- *Court rulings that determine property rights.*
- *Secure Possession Certificates, in accordance with the procedures established in Decree 1071 of 2015, which compiles the agrarian regulations in Colombia.*

These documents guarantee proof of land ownership and respect for the owners' rights.

As part of the information analysis and consolidation process, a Title Study is prepared, a document registered in the Cataruben Foundation's quality system. This study centralizes and clarifies the ownership information for each property, facilitating its periodic review and validation.

This reflects the project's commitment to transparency and rigor in property management. These documents form an integral part of each property's file, constituting essential documentary evidence to demonstrate the legality and continuity of planned activities.

This process allows for demonstrating, in accordance with applicable national regulations, land ownership in the project area during the GHG emission reduction or removal quantification period, ensuring compliance with the requirements for project validation.

6 Climate change Adaptation

The Project integrates a set of strategic actions that not only contribute to climate change mitigation but also demonstrate a clear focus on adaptation. Through the conservation of riparian forests and natural savannas, the implementation of sustainable productive landscapes, and ecosystem management based on satellite monitoring, the project builds ecological and social resilience to the current and future impacts of climate change and climate variability.

The conservation of strategic ecosystems such as forests and savannas helps maintain critical ecosystem functions, including water regulation, carbon sequestration, soil protection, and biodiversity. These functions are essential for coping with extreme weather events such as droughts, floods, and forest fires, which are becoming more frequent and intense due to climate change. Maintaining natural cover improves the landscape's capacity to absorb disturbances, ensuring long-term ecological stability.

Additionally, the project incorporates the use of remote monitoring tools and early warning systems that allow for the identification of environmental threats such as deforestation and fires. This information is used to make timely management decisions, which constitutes a key adaptation strategy by anticipating risks and reducing their potential impacts on ecosystems and the communities that depend on them. This knowledge-management-based approach strengthens institutional and territorial capacity to address climate uncertainty.

Furthermore, the strategy of generating economic incentives through the sale of carbon credits associated with conservation, both in forests and savannas, promotes the transition toward less vulnerable and more sustainable land use models. These incentives diversify and stabilize the income of rural landowners, reducing their dependence on activities that entail environmental degradation and greater exposure to climate risks.

Finally, strengthening local capacities, with special attention to gender equity, represents a key social dimension for adaptation. By promoting equitable access to resources, ownership, and decision-making, especially for rural women, the project recognizes their central role in ecosystem management and community resilience. This inclusion strengthens the social fabric necessary to collectively address the challenges posed by climate change.

Below is an analysis of how the Project activities contribute to the lines of action of the National Forest Policy (defined in CONPES 2834 of 1996) and are consolidated as a comprehensive response to the challenges of territorial transformation in a context of growing climate vulnerability:

Table 59 Relationship between project activities and the National Forestry Policy (defined in CONPES 2834 of 1996)

Strategy: Management and conservation of forest resources		
Line	project activity	Analysis
Promote sustainable forest management practices	R3: Promote the implementation of sustainable forestry practices and conservation actions, in order to reduce deforestation and forest degradation, and maintain carbon stocks.	These activities strengthen active and responsible forest management, promoting management models that reduce deforestation and increase ecosystem resilience. They also consolidate an approach based on maintaining ecosystem services and carbon stocks, which is key to meeting climate and biodiversity goals.
Prevention and control of degradation	R2: Continuous monitoring of forest cover in project areas, including the detection of changes in forest cover and the identification of environmental threats such as fires, through early warnings and remote monitoring tools to support timely land management.	Through the use of modern technologies and spatial analysis, the project contributes to the timely detection of threats such as fires or land-use changes, enabling efficient corrective measures. This contributes to controlling forest degradation, ensuring preventive ecosystem management.
Strategy: Institutional strengthening		
Community participation and equity	CB4: Strengthen gender equity in access to property and financial resources	This action improves equitable access to benefits and opportunities within the framework of the project, promoting the participation of women as key actors in local governance. It contributes to the construction of more inclusive, representative, and sustainable processes in forest resource management.
Strategy: Socioeconomic development and competitiveness		
Generation of economic incentives for conservation	R1 and S1: Transfer of economic incentives derived from the sale of carbon credits (to avoid deforestation and the transformation of natural savannas)	This strategy positions conservation as an economically viable option, recognizing and valuing environmental services. It incentivizes landowners to maintain natural cover, linking conservation with socioeconomic well-being.

Sustainable management of landscapes and territories	S2: Implementation of integrated strategies for sustainable, low-carbon productive landscapes in natural savannas.	It contributes to comprehensive territorial planning, integrating ecological, productive, and social criteria. It supports the rational use of resources and the reduction of emissions, aligned with a vision of long-term sustainable development.
Strategy: knowledge, science and technology		
Research and monitoring of forest resources	CB1: Monitoring and conservation of threatened species; identification and monitoring of Conservation Value Areas (HCVs)	The project's technical and scientific monitoring generates reliable information for decision-making, informing conservation and adaptive management policies. It also protects priority species and key biodiversity areas.

In this way, in compliance with the BCR STANDARD requirements, the Project has designed and implemented strategies that not only aim to reduce emissions from deforestation and land-use change, but also generate structural transformations in land use, consolidating a low-carbon and climate-resilient rural development model. The applicability of these strategies is reflected in their ability to articulate environmental conservation, productive sustainability, and social benefits within a single operational framework, which amplifies their impact beyond the technical sphere.

From an environmental perspective, strategies aimed at conserving and monitoring natural ecosystems such as forests and savannas safeguard key biological diversity and ensure the provision of fundamental ecosystem services. Their importance lies in the fact that these actions are not limited to emissions control but actively contribute to the ecological stability of the landscape, including strategic areas outside the project perimeter. This strengthens ecological connectivity and the maintenance of critical functions such as water regulation, carbon sequestration, and resilience to extreme events.

Regarding its applicability in terms of public policy, the project directly responds to the lines of action of the National Climate Change Policy, the National Biodiversity Policy, and the National Forestry Policy, by promoting sustainable productive landscapes, ecological restoration, and conservation in strategic areas. The strategy of implementing conservation-compatible production models not only aligns with rural sustainability objectives but also offers a viable and replicable alternative at the national level for environmental land use planning.

From a social perspective, the transfer of economic incentives for climate-related outcomes, the inclusion of women, and the strengthening of local capacities represent key strategies for ensuring ownership of processes and the sustainability of results. These actions promote the empowerment of rural stakeholders to actively participate in decision-making regarding climate change, increasing their capacity to anticipate and respond to current and future climate risks.

The project's approach is based on a rigorous characterization of the factors driving deforestation and natural ecosystem degradation in the Colombian Orinoco region. Based on historical analyses of land-use change, assessment of anthropogenic pressures, and deforestation models, it has been determined that the main source of net greenhouse gas (GHG) emissions comes from the conversion of natural land cover—primarily riparian forests and natural savannas—to low-efficiency agricultural systems. This dynamic of extensive transformation has been identified as the main driver of carbon loss and ecological fragmentation in the territory.

In this context, the project design deliberately chooses to prioritize the active conservation and protection of functioning natural ecosystems, rather than interventions through the conversion or technicalization of existing agricultural practices. This choice responds to a technical strategy that maximizes the environmental integrity of the interventions and allows for higher levels of mitigation by directly avoiding emissions associated with deforestation, soil degradation, and the loss of key ecosystem services. Conservation actions ensure not only the maintenance of highly vulnerable carbon stocks, but also the continuity of hydrological functions, climate regulation processes, and the provision of habitat for threatened species.

In terms of climate change adaptation, the project promotes ecological stability of the landscape by protecting key land cover, restoring areas with critical ecosystem functions, and strengthening community capacities for adaptive land management.

7 Risk Management

In compliance with section 14 of the BioCarbon Registry standard (Risk Management) and the “Permanence and Risk Management” tool version 2.0 (June 2025), the project applied the standardized methodology for rating the reversal risk, in accordance with Annex 1 of said tool. The complete analysis, with the detailed justification of each risk category and the calculation of the contribution to the reversal fund, is documented in the following link: ([7. Risk Management/7.1. . Aneex 1. BCR risk-and-permanence](#)).

This exercise was carried out following the guidelines established for AFOLU sector projects, through a quantitative assessment of five risk categories: legal/tenure, environmental/natural, financial/operational, political/governance, and social/stakeholder. Each category was rated on a scale of 1 (low risk) to 5 (very high risk) and weighted according to the standard.

As a result of the analysis, the project obtained a weighted average score of 1.25, indicating a low risk of reversal. This translates, according to the standard's allocation table, into a 10% contribution of credits to the reversal buffer, the minimum level contemplated for projects with effective risk management.

Risk Category	Score (1-5)	Weight (%)	Weighted Score
Legal/Tenure Risk	1	35	0.35
Natural/Environmental Risk	1.5	15	0.225
Financial/Operational Risk	1.33	15	0.3
Governance/Political Risk	1.33	10	0.133
Community/Stakeholder Risk	1	25	0.25
Total	-	100	1.25

The rating obtained reflects favorable and verifiable conditions in the five risk analysis categories:

In the legal/tenure component, the minimum score assigned is based on the existence of formal legal documentation supporting ownership of the associated properties, as well as the signing of contractual agreements with the owners. This process included two stages of consent: an initial letter of intent and a formal connection contract, which guarantees the legality and voluntariness of participation ([See Annex 4. Carbon Ownership and Rights/4.3. Carbon Ownership Monitoring/4.3.2. Linkage](#)).

Regarding the natural/environmental component, the project has an active forest fire prevention and management system implemented through geospatial monitoring platforms (GIS), dry vegetation management activities, community training actions, contingency plans, and a specific monitoring plan to monitor these measures in the intervention area ([See Annex 13. Monitoring and follow-up plan/R-2.3. Satellite monitoring to identify thermal anomalies and fires in forest cover G/R-2.3.1. Methodological process for monitoring hot spots and thermal anomalies](#)).

