MONITORING REPORT
CO2Bio P2-2

Document prepared by The Cataruben Foundation

Date of issue (*Version 2.2 12/15/2023*)

Monitoring Report (Version 2.2)	
Project name	CO2Bio P2-2
Project ID BCR	BCR-CO-635-14-005 BCR-CO-635-14-005
Date of registration of the project activity	16/06/2023
Project owner	The Cataruben Foundation
Contact	**María Fernanda** Wilches General Manager **Sandra Duarte Chaparro** Carbon Superleader **Lisbeth Menjure Barrera** Project Leader co2bio@cataruben.org Tel. 3204690315 / 3203108839 Carrera 20 # 36 - 04 Yopal - Casanare
Version number of the Project Document applicable to this monitoring report	*Version 2.2 of 12/15/2023*
Methodology applied	Methodological Document AFOLU Sector / BCR0002 Quantification of GHG Emission Reductions from REDD+ Projects. Version

Monitoring Report (Version 2.2)	
	3.1. September 15, 2022. Methodological Document AFOLU Sector / BCR0004 Quantification of GHG Emission Reductions and Removals - Activities that avoid land use change in inland wetlands. Version 2.0 23 June 2022.
Project Location (Country, Region, City)	Colombia, Orinoco region: Department of Arauca: Arauca, Cravo Norte, Puerto Rondón and Tame. Department of Casanare: Hato Corozal, Paz de Ariporo, Orocué, Pore, San Luis de Palenque, Trinidad , and Yopal.
Project start date	15/01/2018
Period for quantification of GHG reductions/removals	15/01/2018 a 14/01/2038
Tracking period number	*01*
Monitoring Period	15/01/2018 - 31/12/2021
Number of emission reductions or removals achieved by the project in this monitoring period.	Total reductions: **804,951 tCO_{2e}** Annual average: **201.238 tCO /$year_{2e}$**
Contribution to the Sustainable Development Goals	SDG 6: Water and Sanitation SDG 13: Climate action SDG 15: Terrestrial Ecosystem Life

Monitoring Report (Version 2.2)	
Special category, related to co-benefits	Orchid

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1. General description of the project

CO2Bio P2-2 is a climate change mitigation project that reduces CO_2 emissions by developing activities that reduce deforestation and transformation of natural Wetlands in 124 private properties located in the departments of Arauca and Casanare, the environmental, social and economic impact of the Project is directed to 102,863 total hectares, whose accounting areas are distributed in 10,532.3 hectares of forest and 50,352.8 hectares of Wetlands.

To achieve this goal, the project supports actions that take a holistic approach to ecosystem management, addressing both land use change and the adoption of more sustainable practices in forests and wetlands. This project is based on the mechanism of payment by results, through the strategy of obtaining benefits through the sale of carbon certificates, effectively contributing to the preservation of forests and the prevention of land use change.

This project achieved a reduction of 804,951 tons of greenhouse gasses during the period from 2018 to 2021. To ensure the management of emission reductions, the methodological guidelines detailed in BCR Standard 3.2 are implemented, which establishes the principles and requirements applicable to the project.

1.1 Sectoral scope

The Project is eligible under the scope of the BCR Standard by meeting one or more of the following conditions mentioned in Table 1.

Table 1. Scope of the standard.

The scope of the BCR Standard is limited to:	
The following greenhouse gases, included in the Kyoto Protocol: Carbon Dioxide (CO2), Methane (CH4) and Nitrous Oxide (N2O).	**x**
GHG projects using a methodology developed or approved by BioCarbon Registry, applicable to GHG Removal Activities and REDD+ activities (AFOLU Sector).	**x**
Quantifiable GHG emission reductions and/or removals generated by the implementation of GHG Removal Activities and/or REDD+ activities (AFOLU Sector).	**x**

The scope of the BCR Standard is limited to:	
GHG projects using a methodology developed or approved by Biocarbon Registry, applicable to activities in the energy, transportation and waste sectors.	
Quantifiable GHG emission reductions generated by the implementation of activities in the energy, transportation and waste sectors.	

Source: BioCarbon Registry, 2023.

1.1.1 Type of project

The Project is classified in the AFOLU sector, which includes GHG emission reduction activities through REDD+ activities and activities focused on the Wetland ecosystem.

Table 2. Project characteristics.

Activities in the AFOLU sector, other than REDD+	x
REDD+ Activities	x
Activities in the energy sector	
Activities in the transport sector	
Activities related to waste management and disposal	

Source: BioCarbon Registry, 2023.

1.2 Project start date

The start date of the Project is given as of January 15, 2018.

1.3 Project quantification period

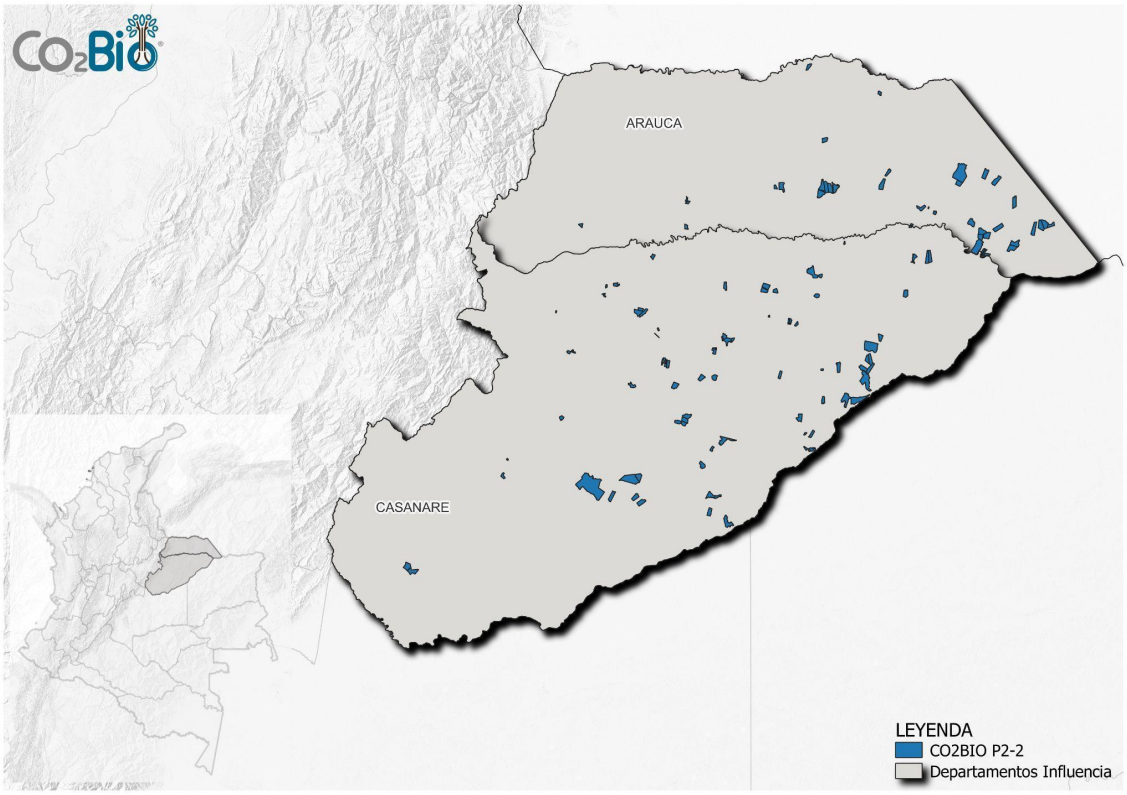
According to the BCR Standard guidelines (section 10.5) for REDD+ projects and the AFOLU sector, the quantification of GHG emission removals and/or reductions contemplates the following periods:

- Accreditation period: January 15, 2018 - January 14, 2038.
- Verification period 1: January 15, 2018 - December 31, 2021.

1.4 Project location and Project boundaries.

The project is located in eastern Colombia in the Orinoquia biome, with an area of more than 300,000 km2, and an altitude that varies between 80 and 500 m.a.s.l., which is bordered to the north and east by Venezuela, to the south by the Amazon biome and to the west by the Andean biome.m, which limits to the north and east with the country of Venezuela, to the south with the Amazon biome and to the west with the Andean biome, specifically the project is distributed in the departments of Arauca and Casanare, with the natural limits that are the foothills of the eastern mountain range to the west and the Arauca and Meta rivers to the north. The predominant landscape in this area is floodable and non-floodable plains known nationally as the eastern plains. See image 1.

Image 1. Project location map



Source: Cartographic (IGAC)

Elaboration: The Cataruben Foundation, 2023.

The following are the **124** enrolled properties of private owners participating in the Project, listed by department, municipality, rural district and property. Additionally, the KML of the coordinates of the area of intervention and influence of the project is attached.

Table 3. Location of the properties enrolled in the project

DEPARTMENT	MUNICIPALITY	VEREDA	PROPERTY
Casanare	Hato Corozal	Berlin	El Baúl de los Recuerdos
		El Brillante	Finca El Torreño Dos
			Finca La Arenosa Dos
			Finca La Arenosa 3
		La Florida	El Guamo
			Santo Domingo Florideño
			La Florida
		Las Mercedes	Miramar
		San Nicolas	El Porvenir
		Santa Barbara	Puerto Lindo
		Santa Maria del Chire	No Se Sabe
	Orocue	Aguaverde	Las Brisas
			Buenos Aires
		Claveles	Lote La Mosca
		La Esmeralda	Buenavista I
			Lote 6
		La Independencia	La Candelaria
			Candelaria Uno
		La Libertad	Buenos Aires
		Mariara	Lote Dos (San Felipe 2)
		San Rafael de Guirripa	El Renacer
	Paz de Ariporo	Caño Chiquito	San Benito
		El Caribe	Guaratal 2
			La Honda I
		La Aguada	Babilonia
		La Hermosa	Lote 2 Ana Maria

			Lote 1 La Esperanza
			Lote 3 El Paraíso
			San Jose
			El Tirrigal
		La Lopera	Los Esfuerzos
		La Veremos	El Garcero
		Las Guamas	El Caribe
		Los Morichales	La Cascabel
		Normandía	El Morichal de los deseos
		San Esteban	Los Arrecifes
			Naranjal
			El Brillante
			Finca San Juan Lote
			San Juan 2
			El Canal Lote 1
			Lagunitas
			El Espejo
			La Esperanza
			El Milagro
			Finca La Esperanza
			La Bendición
			Villa Fernanda
			El Palmar
			La Cucaracha
			Banco Fresco
			San Esteban
			El Delirio
			El Control
			La Libertad
			Las Garzas
			La Palmita
			El Algarrobo
		San José de la Lopera	Campo Hermoso
		Varsovia	La Yubereña
			El Rincón

	Pore	Bocas de Pore	El Cebú
		Vijagual	Lote 1
			Lote 2
	San Luis de Palenque	El Tigre	Mata de Samuro
		Guanapalo	El Garcero
		La Venturosa	Buenavista
	Tauramena	La Guira	El Tranquero
			Hacienda El Rosal
	Trinidad	Araguaney	Las Pampas
		Bélgica	El Zaman
			El Cairo
			La Libertad
		El Cepilla	La Esperanza
			Villa Blanca
		La Esperanza	El Amparo
		La Reforma	El Remache Numero 1
		Porvenir de Guachiria	Miralindo
			La Gloria
			Campo Lindo
		Santa Maria del Loro	La Macolla
			El Cairo
	Yopal	Alemania	La Maporoza
		Tilodiran	Las Brisas
Arauca	Arauca	Barrancón	Villa Martha
		Maporita	Moscú
		Merecure	Finca La Costeña
	Cravo Norte	Agualinda	Finca La Fuente de Oro
			Los Siete Diamantes
		Buenos Aires	Las Escudillas
		Cinaruco	Panamá
			El Cielo
			La Revancha
		El Corozo	La Magola
		Juriepe	Finca Cuernavaca

			Finca Los Pionios
			Finca Vida Tranquila
			Finca Villa Tania
		La Esperanza	Finca La Bonanza
			Finca Vendaval
			Finca El Morrocoy
			Finca La Ponderosa
			Finca Los Paraguitos
			Finca El Ponqué 2
			Finca El Ponqué 3
		Lejanías	La Calandria
			El Corozo
		Lejanías de Juriepe	Finca Suro Verde
			Finca Santa Ana
		Macuelo	Las Brisas
		Mochuelo	Finca El Conuco
		Samuco	Finca Santa Martha
		San José	Finca La Ponderosa
	Puerto Rondón	Aguas Claras	Finca Altagracia
			Finca Las Pampas
			Finca El Palmar
			Finca Los Corazones
			Altagracia
		El Letrero	Finca Santa Barbara
	Tame	La Piedra	Altamira
		Las Canoas	Franfol
		Sabana de la Vieja	Sinai
		Saparay	Finca Las Delicias

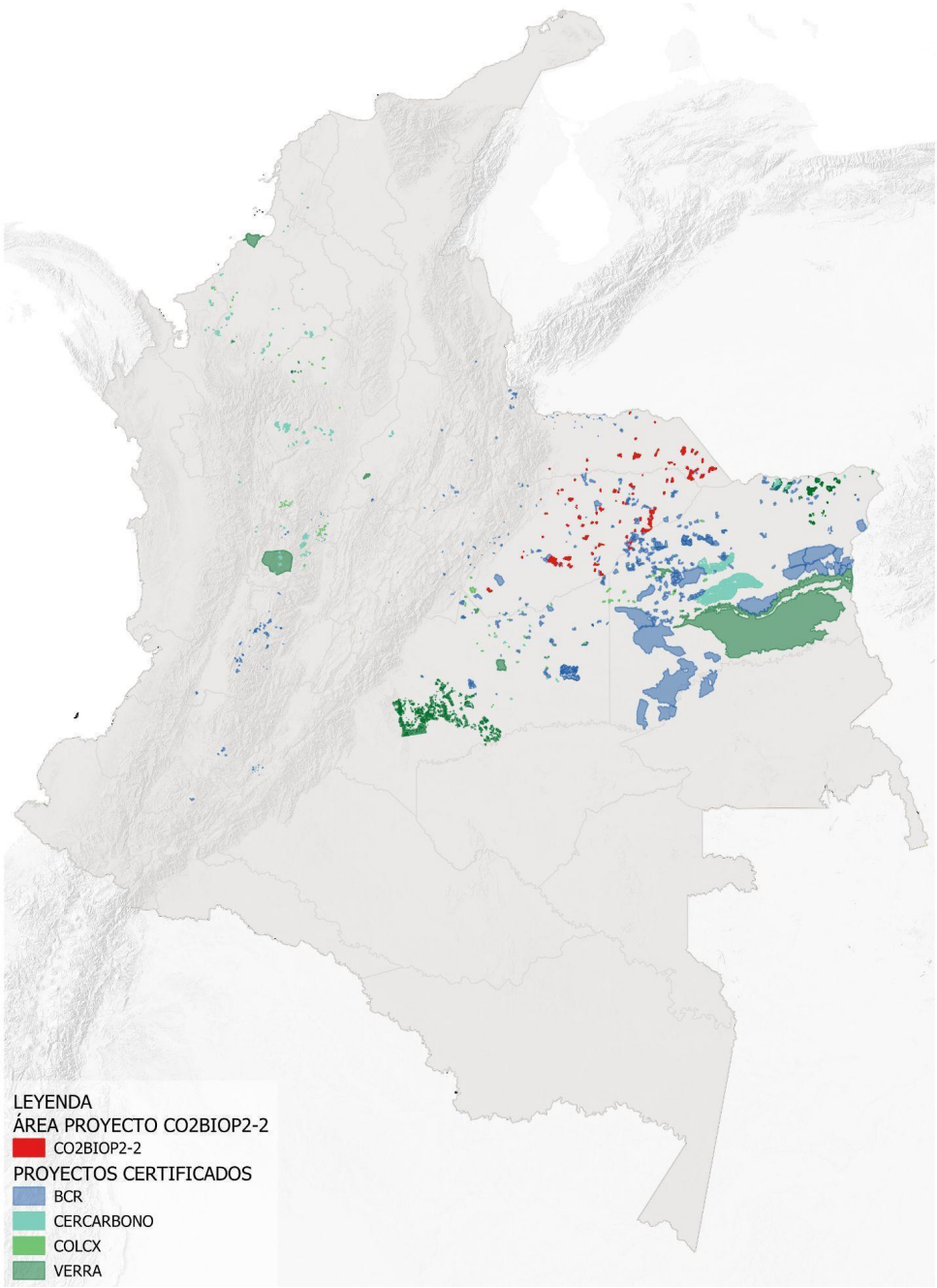
Source: *The Cataruben Foundation, 2023.*

1.4.1 Area of influence of other projects in the area

In order to avoid double counting, the project holder performs spatial analysis actions to verify that the geographic boundaries associated with CO2Bio P2-2 do not overlap with other carbon projects. To perform this verification, vector information (Project Vector Data) is downloaded from the official pages of the following Carbon Standards (Biocarbon Registry, Colcx, Cercarbon and VERRA), where nine (9) projects are located in the areas of influence (Standard Review-CO2Bio P2-2). These data are integrated into a Geographic Information System (SIG_Geodatabase), with the purpose of confirming conclusively that the areas enrolled in CO2Bio P2-2, do NOT present overlaps with other carbon projects (Map Package).