In the financial/operational area, a low score was assigned due to the existence of a consolidated technical-financial model, initially supported by Agreement No. 3051645 with Ecopetrol, and currently in the process of structuring a second, broader agreement projected until 2030, which demonstrates operational continuity and economic sustainability ([See Annex 1. Project Description/1.4 Agreements with strategic allies](#)).

For political/governmental risk, the assessment recognizes the project's explicit alignment with national public policy instruments, such as the National Forest Policy, the National REDD+ Strategy, Colombia's Nationally Determined Contribution (NDC), and other conservation and climate change-related strategies ([See Annex 3. Compliance with Laws, Statutes and Other Regulatory Frameworks/3.1.1. Orinoco P2 Compatibility Matrix](#)).

Finally, in the social and stakeholder dimension, the lower score was justified based on the application of a structured consultation process with communities and key actors in the design phase, the use of social profiling tools, the implementation of formal participation mechanisms (such as the PQRS system), and the existence of permanent communication channels with the groups involved ([See Annex 11. REDD+ Safeguards/11.2. Safeguard B](#)).

7.1 Reversal risk

In accordance with the BioCarbon Registry standard (version 4.0, July 2025), the project applies the two reserve mechanisms required for AFOLU sector projects in order to safeguard the permanence of the mitigation results:

Project-specific reserve (risk-based component):

The "Permanence and Risk Management" tool (version 2.0, June 2025) was applied for the quantitative assessment of reversal risk, in accordance with Section 14 of the standard. As a result, the project obtained a weighted score of 1.16, classifying it as low risk. This implies a 10% deduction of verified emissions from the Project Reserve Account.

Contribution to the General Reserve (fixed component):

Additionally, the project recognizes and applies a fixed deduction of 10% of verified removals, which will be allocated to the BCR's General Reserve Account, in compliance with the guidelines applicable to all AFOLU projects registered with BIOCARBÓN.

These two components will be deducted from the total Verified Carbon Credits (VCCs) in each verification cycle. This way, the project ensures full compliance with permanence requirements and maintains the environmental integrity of the program.

In conclusion, the Project has adopted a preventive, participatory, and adaptive approach to reversal risk. These measures are integrated into the contracts, the operational strategy, and the project's monitoring processes, enabling robust management of expected risks. This strategy ensures that the environmental and social benefits generated will be sustained over time, effectively contributing to climate change mitigation objectives in the Orinoco region.

7.1.1 Loss Event Report

N/A

8 Sustainable Development Safeguards (SDS)

The Project is a climate change mitigation initiative in the AFOLU sector, focused on reducing emissions from deforestation, forest degradation, and land-use change in the Colombian Orinoquía region. Its implementation in the departments of Casanare, Meta, and Vichada addresses the main factors that threaten biodiversity and ecosystems, including agricultural expansion and forest fires.

To ensure that the Project activities do not generate negative impacts on the environment or local communities, the Sustainable Development Safeguards Tool (SDSs Tool), version 2.0 (June 2025) developed by BioCarbon Standard ([See Annex 8. Safeguards for Sustainable Development/ 8.1 P2 - SDS Assessment Questionnaire](#)) This tool requires that project impacts be assessed in terms of land use, resource efficiency, pollution prevention and management, as well as water, biodiversity, ecosystems, and climate change components.

To meet the requirements of the SDSs Tool, the Cataruben Foundation addresses each component through a specific questionnaire provided by the tool. Each question has been answered accurately and justifiably, and it can be concluded that no risks have been identified given the nature of the project. The monitoring of these measures is carried out through the Project Monitoring Plan and the update of the questionnaire in Annex A of the SDS tool, which allows for continuous evaluation of the results of preventive and mitigation actions, providing a clear view of the progress and effectiveness of the actions implemented.

The analysis supported by the implementation of the activities of conservation and sustainable development show that the Project not only avoids negative environmental impacts, but also generates significant benefits in biodiversity conservation and ecosystem protection.

9 Stakeholder engagement and consultation

The project, implemented in the departments of Meta, Casanare, and Vichada, has developed a robust stakeholder consultation process as part of its formulation and implementation phase. This process aimed to identify and consider the interests, concerns, and contributions of individuals, social organizations, public entities, ethnic communities near the area of direct influence, and stakeholders in the productive sector who could be affected by or involved in project activities.

Stakeholder identification encompassed different levels of governance (municipal, departmental, and regional), as well as public, private, and community actors. Stakeholders consulted included individual producers, municipal governments, environmental corporations, NGOs, productive associations, and liaisons with ethnic communities.

The consultations were carried out mainly through formal invitations sent via email, of which supporting documentation is kept in the form of digital records ([See Annex 9. Stakeholder Participation and Consultation/9.1 Letters Sent](#)). The stakeholders received detailed information about the project's objectives, scope, and activities, which enabled their understanding and evaluation prior to the feedback sessions.

The project has established various permanent channels to ensure continuous feedback from stakeholders, including the telephone line 310 208 8379, the institutional email orinoco2@cataruben.org, the virtual mailbox for requests, complaints, claims, suggestions, and compliments (PQRSF) accessible at this link, as well as the physical address at Carrera 20 # 36-04 in Yopal, Casanare, where formal communications are also received. These mechanisms ensure the public and culturally appropriate availability of the complaints channel, in accordance with the requirements of section 16.2 of the BCR standard.

This process allowed for the joint development of the project's structural activities. Through participatory exercises, interventions aligned with local needs and the direct and underlying causes of deforestation and land-use change in natural savannas were defined. In each phase, consultations included discussions about the causes and drivers of deforestation, recognizing these factors as crucial for defining effective actions to mitigate emissions and conserve carbon stocks. This approach enabled community ownership of the project and informed and effective participation of local stakeholders.

During the technical design, the diversity of stakeholders was taken into account to build implementation paths that responded to differences in productive, environmental, organizational, and cultural contexts. In addition, elements of participatory impact assessment were included, especially with landowners linked to strategic ecosystems, to strengthen the traceability of the benefits generated.

The stakeholder consultation process developed by the Project directly contributes to compliance with Safeguards B and D of the BCR standard. Regarding Safeguard B, initial consultations, official outreach sessions, thematic training sessions, and PQRSF mechanisms have ensured transparency and access to information (B2), accountability (B3), recognition of forest governance structures (B4), and capacity building of local stakeholders (B5) throughout all RENARE stages of the project ([See 11. REDD+ Safeguards/Safeguard B](#)).

Regarding Safeguard D, ongoing dialogue with stakeholders has made it possible to identify and agree on actions that promote sustainable environmental, social, and economic benefits. These actions are incorporated into the land implementation plans and strengthened through conservation, sustainable use, and restoration activities, ensuring their permanence and equitable distribution over time. The evidence supporting these actions and their correspondence with both safeguards are presented in the annexes cited in this section ([See 11. REDD+ Safeguards/Safeguard D](#)).

9.1 Summary of comments received

As a result of the consultation process, six documented responses were obtained from the stakeholders contacted. Four of these entities confirmed receipt of the information through formal acknowledgment of receipt, demonstrating the traceability of the process. One foundation expressed interest in scheduling a meeting with the project's technical team to explore opportunities for coordination between its initiatives and the actions planned within the project framework.

Likewise, a peasant association issued a statement expressing its willingness to actively participate in the project, requesting to be considered within the territorial implementation strategies. These responses reflect a significant level of ownership and interest on the part of the stakeholders consulted, thus strengthening the principles of participation and co-responsibility in territorial management.

([See Annex 9. Stakeholder Participation and Consultation/ 9.2 Comments Received](#)).

9.2 Consideration of comments received

The comments received during the consultation process were systematically recorded, analyzed, and, to the extent possible, incorporated into the project's technical and operational design. Stakeholder observations focused on aspects such as coordination with other ongoing conservation initiatives, strengthening local capacities for environmental management, the need to ensure clear community participation mechanisms, and the inclusion of rural stakeholders in the implementation of activities. These contributions were considered in the structuring of the farm implementation plans and the definition of local governance mechanisms, ensuring that the project proposals were responsive to the social and environmental contexts of the affected territories.

During the public consultation, no formal complaints were recorded that implied direct negative impacts or manifest conflicts with project activities. Most concerns throughout the project feasibility process were addressed through direct feedback sessions with the requesting stakeholders, providing technical and explanatory information and recording

the satisfactory completion of the requirements. The project maintains its support channels open to ensure a permanent flow of communication with stakeholders, as part of its transparent and adaptive management approach.

10 Sustainable Development Goals (SDGs)

The Project demonstrates a clear and verifiable contribution to Sustainable Development Goals (SDGs) 5, 6, 13 and 15, in line with the BioCarbon Registry's Tool for Determining GHG Project Contributions to the SDGs. This tool was applied during project planning and appraisal to identify positive and sustainable impacts, based on relevant criteria and indicators ([See Annex 10. Sustainable Development Goals/10.1. P2-SDG-Tool](#))

In relation to SDG 5: Gender Equality, the project incorporates a gender-based approach, particularly through the activity "Strengthening gender equity in access to property and financial resources." This action seeks to empower participating rural women, promoting their equitable access to economic benefits and strengthening their role in decision-making regarding land and natural resource management. This contributes to indicator 5.a.1, related to secure agricultural land rights and women's participation in land tenure, through records and evidence disaggregated by sex within the project.

Regarding SDG 6: Clean Water and Sanitation, the project directly contributes to indicator 6.6.1 (change in the extent of water-related ecosystems over time) by prioritizing the conservation of ecologically strategic areas such as gallery forests, natural savannas, and wetlands. Although no active restoration activities are planned, protection, monitoring, and management actions are implemented to ensure the conservation of these ecosystems. Monitoring these actions allows for establishing baselines and assessing positive changes in their ecological integrity, thus supporting sustainable water resource management.

Regarding SDG 13: Climate Action, the project is fully aligned with the climate change mitigation goals of the AFOLU sector. Activities are aimed at reducing emissions from deforestation, forest degradation, and land-use change through the conservation of natural cover, sustainable landscape management, and strengthening local capacities. The use of a Monitoring, Reporting, and Verification (MRV) system, based on satellite imagery and community participation, allows for the quantification of the climate benefits achieved, which are further incentivized through a payment-for-results (PPR) mechanism, thus promoting the sustainability and scalability of the activities.

Finally, within the framework of SDG 15: Life on Land, the project makes a significant contribution to biodiversity conservation and the protection of natural ecosystems in the Orinoquía region. Priority is given to the preservation of strategic vegetation cover that hosts endemic species and performs key ecological functions, such as water regulation, carbon sequestration, and landscape connectivity. Through technical support, the implementation of sustainable production practices, and local governance, efforts are strengthened to halt biodiversity loss and ensure the sustainable use of ecosystems.

In conclusion, the Project has successfully used the BCR tool to determine its contributions to the SDGs, demonstrating that its activities generate concrete social, environmental, and climate benefits aligned with international indicators. The implementation, monitoring, and evaluation strategies demonstrate real and sustainable progress toward these goals, integrating the SDGs as an essential part of the project's territorial approach.

Below is a summary of the contribution made by the Project, and the monitoring methodologies proposed for its follow-up:

Table 6o Summary of the project's contribution to the Sustainable Development Goals.

SDGs to impact	Global SDG Indicator	Project Activity	Measurement indicator
ODS 5	5.a.1 a) Proportion of the total agricultural population with ownership rights or secure rights to agricultural land, by sex; and b) Proportion of women among owners of agricultural land, or holders of rights to agricultural land, by type of tenure	Strengthening gender equity in access to property and financial resources	Progress on the training plan on access to property, financial resources, and gender equality Progress in legal advice for access to property, financial resources, and economic rights.
ODS 6	6.6.1 Change in the extent of water-related ecosystems over time	Continuous monitoring of forest cover in project areas, including the detection of changes in forest cover and the identification of environmental threats such as fires,	Satellite monitoring of changes in the extent of water-related ecosystems

		through early warnings and remote monitoring tools to support timely land management.	
ODS 13	13.2.2 Total greenhouse gas emissions per year	All activities contribute to reducing emissions from deforestation, degradation and land use change in natural savannas.	reduced equivalent tCO ₂
ODS 15	15.1.1 Forest area as a proportion of total area	Continuous monitoring of forest cover in project areas, including the detection of changes in forest cover and the identification of environmental threats such as fires, through early warnings and remote monitoring tools to support timely land management.	Satellite monitoring of the proportion of the area covered by natural forest
	15.1.2 Proportion of important sites for terrestrial and freshwater biological diversity that are part of protected areas, by ecosystem type	Identification and monitoring of Conservation Value Areas (HCVs) within the project area, through the development of a technical document recording the identified HCVs, their hectare size, and their conservation status, ensuring their periodic updating to assess changes and external pressures.	Monitoring of identified HCVs with updated conservation status
	15.5.1 Red List Index	Monitoring and conservation of globally threatened species in the project area	Monitoring and conservation of globally threatened species, collected through participatory (bioacoustic) monitoring and

			secondary information, using the species richness index.
--	--	--	--

11 REDD+ Safeguards (For REDD+ projects)

In Colombia, a process of interpreting the Cancun social and environmental safeguards began in 2013. From the beginning, this process was part of a literature review that addressed the national regulatory framework and the most relevant international agreements on the matter. This process is in continuous evolution, with the participation each year of more strategic actors committed to strengthening the respect and application of these safeguards at the national level. The main objective is to ensure that REDD+ projects do not generate negative social or environmental impacts in the intervention areas. To achieve this, the guide established by the BCR Standard has been used in the tool. Safeguard Tools for Sustainable Development (SDSs Tool), Version 1.0 April 2024.

It is crucial to highlight that the project is carried out on private properties. Cataruben has formalized civil contracts, transparent and informed, with each owner. These agreements detail the actions and responsibilities of both parties to ensure the conservation of biodiversity and carbon reserves. This approach is significant, as from the project's conception, a clear commitment is established to mitigate any risk that may affect communities or biodiversity. These risk conditions are greater when a project is implemented in collective indigenous, peasant, or Afro-descendant communities.

In line with the above, the project addresses these safeguards following the approach of the document "Social and Environmental Safeguards for REDD+ in Colombia". This document offers a detailed interpretation of fifteen operational and coherent elements for the national context, which guide the activities proposed within the framework of the project. These fifteen elements are grouped into seven safeguards, organized into three broad themes: institutional, social and cultural, environmental and territorial..

Table 61. Thematic organization for Environmental and Social Safeguards for REDD+.

Thematic	Safeguards Cancun	In National Safeguard Element
Institutional	Safeguard A	A1. Correspondence with national legislation.
	Safeguard B	B2. Transparency and access to information.
		B3. Responsibility.
		B4. Recognition of forest governance structures.
		B5. Capacity building.
Social and cultural	Safeguard C	C6. Free, prior and informed consent.
		C7. Respect for traditional knowledge.
		C8. Distribution of benefits.
		C9. Territorial rights.
Environmental and Territorial	Safeguard D	D10. Stake.
	Safeguard And	E11. Conservation of forests and their diversity
		E12. Provision of environmental goods and services.
	Safeguard F	F13. Environmental and territorial planning
		F14. Sectoral planning.
	G Safeguard	G15. Forest control and surveillance to prevent the displacement of emissions.

Source: Fundación Cataruben, 2025.

Following this same line, the project activities are based on respecting, attending to, and complying with these seven (7) social and environmental safeguards. However, to continue with the positive and compliance approach, in addition to the national reading and interpretation, which focuses on the implementation of policies, measures, and affirmative actions that guide the gradual reduction of deforestation and land use change, it is necessary to promote, in parallel, access to material and symbolic benefits for local communities and their territory. (Camacho A, Lara I & Guerrero. 2017). A second document and as a main guide, I appeal to the document called "Tool to demonstrate compliance with REDD+ safeguards" Version 1.1 of January 26, 2023 developed by BioCarbon Registry. This text offers clarity in both the indicators and the criteria (the type of evidence) that must demonstrate the percentage of compliance with each of these safeguards in the previously mentioned period, basically representing an articulated approach between the vision of the BCR and the local one. , that is, the context and the individuals who inhabit it (Brigard & Urrutia, 2023)²⁷.

²⁷ Brigard & Urrutia, BioCarbon Registry. 2023. Tool to demonstrate compliance with REDD+ safeguards. Version 1.1. January 26, 2023. Bogotá, Colombia. 20 p. <http://www.biocarbonregistry.com>

For this reason, the REDD+ Safeguards Monitoring Plan was designed, which is based on the [Annex 11. REDD+ Safeguards/11.1 P2. REDD+ Safeguards Monitoring Plan](#). Based on the above context and the project, compliance, approach, and respect for each of the seven safeguards is projected as follows:

Table 62. Indicators to address safeguards

Safeguard	Indicator	Analysis
A. The complementarity or compatibility of the measures with the objectives of national forest programmes and of the international conventions and agreements on the subject.	Percentage of Project actions aligned with national forest policies and with updated analysis in the last reporting period.	The project ensures that all implemented activities are supported by national regulations and plans such as ENREDD+, the National Forest Policy, and the Climate Change Law. This consistency is verified through a systematic documentary analysis that is updated periodically, ensuring that the project contributes to Colombia's national and international commitments regarding forestry and climate change.
B. The transparency and effectiveness of national forest governance structures, taking into account national legislation and sovereignty. Provide transparent and consistent information accessible to all stakeholders and update it regularly. Be transparent and flexible to allow for improvements over time. Build on existing systems, where they exist.	Design, implementation, and compliance with the Project Communications and Dissemination Plan, ensuring transparency, access to information, and the inclusion of local and territorial forest governance structures.	The project has established a comprehensive communications plan to continuously and easily disseminate information to local and institutional stakeholders. Information products and social media platforms are generated, and the active participation of environmental and community authorities is promoted, strengthening local forest governance, trust, and social ownership of the project.
C. Respect for the knowledge and rights of indigenous peoples and members of local communities, taking into account relevant international obligations and national	Monitoring of ethnic communities in the project's area of influence Linkage through	The project conducts annual monitoring of ethnic communities within its area of influence, recognizing collective rights and determining whether it is necessary to activate FPIC processes. Although it primarily works with private lands, this action demonstrates respect for and compliance with ILO Convention 169

circumstances and legislation, and bearing in mind that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples.	contracts and/or conservation agreements signed with ecosystem managers	and allows for preventive measures to ensure free and informed consent where appropriate.
D. The full and effective participation of stakeholders, in particular indigenous peoples and local communities, in the measures referred to in paragraphs 70 and 72 of this decision.	Implementation of participatory spaces designed to ensure the integration of traditional knowledge and the active participation of local communities in the project.	The project promotes participatory processes for decision-making, sharing activities, and receiving feedback. Although the stakeholders involved are not fully established communities, spaces for dialogue with owners and local stakeholders are created, and their development is documented, thus complying with the principles of inclusion, representativeness, and active listening.
E. The compatibility of the measures with the conservation of natural forests and biological diversity, ensuring that those indicated in paragraph 70 of this decision are not used for the conversion of natural forests, but instead serve to incentivize the protection and conservation of those forests and the services derived from their ecosystems and to enhance other social and environmental benefits.	Continuous monitoring of forest cover in project areas, including the detection of changes in forest cover and the identification of environmental threats such as fires, through early warnings and remote monitoring tools to support timely land management.	The project continuously monitors forest cover on the associated properties using satellite imagery and alert systems. This allows for the detection of deforestation, fires, and other threats, and timely decisions can be made to prevent forest cover loss, promoting the effective conservation of natural forests and their ecosystem functions.
F. The adoption of measures to address reversal risks	Analysis and monitoring of reversal risks carried out within the framework of the initiative Define and implement	The project annually identifies factors that could compromise the sustainability of its results (change of use, abandonment of commitments, sale of land). This assessment is key to maintaining the project's environmental integrity over time and taking corrective action. Compliance with signed

	a Risk Management Plan associated with the reversal	conservation agreements is also evaluated.
G. Adoption of measures to reduce the displacement of emissions	Perform leak identification analysis and its causes Design and implementation of the response protocol to minimize such leaks	Analysis of the identified leaks and actions to minimize them Monitoring the implementation of the response protocol

12 Special categories, related to co-benefits (optiDemonstrated ecological improvements over time.onal)

The Project qualifies for recognition under the BIOCARBON standard's Orchid Category, thanks to the sustained and systematic execution of actions aimed at biodiversity conservation in the Colombian Orinoquía region. Since its design and implementation, the project has ensured the protection of strategic habitats such as natural savannas, riparian forests, and wetlands, ecosystems that host endemic species and represent areas of high conservation value.