Image 2 shows the spatial location of the carbon projects of the different standards as well as the geographic limits of the CO2Bio project areas (red).

Image 2. Carbon projects in the CO2BIO P2-2 project areas.



Source: *The Cataruben Foundation, 2023.*

1.5 Summary description of the status of project implementation

As of the cut-off date of the monitoring period, both the wetland ecosystem project activities and REDD+ are underway.

The implementation status for each Wetland activity is presented in detail in Section 13.2. The following table summarizes the implementation status of each activity.

Table 4. Summary description of the implementation status of the Wetland project activities.

ID	Description of the activity	Implementation dates	General progress of the activity	Total GHGs
1	Train personnel in wetland conservation and sustainability issues.	The development of this activity starts on January 31, 2018.	28.83%	121,016 reduced tCO_2e
	Conduct training on wetland conservation and sustainability issues.		20.00%	
2	Manage the implementation of sustainable production and conservation practices.	Conducted using information reported by owners in the 2018 - 2021 monitoring period.	25.00%	
3	Promote the implementation of governance strategies	The development of the first phase of the activity is scheduled to begin in 2018 - 2021.	25.00%	
4	Property declared under a conservation category	Carried out with information from documents certifying the figure and area under conservation during the monitoring period 2018 - 2021.	58.33%	

Source: The Cataruben Foundation 2023

Section 13.3 presents a detailed status of implementation for each REDD+ project activity. The following table summarizes the implementation status for each activity.

Table 5. Summary description of the implementation status of REDD+ project activities.

ID	Description of the activity	Implementation dates	General progress of the activity	Total GHGs
1	Conduct training on ecosystem services and conservation of strategic ecosystems.	The development of this activity begins on January 15, 2018.	30,00%	683,935 reduced tCO_2e
2	Promote the implementation of governance strategies	The development of the first phase of the activity is scheduled to begin in 2018 - 2021.	25,00%	
3	Conduct training on sustainable forest management	The development of this activity begins on January 15, 2018.	20,00%	
4	Promote the delimitation and/or signaling of conservation areas.	Conducted with information reported by owners in the 2018 - 2021 monitoring period.	25,00%	
5	Promote and improve agricultural production, livestock (on existing land) and tourism, through the implementation of good sustainable practices.	Conducted with information reported by owners in the 2018 - 2021 monitoring period.	31,25%	
6	Conduct satellite monitoring of hot spots	It is being carried out on a permanent basis as of 2018.	25,00%	

Source: The Cataruben Foundation 2023

2. Title, reference and version of the baseline and monitoring methodology applied to the project.

The project is based on the Biocarbon Registry voluntary standard version 3.2 and its methodologies described below:

- AFOLU Sector Methodological Document for the Quantification of GHG Emission Reductions from REDD+ Projects in its version 3.1. September 15, 2022.

- For the Wetlands area Methodological Document AFOLU Sector / BCR0004 Quantification of GHG Emission Reductions and Removals - Activities that avoid land use change in Continental Wetlands, version 2.0 23 June 2022.

In addition, the following tools provided by the BCR standard were used:

- Baseline and Additionality Tool Version 1.2, dated September 27, 2023.
- Tool to demonstrate compliance with REDD+ Safeguards Version 1.1, January 26, 2023.
- No net harm Environmental and social safeguards (NNH) Version 1.0, dated March 7, 2023.
- Tool for determining contributions to the achievement of the Sustainable Development Goals (SDGs) Version 2.0, March 1, 2022.
- Double Counting Avoidance Tool. v 1. March 09, 2023
- Monitoring, Reporting and Verification Tool. v 1. February 13, 2023.
- Permanence and risk management tool. v 1. Mallet 7 of 2023.
- The Monitoring Report document under the GHG project template in version 1.0.

3. Contribution to the Sustainable Development Goals

In accordance with the provisions provided by the BCR standard and the "No Net Harm" tool regarding the relevance of the assessment of the project's contribution to the Sustainable Development Goals (SDGs), and taking into account that the Project's monitoring period is between 2018-2021 (4 years), the following is the analysis of the results of the SDG Monitoring Report - the Project (See sheet: **"**SDG Monitoring Report"):

3.1 SDG 6: Water and sanitation

After the use of the TOOL SDG applied to the CO2Bio P2-2 Project, it was possible to determine that SDG 6 (Clean Water and Sanitation) aims to meet **target 6.4.1**: "*Increase the change in water use efficiency over time*".

Considering that the monitoring report covers the period 2018 - 2021, we will present the results obtained, but not before describing the methodological procedure taken into account.

Figure 3. SDG 6 Target (Water and sanitation)

Source: https://www.isglobal.org/, 2023.

To achieve this goal, a characterization of the enrolled properties was carried out, focusing on the water component. This process helps to identify the key needs of the community.

The data obtained from this survey allow for the development of Water Efficiency and Saving Plans (PUEAA's), which aim to raise awareness and promote the transfer of knowledge to the community on issues such as: The importance of sustainable water resource management and the promotion of practices that strengthen its efficient use and saving. It is important to emphasize that these activities are fundamental to progressively increasing water efficiency, which translates into a direct impact on people's quality of life and the achievement of sustainable development.

Through the four methodological stages proposed for the fulfillment of this goal (mentioned in the Project Design Document), the following equation is implemented, which allows the calculation of the percentage of progress during the development of the project:

$$\% \text{ de Progreso} = \frac{(N°D*0,10)+(N°DI*0,15)+(N°I*0,55)+(N°S*0,20)}{n}$$

Equation 1. Calculation to determine the percentage of progress in meeting SDG 6 **CO2Bio P2-2** Project.

Where:

N°D = Number of Diagnosed Properties

N°DI = Number of Properties with Design

N°I = Number of Properties Implemented

N°S = Number of Properties with Follow-up.

n = Total number of Properties

Taking this premise into account, the monitoring report frames the two initial stages (diagnosis and design of efficient water use and water saving plans) in 74 characterized properties. These plans address 3 water resource management sheets, focused on: 1) potable water management on the Property; 2) maintenance and cleaning of sanitary management areas; and 3) sanitary management of domestic wastewater. The implementation of these sheets will make it possible to achieve resource efficiency and promote the proper disposal of wastewater.

The 74 plans developed to date are available in the annexes folder of the SDG 6 (Sustainable Development Goals) monitoring report. It should be noted that in this drive, the PUEAA documents for the remaining 50 properties are in progress in their respective electronic folders, and it is estimated that these plans will be completed in the remaining time of the design phase.

It should also be noted that of the 74 properties characterized, 2 do not have housing. As a result, there is no human consumption of water resources in this area and therefore, there are no records of improvement in the use and management of water resources in these properties.

Of the 124 Properties enrolled in the CO2Bio P2-2 Project, a total of 74 diagnostics (6%) and 74 PUEAA's (9%) have been carried out to date.

In view of the above, **15% of** the proposed global goal has been achieved, as can be seen in the distribution of the phases of the above equation.

$$\% \text{ de Progreso} = \frac{(74*0{,}10)+(74*0{,}15)+(0*0{,}55)+(0*0{,}20)}{124} = 15\%$$

Equation 2. Calculation to determine the percentage of progress in meeting SDG 6 **CO2Bio P2-2** Project.

3.1.1 SDG 6 Indicator progress

In relation to indicator 6.4.1, a baseline or reference value has been established for 2017 of zero (0), which corresponds to the absence of activities for the improvement of efficient use and saving of water.

Image 4. Visualization of the current progress of indicator 6.4.1 of SDG 6 according to the BioCarbon Registry's TOOL ODS for the period 2018-2021 in the framework of the CO2Bio P2-2 Project.

Indicador	Unidad	Meta	Valor de referencia	Año1		Año2		Año3		Año4	
				Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia
6.4.1 Cambio en la eficiencia del uso del agua con el tiempo	%	Aumentar	0	15	Aumentar	15	IGUAL	15	IGUAL	15	IGUAL

Resultado Promedi	Tendencia (promedio vs referencia)	Cumple (respecto al promedio)
15	Aumentar	Si

Source: The Cataruben Foundation, 2023

3.1.2 Progress of the indicator against the global target

Table 6. Result of the progress made in meeting indicator 6.4.1 of SDG 6 (Water and sanitation), with respect to the global target of the SDG monitoring plan.

SDGS	Target	Goal - Indicator(s)	Approach and/or Compliance	Progress (%) Period 2018-2021 with respect to the overall goal.
6	6.4	6.4.1 Increasing change in water use efficiency over time	In summary. Of the 124 Properties enrolled in the CO2Bio P2-2 Project, a total of 74 diagnoses (6%) and the formulation of 74 PUEAA's (9%) have been carried out to date.	**15%**

Source: The Cataruben Foundation, 2023.

3.1.3 Compliance with indicator 6.4.1

To check progress on indicator 6.4.1, equation 3 is presented, which relates and links the three management sheets included in each PUEAA. It is important to note that the use of all the tabs will depend on the specific needs of each property.

$$\%\ \text{Cumplimiento indicador 6.4.1 (ODS 6)} = \frac{\left(\sum_{i=1}^{n} \bar{X}\ \text{Imp. Fichas}\right) * n\ \text{P. Imp.}}{n}$$

Equation 3. Calculation to determine the percentage of compliance with indicator 6.4.1.

Where:

∑(i=1)^n x̄ Imp. Chips = Sum of the average implementation of the 3 Management Chips per Property.

n P. Imp. = Number of implemented Properties

n = Total number of Properties

The sum of the average implementation of the management sheets can be understood as follows:

$$\sum_{i=1}^{n} \bar{X}\ \text{Imp. Fichas} = \sum_{i=1}^{n} \frac{\left(\frac{\%\text{Cum. F1} + \%\text{Cum. F2} + \%\text{Cum. F3}}{\text{n Fichas. P. 1}}\right)\left(\frac{\%\text{Cum. F1} + \%\text{Cum. F2} + \%\text{Cum. F3}}{\text{n Fichas P. 2}}\right)\cdots}{n}$$

Equation 4. Sum of the average of the implementation of the 3 management sheets.

Where: the average percentage of compliance of the three management sheets for each of the properties enrolled in **CO2Bio P2-2** must be taken into account. According to the development and compliance of these activities, the percentage of compliance is calculated.

The following equation shows specifically how the percentage of compliance with Indicator 6.4.1 (SDG 6) is calculated:

$$\%\ \text{Cumplimiento indicador 6.4.1 (ODS 6)} = \frac{\left(\sum_{i=1}^{n} \frac{\left(\frac{\%\text{Cum. F1} + \%\text{Cum. F2} + \%\text{Cum. F3}}{\text{n Fichas. P. 1}}\right) + \left(\frac{\%\text{Cum. F1} + \%\text{Cum. F2} + \%\text{Cum. F3}}{\text{n Fichas P. 2}}\right)\cdots}{n}\right) * \text{n P. Imp.}}{n}$$

Equation 5. Calculation for the percentage of compliance with Indicator 6.4.1.

3.2 SDG 13: Climate action

Incorporating climate change measures into national policies, strategies and plans is one of the objectives of SDG 13 (Climate Action).

Image 5. SDG 13 Target (Climate Action).

Source: https://www.isglobal.org/, 2023.

After using the TOOL ODS tool applied to the Project, it was determined that SDG 13 aims to comply with an indicator whose purpose is to reduce total greenhouse gas emissions per year (SDG 13 > Objective 13.2 > Indicator

13.2.2). Under this premise and taking into account that the monitoring report of the Project corresponds to the period 2018-2021, below are the results per year for the period in question.

3.2.1 Reducing total greenhouse gas emissions per year

Sustainable Development Goal (SDG) 13 focuses on achieving a specific indicator that seeks to reduce total greenhouse gas emissions per year. This indicator is found within Objective 13.2 and is identified as Indicator 13.2.2.

Image 6. Completion of SDG 13 indicator 13.2.2.2 in the BioCarbon Registry's TOOL ODS (REDD+) tool for the period 2018-2021 in the framework of the CO2Bio P2-2 Project.

Indicador	Unidad	Meta	Valor de referencia	Año1		Año2		Año3		Año4	
				Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia
13.2.2 Emisiones totales de gases de efecto invernadero por año	Ton CO_2 e	Reducir	172.163,20	284,87	Reducir	284,87	IGUAL	284,87	IGUAL	284,87	IGUAL

Resultado Promedio	Tendencia (promedio vs referencia)	Cumple (respecto al promedio)
284,87	Reducir	Si

Source: The Cataruben Foundation, 2023

Image 7. Completion of indicator 13.2.2 of SDG 13 in the Biocarbon Registry TOOL SDG (Wetlands) tool for the period 2018-2021 within the framework of the CO2Bio P2-2 Project.

Indicador	Unidad	Meta	Valor de referencia	Año1		Año2		Año3		Año4	
				Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia
13.2.2 Emisiones totales de gases de efecto invernadero por año	Ton CO_2 e	Reducir	39.157,67	12.169,86	Reducir	12.169,86	IGUAL	12.169,86	IGUAL	12.169,86	IGUAL

Resultado Promedio	Tendencia (promedio vs referencia)	Cumple (respecto al promedio)
12169,86	Reducir	Si

Source: The Cataruben Foundation, 2023

Thus, based on the monitoring of GHG emissions during the analysis period, a value of 12,454.73 tCO2e were released into the atmosphere each year, of which 97.71% were the result of the transformation of wetland ecosystems and the remaining 2.29% were due to deforestation of forests in the project areas.

3.2.1.2 Progress of the indicator against the global target

Accordingly, although GHG emissions were recorded during the monitoring period, the figures are below the baseline value, which shows a 94.02% reduction in GHG emissions compared to the annual average estimated in the baseline scenario, as well as compliance of 18.5% with the overall target for the project's implementation period.

Table 7. Progress of compliance with indicator 13.2.2 of SDG 13 (Climate action) with respect to the global target of the SDG monitoring plan**.**

SDGS	Target	Goal - Indicator(s)	Approach and/or Compliance	Progress (%) Period 2018-2021 with respect to the overall goal.
13	13.2	13.2.2 Reducing total greenhouse gas emissions per year	Annual GHG emissions monitoring was conducted for the period 2018-2021, for the	18,5 %

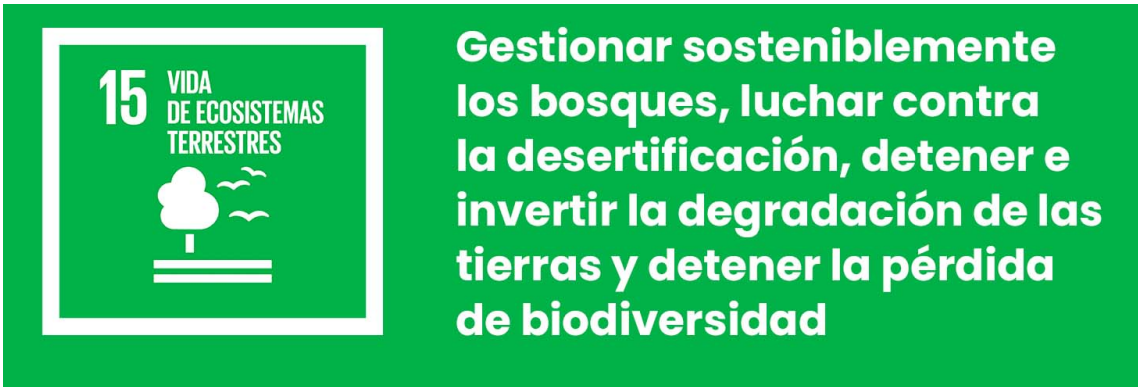
			Wetlands and REDD+ components, under which compliance with the target in terms of GHG emissions reduction with respect to the baseline value was evaluated.	