This application is supported by verifiable results that demonstrate the project's commitment to wildlife protection, the strengthening of local capacities for biodiversity monitoring and management, and the consolidation of actions that have generated positive environmental benefits aligned with the Sustainable Development Goals (SDGs).

In coherence with the Orchid Category guidelines, the project has developed and implemented additional activities to address each of the established requirements. Likewise, monitoring indicators have been defined and applied to demonstrate the progress achieved and the permanence of positive impacts on biodiversity.

Table 63. Compliance BCR Tool. Special categories exceptional benefits label.

Criterion	Compliance
Protection of critical habitats for threatened or endemic species	The project implements a participatory monitoring system that identifies and assesses critical habitats for endemic and

	threatened species within the project area. The information collected is consolidated into periodic technical reports that guide management and conservation actions, ensuring the active protection of these habitats against anthropogenic and natural pressures.
Prevention and monitoring of invasive species	The prevention and monitoring of invasive species are integrated into the project's participatory biodiversity monitoring program, incorporating specific indicators for the early detection of exotic species, their georeferenced recording, and the periodic analysis of their distribution and abundance. This approach enables the activation of timely management protocols and strengthens local response capacity, contributing to the protection of native biodiversity and the reduction of ecological risks associated with invasive species.
Conservation of formally identified High Conservation Value (HCV)	The project has developed a technical document that identifies and maps High Conservation Value (HCV) areas, detailing their extent, conservation status, and threats. This document is periodically updated and serves as an input for land-use planning and the definition of conservation strategies, ensuring the long-term protection of HCV areas.
Demonstrated ecological improvements over time	The monitoring methodology establishes baselines and conducts periodic evaluations to compare indicators over time, evidencing changes in habitat quality and the conservation status of HCV areas. This information is used to implement adaptive management and demonstrate progressive improvements in the ecological conditions of the project area.

Table 64. Actividad CB₁ propuesta para abordar requisito de la categoría Palma de Cera

ID	CB1			
Componente	Cobeneficios			
Descripción	Monitoreo de la Calidad del hábitat a través de atributos claves			
Requisito de la categoría que aborda	Seguimiento continuo y comunitario de la biodiversidad local, integrando saberes técnicos y tradicionales. Priorización de zonas clave para la conservación dentro del área del proyecto, estableciendo medidas de manejo específicas. Disponibilidad de información actualizada para tomar decisiones de manejo adaptativo y medir el impacto positivo del proyecto en el territorio			
Indicadores para reportar el avance de la actividad				
Nombre	Tipo	Meta	Unidad de medida	Responsable de la medición
Monitoreo participativo y conservación de especies endémicas en el área del proyecto	Producto	18	Número de monitoreos	Fundación Cataruben
Identificación y monitoreo de Áreas de Valor para la Conservación (AVC) dentro del área del proyecto, mediante la elaboración de un documento técnico que registre las AVC identificadas, su extensión en hectáreas y su estado de conservación, asegurando su actualización periódica para evaluar cambios y presiones externas.	Producto	18	Número de monitoreos	Fundación Cataruben

Adicionalmente, el proyecto se encuentra en proceso de fortalecimiento técnico y operativo para aplicar, en un siguiente ciclo de verificación, a la Categoría Palma de Cera, orientada al reconocimiento de impactos socioeconómicos transformadores. A través del mecanismo de pago por resultados, el proyecto espera canalizar recursos hacia propietarios privados que implementan acciones de conservación y producción sostenible en sus predios, lo cual genera beneficios económicos directos, estabilidad territorial y nuevas capacidades en actores locales.

Se han fortalecido las estructuras participativas para la gestión transparente de beneficios y procesos de fortalecimiento de emprendimientos rurales vinculados a la producción sostenible, así como indicadores desagregados para el seguimiento de mejoras en ingresos, capacidades y acceso a oportunidades económicas. Estos elementos están siendo articulados progresivamente en el marco del Plan de Monitoreo, con el objetivo de construir una línea base sólida y evidencias verificables que sustenten una futura aplicación a esta categoría.

13 Grouped projects (if applicable)

The Project is developed as a grouped project, in accordance with the provisions of the BCR Standard (July 2025 version).

The first set of areas has complied with all the standard's requirements in terms of baseline, additionality, project activities, applicability conditions, and implementation region, among others.

In future verifications, and in accordance with the provisions of the standard, the incorporation of new properties will be carried out by fully following the inclusion procedure established for grouped projects, including the application of the defined eligibility criteria, the validation of methodological and baseline consistency, the updating of the leakage belt when appropriate, and the validation of eligibility by a Conformity Assessment Body before its official registration.

In this sense, the project 's expansion area is defined as the private property areas present in the Colombian Orinoquía region in the departments of Casanare, Meta, and Vichada.

14 Other GHG program

Not applicable, the project does not originate from other GEI programs, nor is it registered in other GEI programs.

A systematic search for carbon standards was conducted, and it was confirmed that no area of the project is located within another project (REDD/ Feature Dataset "Proyecto_Standart_DobleContabilidad"; Proyectos de Carbono).

15 Double Counting avoidance

The project strictly satisfies and applies the requirements and mechanisms of the Biocarbon Standard, as defined in the BCR tool "Avoiding Double Counting V2.0".

The project monitors records on other relevant platforms (see section 14).

16 Monitoring plan

16.1 Description of the monitoring plan

The monitoring plan adheres to the BCR regulations and methodological guidelines BCR 0005 and BCR 0002, and follows the guidelines of the Monitoring, Reporting, and Verification (MRV) tool. The monitoring procedures for each project component, along with the data and parameters established during validation and ongoing monitoring during verifications, are detailed below..

16.1.1 Monitoring project boundaries and quantifying project emissions reductions/removals

Project boundary monitoring includes monitoring activities and GHG emissions occurring within the project area, as well as identifying any potential GHG emissions that may occur outside the project boundary as a result of project activities (leakage).

The baseline will be updated 5 years after the start date and every 10 years thereafter. Therefore, the monitoring of the quantification of emissions will be carried out initially from the 2020 to 2027. Likewise, additional data and information to establish the base or reference scenario are detailed in the section [3.7.3 Reference GHG emissions](#).

Project limits and emissions are controlled following the guidelines of the BCR 0002 and BCR 0005 methodologies. The monitoring process is detailed in section 16.1, Project Limits and Emissions Monitoring. As part of this process, the monitoring tools, the geographic information system (GIS), and the quantification Excel document are updated.

- 2.2.1.1. Geodatabase REDD; 2.2.2.1. Geodatabase Sábanas
- Annex 1.2.1. PROJECT EMISSIONS / Sheet 4. EMISSION MONITORING

This section also includes the data and information necessary to calculate the reduction in GHG emissions and leakage over the project's crediting period. In addition, the procedure for the periodic calculation of GHG emission and leakage reduction is described.

16.1.1.1 Project Area and Leakage Data Monitoring - Natural Savannas

Remote sensing such as Sentinel and high-resolution sensors such as Planet Images and Worldview-2, complemented by in-situ observations, will be used to monitor the project's geographic boundaries, consisting of eligible areas of natural savannah where project activities are carried out. Change detection in eligible areas will be achieved through the application of the Corine Land Cover methodology and the Computer-Assisted Interpretation Procedure (PIAO).

The estimation of changes in land use in the project area and the leakage area during the monitoring period is carried out with the following equations:

$$SCNC_{project,yr} = \left(\frac{1}{t_2 - t_1} \right) x (A_1 - A_2)$$

y,

$$CSCN_{lk,yr} = \left(\frac{1}{t_2 - t_1} \right) x (A_{lk,1} - A_{lk,2})$$

Dónde:

$SCNC_{project,yr}$	Cambio en la superficie con cobertura vegetal natural en el área del proyecto; ha/año
$CSCN_{lk,yr}$	Cambio en la superficie cubierta por vegetación natural en el área de fuga; ha/año
t_1	Año de inicio del período de seguimiento; año
t_2	Año final del período de seguimiento; año
A_1	Superficie con cobertura vegetal natural en el área del proyecto al inicio del periodo de monitoreo; ha
A_2	Superficie con cobertura vegetal natural en el área del proyecto al final del periodo de monitoreo; ha

$A_{lk,1}$	Superficie con cobertura vegetal natural en el área de fuga al inicio del periodo de monitoreo; ha
$A_{lk,2}$	Superficie con cobertura vegetal natural en el área de fuga al final del período de monitoreo; ha

16.1.1.2 Emission Reduction Monitoring - Natural Savannas

The reduction in emissions from avoiding land use changes in natural savannas during the monitoring period is estimated according to the equation:

$$ER_{project,mp} = (t_2 - t_1) \times (AE_{bl} - AE_{project,mp} - AE_{lk})$$

Where:

$ER_{project,mp}$	Emission reduction from avoided changes land use in the monitoring period; tCO ₂ e yr ⁻¹
t_2	Final year of the monitoring period
t_1	Initial year of the monitoring period
AE_{bl}	Emission by land use changes in the baseline scenario; tCO ₂ e
$AE_{project,mp}$	Emission by land use changes in the project area in the monitoring period; tCO ₂ e
AE_{lk}	Emission by land use changes in the leakage area in the monitoring period; tCO ₂ e

16.1.1.3 Monitoring project areas and leakage - Deforestation

The estimation of forest deforestation in the project area during the monitoring period is carried out with the following equations:

$$AD_{P, yr} = \left(\frac{A_{A, t1} - A_{A, t2}}{t_2 - t_1} \right)$$

Where:

- $AD_{P, yr}$ Estimated annual deforestation in the project scenario; ha/year
- $A_{A, t1}$ Forest area in the project at the start of the monitoring period; ha
- $A_{A, t2}$ Forest area in the project at the end of the monitoring period; ha
- $t_2 - t_1$ Duration of the monitoring period; years

16.1.1.4 Emission Reduction Monitoring - Deforestation

Annual GHG emissions from deforestation in the project area and leakage area are calculated using the equations:

$$AE_{proj, yr} = FSC_{proj, yr} \times EF$$

Y,

$$AE_{lk, proj, yr} = FSC_{lk, pr, yr} \times EF$$

Where:

- $AE_{proj, yr}$ Annual emissions from deforestation in the project area under the project scenario; tCO₂e ha⁻¹
- $AE_{lk, proj, yr}$ Annual emission in the leakage area; tCO₂ ha⁻¹
- $FSC_{proj, yr}$ Annual forest loss in the project area under the project scenario; ha year⁻¹
- $FSC_{lk, pr, yr}$ Emission factor per hectare deforested (tCO₂e/ha)
- yr Specific year of analysis during the monitoring period

Finally, the reduction in emissions from avoided deforestation, in the monitoring period, is calculated according to the equation:

$$ER_{DEF} = (t_2 - t_1) \times (AE_{bl,proj} - AE_{prj,proj} (-AE_{bl,lk} - AE_{prj,lk}))$$

Where:

ER_{DEF}	Emission reduction due to avoided deforestation; tCO ₂ e
$AE_{bl,proj}$	Annual emissions from deforestation in the project area, under the baseline scenario; tCO ₂ e year ⁻¹
$AE_{prj,proj}$	Annual emissions from deforestation in the project area, under the project scenario; tCO ₂ e year ⁻¹
$AE_{bl,lk}$	Annual emissions from deforestation in the leakage area, under the baseline scenario; tCO ₂ e year ⁻¹
$AE_{prj,lk}$	Annual emissions from deforestation in the leakage area, under the project scenario; tCO ₂ e year ⁻¹
$t_2 - t_1$	Duration of the monitoring period; years

16.1.1.5 Monitoreo de reducción de emisiones - Degradación Forestal

la estimación de las emisiones en el periodo de monitoreo se estima a partir de la relación entre la degradación registrada y los factores de emisión por clase, siguiendo las ecuaciones:

$$AE_{prj,deg,yr} = PFD_{prj,yr} \times EF_{prim} + SFD_{prj,yr} \times EF_{sec}$$

y,

$$AE_{lk,deg,yr} = PFD_{lk,yr} \times EF_{prim} + SFD_{lk,yr} \times EF_{sec}$$

Dónde:

$AE_{prj,deg,yr}$	Annual emissions from forest degradation in the project scenario; tCO ₂ e ha ⁻¹
$AE_{lk,deg,yr}$	Annual emissions from forest degradation in the leakage area; tCO ₂ e ha ⁻¹
$PFD_{prj,yr}$	Annual area of primary forest degradation in the project scenario; ha year ⁻¹
$PFD_{lk,yr}$	Annual area of primary forest degradation in the leakage area; ha year ⁻¹
EF_{prim}	Emission factor for primary forest degradation; tCO ₂ e ha ⁻¹
$SFD_{prj,yr}$	Annual area of secondary forest degradation in the project scenario; ha year ⁻¹
$SFD_{lk,yr}$	Annual area of secondary forest degradation in the leakage area; ha year ⁻¹
EF_{sec}	Emission factor for secondary forest degradation; ha year ⁻¹

Finally, the reduction in emissions due to degradation, in the monitoring period, is estimated according to the equation:

$$ER_{FD} = (t_2 - t_1) \times (AE_{bl,deg} - AE_{prj,deg} - AE_{lk,deg})$$

Dónde:

ER_{FD}	Emission reduction due to avoided forest degradation; tCO ₂ e
-----------	--

$AE_{bl,deg}$	Annual emissions from forest degradation under the baseline scenario; tCO ₂ e year ⁻¹
$AE_{prj,deg}$	Annual emissions from deforestation in the project area, under the project scenario; tCO ₂ e year ⁻¹
$AE_{lk,deg}$	Annual emissions from forest degradation in the leakage area; tCO ₂ e year ⁻¹
$t_2 - t_1$	Duration of the monitoring period; years

16.1.2 Monitoring the execution of project activities and Co-Benefits

The project activity monitoring plan was created to monitor project activities and additional co-benefit actions. This plan meets the requirements of section 14.2 of the BCR 0002 Methodology and section 13.1.2. of the BCR 0005 Methodology. In this sense, the tool for monitoring the implementation of activities is created, which contains the following information.

- Activity identification
- Indicator identification
- Indicator name
- Type²⁸
- Meta²⁹
- Unit of measurement
- Monitoring methodology
- Monitoring frequency
- Responsible for measurement
- Indicator result in the reporting period
- Documents to support the information
- Observations

Activities BCR 0002, BCR 0005 are described in section 2.3 Project Activities.

The actions required to qualify for the Orchid category are further described in Section 12. Special Categories Related to Co-benefits. In this regard, the matrix includes the criteria and indicators defined to demonstrate additional benefits and the measurement of co-benefits and the specific category, as applicable.

²⁸Result, product or impact.

²⁹Expected value and completion time

For monitoring, a comprehensive tool is developed that includes project activities and co-benefit actions. The tool differentiates between BCR 0002, BCR 0005 activities and co-benefit actions. Procedures associated with monitoring co-benefits in the Orchid category are similar to those for monitoring project activities to ensure coordination and efficiency in the monitoring processes. [See Annex 13. Monitoring and Follow-up Plan/13.1 PM Project Activities P2\)](#)

16.1.3 Procedures, criteria and indicators to evaluate the project's contribution to the Sustainable Development Goals (SDGs)

The assessment of the contribution to the sustainable development goals under the identified indicators will be carried out using the tool defined by the BCR, which is described in section 10. Sustainable development goals. The contribution to the sustainable development goals, under the identified indicators, will be evaluated using the tool defined by the BCR, described in section 10: Sustainable Development Goals. [\(See Annex 10. Sustainable Development Goals/10.1 P2- Tool - SDG\)](#)

16.1.4 Monitoring REDD+ safeguards

Compliance with the safeguards will be managed through the Monitoring Plan, which will include the following structural criteria: the Cancun and national safeguards, as well as the monitoring indicators for each safeguard, specifying the type of indicator, the established target, the measurement unit, the methodology, and the monitoring frequency. Additionally, the person responsible for the measurement, the results of the indicator during the reporting period, supporting documents, and additional observations will be identified. This will ensure compliance with the criteria established in the AFOLU Sectoral Methodological Document "Quantification of GHG Emission Reductions in REDD+ Projects BCR002," version 4.0 (May 27, 2024) of the BioCarbon Standard.

Monitoring indicators will be defined according to the evidence criteria established in the REDD+ Safeguards Compliance Demonstration Tool, version 1.1, January 26, 2023, also developed by BioCarbon Standard. Likewise, the criteria of the National Interpretation of Environmental and Social Safeguards for REDD+ in Colombia (Camacho A., Lara I., Guerrero, RD, 2017) will be considered.

The Monitoring Plan will measure safeguard compliance in areas such as legal compliance, transparency and access to information, respect for traditional knowledge, participation, risks, and emissions displacement. This plan will be updated with each project verification, incorporating the results achieved and adjusting indicators as necessary to accurately reflect progress toward the objectives. Updates will ensure that the project remains aligned

with international and national standards, as well as with REDD+ safeguard requirements. [See Annex 11. REDD+ Safeguards/11.1 P2. Monitoring Plan Safeguards](#)).

16.1.5 Monitoring Sustainable Development Safeguards

To ensure continuous and rigorous assessment of the Sustainable Development Safeguards, monitoring will be carried out through the periodic application of the Assessment Questionnaire set out in Annex A of the SDSs Tool, version 1.1 (July 4, 2024). In this way, each monitoring cycle will include:

Execution of the complete questionnaire: All questions related to land use, resource efficiency, pollution prevention and management, as well as water, biodiversity, ecosystems, and climate change will be answered.

Recording and justification of responses: Each response will be documented with the corresponding technical evidence, ensuring traceability and transparency.

Updating the analysis matrix: Based on the results of the questionnaire, the impact and risk matrix will be reviewed and adjusted, incorporating new observations or findings.

Follow-up report: A report will be prepared summarizing progress, identifying possible deviations, and proposing corrective or improvement actions, in accordance with the Project Monitoring Plan.

The Project, implemented in Casanare, Meta, and Vichada, incorporates these reviews throughout the project's lifespan, with a frequency established in the Monitoring Plan (annually, or more frequently if conditions require). Thanks to this systematic approach, the Cataruben Foundation ensures not only the absence of negative impacts, but also the generation of benefits in biodiversity conservation and ecosystem protection, fully aligning with the BioCarbon Standard.