Source: The Cataruben Foundation, 2023.

3.3 SDG 15: Life of terrestrial ecosystems

Ensuring the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements is one of the targets under SDG 15 (Life of Terrestrial Ecosystems).

Image 8. SDG 15 Target (Life of terrestrial ecosystems)



Source: https://www.isglobal.org/, 2023.

On the other hand, after using the SDG TOOL tool applied to the project, it was determined that SDG 15 targets two indicators that aim to: (i) increase the forest area as a proportion of the total area (SDG 15 > Goal 15.1 > Indicator 15.1.1) and (ii) increase the proportion of important sites for terrestrial and freshwater biodiversity that are part of protected areas, broken down by ecosystem type (SDG 15 > Target 15.1 > Indicator 15.1.2). Under this premise and taking into account that the Project's monitoring report corresponds to the period 2018-2021, the results by year for the period in question are listed below.

3.3.1 Increasing forest area as a proportion of total forest area

Sustainable Development Goal 15 focuses on achieving a specific indicator that seeks to increase forest area as a proportion of total area. This indicator is found within Objective 15.1 and is identified as Indicator 15.1.1.

Image 9. Completion of indicator 15.1.1 of SDG 15 in the BioCarbon Registry's TOOL ODS tool for the period 2018-2021 under the CO2Bio P2-2 project.

Indicador	Unidad	Meta	Valor de referencia	Año01		Año02		Año03		Año04	
				Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia
15.1.1 Superficie forestal como proporción de la superficie total	%	Aumentar	12,51	12,54	Aumentar	12,57	Aumentar	12,57	IGUAL	12,57	IGUAL

Resultado Promedi	Tendencia (promedio vs referencia)	Cumple (respecto al promedio)
12,5625	Aumentar	Si

Source: The Cataruben Foundation, 2023

A reference level of 12.51 is established for the proportion of the area covered by natural forest (PSBN) for the year 2017, this value is argued in the sense that by that date the project was not present in the area.

Table 8. Variable values to determine PSBN 2018:2021

VARIABLE	2017	2018	2019	2020	2021	PSBN*
AUER (ha)	85619,2					
SCBN (ha)	10711,79	10737,80	10765,90	10764,00	10763,40	
PSBN	12,51	12,54	12,57	12,57	12,57	0,03

PSBN* Analysis 2018 and 2021
Source: The Cataruben Foundation.

Table 8, establishes the variations between the forest in the project area and the proportion of forest, for the reference period 2017, when the project was not yet in implementation, the forest presented a proportion of 12.51 against the total hectares of the Property (85618.2 ha), during the establishment the PSBN takes a value of 12.54. As a result of the project activities, the PSBN remains constant

as of 2019. This indicates that the project activities have increased the areas of the forest component, in addition to promoting collective conservation awareness.

3.3.1.2 Progress of the indicator against the global target

As a result of the implementation of the project, 0.03% of the forest cover or PSBN is increased compared to the total project areas; the project activities promote the protection of the forest resource.

Table 9. Progress of compliance with indicator 15.1.1 of SDG 15 (Life of terrestrial ecosystems) with respect to the global target of the SDG monitoring plan (CO2Bio P2-2 Project).

SDGS	***Target***	***Goal - Indicator(s)***	***Approach and/or Compliance***	***Progress (%) Period 2018-2021 with respect to the overall goal.***
15	15.1	15.1.1 Increasing forest area as a proportion of total forest area	The calculation and reporting followed the guidelines defined in the environmental indicators of the Ministry of Environment and Sustainable Development and IDEAM corresponding to the indicator "Proportion of the area covered by natural forest".	18%

Source: The Cataruben Foundation, 2023.

3.3.2 Increase the proportion of sites important for terrestrial and freshwater biodiversity that are part of protected areas, broken down by ecosystem type.

The focus of SDG 15 for the project is to achieve a specific indicator that seeks to increase the proportion of sites important for terrestrial and freshwater biodiversity that are part of protected areas, disaggregated by ecosystem type.

This indicator falls under Objective 15.1 and is identified as Indicator 15.1.2. In the context of the Project's monitoring period, which runs from 2018 to 2021, a baseline or reference value has been established for the previous year (2017) of 0 properties identified or marked.

Image 10. Completion of indicator 15.1.2 of SDG 15 in the BioCarbon Registry's TOOL ODS tool for the period 2018-2021 under the Project.

Indicador	Unidad	Meta	Valor de referencia	Año1		Año2		Año3		Año4	
				Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia	Resultado	Tendencia
15.1.2 Proporción de lugares importantes para la diversidad biológica terrestre y del agua dulce que forman parte de zonas protegidas, desglosada por tipo de ecosistema	%	Aumentar	0	5	Aumentar	5	IGUAL	5	IGUAL	10	Aumentar

Resultado Promedi	Tendencia (promedio vs referencia)	Cumple (respecto al promedio)
6,25	Aumentar	Si

Source: The Cataruben Foundation, 2023.

As part of the project, properties were identified according to REDD+ coverage and wetlands that are part of areas of importance for biodiversity and its conservation, in order to subsequently carry out the signaling of the identified areas, and thus promote the process to allow them to become natural reserves of civil society.

The analysis of areas of importance for the 124 properties of the Project shows that a total of 21 properties were identified in the high priority category, 97 in the medium category and 8 in the low category. The results are shown in the annex "Proportion of important sites for terrestrial biodiversity".

Analyzing the results of this indicator through the implementation of the TOOL SDG, it was determined that activities have been carried out to contribute to the proportion of places of importance, contributing at the national level with contributions to terrestrial ecosystems that can have an impact on the conservation of biological diversity and contribute to the permanence of ecosystems that contain the flora, fauna and ecosystem services that these areas contain.

3.3.2.1 Progress of the indicator against the global target

The percentages established for each of the two stages of the project with respect to this indicator were selected based on the methodological effort and

data collection. In this sense, the times allocated for the development of each of these stages are: identification (5 years) and implementation (15 years), for a total of 20 years in which the project is framed.

Table 10. Progress of compliance with indicator 15.1.2 of SDG 15 (Life of terrestrial ecosystems) with respect to the global target of the SDG monitoring plan.

SDGS	*Target*	*Goal - Indicator(s)*	*Approach and/or Compliance*	*Progress (%) Period 2018-2021 with respect to the overall goal.*
15	15.1	15.1.2 Increase the proportion of sites important for terrestrial and freshwater biodiversity that are part of protected areas, broken down by ecosystem type	Twenty-one properties have been identified as high priority for the marking of areas of importance for biological diversity among the 124 properties enrolled in the project. The implementation process will be carried out in the following years of project development to increase the contribution of this indicator. Given the aforementioned parameters, so far there is a 25% progress percentage within the activities for this indicator.	25%

Source: The Cataruben Foundation, 2023

4. Compliance with Applicable Legislation

Applicable legislation covers a wide variety of areas, including social, environmental, economic and cultural aspects, among others. These regulations are constantly updated to reflect ongoing changes and the need to keep them up to date. In this context, a rigorous control of the updating of the regulatory matrix was implemented, following the procedure stipulated in the document management system called "Procedure GJP-14: Management of Legal Requirements". This process ensures timely and adequate compliance with the regulations applicable to the project, which aims to conserve biodiversity, carbon stocks and clean water on enrolled private properties.

The Cataruben Foundation, since the planning of the project, adheres to international standards that regulate climate change mitigation issues, the reduction and removal of Greenhouse Gases (GHG) as an activity of common interest in the world, these international policies have led States to issue laws that regulate the actions of people in their daily activities towards the environment and thus, those who cause carbon footprint offset their emissions through the purchase of carbon certificates.

In Colombia, care for the environment is promoted through the adoption of international agreements such as the Paris Agreement, the United Nations Framework Convention on Climate Change, and/or national ones such as the National Policy on Climate Change, National Policy on Environmental Education, National Policy for the Control of Deforestation and Sustainable Management of Forests, among other policies that regulate areas related to the reduction of GHG emissions; as well as the issuance of tax regulations on carbon such as, Law 1753 of 2015, in its article 175 through which the RENARE is created, Law 1819 of 2016 tax reform that creates the carbon tax and Law 2277 of 2022 that modifies articles 221 to 223 facing the non-causation of the tax, Decree 926 of 2017 that regulates the non-causation of the carbon tax, Law 1931 of 2018 through which guidelines for climate change management are issued, Resolution 1447 of 2018 modified by Resolution 0831 of 2020 that establishes the monitoring, reporting and verification system of mitigation actions at national level, regulations that allow establishing conditions or guidelines for the development of a climate change mitigation project.

These norms and their regulatory complements are grouped in the legal regulations matrix, which is reviewed and updated periodically for effective management of regulatory compliance. This regulatory framework is aligned with the project activities promoted by the Project, thus contributing to the joint effort to preserve the environment and combat climate change.

5. Adaptation to climate change

Table 11. Compliance with Climate Change Adaptation Items.

Component	Approach and compliance
1. Consider any of the activities proposed in the National Climate Change Policy.	Within the framework of the project, it takes into account line of action E of the National Climate Change Policy, which focuses on the "*Management and conservation of ecosystems and their ecosystem services for low-carbon and climate-resilient development*", specifically in the project area "Evaluate the conservation status of ecosystems associated with areas of water supply, flooding and drought, and sea level rise, such as water sources and watersheds within priority watersheds, and mangroves in coastal areas". This assessment will allow us to analyze and understand the essential ecosystem services provided by the water sources within the Orinoco watershed, with the objective of diagnosing and improving their conservation status. The proper functioning of these ecosystems is considered of vital importance, as they provide benefits such as regulation of the water cycle, flood and drought mitigation, biodiversity protection and provision of natural habitats.
2. Improve the conditions for the conservation of biodiversity and its ecosystem services in the areas of influence, outside the Project boundaries (natural coverage in areas of special environmental interest, biological corridors, water management in watersheds, among others)**.**	The project's objective is to improve the conditions for biodiversity conservation and ecosystem services. The project aims to contribute to the conservation of forest and Wetland areas by providing vital spaces for flora and fauna, which play a fundamental role in the maintenance of ecosystem services. Therefore, project activities include capacity building in the environmental management of the properties through training and support through training processes aimed at improving land planning, promoting biodiversity conservation, and fostering sustainable forest management. There are also plans to implement measures to monitor and conserve the fauna and flora in the project area and to monitor threatened ecosystems in order to evaluate their conservation status and take appropriate actions to protect them. In addition, participatory monitoring of endangered species will be promoted, actively involving local communities in data collection and decision-making related to their conservation.

3. Implement activities that generate sustainable and lo-carbon productive landscapes.	The project will actively promote the adoption of sustainable and low-carbon production systems in the Agriculture, Forestry and Land Use (AFOLU) sector. To achieve this, training and technical assistance will be provided to ecosystem managers. These activities aim to share knowledge and develop specific competencies for each productive activity they wish to implement. This involves identifying and applying techniques and technologies to reduce carbon emissions, improve efficiency in the use of natural resources and promote biodiversity conservation. In addition, they will be provided with specific guidance and training on best practices and opportunities available in sectors such as agroecology, sustainable forestry, natural resource management and other economic alternatives.
4. Designs and implements adaptation strategies based on an ecosystem approach.	In this case, in dry seasons the ecosystem managers are affected by this climatic condition, which brings with it the frequency of fires and poor access to water, which generates direct impacts on the cover and conservation areas of the properties; facing this problem, the project will implement adaptation strategies based on an ecosystem approach which aims to generate alerts of changes by deforestation and/or transformation of ecosystems in the project area and its surroundings, through satellite analysis to identify changes by fire, winds, floods, etc. These alerts are aimed at responding in a timely manner to some of the conditions that may arise and thus be able to act in a timely manner and improve efficiency in the use of natural resources. The project owner also believes that landowners can adopt conservation practices and sustainable production practices such as implementation of silvopastoral systems, water harvesting, recovery of water sources and gallery forests, landscape connectivity, promotion of natural reserves of civil society, this can increase with advice and training, which is why the project owner will implement knowledge transfer strategies focused on conservation issues and sustainable practices.

5. Strengthens the local capacities of institutions and/or communities to make informed decisions that allow them to anticipate negative effects derived from climate change (recognition of vulnerability conditions); as well as to take advantage of opportunities derived from the foreseen or evidenced chnges.	The project contributes to strengthening the local capacities of institutions and/or communities to make informed decisions that allow them to anticipate negative effects derived from climate change (recognition of vulnerability conditions); as well as to take advantage of opportunities derived from foreseen or evidenced changes. For this reason, we have been implementing knowledge transfer strategies focused on sustainable management of natural resources and sustainable practices in the Project's properties. Additionally, given the strategic importance that forests and Wetlands represent today for the country, in a context of modernization and promotion of productive sectors, climate change and land use planning, the aim is to integrate different forest governance inputs that have been developed and others that are being developed in order to integrate and validate them in a way that responds to the country's challenges.
6. For activities in the AFOLU sector: **a).** Agricultural and forestry production systems better adapted to high temperatures, droughts or floods, to improve competitiveness, income and food security, especially in vulnerable areas.	The project will promote the implementation of agricultural and forestry production systems adapted to high temperatures, droughts and floods. These systems seek to improve competitiveness, income and food security, especially in vulnerable areas. To achieve this, training cycles will be carried out and participants will be accompanied. Through these training processes, sustainable practices will be strengthened and greater efficiency in productive economic activities will be sought. During the trainings, knowledge will be shared on appropriate techniques and technologies to address climate and environmental challenges. The use of soil and water conservation practices, crop diversification, agroforestry and other strategies that contribute to climate change adaptation and mitigation will be promoted.
6. For activities in the AFOLU sector: **b).** Integral actions that help the efficient use of land, including, for example: conservation of existing natural cover, use consistent with the vocation and agro-ecological conditions of the territory, family agriculture and agricultural technology transfer to increase	Compliance with these actions is achieved through a contractual document signed by the two interested parties. Through this contractual agreement, the ecosystem managers acquire specific responsibilities aimed at the conservation of the areas related to the project and at the same time, the project owner (The Cataruben Foundation) assumes responsibilities that focus on follow-up and monitoring activities to ensure the conservation of these areas. The contract will clearly establish the obligations and commitments of both parties, creating a mutually beneficial

competitiveness and reduce vulnerability to climate change.	framework for cooperation and collaboration.
6. For activities in the AFOLU sector: **c).** Actions directly related to climate change adaptation measures, such as: use and management of seeds resistant to temperature change, water management through rainwater harvesting and/or recycling, drainage and irrigation, planting around watercourses to prevent erosion, soil management with practices that reduce compaction and techniques to reduce fertilizer use.	There are several climate change adaptation measures in the agriculture and forestry sector that can contribute to the goal of reducing emissions and increasing carbon sequestration. The project holder will establish within its activities actions directly related to climate change adaptation measures, such as: silvopastoral systems, landscape connectivity through biological corridors, renewal of introduced or improved pastures, natural regeneration, promotion of the use of clean energy, the incorporation of trees in agricultural systems and pre-farm implementation plans that promote sustainable activities.