16.1.6 Monitoring the permanence of the project

Project risk management is carried out comprehensively based on the identification and analysis developed in sections 7. Risk Management and 3.5. Leakage and Non-Permanence. In this regard, risks are assessed from a social, environmental, and economic perspective, necessary mitigation actions are determined, and the impact of the actions taken is evaluated. ([See Annex 7. Risk Management/7.1 P2- Risk Analysis and Management](#))

16.1.7 Quality control and assurance procedures

At the Cataruben Foundation we have implemented a robust Quality Management System (QMS), articulated within an Integrated Management System (IMS) that integrates standards such as ISO 9001 (Quality), ISO 1400 (Environment), ISO 45001 (Occupational Health and Safety) and NTC 5801 (Innovation)). The focus is on ensuring the proper management, quality, environment, OSH and reliability of all information generated by the project, following international best practices and the IPCC (Intergovernmental Panel on Climate Change) framework.

Compliance is ensured through the following structured actions:

- Design of a QA/QC System.**

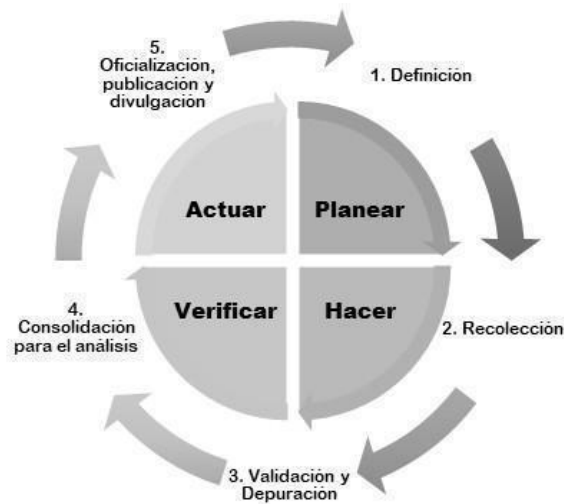
Measures are adopted and implemented Quality Control (QC) and Quality Assurance (QA) in the generation, monitoring, reporting and verification of data.

Good quality control and quality assurance are two of the most important elements for the success of an operation. Achieving, guaranteeing, and maintaining information quality is essential to achieving the expected results when implementing the methodologies applicable to each project.

In the Quality Assurance and Control Procedure you can see the internal process that is carried out to ensure Quality Control (QC) and Quality Assurance (QA)

To comply with these principles, information management activities must implement the continuous improvement cycle to prevent non-conforming results during the process, as described below:

Figure 7. Information management cycle.



Source: Cataruben Foundation.

- **Preparation of Documented Protocols and Manuals**

Develop procedures that establish roles, responsibilities, methodologies, collection instruments, measurement frequency, acceptable margins of error and validation methods.

- **Consistency of Processes**

They integrate protocols and manuals into the continuous improvement cycle of the IMS, ensuring that all processes are documented, implemented, maintained and improved, following the PDCA cycle scheme (Plan - Do - Check - Act).

Data capture formats are standardized and version controls are established to ensure traceability and consistency of information throughout the project lifecycle.

- **Independent Audits and Evaluations**

Through the audit program, they schedule periodic internal and external audits of the management system, these independently as part of quality assurance, as recommended by best practices and international management standards.

- **Change Management and Continuous Improvement**

The organization has a formalized change management procedure designed to ensure that any modifications to procedures are appropriately controlled, evaluated, and documented. This procedure is activated in response to technological improvements, changes in regulatory requirements, findings from internal or external audits, or any other

circumstance that may significantly impact project development or the stages of the Cataruben Foundation's Integrated Management System.

The process includes both temporary and permanent changes, ensuring that any modification, regardless of its nature, is evaluated in terms of its impact on operations, compliance, and continuous improvement. For the updating of procedural documents, a specific mechanism has been implemented that regulates the receipt, analysis, approval, implementation, and communication of changes, guaranteeing the integrity and traceability of current documentation.

Additionally, annual reviews of the management system are implemented, including management review, to ensure its adequacy, effectiveness, and continuous improvement.

Within the management system, internal procedures are registered that guarantee the control and quality assurance of the project.

Item	Procedure	Aim
1	Procedure for the Legal Linking of Properties to Greenhouse Gas (GHG) Projects V.02 Under Modification	standardize the activities carried out regarding the legal linkage of private properties to the Cataruben Foundation's Climate Change Mitigation projects.
2	Procedure for Determining Degradation and Fragmentation in REDD+ Projects	Standardize procedures for estimating degradation and fragmentation in REDD+ project areas, according to the parameters provided by the document entitled "Estimating Forest Degradation in Colombia through Fragmentation Analysis."
3	REDD+ Activities Monitoring Procedure	Describe the relevant items when establishing the monitoring of activities that allow Reducing Emissions from Deforestation and Degradation (REDD+), in carbon projects for the forest ecosystem.
4	Procedure for quantifying Emission Reduction and/or Removal of GHG in Projects	Quantify the reductions and/or removals of GHGs resulting from the implementation of project activities in climate change mitigation initiatives developed by the Cataruben Foundation.

5	Camera Trap Procedure	To publicize the basic protocol for the preparation, installation, and removal of camera traps implemented on the premises.
6	Procedure for Classifying Forest Plot Information	Standardize the processing of information obtained from field plots.
7	REDD+ Activities Monitoring Procedure	Describe the relevant items when establishing the monitoring of activities that allow Reducing Emissions from Deforestation and Degradation (REDD+), in carbon projects for the forest ecosystem.
8	Procedure for quantifying Emission Reduction and/or Removal of GHG in Projects	Quantify the reductions and/or removals of GHGs resulting from the implementation of project activities in climate change mitigation initiatives developed by the Cataruben Foundation.
9	General Procedure for Field Trips	Establish the procedure for field trips led by the quantification and implementation unit to develop activities for initiatives under the Cataruben Foundation Project process.
10	Procedure for Technical Training	Strengthen the skills and knowledge of stakeholders by sharing and reinforcing technical information. This approach seeks to enhance the execution of activities linked to achieving objectives in various projects, all while taking into account the organization's Integrated Management System.
11	Quality Assurance and Control Procedure	Establish parameters to ensure proper control and quality assurance of information from the Cataruben Foundation's various initiatives.
12	Quality Guidelines for the Consolidation of Legal, Technical and Financial Information in a Database	Establish guidelines for the legal, technical, and financial information of the priority areas to be linked to the different projects and/or consultancies, so that when entered into the Cataruben Foundation database, it complies with the Quality Management System standards and applicable methodologies.
13	PQRSF Management Procedure	Provide timely attention to interest groups, through the reception and processing of

		requests, complaints, claims, suggestions and congratulations (PQRSF) that are directed to the Cataruben Foundation, through different means of communication, in an open, fluid and effective in relation to the activities and operations of the Foundation, preventing and/or mitigating possible social conflicts, false expectations that hinder the different processes and ensuring citizen participation.
14	Documented Information Management Procedure	Establish the methodology for the preparation, identification, review, updating, approval, distribution, access, retrieval, storage, preservation, shelf life retention and disposition of documents and records of internal and external origin, which make up the Comprehensive Management System of the Cataruben Foundation.
15	Procedure Corrective and improvement actions	Establish the methodology to identify, analyze and eliminate the causes of Non-Conformities Real or Potential that may arise during the performance of activities by the Cataruben Foundation, in order to establish actions that allow preventing, correcting and improve the operation of processes.
16	Change Management	Establish the methodology for implementing good practices and responsibilities in front of to temporary or permanent changes that may significantly affect the development of projects, as well as any of the stages of the Foundation's Comprehensive Management System Cataruben
17	Procedure for Requesting Authorization for Work Exits	Establish the procedure for requesting exit authorizations related to the carrying out activities or attending external events on behalf of the Foundation Cataruben.

16.1.8 Review of information processing

Once the data collected from the project has been recorded, a representative sample equivalent to 10% of the total records is randomly selected. This sample is reviewed in detail to verify the accuracy of the transcription, identify possible inconsistencies, and validate consistency with the original records.

- **Evaluation Criteria:**

During the review, any errors found are documented, including typing errors, omissions, or discrepancies. The percentage of errors detected is calculated by dividing the number of incorrect records by the total number of records reviewed and multiplying by 100.

- **Acceptance Threshold and Corrective Actions:**

If the error rate is equal to or less than 10%, the results of the information processing are considered acceptable and the review process is concluded.

If the error rate exceeds 10%, a thorough review of all recorded data is triggered. In this case, errors found are corrected and corrective actions are taken, which may include staff training, adjusting collection tools, or improving internal quality controls.

- **Documentation of Results:**

All findings, error rates, corrective actions, and final results are documented in specific review logs, which are stored in accordance with the organization's document control procedure. This documentation ensures traceability and facilitates internal and external audits.

- **Continuous Improvement:**

Based on the results of the reviews, trends are analyzed and opportunities for improvement are identified in the data collection, recording, and processing processes, strengthening the continuous improvement approach of the Cataruben Foundation's Comprehensive Management System.