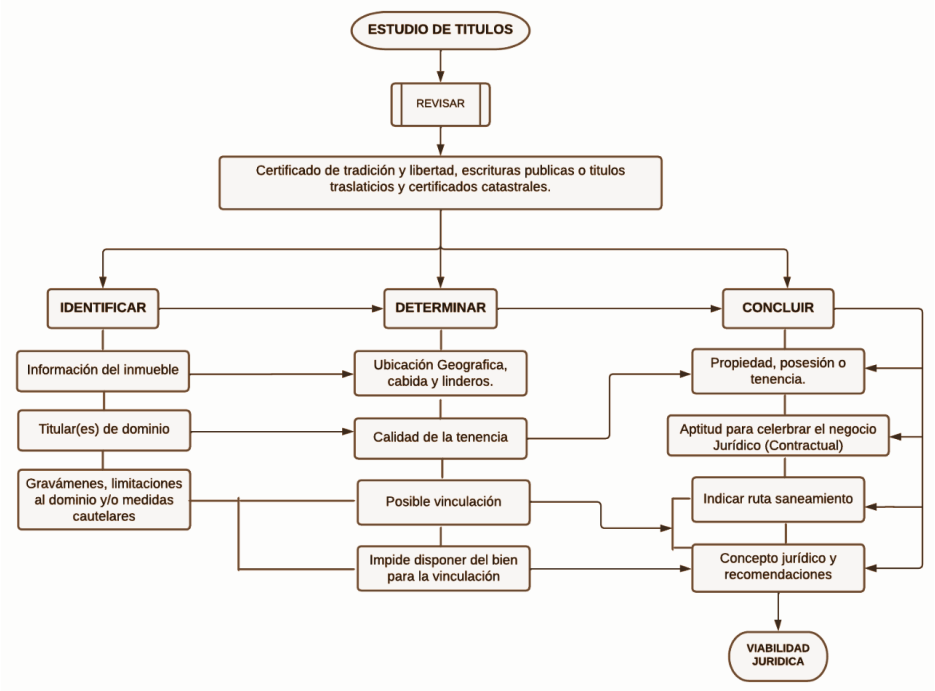
6. Carbon ownership and rights

In the context of the carbon project, it is essential to provide a comprehensive description of the current status of the property and carbon rights, this involves identifying who is the holder of the carbon rights and how they relate to the ownership of land and natural resources located in each of the properties, for this a series of documents are analyzed that are provided by stakeholders that allow a glimpse into what capacity they act, some of the documents analyzed are Certificates of Tradition and Freedom, Certificates of Good Possession, Sales, Public Deeds, Property Taxes, among others.

Property regulations are established in the Colombian Civil Code and its complementary norms, where specific rules are grouped together to determine who has the best rights to a property, and thus, the right to carbon credits and all the benefits they entail.

The Cataruben Foundation performs the analysis of documents to determine the ownership of the carbon according to the following image, a process in which documents are received and analyzed in detail to determine the legal status of the property and the ownership.

Image 11. Carbon property analysis**.**



Source: The Cataruben Foundation,2023

Once this process has been completed, the parties involved in carbon mitigation projects sign contracts and agreements detailing who is entitled to the carbon credits generated by the project, how the income will be distributed and who will be responsible for reporting the emission reductions. This process was carried out and as a result 124 properties were enrolled, which make up the project as shown in image 12.

Image 12. Carbon property results, Monday database.

Source: The Cataruben Foundation,2023

7. Environmental aspects

The project owner has carried out the environmental assessment for the project in which an analysis of the impacts that the project activities could cause in the area of influence of the project was performed. In order to carry out the environmental assessment of the components that are part of the ecosystems within the project's area of influence, the BCR "No Net Harm" tool was used. The environmental impact matrix for the project is listed below with the results obtained (Annex 1.1. General/1.1.4. Environmental Aspects/ 2. Environmental Impact Matrix CO2Bio P2-2).

The environmental assessment matrix has determined that the project activities do not represent any negative impact on the project's area of influence, and all activities are oriented towards environmental protection and greenhouse gas (GHG) reduction, indicating that the project is considered favorable from an environmental perspective. This positive assessment suggests that the proposed project activities are in line with the established criteria and standards; however, constant monitoring and stakeholder participation is necessary to ensure the environmental effectiveness and sustainability of the project.

The following is a list of the three (3) activities with the highest (Positive) Importance of the evaluated impact.

- *Environmental Assessment Component 4. Safeguards.*

According to the weighting obtained in the environmental matrix for component 4, which refers to Governance activities, specifically Safeguards ***5*** *"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 encourage the protection and conservation of these forests and the services derived from their ecosystems and to enhance other social and environmental benefits",* indicates that the impact generated in the area of influence is positive, that the activities proposed for the properties enrolled in the project are focused on the conservation of forests and the implementation of measures to preserve the biological diversity existing in them, through the sustainable practices implemented that seek to encourage the protection and conservation of these forests along with all the biodiversity existing in them.

In addition to this, we intend to transfer knowledge and support through training given by trained personnel to ecosystem managers, sharing knowledge aimed at the implementation of good practices that result in the conservation of forests and their biodiversity. We also seek to identify potential areas of endangered species and monitor their conservation, as well as monitoring to demonstrate that activities that involve the conversion of natural forests into other types of land use are not being carried out.

- *Environmental Assessment Component 4. SDGs*

This component refers to the activities of OSD 13- "*Climate Action: Adopt urgent measures to combat climate change and its effects", according to* the results obtained from the environmental assessment, it can be concluded that the activities proposed for the project are contributing to the reduction of greenhouse gas emissions that were being generated by the activities that were being implemented in the different enrolled properties. The project also seeks to improve environmental education, awareness and human capacity in relation to

climate change, adaptation to it, reduction of its effects and early warning of any change, through training and support for ecosystem managers in the implementation of sustainable productive practices that contribute to combating climate change.

Similarly, the purpose of the project holder is that the project activities contribute to the reduction of Greenhouse Gases established in national policies, strategies and plans, as established in the Paris Agreement at the COP21 in Paris.

- *Environmental Assessment Component 5. Project activities.*

Component 4, Project Activities, refers to the *"Characterization and implementation of sustainable productive and conservation practices".* It is concluded that the impact of this project activity on the elements of the environment is positive, due to the fact that, with the implementation of the project, the implementation of sustainable productive practices is encouraged, which help to reduce the negative environmental impact of those practices that are not environmentally friendly, and that will be demonstrated based on the monitoring of the implementation plan of project activities and information reported by the owners and field visits.

For the owner of the project it is essential to promote the efficient use of resources through sustainable consumption and production patterns, therefore, within the activities proposed in the execution of the project, training and support by professionals are contemplated for all those activities established in the land planning of each of the properties enrolled in the project.

8. Socioeconomic aspects

The following is the Socioeconomic Evaluation Matrix for the Project, with the results obtained after an exhaustive verification of the input information of this project, as well as the documents investigated, through a weighting of figures on the possible impacts that could be generated by the implementation of project activities, once considered by technical expertise its social and economic components.

Taking into account that, although the impacts can be positive or negative, in the case of the assessment of this project it is evident that the impacts are positive, so the main effects with the greatest positive impact are described in detail below, since all activities are aimed at generating social and economic benefits in accordance with climate change mitigation actions, in order to reduce the emission of greenhouse gasses (GHG).

- *Co-benefits: Benefits to communities*

The benefits on the communities is one of the most outstanding factors after the socioeconomic impact assessment, the Project's Project covers various types of benefits (social and economic) understanding the realities of their territories.

To this end, instruments of understanding, organization, participation and assurance are used to ensure the recognition of forest governance structures. Likewise, mechanisms are used for socialization, dissemination and transparency of information aligned with communication objectives that involve the use of tools (radio, video calls, brochures, billboards, illustrative documents, guides, face-to-face workshops, emails and website) to achieve the desired objectives.

On the other hand, the economic benefits of the project stand out for their high impact. I understand that they are economic resources provided in the short and long term to the beneficiaries for the commercialization of carbon certificates for the development of conservation actions in their properties and whose destination is the reinvestment in the maintenance of these activities for environmental sustainability, improving their quality of life and producing an average net increase in their income.

- *Project activities: Benefits on communities*

The actions evaluated under the "Project Activities" component of the project were as follows:

- Training cycle to strengthen knowledge on wetland conservation and sustainability to prevent the expansion of the agricultural frontier.
- Characterization and implementation of sustainable production practices.

- Participatory monitoring for biodiversity conservation and HCVs in the project area.
- Strengthening of governance structures in the territory.
- Recognition of conservation areas and figures and environmental management for biodiversity conservation.

Of the above, it was determined that with respect to the socioeconomic evaluation, those that had the best positive impact, prevailing over the rest of the project activities were:

- Training cycle to strengthen knowledge on wetland conservation and sustainability to prevent the expansion of the agricultural frontier (27 points).
- Characterization and implementation of sustainable production practices (27 points).

The training generated positive social impacts through the transfer of knowledge on topics such as biodiversity conservation and sustainable management of forests and wetlands, resulting in informed property owners whose skills have been strengthened. In addition, the implementation of sustainable productive practices has brought advantages for the proper management of the Properties and the improvement of their quality of life.

9. Stakeholder consultation

The Cataruben Foundation, in compliance with paragraph 16 of BRC standard version 3.2, carried out a consultation process with representatives of local governmental and non-governmental entities. The purpose of this consultation was to inform about the activities and design of the project, as well as to provide access to all information related to the environmental and social effects of the project.

In total, 29 entities located in the territories where the CO2Bio P2-2 Project was implemented were involved. These entities had the opportunity to communicate with The Cataruben Foundation using various means of communication, such as phone calls, emails, WhatsApp messages and physical correspondence.

The main communication mechanism used for the socializations was the realization of virtual meetings with personalized attention, adapted to the specific needs of each entity. This process of socialization of the project allowed The Cataruben Foundation to present detailed and complete information on the aspects of the project and its scope.

It is important to note that no complaints or claims were received from stakeholders, as shown in table 12, through any of the available means of communication. In addition, during the meetings held, ways of working together were discussed in case it was necessary to transfer information.

Table 12. Stakeholder communication results

Entities	Approach and/or Compliance	Comments and answers.	Communication mechanisms
Governorships: Arauca and Casanare	The Cataruben Foundation notified and invited the two (2) governorships for the purpose of socializing the CO2Bio P2-2 climate change mitigation project, as evidenced in the folder Governorships.	No comments were received from the governorates. A personalized mode of communication was established for each interested party that responded to the consultation. A copy of the communication with the Governorate of Casanare was received in response.	- E-mails. - Face-to-face meetings - Virtual meetings - Telephone calls - Physical correspondence - Whatsapp

Entities	Approach and/or Compliance	Comments and answers.	Communication mechanisms
Casanare Municipalities: Hato Corozal, Maní, Nunchia, Orocue, Paz de Ariporo, San Luis de Palenque, Tauramena Trinidad, Villanueva and Yopal. Arauca Mayors' Offices: Arauquita, Cravo Norte, Saravena	The Cataruben Foundation notified and invited 13 municipalities and their agencies, in order to socialize the CO2Bio P2-2 climate change mitigation project.	Comments were received from the mayors' offices of Hato Corozal, San Luis de Palenque, Trinidad, Yopal and Saravena, entities interested in establishing a meeting for the socialization of the project. Communication is established with each mayor's office to coordinate the socialization of the project. See in the Mayor's Office Comments folder.	- E-mails. - Face-to-face meetings - Virtual meetings - Telephone calls - Physical correspondence - Whatsapp
Regional Autonomous Corporations: CORPORINOQUIA with jurisdiction in Arauca and Casanare.	The Cataruben Foundation made the notification and invitation to Corporinoquia and its administrative entities in order to socialize the CO2Bio P2-2 climate change mitigation project. Regional Autonomous Corporation	A response was received from Corporinoquia, Arauca office, expressing their interest in learning about the CO2Bio P2-2 project. Communication was established to respond to their request. See in the folder of comments from the Regional Autonomous Corporations.	- E-mails. - Face-to-face meetings - Virtual meetings - Telephone calls - Physical correspondence - Whatsapp
Non-Governmental Entity	The Cataruben Foundation notified other entities whose corporate purpose is related to the environment, such as Fundación Cunaguaro, La Asociación de Becarios de Casanare, Fundación Orinoquia Biodiversa, La Palmita Centro de Investigación, Fundación	No comments were received. However, personalized communication was established for each interested entity. See Comments folder for non-governmental entities.	- E-mails. - Face-to-face meetings - Virtual meetings - Telephone calls - Physical correspondence - Whatsapp

Entities	Approach and/or Compliance	Comments and answers.	Communication mechanisms
	Palmarito, in order to socialize the CO2Bio P2-2 climate change mitigation project. Non-Governmental Entities		

Source: The Cataruben Foundation,2023.

10. REDD+ Safeguards

The Project addresses the respect and compliance with the seven (7) social and environmental safeguards of Cancun in the period between 2018-2021, as provided mainly in the document ***"Tool to demonstrate compliance with REDD+ safeguards"*** Version 1.1. In this regard, the indicators and targets stipulated in the REDD+ Safeguards Monitoring Report - the Project (See sheet: "M. SAFEGUARDS Report") for the period in question are being monitored.

On the other hand, and taking into account the update of the BioCarbon Registry standard in its version 3.1, the inclusion of the tool ***"No Net Harm: Environmental and Social Safeguards (NNH)"*** Version 1.0 was key, which adds sections that solidify the approach and compliance with the REDD+ Social and Environmental Safeguards, by highlighting the importance of *action without harm*. In this sense, and as dictated by these tools, the project management has included compliance especially with section 3, which states *"Do no harm to the environment and society".*

Nevertheless, the aforementioned tools are not the only guides implemented in this approach. In addition, and due to key provisions, a more than pertinent reading was given to the document of analysis, approach and respect from the national government, called: ***Social and Environmental Safeguards for REDD+ in Colombia***[1] . This document provides an interpretation and reading that yields fifteen elements that should be operational and coherent for this territory, translated into the activities proposed within the framework of the

[1]https://archivo.minambiente.gov.co/images/cambioclimatico/pdf/Reed_/Cartilla-Interpretacion-Nacional-de-Safeguards-ministerio-de-ambiente.pdf

Project. Furthermore, these 15 elements are divided among each of the 7 Safeguards that, for practical purposes, are organized into three themes: **(1) Institutional, (2) social and cultural, and (3) environmental and territorial** (Camacho A, Lara I & Guerreo, 2017). Likewise, each thematic is distributed in this way:

- **Institutional:** *Safeguards REDD+ 1 and 2*, its elements are (a) correspondence with national legislation, (b) transparency and access to information, (c) accountability, (d) recognition of forest governance structures and (f) capacity building.
- **Social and cultural:** *Safeguards REDD+ 3 and 4*, its elements are (g) free, prior and informed consent, (h) respect for traditional knowledge, (k) benefit sharing, (l) territorial rights and (m) participation.
- **Environmental and territorial:** *Safeguards REDD+ 5, 6 and 7*, its elements are: (n) conservation of forests and their diversity, (ñ) provision of environmental goods and services, (o) forest control and surveillance to avoid displacement of emissions, (p) environmental and territorial management, and (q) sectoral planning.

In this same line, the (15) elements must be integrated in any action, program or policy related to the reduction of deforestation in the national territory. Then, from CO2Bio P2-2, the 15 elements are intertwined with the general activities and specific activities, this, for the transversality and correspondence with the respect for individual and collective rights of local communities and their territories. Below, a report on compliance with each of them will be presented, drawing on both the national reading of these Safeguards, as well as the guidance represented by the BCR Standard and its tools (2018-2021 period):

10.1 Safeguard 1

"The complementarity or compatibility of the measures with the objectives of national forestry programs and international conventions and agreements on the subject."

The document called "Tool to demonstrate compliance with the Safeguards

REDD+", in its latest version, states that the activities implemented in the framework of CO2Bio P2-2 must be related to and not contradict the objectives set out in national forest policies and programs, as well as international conventions and / or agreements signed by Colombia. For this purpose, a detailed investigation of these environmental regulations has been carried out, where the validity and relevance, according to the strategic ecosystems to which the project is directed, were key to determine this transversality with conservation and restoration activities, and of course the responsible management of natural resources.

Basically, the purpose is to ensure that all these activities are consistent with the territory in question (Casanare and Arauca), and are adjusted to the regulations, but also with the technical knowledge offered from Cataruben and the local knowledge surrounding land use, which implies the gradual strengthening of the governance of the properties. In sum, this Safeguards, is integrated into the **Institutional** thematic that, according to the national interpretation, any REDD+ activity projected, must adapt to the National Forestry Development Plan, and clearly know and adjust in detail not only to the regulations linked to this, but also to local practices (Camacho A, Lara I & Guerreo, 2017).