Table 65. Review of information processing

Stages of information management	Responsible	Controls
Definition of Information: Review of the BCR 0002 Methodology and the AFOLU Sectoral Methodological Document /BCR0005 Quantifying GHG Emissions and Removal Reductions - Activities that Prevent Land-Use Change in natural savannas, to identify the type of data required, as well as the appropriate tools, means, and strategies for their collection, to avoid duplication of efforts and ensure compliance with applicable technical and legal requirements. In this first step, the structure of the information, its relationships, and its integrity are identified, in addition to identifying and ensuring that the sources are reliable and official, such as IDEAM and IGAC.	-Project Manager -Care unit -Quantification of units -Governance Unit - Geospatial Area -Implementation unit -Economic Area	This stage of the process must be recorded in the meeting minutes, in which the describe and approve, at a minimum, the following aspects: -Technical requirements -Legal requirements -Formats and their content (geographical, social, biodiversity, land legality) -Tools and means of collecting information (official and appropriate) -Responsible for each activity
Harvest In accordance with the means and tools established in the previous stage, the information identified as necessary for the implementation of the BCR 0005 Methodology and the Sectoral Methodological Document AFOLU / BCR0005 Quantification of the Reduction of GHG Emissions and Removals - Activities that Avoid Land Use Change in savannas is collected. For this process, we have competent personnel and the appropriate tools for collecting information.	-Project Manager -Care unit -Quantification of units -Governance Unit - Geospatial Area -Implementation unit -Economic Area	Before beginning data collection activities, the equipment to be used must be operational and the personnel who will perform this activity must be competent, both in the use of tools (procedures and forms) and technological equipment. Any non-compliance must be reported to the appropriate department for management purposes and to avoid scheduling delays and/or inadequate

Stages of information management	Responsible	Controls
The information collected is stored in the organization's Drive.		processing of the collected information. Procedures and instructions for collecting information have been established at this stage, and these have been validated in the previous stage by the project leaders or managers and each of the units involved in the process.
Validation and debugging Once compliance with the information principles has been reviewed in the previous stage, the data is validated and cleaned using the initially established technological tools and equipment. In order to comply with the BCR 0002 Methodology and the AFOLU/BCR0005 Sectoral Methodological Document Quantification of the Reduction of GHG Emissions and Removals – Activities that Prevent Land Use Change in savannas, related to the review of information processing, 10% of the records of the collected information will be reviewed in order to avoid errors during the consolidation of the information for analysis.	-Project Manager -Care unit -Quantification of units -Governance Unit - Geospatial Area -Implementation unit -Economic Area	The collected data must be verified, for which the approval of the person responsible for the Quality Unit must be established in the records (both physical and digital). If inconsistencies are found in the collected data, they must be recorded on the corresponding form and managed through the non-compliant output procedure.

Stages of information management	Responsible	Controls
Consolidation of information for analysis The collected information is stored in digital and physical databases in compliance with the Information Control Procedure Methodology BCR 0002 and the Sectoral Methodological Document AFOLU/BCR0005 Quantification of the Reduction of GHG Emissions and Removals – Activities that Prevent Land Use Change in savannas, applicable through the use of the ODK Collect platform.	-Project Manager -Care unit -Quantification of units -Governance Unit - Geospatial Area -Implementation unit -Economic Area	At this stage, the DDP is prepared, which is reviewed and validated by the Project Manager according to the requirements identified in the initial stage and the applicable methodology. To validate compliance with the requirements, the information is audited by the relevant entity, and corrective actions are taken if significant findings are found.
Officialization, Publication and Dissemination Once the DDP has been generated and validated, the results are published and disseminated to the relevant stakeholders.	-Project Manager	The information generated throughout the process is stored on physical and digital media in accordance with the Information Security Manual (F-GAM-03) and the Archive Manual (FC-GAM-04), in order to guarantee the security and proper maintenance of said information for the required time.

Fuente:Fundación Cataruben, 2025.

All documented information generated during the process must meet the following characteristics:

They must be written in the present tense of the verb.

They must have uniformity in terminology and wording.

They must have uniformity in terminology and wording.

They must comply with the image of the FoundationCatarubenin terms of icons, logos, fonts, color palette, among other aspects.

The process leader and/or project manager is responsible for ensuring compliance with the project's document management requirements.

16.1.9 Data recording and archiving system

The organization has established and implemented a data recording and archiving system that ensures the organized, secure, and accessible preservation of all project-related information, in compliance with the guidelines established in the BCR requirement.

The system considers the following aspects:

1. Storage Formats:

All project-related information is stored digitally and archived (if required), ensuring its preservation and availability. The number of copies generated is determined by operational needs and the personnel responsible for information management, ensuring the necessary redundancy to prevent data loss.

2. File Contents:

Each file, both physical and digital, is properly organized and identified, and includes at least:

- *Field forms completed during data collection.*
- *Geographic information (GIS), such as maps, coordinates, and relevant spatial analysis.*
- *Reports of measurements and monitoring activities.*

3. Organization and Information Security:

A is being implemented Information Security Management System (ISMS) aligned with the standard ISO/IEC 27001, which will strengthen existing controls and ensure comprehensive protection of critical information. This system includes security policies, information classification, incident management, change control, and regular internal audits to verify compliance and effectiveness of security measures.

- *Physical documents are archived in secure facilities with access control and protection against physical damage (humidity, fire, tampering).*

- Digital documents are stored on secure servers, backed up periodically, and access is controlled using personalized credentials and information security protocols.
- Version controls and traceability mechanisms are implemented to ensure data integrity and identify modifications.

4. Conservation Period:

The organization ensures that all collected data is archived for a minimum of five years after the end of the emission reduction quantification period for each project. This retention period is formalized in internal document management procedures.

5. Accessibility and Consultation:

The filing system enables the efficient location of information required for audits, external verification processes, or internal reviews, promoting transparency and efficiency in data management.

By implementing a data recording and archiving system, the organization ensures the proper preservation of critical project information, meeting BCR requirements and strengthening its quality management system.

Table 66 Documents obtained in the different phases of the project.

Administrative documents	During all stages of the project, administrative documents are generated to support and guarantee the accuracy of the project information. This documented information is classified as follows: - Procedures, rules, policies. - Records of resource requests (human, financial, purchasing, among others). - Administrative records (POA, risk matrices, among others). - Follow-up report. - Meeting minutes. - Audit report
Legal documents	Are copies made of documents that support ownership of properties? - Public deed of ownership. - Certificate of tradition and freedom. - Real estate property registry. - Certificate of healthy possession.

	- Cadastral certificate. - Property tax. Copies of the identification documents of the project beneficiaries. - Citizenship card. - Chamber of Commerce Certificate. Conservation agreements: - Letter of intent. - Certificate of veracity of the information. - Control of documented information. - Legal viability. - Technical feasibility. - Title study. - Binding contracts. - Confidentiality agreements. - OTHER YES (if applicable). - Special power (if applicable). - Authorization for payment of economic incentives to third parties (if applicable) In the event of the death of a project beneficiary, the following must be provided: - Death certificate of the beneficiary. - Birth certificate of your heirs. - Support for succession. - Without the aforementioned documents, the Project Owner will not be able to make any disbursements until the legal status of the property associated with the project is clear.
Technical documents	Before, during and after field trips, the following are taken into account: - guides, programs, procedures and manuals that provide guidelines for the collection and analysis of the information obtained. - Databases. - Field records. - Property maps. - Photographic evidence. - Attendance list- - construction plan
Economic documents	The economic documents that are related during the validity of the project are:

	- Supplier registration form. - Single Tax Registry (RUT) of the administrator, agent and/or legal representative of the ecosystem. - RUT commitment letter (if applicable). - Bank certificate of the ecosystem manager or representative. - Certificate of existence and legal representation (if applicable). - Power or authorization to transfer economic benefits to a third party (if applicable), duly authenticated. - DIAN Resolutions (if applicable) - Supplier selection document. - Supplier evaluation document. - Evidence of socialization of results and selection of suppliers. - Evidence of socialization of supplier evaluation results. - Documentary package of evidence of registration from the application provider (if applicable) - Minutes of meeting and/or commitment regarding economic issues. - Economic benefit simulators. - Economic benefit projection documents or CCV projection. - Evidence of socialization and delivery of economic benefits. - Statement of financial benefits. - Collection document (invoices/collection accounts). - Signing summaries of financial documents through the Docusign platform (if applicable). - Successful payment file (proof of payment). - Preliminary payment plans (if applicable). - Donation certificates. - Linking payment reports. - Letters of economic distribution. - Linking payment invoices. - Linking payment supports. - Issuance reports ofCCV. - Tax auditor certificates. (if applicable)
--	--

Fuente: Fundación Cataruben, 2025.

These documents are classified and processed according to the guidelines established by the procedures, manuals and policies of the Management System.

16.2 Data and parameters determined in the record and not monitored during the quantification period, including predetermined values and factors.

Data/Parameter	<i>Total biomass in forests (Core forest)</i>
data unit	<i>t/ha</i>
Description	<i>Plant biomass contained in forest ecosystems. It is estimated from the sum of the aboveground biomass (AB) and the underground biomass (BS)</i>
Data source used	<i>Ministry of Environment and Sustainable Development – IDEAM (2024)</i>
Values	<i>159,58</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Definition of the carbon emission factor in total biomass (REDD+ Activities) Calculation of emissions in baseline forest ecosystems. Calculation of emissions in forest ecosystems in project areas. Calculation of emissions in forest ecosystems in leakage zones.</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>The value is taken from NREF(2023-2027), which represents a conservative value, in line with the national context for estimating GHG emissions.</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>Total biomass in forests (Forest edge)</i>
data unit	<i>t/ha</i>
Description	<i>Plant biomass contained in forest ecosystems. It is estimated from the sum of the aboveground biomass (AB) and the underground biomass (BS)</i>
Data source used	<i>Ministry of Environment and Sustainable Development – IDEAM (2024)</i>
Values	<i>104,35</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Definition of the carbon emission factor in total biomass (REDD+ Activities)</i>