The following is a description of the approach and compliance with this safeguard.

Table 13. Addressing and/or complying with Safeguard 1 in the framework of the project.

Thematic National Interpretation	Item	Requirement "BCR tool to demonstrate compliance with the Safeguards REDD+".	Component	Elements National Interpretation	Approach and/or compliance
	1.1	**Compatibility analysis:** Documentary analysis listing all actions implemented under the project and relating each action to national forest policies and programs as appropriate.	Normative	Correspondence with national legislation	A report was prepared showing the analysis of the compatibility of project activities with (i) international agreements and (ii) national policies, strategies, plans and programs. The analysis is contained in the document called 1.1 Safeguards Report REDD+ (CO2Bio P2-2). Additionally, the Legal Compatibility Matrix - the Project is attached as an annex document that supports this analysis.

Source: The Cataruben Foundation, 2023.

10.1.1 Progress of the Safeguards indicator(s) against the overall target

Based on the results report provided above, the percentage of compliance with Safeguard 1 and its indicators with respect to the overall goal is shown below.

Table 14. Progress of Safeguard 1 compliance with respect to the overall goal of the Safeguards monitoring plan.

Safeguards	Item	Indicator(s)	Progress (%) Period 2018-2021	Compliance (%) Global Target
1	1.1	# of compatibility reports performed	60%	**60%**

Source: The Cataruben Foundation, 2023.

10.2 Safeguard 2

"The transparency and effectiveness of national forest governance structures, taking into account national legislation and sovereignty. Provide transparent and consistent information that is accessible to all stakeholders and regularly updated. Be transparent and flexible to allow for improvements over time. Build on existing systems, if any".

This Safeguards also requires demonstrating that project activities are consistent with the international, national, regional and local regulatory framework. A whole system or mechanisms must be set up to allow for the socialization, disclosure and transparency of information. That is, the project developer (The Cataruben Foundation) must ensure that "stakeholders have transparent, accessible and timely information related to REDD+ actions in the information platforms or media to be determined" (Camacho A, Lara I & Guerreo, 2017: 22). Therefore, for the specific case of the Project, a diverse network of communication channels was configured, including: institutional telephone lines, institutional emails, face-to-face and virtual socializations, workshops, radio spots, brochures and flyers, and the PQR system. These were mainly established according to the territory to be intervened, examining their effectiveness with the policies, measures and actions (PAM) that had been previously developed in the region.

Another measure to ensure the transfer of information is that the project owner must issue to the Ecosystem Manager a report of carbon certificate emissions generated in its Property, before the transfer of economic benefits, in accordance with the provisions of the contract enrolled in the Climate Change Mitigation Project CO2Bio P2-2. The purpose of this is to guarantee free access to information, to maintain efficient communication between the parties and to manage the processes in a transparent manner.

In addition, the imperative need to investigate how governance structures have been developed or created at the local level is revealed, with the objective of issuing a diagnosis of the forms of intervention and relationship with the territory. In addition to the above, it is worth noting that the Project is currently registered in the platform of the Ministry of Environment and Sustainable

Development RENARE[2] , in the initial feasibility phase (RENARE CO2Bio P2-2 Support), However, the project owner has not been able to continue reporting the information corresponding to the formulation phase due to the fact that the platform is under maintenance since August 9, 2022; however, it is expected that the Ministry of Environment will complete the maintenance of the application to proceed with the reporting of project information and be able to provide the necessary updates as required by national regulations. **Table 15** below shows the approach and compliance, according to the BCR tool and the national reading.

Table 15. Addressing and/or complying with Safeguards 2 in the framework of the project.

Thematic National Interpretation	Item	Requirement "BCR tool to demonstrate compliance with the Safeguards REDD+".	Component	Elements National Interpretation	Approach and/or compliance
	2.1	**Radio:** Radio spots and/or audios produced and broadcast within the framework of the project.	Informative	Transparency and Access to Information	A report was prepared showing how transparency and access to information is guaranteed to stakeholders within the framework of the project. This report is available in the document called "REDD+ Safeguards Report (Co2Bio P2-2) / Safeguard 2". Additionally, the Project Communications Plan is attached as an annex document that allows (i) identifying the project's
	2.2	**Brochures, billboards, documents illustrative** documents, **guides, among others:** Digital documents that were produced and disseminated within the framework of the Project.	Informative		

[2] National Greenhouse Gas Emissions Reduction Registry.

	2.3	**E-mails and web page:** Supports of emails sent for the dissemination of information within the framework of the project, and evidence of maintained and constant access to the web page.	Informative		communication phases and processes, (ii) determining the communication objectives according to the process, and (iii) identifying the media to disseminate information (e.g. written press, radio, television, internet, e-mail, among others), as well as their respective evidence.
	2.4	**Virtual and/or face-to-face socializations:** carried out in the area of influence of the project for hectare management (attendance lists, photographs and videos).	Informative		
	2.5	**Video calls:** to show how information is socialized with stakeholders.	Informative		
	2.6	**Activities or documents carried out with organizations, associations, community action boards or interest groups:** minutes, audio or video recordings, copies of documents or activities carried out.	Informative		

	2.7	**RENARE Registration:** the Climate Change Mitigation Project	Normative	3. Accountability	The project is currently registered in the National Registry for the Reduction of Greenhouse Gas Emissions (RENARE), REDD+ Project.
	2.8	**Forest governance analysis:** Analysis that identifies the forest governance structures in the territory and demonstrates compliance with national, regional and local regulations. Special emphasis should be given to the differential approach in the management of information when applicable.	Normative	4. Recognition of Governance Structures	A report was prepared showing how the Project ensures the recognition of forest governance structures. This report is available in the document called "Safeguards Report REDD+ (Co2Bio P2-2) / Safeguard 2". Additionally, the Forest Governance Policy Identification - the Project is attached as an annex document supporting this analysis.

	2.9	**Workshops and/or face-to-face training:** developed within the framework of the Project (attendance records, photographic record, supporting documents, video recordings, etc.).	Informative	5. Strengthening Training	A report was prepared showing how transparency and access to information is guaranteed to stakeholders within the framework of the project. This report is available in the document called "REDD+ Safeguards Report (Co2Bio P2-2) / Safeguard 2". Additionally, the CO2Bio P2-2 Communications Plan is attached,

Source: The Cataruben Foundation, 2023.

10.2.1 Progress of the Safeguards indicator(s) against the overall target

Based on the results report provided above, the percentage of compliance with Safeguard 2 and its indicators with respect to the overall goal is shown below.

Table 16. Safeguard 2 compliance progress with respect to the overall goal of the Safeguards Monitoring Plan (CO2Bio P2-2 Project).

Safeguards	Item	Indicator(s)	Progress (%) Period 2018-2021	Compliance (%) Global Target
2	2.1	# of radio spots and/or audios produced and broadcast within the framework of the project.	6%	**31%**
	2.2	# of digital documents produced and disseminated within the framework of the Project (brochures, posters, illustrative documents, guides, etc.).	20%	
	2.3	# of communications sent via e-mail to disseminate information within the framework of the project.	23%	
	2.4	# of virtual and/or face-to-face socializations for	20%	

		property acquisition		
	2.5	# of workshops and/or training to show how information is socialized with stakeholders.	15%	
	2.6	# of activities or documents carried out with organizations, associations, community action boards or interest groups (report with attached and/or linked evidence).	20%	
	2.7	# of Project registrations in RENARE	100%	
	2.8	# of reports on the recognition of forest governance structures	60%	
	2.9	# of workshops and/or trainings developed within the framework of the Project (attendance records, photographic record, supporting documents, video recordings).	15%	

Source: The Cataruben Foundation, 2023

10.3 Safeguard 3

"Respect for the knowledge and rights of indigenous peoples and members of local communities, taking into consideration relevant international obligations and national circumstances and legislation, and bearing in mind the United Nations Declaration on the Rights of Indigenous Peoples."

This Safeguard highlights the guidelines that ensure respect for the traditional knowledge, customs and practices of the ethnic communities present in the territory.

Since it is the duty of the developer to address it from the minimum standard of law and international declarations on the rights of these peoples (**NOTE:** does not apply in this particular case since no collective or ancestral territory will be intervened).

At the same time, Safeguard 3 states the need to carry out working groups that actively include the local communities or those that will carry out the conservation and restoration activities of the natural ecosystems, i.e., self-identified as farmers and that can demonstrate ownership or private possession of the territory. This decision is not arbitrary, but the result of the

design of the technical and legal specifications to demonstrate the viability of the territory that will be part of the eligible area, where the project activities will intervene.

Now, these spaces for articulated decision making between stakeholders are projected in the different phases of the project, i.e., the pre-feasibility phase, the structuring and implementation of conservation and restoration activities. In other words, this community, self-recognized as a farmer community that develops economic activities related to agricultural or livestock practices, makes it clear that it is not occupying any collective territory, indigenous reservation or ancestral territory whatsoever.

In addition, the respect and recognition of the knowledge and practices of land use from the local level is strengthened in an uninterrupted interaction and reciprocal learning relationship that develops in the total validity of CO2Bio P2-2. Being the scenarios indicated for the joint configuration and reconfiguration of strategies aimed at quantifying removals and storage of greenhouse gasses (GHG). The enrolled ecosystem managers' consent and effective participation is evidenced by the enrolled ecosystem managers' signed enrolled contracts, and above all the recognition of their agency at the time of registering the responsible use of forest services and land use.

Likewise, in these documents are described the clauses that define the distribution of economic benefits, after the commercialization of carbon credits in terms of percentage and already defined the extension of the eligible area and, of course, the legitimate ownership of the land. Next, the approach and compliance with this Safeguards will be described in Table 17:

Table 17. Addressing and/or complying with Safeguard 3 in the framework of the project.

Thematic National Interpretation	Item	Requirement "BCR tool to demonstrate compliance with the Safeguards REDD+".	Component	Elements National Interpretation	Approach and/or compliance
Social and cultural	3.1	**Working groups:** The Project owner must implement working groups with the communities and other mechanisms that allow the enrollment of these communities in the Project from its pre feasibility and structuring phase, in relation to the enrollment of traditional ancestral knowledge in the Project.	Participatory	6. Free, Prior and Informed Consent (FPIC) 7. Respect for Traditional Knowledge	A report was prepared showing the implementation of working groups with the Project's communities. The analysis is contained in the document called "Safeguards Report REDD+ (Co2Bio P2-2) / Safeguard 3". Additionally, attached is the document Plan de Mesas de Trabajo (CO2Bio P2-2), an annex document that supports this analysis.
	3.2	**Conservation agreements:** The Project holder may propose new forms of sustainable use of the territory. In addition, it may limit certain activities carried out by the communities, as long as they accept it through an agreement signed by their representatives.	Legal	8. Benefit Sharing	A report was prepared showing the recognition of the territory and inventory of the communities present in it, as well as the identification of the strategy to respect their rights according to their qualities and qualities. The analysis is contained in the document entitled "Safeguards Report REDD+ (Co2Bio P2-2) / Safeguard 3". Additionally, the digital folder Proceedings of prior consultation is attached with all the documentation related to this process before the competent national authority (Ministry of the

					Interior).
	3.3	**Mapping of communities in the territory and prior consultation:** The Project owner must recognize and respect the rights of the communities present in the territory. This must be complied with under the minimum applicable standard of law and international declarations on the rights of indigenous peoples.	Investigative	9. Land Rights	A report was prepared showing the recognition of the territory and inventory of the communities present in it, as well as the identification of the strategy to respect their rights according to their qualities and qualities. The analysis is contained in the document entitled "Safeguards Report REDD+ (Co2Bio P2-2) / Safeguard 3". Additionally, the digital folder Proceedings of prior consultation is attached with all the documentation related to this process.

Source: The Cataruben Foundation, 2023.

10.3.1 Progress of the Safeguards indicator(s) against the global target

Based on the results report provided above, the percentage of compliance with Safeguard 3 and its indicators with respect to the overall goal is shown below.

Table 18. Safeguard 3 compliance progress with respect to the overall goal of the Safeguards monitoring plan (CO2Bio P2-2 Project).

Safeguards	Item	Indicator(s)	Progress (%) Period 2018-2021	Compliance (%) Global Target
3	3.1	# of work tables held with the communities	20%	**73%**
	3.2	# of contracts and/or conservation agreements signed	100%	
	3.3	# of community mapping analyses developed	100%	

Source: The Cataruben Foundation, 2023.

10.4 Safeguard 4

"The full and effective participation of stakeholders, in particular indigenous

peoples and local communities."

This full and effective participation, referred to in Safeguard 4, refers to effective means of communication and easy access for all stakeholders. The project owner must create the conditions to exhaust all possible communication channels to ensure full disclosure of information related to the project. In addition, project scenarios for decision making and the conscious participation of all stakeholders, which as has already been made clear in other sections of this same text, full and effective participation must be evidenced from the same pre-feasibility phase to the verification and validation of the activities within the framework of the Project.

For practical purposes, four (4) stages have been defined, marking four (4) moments that are related to four types of information, one more important than the previous one, and whose relevance is defined according to the moment in which CO2Bio P2-2 is found, and these are:

At the time of applying a social, environmental and economic characterization survey of the ecosystem managers, in order to identify needs, knowledge and local practices that can be articulated in the strengthening of the conservation and restoration activities of the ecosystems, this is defined in **Stage 1.**

Then, the disclosure of all the information regarding the Project would be consolidated, including the consultation of interested parties, the appropriate socialization (virtual or in person), the delimitation of the Property, the identification of the rights over the carbon credits, the enrolled ecosystem managers, the implementation and monitoring of the activities, and of course, the distribution of the economic benefits. The above is part of **Stage 2**.

Subsequently, activities are implemented to raise awareness, strengthen and promote practices and knowledge, which help to formulate strategies articulated in workshops, training and scenarios that lend themselves to feedback, thus characterizing **Stage 3.**

Finally, the participation mechanisms are reinforced, ensuring that the different suggestions, doubts and complaints will be heard and addressed in a timely manner. For this purpose, three lines of communication have been proposed

that adjust to the needs and access to communication channels of each of the ecosystem managers, such as: e-mails, institutional numbers, and a PQRS system. Thus completing **Stage 4.**

In short, providing the guarantee for the full and effective participation of all CO2Bio P2-2 stakeholders creates the conditions to ensure symmetrical agency in decision making, which, consequently, will represent more than one benefit to those involved. In other words, "[i]n the development of any REDD+ Project, it must be guaranteed that the stakeholders involved exercise their right to effective, free, full and informed participation [...] the participation structures of each interest group, especially the communities, must be recognized and respected, according to national legislation and international agreements signed by Colombia" (Camacho A, Lara I & Guerreo, 2017: 38).

The above, is transversal to Safeguards 1 and 2 respectively, and reinforces the relevance of adjusting the activities to the territory in question, which for this specific case, are the departments of Casanare and Arauca.

Table 19 below shows the approach and compliance with this safeguard:

Table 19. Addressing and/or complying with Safeguard 4 in the framework of the CO2BIO P2-2 project.

Thematic National Interpretation	Item	Requirement "BCR tool to demonstrate compliance with the Safeguards REDD+".	Component	Elements National Interpretation	Approach and/or compliance
Social and Cultural	4.1	**Mechanisms for socialization and dissemination of information:** the project owner must demonstrate with evidence that it has disclosed, socialized and shared the information with the communities in a transparent, clear, complete, inclusive and effective manner through the corresponding means.	Informative	10. Participatory	A report was prepared showing the implementation of communication and disclosure mechanisms to ensure the full and effective participation of stakeholders. The analysis is contained in the document entitled "REDD+ Safeguards Report

					(Co2Bio P2-2) / Safeguard 4". Additionally, a digital folder with minutes, audio and/or video recordings, documents, and other relevant supports are attached, which provide evidence of how the communities present in the territory participated.
	4.2	**Participation mechanisms used:** the project owner shall demonstrate with evidence that the community had the opportunity to participate, really and effectively, from the feasibility and structuring phase of the project.	Participatory		A report was prepared showing how the comments made by the communities were addressed and how they were dealt with. The analysis is contained in the document entitled "REDD+ Safeguards Report (Co2Bio P2-2) / Safeguard 4". Additionally, a digital folder is attached with screenshots of PQR'S and/or comments that provide evidence of the treatment and solution provided to them.