e emissions calculations)	<i>Calculation of emissions in baseline forest ecosystems. Calculation of emissions in forest ecosystems in project areas. Calculation of emissions in forest ecosystems in leakage zones.</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>The value is taken from NREF(2023-2027), which represents a conservative value, in line with the national context for estimating GHG emissions.</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>Organic carbon in wood debris</i>
data unit	<i>tC/ha</i>
Description	<i>Carbon content of wood debris in forest ecosystems</i>
Data source used	<i>Ministry of Environment and Sustainable Development – IDEAM (2024)</i>
Values	<i>4,74</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Definition of the total emission factor (REDD+ Activities) Calculation of emissions in baseline forest ecosystems. Calculation of emissions in forest ecosystems in project areas. Calculation of emissions in forest ecosystems in leakage zones.</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>The value is taken from NREF, which represents a conservative value, in line with the national context for estimating GHG emissions.</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>Soil organic carbon in forests.</i>
data unit	<i>tC/ha</i>
Description	<i>Carbon content in forest ecosystem soils.</i>
Data source used	<i>Ministry of Environment and Sustainable Development – IDEAM (2024)</i>
Values	<i>34,73</i>
Please indicate what the	<i>Definition of the soil carbon emission factor (REDD+ Activities)</i>

data is used for (baseline/project/leakage emissions calculations)	<i>Calculation of emissions in baseline forest ecosystems. Calculation of emissions in forest ecosystems in project areas. Calculation of emissions in forest ecosystems in leakage zones.</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>The value is taken from NREF, which represents a conservative value, in line with the national context for estimating GHG emissions.</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>Total biomass in natural savannas</i>
data unit	<i>t/ha</i>
Description	<i>Plant biomass contained in natural savanna ecosystems. It is estimated from the sum of the aboveground biomass (AB) and the belowground biomass (BS)</i>
Data source used	<i>Own data</i>
Values)	<i>10,57</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Definition of the carbon emission factor in the total biomass of natural savannas Calculation of emissions in baseline forest ecosystems. Calculation of emissions in forest ecosystems in project areas. Calculation of emissions in forest ecosystems in leakage zones.</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>Sampling was carried out according to nationally validated methodologies and was conducted in eligible project areas. The statistical and technical aspects taken into account for its development are described in section 3.7.3.2.3 of the PD.</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>Soil organic carbon in natural savannas.</i>
data unit	<i>tC/ha</i>
Description	<i>Soil carbon content in natural savanna ecosystems</i>
Data source used	<i>Hyman et al., 2022. Soil carbon storage potential of acidic soils in the Eastern Altiplano of Colombia</i>

Values	57,30
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Definition of the carbon emission factor in the soil of natural savannas</i> <i>Calculation of emissions in baseline forest ecosystems.</i> <i>Calculation of emissions in forest ecosystems in project areas.</i> <i>Calculation of emissions in forest ecosystems in leakage zones.</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>The study is regional, so it was carried out in areas with ecosystems and environmental characteristics similar to the project areas.</i>
Additional comments	N / A

Data/Parameter	<i>Total biomass due to the effect of forest degradation</i>
data unit	tC/ha
Description	<i>The total biomass loss due to forest degradation corresponds to the sum of the loss of aboveground biomass and the loss of belowground biomass.</i>
Data source used	<i>Ministry of Environment and Sustainable Development – IDEAM (2024)</i>
Values	57,30
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Definition of the total emission factor (REDD+ Activities)</i> <i>Calculation of emissions in baseline forest ecosystems.</i> <i>Calculation of emissions in forest ecosystems in project areas.</i> <i>Calculation of emissions in forest ecosystems in leakage zones.</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>The value is taken from NREF, which represents a conservative value, in line with the national context for estimating GHG emissions.</i>
Additional comments	N / A

Data/Parameter	<i>Activity data for savannas in 2012 t1</i>
data unit	<i>Hectares</i>
Description	Land cover maps, Corine Land Cover methodology for the year 2012 (scale 1:100,000).
Data source used	<i>IDEAM, 2012.</i>
Values	<i>4.038.843,9 ha</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Baseline Calculation BCR0005</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>Official maps on the state of land cover for the specific year</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>Activity data for savannas in 2020</i>
data unit	<i>Hectares</i>
Description	Land cover maps, Corine Land Cover methodology for the year 2020 (scale 1:100,000).
Data source used	<i>IDEAM</i>
Values	<i>4.038.843,9 ha</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Baseline Calculation BCR0005</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>Official maps on the state of land cover for the specific year</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>REDD activity data t2 2010</i>
data unit	<i>Hectáres</i>
Description	<i>Map of the area covered by natural forest 2010</i>
Data source used	<i>SMBYC - IDEAM</i>
Values	<i>Core: 39.832 ha Edge: 112.139 ha</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Baseline Calculation t1 BCR0002</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>Official maps on the state of the forests for the specific year</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>REDD activity data t2 2019</i>
data unit	<i>Hectáres</i>
Description	<i>Map of the area covered by natural forest 2019</i>
Data source used	<i>SMBYC - IDEAM</i>
Values	<i>Core: 34.465 ha Edge: 104.880 ha</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Baseline Calculation BCR0002 t2</i>
Justification of the choice of data or description of the measurement methods	<i>Official maps on the state of the forests for the specific year</i>

and procedures applied	
Additional comments	<i>N / A</i>

Data/Parameter	<i>Baseline degradation Reference Region t1 - 2010</i>
data unit	<i>hectáres</i>
Description	<i>REDD activity data 2010 t2; MSPA procedure is being implemented; 2.2.1.2.7. Colombia's NREF proposal for the 2023-2027 period</i>
Data source used	<i>SMBYC - IDEAM Map - Colombia NREF Procedure</i>
Values	<i>424 ha</i>
Please indicate what the data is used for (baseline/project/leakage emissions calculations)	<i>Baseline degradation</i>
Justification of the choice of data or description of the measurement methods and procedures applied	<i>Use of official data and procedures.</i>
Additional comments	<i>N / A</i>

Data/Parameter	<i>Baseline degradation Reference Region t2 - 2019</i>
data unit	<i>hectáres</i>
Description	<i>REDD activity data 2019 t2; MSPA procedure is being implemented; 2.2.1.2.7. Colombia's NREF proposal for the 2023-2027 period</i>
Data source used	<i>SMBYC - IDEAM Map - Colombia NREF Procedure</i>
Values	<i>176 ha</i>
Please indicate what the data is used for (baseline/project/leakage emissions)	<i>Baseline degradation</i>

calculations)	
Justification of the choice of data or description of the measurement methods and procedures applied	<i>Use of official data and procedures.</i>
Additional comments	<i>N / A</i>

16.3 Data and parameters monitored

Data/Parameter	<i>Eligible forest area</i>
data unit	<i>ha</i>
Description	<i>Areas within the project's geographic boundaries that fall within the forest category, according to national forest definitions, years 2010, 2019</i>
Measured/Calculated/Default:	<i>Calculated</i>
data source	<i>Forest and Carbon Monitoring System: Remote Sensing Satellite Imagery (Sentinel, Worldview-2)</i>
Monitored parameter value(s)	<i>Eligibility 2010 - 2019: 21.359 ha</i> <i>Follow-up 2020 - 2024: 21.315 HA</i>
Please indicate what the data is used for (baseline/project/leak age emissions calculations)	<i>Estimated forest cover change, eligible areas, and monitoring period. Data to define degradation and deforestation in the baseline and project scenarios.</i>
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	<i>ArcGISV3.1 y QGIS V3.28</i> <i>Plataforma Google Earth Engine</i> <i>2010: 97% thematic accuracy</i> <i>2019: 93% thematic accuracy</i> <i>2024: 95% thematic accuracy</i> <i>Thematic precision is achieved through ACATAMA</i>
Measurement/reading /recording frequency	<i>biannual</i>

Calculation method (if applicable)	2.2.1..4.5. GGP-05. <i>Procedimiento de Clasificación Supervisada BNB ORINOCO2.PDF</i>
Quality control procedures applied.	On-site observation formats, field coverage. 2.2.1.4.3. <i>Instructivo AcATaMa</i> 2.2.1.4.6. <i>GOP-13. Procedimiento en Sistemas de información Geográfica.docx</i> 2.2.1.4.4. <i>GOG-01 Guía para verificación de áreas viables</i>

Data/Parameter	<i>Eligible savannah area</i>
data unit	<i>ha</i>
Description	<i>Areas within the geographic boundaries of the project that fall into the savanna category (shrublands and grasslands), according to national definitions of natural savanna.</i>
Measured/Calculated/ Default:	<i>Calculated</i>
data source	<i>Remote sensors such as Sentinel and high-resolution sensors such as Planet Images, Worldview-2 Layers of Corine Land Cover scale 1:100,000 will be used.</i>
Monitored parameter value(s)	<i>Eligibility 2015 - 2020: 99,532,6 ha Monitoring 2020 - 2024: 98,753,8 ha</i>
Please indicate what the data is used for (baseline/project/leak age emissions calculations)	<i>Estimation of land use change in natural shrub and grassland cover in the baseline scenario and in the project scenario.</i>
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	<i>ArcGISV3.1 y QGIS V3.28 The 2015: 95.1% thematic accuracy The 2020 maps are national inputs. Map 2024: 96.5% thematic accuracy Thematic precision is achieved through the confusion matrix.</i>
Measurement/reading /recording frequency	<i>Annual</i>

Calculation method (if applicable)	<i>Procedure for monitoring eligible areas</i>
Quality control procedures applied.	<i>On-site observation formats and field coverage.</i> 2.2.2.4.4. <i>Caracterización de insumos cartográficos para generación de Corine Land Cover - Orinoco p2</i> 2.2.2.4.5. <i>FC-GOG-29. Instructivo Interpretacion Coberturas Corine Land Cover Escala 1:100</i> 2.2.2.2. <i>Matriz Validacion</i>

© 2024 CERTIFICADO DE BIOCARBONO®. Reservados todos los derechos. Este formato sólo podrá ser utilizado para proyectos de certificación y registro ante BIOCARBONO. Prohibida la reproducción total o parcial.