Source: The Cataruben Foundation, 2023

10.4.1 Progress of the Safeguards indicator(s) against the global target

Based on the results report provided above, the percentage of compliance with Safeguard 4 and its indicators with respect to the overall goal is shown below.

Table 20. Safeguards 4 compliance progress with respect to the overall goal of the Safeguards monitoring plan (CO2Bio P2-2 Project).

Safeguards	Item	Indicator(s)	Progress (%) Period 2018-2021	Compliance (%) Global Target
4	4.1	# of reports on communication and outreach mechanisms employed to ensure full and effective stakeholder participation	20%	**20%**
	4.2	# of PQRS reports that show how the comments made by the communities were addressed and how they were dealt with.	20%	

Source: The Cataruben Foundation, 2023.

10.5 Safeguard 5

"The compatibility of the measures with the conservation of natural forests and biological diversity, ensuring that those identified 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 their derived ecosystem services and to enhance other social and environmental benefits."

The articulated work of the actors is the ideal way for the harmonious implementation of conservation and restoration activities of the strategic ecosystems defined for CO2Bio P2-2. And of course, this should also include the protection of the native biodiversity that inhabits them (animal and plant species), and for this, such activities should be focused on national and local conservation objectives.

This, subsequently, makes it possible to highlight the essential particularities of each territory and the most vulnerable native species (whether due to hunting or deforestation). Among the strategies that can be configured as a whole are: socio-environmental impact assessments, the establishment of compatibility and complementarity with conservation objectives and ecosystem services, the protection of habitats and threatened species, and, of course, the local sustainable use of natural resources.

For this reason, the Project's approach *to conservation is* based on coordinated and collaborative work with the local community and strategic allies. Given that such *conservation* seeks well-being for these communities as well as for the environment, in a progressive improvement of productive practices and natural resource management. At this point, training and accompaniment spaces are key, involving an expansion of strategies and various ways to address biodiversity, habitat protection and the identification of endangered species. As well as the promotion of responsible and sustainable management of water sources, all from a culture of care.

In short, these are the measures that have been taken by the Project to ensure compliance with environmental regulations, diagnosis of socio-environmental impacts, and of course, detailed observation of current environmental standards and international agreements. All of the above, subject to a local reading, i.e., with the participation of *ecosystem managers* in monitoring processes and periodic reports that provide assurance that the Project is addressing and complying with regulatory requirements.

Table 21. Addressing and/or complying with Safeguards 5 under the project.

Thematic National Interpretation	Item	Requirement "BCR Tool for demonstrating compliance with the Safeguards REDD+".	Component	Elements National Interpretation	Approach and/or compliance
Environmental and Territorial	5.1	**Project owners must work in coordination with communities** to conserve, protect, restore and sustainably use ecosystems.	Environmental	11. Forest and Biodiversity Conservation	A report was prepared showing the implementation of training cycles aimed at project beneficiaries to encourage the conservation of ecosystems and their biodiversity. The analysis is contained in the document entitled "Safeguards Report REDD+ (Co2Bio P2-2) / Safeguard 5". Additionally, the digital folder with the photographic record and other relevant supports of the development of the training is attached. Also attached are: (i) a digital folder with evidence of information on threatened species distributed in the project area, and (ii) a digital folder with evidence of the monitoring of hot spots in the properties for the REED+ areas.

	5.2 5.3 5.4	The Project holder shall demonstrate that the Project has not incurred in activities involving the conversion of natural forests to other types of land use.	Normative		A report was prepared showing the implementation of training cycles aimed at project beneficiaries to encourage the conservation of ecosystems and their biodiversity. The analysis is contained in the document entitled "Safeguards Report REDD+ (Co2Bio P2-2) / Safeguard 5". Additionally, a digital folder is attached with certifications from environmental authorities evidencing that there have been NO environmental infractions and/or investigations.
	5.5	The activities implemented in the Project must comply with applicable environmental regulations on the use and exploitation of natural resources.	Environmental	12. Provision of Environmental Goods and Services	A report was prepared showing that there were no activities involving the conversion of natural forests to other types of land use. The analysis is contained in the document entitled "Safeguards Report REDD+ (Co2Bio P2-2) / Safeguard 5". On the other hand, the digital folder with evidence supporting the use of geographic visualization programs is attached.

Source: The Cataruben Foundation, 2023

10.5.1 Progress of the Safeguards indicator(s) against the overall target

Based on the results report provided above, the percentage of compliance with Safeguard 5 and its indicators with respect to the overall goal is shown below.

Table 22. Progress of Safeguard 5 compliance with respect to the overall goal of the Safeguards monitoring plan

Safeguards	Item	Indicator(s)	Progress (%) Period 2018-2021	Compliance (%) Global Target
5	5.1	# of cycles of training given to the community	25%	**24%**
	5.2	# of vulnerable species of biodiversity in the study area	25%	
	5.3	# of hot spot alerts identified in the project area	20%	
	5.4	# of forest non-conversion analysis	25%	
	5.5	# of certifications from environmental authorities evidencing the NON-incurrence of infractions and/or environmental investigations.	25%	

Source: The Cataruben Foundation, 2023.

10.6 Safeguard 6

"The adoption of measures to address reversal risk management".

The Cataruben Foundation implements a series of tools through which it seeks to reduce the reversal risk management; one of them is the Land Management Plans (POT), which play an important role, because their reading allows to know the planning and territorial distribution of each municipality; with this it is sought that the project activities are aligned with the established sectorization, which makes conservation activities are consistent with land use.

Another tool to be developed is the incorporation of clauses related to the reversal risk management within the enrolled contracts; these have been established in accordance with the BioCarbon Registry standard, being a

guarantee that the conservation activities will last over time.

In addition, workshops and training are provided to landowners to encourage their commitment to the implementation of conservation practices and to ensure that the decisions made within the framework of the project contribute to the preservation of natural ecosystems.

The application of these tools has become a fundamental element in minimizing reversal risk management, ensuring that conservation efforts are effective.

Table 23. Addressing and/or complying with Safeguard 6 in the framework of the project.

Thematic National Interpretation	Item	Requirement "BCR tool to demonstrate compliance with the Safeguards REDD+".	Component	Elements National Interpretation	Approach and/or compliance
Environmental and Territorial	6.1	The project owner must identify the reversal risk management and ensure its permanence over time.	Legal	13. Environmental and Territorial Planning	A report was prepared which shows: (i) an analysis of the beneficiaries' permanence risk during the project's crediting period, as well as (ii) an analysis of the reversal risk management faced by the project, or that it may face in the future, as well as how to mitigate them. The analysis is contained in the document entitled "REDD+ Safeguards Report (CO2BioP2-2) / Safeguard 6". Additionally, the digital folder containing the supports of the reversal risk management analysis is attached as evidence of compliance with the activity in question, as well as the project's risk identification and management matrix.
	6.2	The Project owner shall take measures to reduce the reversal risk management.		14. Sector Planning	

Source: The Cataruben Foundation, 2023

10.6.1 Progress of the Safeguards indicator(s) against the global target

Based on the results report provided above, the percentage of compliance with Safeguard 6 and its indicators with respect to the overall goal is shown below.

Table 24. Safeguards 6 compliance progress with respect to the overall goal of the Safeguards monitoring plan (CO2Bio P2-2 Project).

Safeguards	Item	Indicator(s)	Progress (%) Period 2018-2021	Compliance (%) Global Target
6	6.1	# of reversal risk management analyses carried out	20%	**20%**
	6.2	# of reports on actions implemented to guarantee the permanence in time of the owners within the framework of the Project.	20%	

Source: The Cataruben Foundation, 2023.

10.7 Safeguard 7

"The adoption of measures to reduce emissions displacement".

Finally, the Project carried out an analysis aimed at identifying the main agents and causes of deforestation and land use change. According to the above, it was possible to recognize *the expansion of the agricultural and livestock frontier* as a cause, and as the main agent, the owners of private properties.

However, in order to comply with the methodological criteria, it was proposed to establish a *buffer*[3] of 1 km distance from the boundaries of the eligible areas (strategic ecosystems), this area will be monitored periodically in order to quantify the displacement of greenhouse gas (GHG) emissions, which could occur outside the project area.

These emissions will be subtracted from the results of the project as a mechanism to identify, monitor and strategically minimize these potential leakages. Likewise, work was carried out with the local community to raise awareness (socialization, workshops, knowledge exchange, working groups, etc.) about the importance and benefits of conservation, restoration and sustainable use of the natural areas on the properties. And complementary, it

[3] It is an area surrounding the project reference region (properties).

will try to consolidate the articulation of these efforts with SINAP[4] and SIDAP[5] , which implies an important strengthening that legitimizes before the region the activities advanced from CO2Bio P2-2. Thus, creating favorable conditions to continue reproducing the impulse of conservation and the idea of caring for the territory, and of course, the material and symbolic benefits that this implies, thus achieving the inclusion of more and more properties to the Project.

Table 25. Addressing and/or complying with Safeguard 7 in the framework of the project.

Thematic National Interpretation	Item	Requirement "BCR tool to demonstrate compliance with the Safeguards REDD+".	Component	Elements National Interpretation	Approach and/or compliance
	7.1	The Project holder must identify the Leakage and its causes and design strategies to: (i) guarantee the monitoring and control of the same, and (ii) minimize them.	Environmental	15. Forestry Control and Surveillance to Avoid Displacement or Emissions	A report was prepared showing the identification of leakage and its causes, monitoring methods and actions to minimize them. The analysis is contained in the document entitled "Report on Safeguards REDD+ (Co2Bio P2-2) / Safeguard 7". Additionally, a folder with evidence of leakage treatment is attached to support compliance with the activity in question.
	7.2	The Project owner must implement response protocols for identifying leaks and how to control them.	Environmental		A report was prepared showing the implementation of the protocol to respond to leakage that may occur within the framework of the project. The analysis is contained in the document entitled "REDD+ Safeguards Report (Co2Bio P2-2) / Safeguard

[4] National System of Protected Areas.
[5] Departmental System of Natural Protected Areas.

					7". Additionally, the folder with evidence of the implementation of the response protocol is attached as support for compliance with the activity in question.

Source: The Cataruben Foundation, 2023.

10.7.1 Progress of the Safeguards indicator(s) against the global target

Based on the results report provided above, the percentage of compliance with Safeguard 7 and its indicators with respect to the overall goal is shown below.

Table 26. Progress of compliance with Safeguard 7 with respect to the overall goal of the Safeguards monitoring plan.

Safeguards	Item	Indicator(s)	Progress (%) Period 2018-2021	Compliance (%) Global Target
7	7.1	# of reports with identification of leaks and their causes	20%	**20%**
	7.2	# of response protocols in place to minimize leakage	20%	

Source: The Cataruben Foundation, 2023

11. Special categories related to Co-benefits

In consideration of the provisions provided by the BCR standard in its version 3.2 and the "No Net Harm" tool regarding the approach and compliance with additional social and environmental benefits (Co-benefits), and taking into account that the monitoring period of the Project is between 2018-2021 (4 years), the following is the analysis of the results of the Co-benefits Monitoring Report - the Project (See sheet: **"**M. CO-Benefits Report**"**).

11.1 Biodiversity conservation

The "Biodiversity conservation" component comprises two co-benefits: (i) it develops effective actions and measures to halt the loss of biological diversity,

allowing ecosystems to continue providing essential services, and (ii) due to project activities, no invasive species have been introduced.

The following is the approach and compliance with the Co-benefits of this component (Biodiversity conservation) in the Orchid category:

Table 27. Progress of compliance with indicators of the "Biodiversity conservation" component with respect to the global goal of the CO BENEFITS monitoring plan.

Co-benefits	***Indicator***	***Approach and/or compliance***	***Progress (%) Period 2018-2021 with respect to the global target.***
Develops effective actions and measures to halt the loss of biological diversity, favoring that ecosystems continue to provide essential services.	# of Property declared as RNSC (Civil Society Nature Reserve)	In accordance with the conservation actions carried out since the implementation of project activities, 15 civil society nature reserves have been declared, which favor national objectives for biodiversity conservation and the availability of ecosystem services in the project area.	58%
	# of assessments of the status of areas of importance for biological diversity	In accordance with the objective of the co-benefits, an analysis of areas of importance for biological diversity has been carried out in the 124 properties enrolled in the project, where 21 properties were identified in a high category, as they are important ecosystems for ecological processes and integrate habitats of great importance for conservation, 97 properties were located in the medium category and 8 properties in the low category.	25 %
Due to project	# of invasive	Based on the development of the project activities, a low risk for the introduction of exotic species in the project area has	25%

activities, no invasive species have been introduced.	species presence assessments conducted in the project area	been identified. It is verified that no exotic species have been used in any activity carried out during the project and the possible presence of these species will continue to be evaluated in the future.	

Source: The Cataruben Foundation, 2023

11.2 Benefits on communities

The "Community Benefits" component comprises three co-benefits: (i) it identifies and strengthens mechanisms for social and community participation at the local and regional levels, (ii) the project generates short- and long-term benefits for small-scale productive projects with members of the communities in the project area, and (iii) the activities framed within the GHG mitigation project produce an average net increase in the income of local producers.

The following is a description of the approach and compliance with the Co-benefits of this component (Benefits on communities) in the Orchid category and within the framework of the CO2Bio P2-2 project:

Table 28. Progress of compliance with the indicators of the "Benefits on communities" component with respect to the overall goal of the CO-BENEFITS monitoring plan.

Co-benefits	Indicator	Approach and/or compliance	Progress (%) Period 2018-2021 with respect to the overall goal.
Identifies and strengthens mechanisms for social and community participation at the local and regional levels.	# of people participating in training, decision-making and advocacy spaces in the territory.	According to the project activities contemplated for the two project ecosystems, 347 of the 1,000 people planned have been trained, involving the different groups in strengthening the sustainable management and conservation of the strategic ecosystems enrolled in the project.	35%

The project generates short and long-term benefits to small-scale productive projects with members of the communities in the project area.	# of monitored and implemented sustainable activities	In accordance with the sustainable activities promoted in the macro operation of the project, good practices are designed and implemented for agricultural production, livestock and tourism in the project area.	25%
The activities included in the GHG mitigation project produce an average net increase in the income of local producers.	Increase (%) in producer's income	According to the characterization of the ecosystem managers and the projection of economic benefits from the sale of carbon credits, it is evident that there is a percentage increase in their income.	25 %

Source: The Cataruben Foundation, 2023.

11.3 Gender equality

The "Gender Equality" component comprises two co-benefits: (i) it considers determinants set forth in the normative framework related to gender, and (ii) it ensures women's full and effective participation and equal leadership opportunities at all levels of decision-making at the project level.

The following is a description of the approach and compliance with the Co-benefits of this component (Gender Equality) in the Orchid category:

Table 29. Progress of compliance with indicators of the "Gender Equity" component with respect to the global goal of the CO-BENEFITS monitoring plan.

Co-benefits	Indicator	Approach and/or compliance	Progress (%) Period 2018-2021 with respect to the overall goal.
It considers determinants set forth in the normative framework related to gender.	Number of women trained for the promotion and strengthening of gender equality and women's empowerment.	The project management conducted an analysis of determining points in the regulatory framework related to gender. The project is aligned with the following normative points: **(i) Law 731 of 2022**, *Chapter 4: Norms related to the education, training and recreation of rural women, Art 16.* Likewise, *Chapter 5: Participation of rural women in decision-making bodies, Art 19. Equitable participation of rural women in different decision-making, planning and monitoring bodies at the territorial level.* **(ii) Law 2117 of 2021**, *Chapter 2: Implementation of gender policies, Art. 5: Promote and strengthen women's access to urban and rural work and income generation under equal conditions*. On the other hand, in attention to the Co-benefits indicator, it was possible to determine that for the period 2018-2021, 347 people were trained, of which 160 (46%) were women. However, with respect to the overall goal, it was projected to reach 100 trained women (20%) for the period 2018-2021, however, the Project reached 160, i.e. 32% of the overall goal. In this sense, the projection for the period in question (Projection:	32%

		20% = Result: 32%) was met above expectations.	

Source: The Cataruben Foundation, 2023.

12. Grouped Projects

The Project does not consider the inclusion of new areas after validation.

13. Project implementation

13.1. The start date of the project operation and the operation of the project activities.

The Project started its operation on January 15, 2018, at which time it began to constitute, direct and coordinate the implementation of conservation activities with the purpose of preventing deforestation and land use change in Wetland ecosystems.

13.2. Report on the implementation of activities in the Wetland ecosystem

Below is a description of the implementation and operational status of each of the project activities that seek to reduce GHG emissions through the conservation of the Wetlands that are part of the eligible area. A description of the start date of each activity is also presented.

13.2.1 Strengthening knowledge of wetland conservation and sustainability to prevent expansion of the agricultural frontier

This activity focuses on the promotion of sustainable practices and policies related to wetland conservation, through training that will enable ecosystem managers to play a more active and effective role in environmental preservation, with the aim of halting the expansion of agricultural and livestock areas at the expense of wetlands, which is why this activity consists of training 600 people and conducting a total of 10 trainings during the development of the project.

The process of implementation of the activities has started in 2018, managing to maintain 100% compliance during the monitoring period, although the overall compliance of the project stands at 28.83%; with an additional compliance over

what was planned of 8.8% in terms of people trained and 20% in terms of trainings carried out, with a frequency of every 2 years

In the monitoring period, a total of 2 training cycles were carried out between 2018, 2019, 2020 and 2021; see annex, Training Cycles These cycles promoted trainings of a comprehensive nature, addressing various topics, which included:

- Strengthening knowledge on wetland conservation and sustainable agricultural and livestock practices.
- Property planning.

13.2.2 Characterization and implementation of sustainable production and conservation practices.

The objective of this activity is to maintain a commitment of at least 90% over time to achieve the adoption of sustainable production practices that are environmentally friendly and contribute to long-term sustainability, requiring changes in management, worker training and investment in cleaner and more efficient technologies.

Monitoring of this activity was carried out through an indicator that assessed progress in the implementation of sustainable practices in the properties related to the project. At the time of monitoring, 100% compliance was achieved for this activity, which placed overall compliance at 25%.

The report addresses the sustainable practices implemented on the properties, including both sustainable production practices and conservation activities. The report also includes sustainable practices that identify the environmental challenges present and promote responsible economic development, minimizing negative impacts on the environment.

13.2.3 Strengthening governance structures in the territory.

The objective of this activity is to achieve more effective and responsible governance in the territory, which can have a positive impact on areas such as economic development, natural resource management, social equity and the quality of life of the local population, by implementing the governance strategy, which will allow maintaining 100% progress. The execution of this activity will be

developed in two (2) phases: the first design phase (first 5 years) and the second phase of implementation and consolidation of the strategy (remaining 15 years). For the monitoring of this activity, reports will be presented taking into account the progress achieved in each of the phases; see annex, Governance Strategy. In this activity, several actions are carried out, such as training of local leaders, improvement of citizen participation, creation or revision of local policies and regulations, etc.

During the monitoring period, 100% of the activity's progress was reported as planned, while overall compliance is 25%, with a monitoring start date for 2018.

13.2.4 Recognition of conservation areas and figures for the sustainable management of biodiversity.

The activity is focused on identifying and managing 24 properties along the project's development as protected natural reserves, which will be home to a wide variety of plant and animal species, playing a crucial role in the conservation of biodiversity; ensuring long-term protection in the preservation of ecosystems, while promoting research, education and sustainable use of natural resources in these areas.

The activity began its follow-up in 2018, reaching 100% compliance during that monitoring period, which placed the overall compliance at 58.33%, reporting an additional compliance over the planned 33.33%. The development of the activity is carried out through the review of the documents that certify the figure and the area under conservation, such monitoring will be carried out every 3 years. See annex, Properties under conservation figure.

13.2.5 Monitoring Report on changes in biodiversity associated with Wetlands

13.2.5.1. Monitoring of High Conservation Values (HCVs)

High Conservation Values (HCVs) are a tool used in the planning and management of natural areas to identify and protect key elements that represent a high value from the point of view of biodiversity conservation and ecosystem services. As part of the proposed monitoring activities, HCVs in the

project area were monitored through geospatial analyses that integrate ecological, environmental, social and economic factors.

In the development of this monitoring, the monitoring exercise of HCV1-Species Diversity and HCV3-Ecosystems and Habitats was carried out. For HCV1, an analysis was carried out using the potential distribution of flora and fauna species, protected areas and continental, coastal and marine ecosystems in Colombia, establishing that most of the areas of these properties are in the high and medium category. For HCV3, the ecosystems under some degree of threat and the rarity of ecosystems present in the project area were taken, where it was noted that most of the properties are in medium category zones with ecosystems of medium incidence and rarity such as floodable savannas. All the results of these analyses can be found in the High Conservation Values annex.

13.2.5.2 Participatory Biodiversity Monitoring

One of the most influential activities within the socio-environmental aspect is the development of processes with the community to promote environmental education, to encourage the conservation and preservation of nature, while managing natural resources in a sustainable manner.

To fulfill this purpose, it was proposed to carry out a participative monitoring that involves as an active part the owners of the properties enrolled in the Project. For this purpose, a monitoring methodology was proposed to evaluate the soundscape within the properties by means of audio recordings. These audios are processed to obtain acoustic footprint indexes that measure the incidence of biophony, geophony and anthropophony.

According to the aforementioned criteria, the selection of sampling points for participatory biodiversity monitoring within the Project was carried out, a total of 39 points were chosen according to the criteria set out within a total of 124 properties. The methodological development and selection of sampling points for this activity is described in the annex Participatory Biodiversity Monitoring.

13.2.5.3.Biodiversity monitoring in Wetlands Biodiversity Monitoring Wetlands

Under the concept of biodiversity conservation in wetlands, a Biodiversity Monitoring Plan was developed for the identification and follow-up of the most

representative flora and fauna groups for the wetlands of the Project's properties. The objective of this monitoring is to evaluate the status and trends of change of these groups in the Project boundaries to corroborate the maintenance and/or improvement of biodiversity, relating the activities carried out in the project to the baseline scenario.

For the first part of the delivery, a methodology was formulated to monitor groups of birds and mammals of medium and large size in the case of fauna and macrophytes associated with wetlands where it is intended to estimate the richness and diversity of species and their threat status. It was planned to carry out the sampling in some selected properties through a randomized analysis that will be developed during the following years. These activities are presented in the following annex Biodiversity monitoring in wetlands.

13.3. Reporting on the implementation of REDD+ activities

This report on the implementation of REDD+ activities details the implementation and operational status of each activity aimed at reducing and removing GHG emissions through the conservation and sustainable management of forests. In addition, information is provided on the start date of each of these actions.

13.3.1 Strengthen knowledge for sustainable ecosystem management and biodiversity conservation through virtual and/or face-to-face training.

The purpose of this activity is to carry out a cycle of 10 training sessions to enhance understanding and skills in sustainable ecosystem management and biodiversity preservation.

It also seeks to equip participants with the knowledge and skills necessary to make informed and ethical decisions in the management of natural resources and the protection of biodiversity, fostering the conservation of vulnerable ecosystems and promoting more environmentally friendly practices.

The process of implementation of the activities has started in 2018, managing to maintain 100% compliance during the monitoring period, although the overall

compliance of the project stands at 30% reporting an additional compliance over the planned of 10%; with a frequency of every 2 years.

During the monitoring period, a total of 2 training cycles were carried out between 2018, 2019, 2020 and 2021; see annex Training Cycle. These cycles promoted comprehensive trainings, addressing various topics, which included:

- Climate change, forests and carbon cycle.
- Strengthening sustainable ecosystem management and biodiversity conservation.
- Conservation of forest biodiversity.

13.3.2 Promote forest governance in the project area.

The purpose of this project is to strengthen forest governance in the project area through a set of actions that include the review and reform of laws and regulations, the promotion of active participation of local communities and interest groups in the decision-making process related to forest resources. The promotion of sustainable forest management practices, and the resolute fight against illegal logging and unsustainable exploitation of forest resources.

The development of this activity will be executed in two (2) phases: the first design phase (first 5 years) and the second phase of implementation and consolidation of the strategy (remaining 15 years). For the monitoring of this activity, reports will be presented taking into account the progress made in each of the phases; see annex, Governance Strategy. The Cataruben Foundation, as the executing agency, monitors every 5 years.

Overall project compliance is at 25%; maintaining 100% compliance during the monitoring period (2018 - 2021).

13.3.3 Promoting sustainable forest management

The objective of this activity is to carry out a cycle of 10 training sessions to promote the administration of forest resources in order to ensure their responsible and sustainable use. This involves implementing forest management practices that balance economic benefits with forest and biodiversity conservation.

The implementation process of the activities started in 2018, managing to maintain 100% compliance during the monitoring period, although the overall compliance of the project stands at 20%, with a frequency of every 2 years.

During the monitoring period, a total of 2 training cycles were carried out between the years (2018 - 2021) see annex, Training Cycle. These cycles promoted comprehensive training, addressing various topics, including:

- Planning and sustainable forest management.
- Workshop on copaiba oil extraction

13.3.4 Promote the delimitation and/or signage of conservation areas.

The objective of this activity is to maintain a commitment of at least 90% in delimitation and signage activities over time, in order to establish boundaries and clearly and visibly mark areas designated for biodiversity conservation and the protection of fragile ecosystems. This can apply to natural protected areas, ecological reserves, national parks, and other territories designated for conservation purposes.

The purpose of this activity is to prepare progress reports on the implementation of the activity. The reports will be prepared based on the monitoring of the implementation plan of project activities and information reported by the owners and field visits; see annex Conservation Activities Report.

The implementation process of the activities started in 2018, managing to maintain 100% compliance during the monitoring period, although the overall compliance of the project stands at 25%, with a frequency of every 5 years.

13.3.5 Promote and improve agricultural production, livestock (on existing land) and tourism, through the implementation of good sustainable practices.

The objective of the activity is to maintain a commitment of 80% of properties that implement sustainable productive activities over time; this activity seeks to improve agricultural, livestock and tourism production through the adoption of good sustainable practices, which benefits the local economy as well as the natural environment and the quality of life of the communities.

The development of the activity is carried out through the review of progress reports related to the implementation of the activity. These reports are based on the monitoring carried out in the implementation plan of the project activities, as well as the information provided by those responsible and the observations made during the field visits; see annex, sustainable production practices.

The implementation process of the activities started in 2018, managing to maintain 100% compliance during the monitoring period, although the overall compliance of the project stands at 31.25%, reporting an additional compliance over the planned 6.25% with a frequency of every 5 years.

13.3.6 Generate warnings of changes due to deforestation and/or transformation of ecosystems in the project area and its surroundings.

The objective of the activity is to provide satellite monitoring of properties to identify changes due to deforestation and/or transformation of eligible areas. It consists of establishing a monitoring system that detects and provides early notification of any negative changes in ecosystems.

The development of the activity will be done through the report of hot spots in which the information is reported for each Property, as well as an analysis of the response protocol will be presented, see annex Report - hot spots.

The report provides a summary of the data collected during the monitoring period between 2018 and 2021. Counting 100% compliance during the monitoring period, while overall project compliance stands at 25%, with a frequency of every 5 years, by The Cataruben Foundation.

13.4. Non-Permanence Risk Monitoring Report

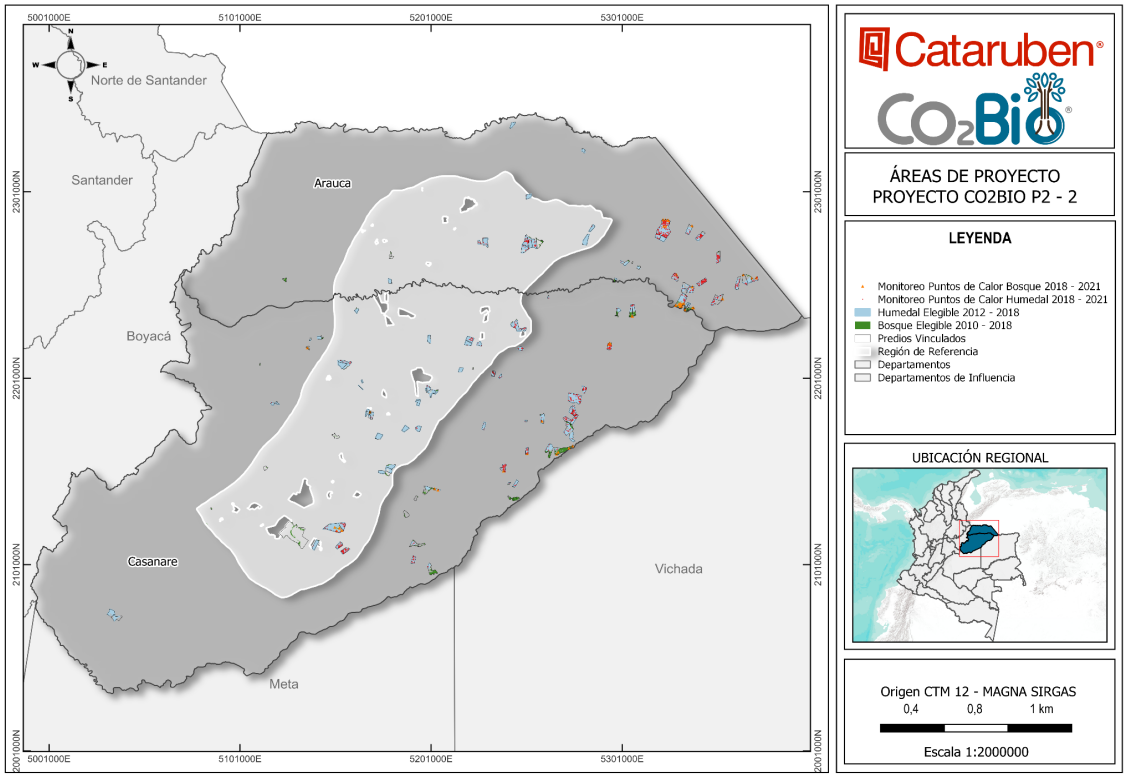
Taking into account the risks assessed in the environmental, financial and social dimensions and standardizing a risk classification as mentioned in paragraph 13 of the BCR standard, the analysis was carried out for the Wetland and Forest ecosystems; compliance with the mitigation measures is presented below.

13.4.1 Environmental risks.

Risk 1 - Fire. The project monitors hotspots - thermal anomalies on a daily basis through the system for monitoring hot spots in Colombia detected by satellite; the analysis is supported by the Google Earth Engine computational tool.

For the period 2018 - 2021, 53 hot spots were recorded in REDD+ project areas and 1036 in Wetland project areas, but did not materialize in vegetation cover fire. In this sense, fires are categorized as medium risk due to the fact that the magnitude of hot spots has an average of 0.74 points assessed over 4 years. Monitoring also extends to the leakage belt of both components, where the average thermal anomaly during the monitoring period is 0.93 but does not consolidate into fire occurrence.

Image 13. CO22Bio P2 - 2 fire map.



Source: The Cataruben Foundation, 2023.

Risk 2 - Flooding. Because the project focuses on wetlands and the enrolled project areas are located outside the water course - marginal strips of the double drainage (rivers), the risk of flooding is low.

The analysis of the 124 properties indicates that 78% have Wetland conditions throughout the territory, as a result of the conditions of the floodplain, often because continuous rainfall exceeds the absorption capacity of the soil.

Finally, during the 2018 - 2021 monitoring period, there were no episodes of strong or severe flooding, overflowing, or overflowing in the project areas that could affect production and/or conservation targets, or affect households as a result of this climatic event.

In relation to the environmental aspect, it can be seen that for the risks of fire and flooding a compliance of 20% has been generated for each one, complying with the mitigation actions for each risk.

13.4.2 Financial risks

Risk 3 - Liquidity. It is categorized as medium risk, the financial model is attached and the cash flow is highlighted, it is evident that the project has financial liquidity, economically sustaining the operation, in relation to the implementation of conservation actions for the Wetland ecosystem,

Risk 4 - Market. It is categorized as medium risk, the financial model highlights in the income tab, the behavior of the sales market with respect to the price of the carbon certificate during the life of the project, allowing economic benefits for the operation in the

Risk 5 - Supply: This translates into the project's need to enroll a minimum number of hectares to guarantee the project's break-even point, so as part of risk management, strategies for land acquisition, communication plans and management of strategic allies are established.

Risk 6 - Country Risk. It is categorized as medium risk, in order to foresee country risk, the inflation evaluation and projection tab is included in the financial model, which directly affects the increase in the project's cost and expense values, and it is also added; in addition, the minutes of the formation of the economic benefits committee are also included.

In the financial aspect, there is a 21.5% progress according to the mitigation measures; and the risks regarding the non-profitability risk of low market demand and contractual non-compliance.

14.4.3 Social risks

It is categorized as medium risk, taking into account that the project is composed of 100 properties integrated by two ecosystems (Forests and Wetlands), of which 84 properties provide eligible areas for the wetland ecosystem and 79 properties provide eligible areas for the forest ecosystem; These were subjected to title studies, verification of each and every one of the documents that make up the tradition, that is, the deeds, judgments and other titles registered in the real estate registration folio in order to verify that they coincide with what is stated in the referred folio in terms of owners, precautionary measures, limitations to the domain, size and boundaries in order to guarantee the rights of carbon in time.

Thus, it was determined that 9 properties integrated by the two ecosystems maintain a medium risk of being affected, of which 6 properties make up the Wetland ecosystem and 8 make up the forest ecosystem; however, they do not limit their enrollment in the project, seeking remedial actions and/or legal considerations if necessary.

Risk 7 - Low stakeholder participation. It is categorized as low risk, according to the project activities, the development of spaces for participation (regional forums), knowledge meetings (in person and virtually), accountability with the stakeholders involved in the project area is planned annually and semi-annually, in order to ensure their full and effective participation. The above, accompanied by a PQRS mechanism.

The Social aspect reports 20% compliance, where land disputes and the strengthening of knowledge exchange are evaluated.

The monitoring report can be viewed at the following link (*Monitoring Report / 1. General / Risk Management Monitoring Report).*

13.5 Uncertainty management

For the REDD+ component, uncertainty management refers to the data source of the non-forest forest maps, also known as "Area covered by natural forest" generated by the IDEAM, being a national product, the evaluation of accuracy and calculation of uncertainty is included in its construction, thus assuming quality standards.

While, to address the uncertainty in the land cover map for the year 2021 (For the years 2012 and 2018, the national land cover maps were processed under the Corine Land Cover legend) prepared from the Corine Land Cover methodology, it was necessary to resort to a combination of field validation data sources, as well as, through remote sensing with better resolution, where the interpreted information is contrasted with that provided by the best resolution.

This process was carried out through the QGIS add-on called AcATaMa (Thematic Map Accuracy Assessment) (See Instructions), a tool designed to assess the accuracy of land use/land cover classification. The result is an accuracy of 98.0% of the interpreted coverages for the year 2021, which means that the methodological requirement that establishes an accuracy higher than 90% is met.

In the case of the emission factors, for the forest component the uncertainty is less than 10%. For the Wetland component, the uncertainty exceeds 10%, so as in the baseline scenario, the lower confidence interval limit value of 95% is applied. The procedures for calculating the uncertainty in the emission factors are detailed in the PDD, section 3.5.

13.6 Deviation request applied to this monitoring period

The deviations identified in the project are only due to document traceability regarding the application of version 3.0 to version 3.2 of the BCR standard during the validation and verification process of the project in accordance with the signing of the OEC offer (March 6, 2023). This meant the consolidation of the project document and monitoring report, as well as the use of the designated tools and formats for auditable documents. As listed in the following table.

Table 30. Deviations in the monitoring plan

Document	Version	Nature of the document
Project document	1.0	PDD and Monitoring Report. First version
Project document	2.0	- Exclusion of properties that have been disassociated. - Adjustment of areas and baseline. - Document map update - Supporting documents are attached start date - GIS information regarding the use of inputs with respect to the monitoring period is completed. - The minimum mapping unit is justified - Leakage area updated for REDD+ and Wetlands component - Calculations for the definition of emission factors are adjusted. - Spreadsheets for REDD+ and Wetlands are adjusted. - Justification for the selection of %P and %Pf is included. - includes a review of other projects in the Project's area of influence.
Monitoring report	2.0	- Eligible area update - Updating of monitoring areas - Update on REDD+ Emissions and Wetlands Emissions Report
Project document	2.1	- Upgrade to BCR Standard version 3.2. - Form update with Project Document BCR 2.0 template.
Monitoring report	2.1	- Upgrade to BCR Standard version 3.2. - Form update with BCR 2.0 Monitoring Report Template 2.0

14 Monitoring system

14.1. Description of the monitoring plan

The monitoring plan for estimating GHG emissions and reductions during the quantification period is described in the project design document, sections 15. On the other hand, sections 14.2 and 15 of this monitoring report list the data and procedures used for the quantification of the baseline or reference scenario, and the calculation of GHG emissions in project areas and leakage during the monitoring period.

14.2 Data and parameters for quantifying emission reductions

14.2.1 Data and parameters determined in the registry and not monitored during the monitoring period, including default values and factors

Data/Parameter	*Total biomass in forests*
data unit	*t/ha*
Description	*Plant biomass contained in forest ecosystems.* *Estimated from the sum of Aboveground biomass (BA) and Belowground biomass (BS).*
Data source used	*Own data*
Values	*327,22*
Indicate what the data is used for (Baseline/Project/Leakage Emission Calculation)	*Definition of the carbon emission factor in the 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 areas.*
Justification for the choice of data or description of the measurement methods and procedures applied.	*Sampling was conducted according to nationally validated methodologies and was carried out in eligible areas of the project.* *The statistical and technical aspects that were taken into account for their development are described in section 3.7.3.2 of the PDD*
Additional comments	*N/A*

Data/Parameter	*Soil organic carbon in forests*
data unit	*tC/ha*
Description	*Carbon content in soils in forest ecosystems*
Data source used	*National Reference Level (IDEAM, 2019)*
Values	*64,51*
Indicate what the data is used for (Baseline/Project/Leakage Emission	*Soil carbon emission factor definition (REDD+ activities)* *Calculation of emissions in baseline forest ecosystems* *Calculation of emissions in forest ecosystems in the project areas*

Calculation)	*Calculation of emissions in forest ecosystems in leakage areas*
Justification for the choice of data or description of the measurement methods and procedures applied.	*The value is taken from the NRef in its most recent version, so it represents a conservative value, according to the national context for the estimation of GHG emissions.*
Additional comments	*N/a*

Data/Parameter	*Total biomass in Wetlands*
data unit	*t/ha*
Description	*Plant biomass contained in forest ecosystems.* *Estimated from the sum of Aboveground biomass (BA) and Belowground biomass (BS).*
Data source used	*Own data*
Values)	*Herbaceous stratum = 0.56* *Dispersed stratum = 75.80*
Indicate what the data is used for (Baseline/Project/Leakage Emission Calculation)	*Definition of the carbon emission factor in total biomass for herbaceous and sparse strata in Wetlands.* *Calculation of baseline emissions in forest ecosystems* *Calculation of emissions in forest ecosystems in project areas* *Calculation of emissions in forest ecosystems in leakage areas*
Justification for the choice of data or description of the measurement methods and procedures applied.	*Sampling was conducted according to nationally validated methodologies and was carried out in eligible areas of the project.* *The statistical and technical aspects that were taken into account for their development are described in section 3.7.3.2 of the PDD*
Additional comments	*Since the uncertainty value is greater than 10%, the lower limit with 95% confidence is used.*

Data/Parameter	*Soil organic carbon in Wetlands*
data unit	*tC/ha*

Description	*Soil carbon content in wetland covers*
Data source used	*Own data*
Values	*Herbaceous stratum = 110.85* *Dispersed stratum = 114.5*
Indicate what the data is used for (Baseline/Project/Leakage Emission Calculation)	*Definition of soil carbon emission factor for herbaceous and sparse strata in wetlands.* *Calculation of emissions in baseline forest ecosystems* *Calculation of emissions in forest ecosystems in the project areas* *Calculation of emissions in forest ecosystems in leakage areas*
Justification for the choice of data or description of the measurement methods and procedures applied.	*Sampling was conducted according to nationally validated methodologies and was carried out in eligible areas of the project.* *The statistical and technical aspects that were taken into account for their development are described in section 3.7.3.2 of the PDD*
Additional comments	*Since the uncertainty value is greater than 10%, the lower limit with 95% confidence is used.*

14.2.2 Monitored data and parameters monitored during the project quantification period.

Data/Parameter	*Eligible forest area monitoring*
data unit	*Hectare*
Description	*Area within the geographical boundaries of the project that corresponds to the forest category (according to national forest definitions).*
Measured/Calculated/Predetermined:	*Calculated*
Source of data	*Forest and Carbon Monitoring System - SMB&C*
Value(s) of the monitored parameter	*It is established in section 15.*
Indicate what the data is used for (Baseline/Project/Leaka	*Estimated change in forest cover due to deforestation in the baseline and project scenarios.*

ge Emission Calculation)	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	*QGIS V3.28, ArcGIS Pro V3.1.3.* *Accuracy is defined by the data source*
Frequency of measurement/reading/recording	*Annual*
Calculation method (if applicable)	*Eligible areas monitoring procedure*
Quality control procedures applied	*Field verification of coverage*

Data/Parameter	*Wetland Eligible Area Monitoring*
data unit	*Hectare*
Description	*Area within the geographic boundaries of the project that are maintained as natural vegetation cover belonging to the wetland strata.*
Measured/Calculated/Predetermined:	*Calculated*
Source of data	*Corine Land Cover methodology adapted for Colombia - IDEAM, and inputs properly elaborated. Scale 1:100.000*
Value(s) of the monitored parameter	*It is established in section 15.*
Indicate what the data is used for (Baseline/Project/Leakage Emission Calculation)	*Estimated change in natural vegetation cover pertaining to wetlands in the baseline and project scenarios.*
Monitoring equipment (type, accuracy class, serial number,	*QGIS V3.28, ArcGIS Pro V3.1.3.* *Accuracy 98.0 %.*

calibration frequency, date of last calibration, validity)	
Measuring/reading/recording frequency	*Annual*
Calculation method (if applicable)	*Monitoring procedure for eligible areas and Wetland monitoring*
Quality control procedures applied	*Field verification of coverages, Format FC-GOF-09 Quality Control Interpretation of natural coverages, AcATaMA Instructions.*

15 Quantifying the reduction/removal of GHG emissions

15.1 Reference Emissions

The calculation of reference emissions was performed based on the procedures and equations listed in methodologies BCR0002 (section 13) and BCR0004 (section 16).

Section 3.7 of the PDD provides a step-by-step description of the calculations performed. Therefore, the following is a general presentation of the formulas and values used.

15.1.1 GHG Emissions in Wetlands

For the calculation of reference emissions, the historical changes in the without-project scenario and the defined emission factors are related, taking into account the following equations:

$$CSCN_{LB} = \left(\frac{1}{t_2 - t_1} ln \frac{A_2}{A_1}\right) x\, A_p$$

Where:

$CSCN_{LB}$ Change in the area with natural vegetation cover in the baseline scenario, in the reference region; ha/year

t_1 Initial year of the reporting period in which the changes are analyzed

t_2 Final year of the reporting period in which the changes are analyzed

A_1 Area under natural vegetation cover in the reference region in t1; ha

A_2 Area under natural vegetation cover in the reference region in t2; ha

A_p Eligible project area; ha

and

$$EA_{lb} = CSCN_{lb}\, x \left(CBF_{eq} + COS_{eq}\right)$$

Where:

EA_{lb} Annual emission in baseline scenario; tCO /ha/year$_{2e}$

$CSCN_{lb}$ Historical changes in the baseline scenario; ha/yr.

CBF_{eq} Carbon dioxide equivalent contained in total biomass; tCO /ha$_{2e}$

COS_{eq} Carbon dioxide equivalent contained in soils; tCO /ha$_{2e}$

The emission factors were established based on data obtained from the survey of plots in eligible areas, according to the strata identified. Thus, the values defined for carbon dioxide equivalent contained in total carbon correspond to 21.28 tCO2e and 151.63 tCO2e for the Herbaceous and Dispersed strata, respectively.

Based on the historical average of land use changes in wetlands, a transformation rate of 3.4% was calculated for the Herbaceous stratum and 0.7% for Dispersed. In this sense, the projection of changes in the without-project scenario and the calculation of baseline GHG emissions are presented in Table 31.

Table 31. Reference emissions for herbaceous and dispersed strata in wetlands, during the monitoring period.

Stratum	Year	CSCNIb *(ha)*	CTeq *(tCO2e/ha)*	GHG emissions in the baseline scenario *(tCO2e/year)*
Herbaceous	2.018	1.643,14	21,28	34.966
	2.019	1.706,86		36.321
	2.020	1.699,17		36.158
	2.021	1.691,52		35.995
Dispersed	2.018	42,51	151,63	6.446
	2.019	43,95		6.664
	2.020	43,55		6.603
	2.021	43,14		6.542

Source: The Cataruben Foundation, 2023.

Step-by-step calculations can be reviewed in ***Annex 1*** */ 1.2. Wetlands / 3. Emissions /* 4. Emission reductions */ 1. Wetlands_Emissions V2 /* *Sheet 1.*

15.1.2 GHG emissions from forest deforestation

The quantification of GHG emissions from forest deforestation for the reference period was carried out by applying the following equations:

$$CSB_{año} = (\frac{1}{t_2 - t_1}) \; x \; (A_1 - A_2)$$

Where:

$CSB_{año}$ Annual change in area under forest cover in the reference region; ha
t_1 Initial year of the reporting period; year
t_2 Final year of the reporting period; year
A_1 Area of forest in the reference region, at the initial moment; ha
A_2 Area of forest in the reference region at the final point in time; ha

and

$$EA_{lb} = DA_{lb}\ x\ CT_{eq}$$

Where:

EA_{lb} Annual emission in the baseline scenario; tCO /ha$_2$
DA_{lb} Annual historical deforestation in the baseline scenario; ha
CT_{eq} Total carbon dioxide equivalent; tCO /ha$_{2e}$

The total biomass emission factor was established based on our own data, obtained by surveying plots in eligible areas. The value reported by the reference levels for the Orinoco biome was used to define the value of carbon dioxide equivalent contained in the soils. Thus, an emission factor of 575.74 tCO2e/ha was used for total carbon.

On the other hand, for the estimation of the annual change in forest areas in the reference scenario, a deforestation rate of 2% was estimated based on the historical average recorded for the area. In addition, the BSC was adjusted for national conditions, according to the values estimated in the most recent version of the NREF.

Table 32 shows the projected changes in the without-project scenario and the calculation of baseline GHG emissions due to forest deforestation.

Table 32. Reference emissions from forest deforestation during the monitoring period.

Year	**Adjustment for national circumstances** *(%CN)*	**CSCNIb** + *%CNN (ha)*	**CTeq** *(tCO2e/ha)*	**GHG emissions in the baseline scenario** *(tCO2e/year)*
2018	31,77%	269,35	575,74	155.075,36
2019	38,58%	295,59		170.180,67
2020	44,59%	307,58		177.087,32
2021	49,62%	317,39		182.732,19

Source: The Cataruben Foundation, 2023.

REDD+ / 2. Emissions / 3. Emissions reductions */ 1. Emissions_REDD+ V2 /* *Sheet 1.*

15.2 Project emissions

The estimation of project emissions during the monitoring period was carried out in accordance with the guidelines for emissions monitoring established in methodologies BCR0002 (section 14.5) and BCR0004 (sections 18.5 and 19).

Therefore, only activity data was monitored. The emission factors applied correspond to those used for the baseline calculations.

Since the project has a start date of 01/15/2018, in year 1 of monitoring, the adjustment is made according to the quantification time.

15.2.1 Project Emissions in Wetlands

The calculation of emissions due to changes in the natural cover of the Wetland and emissions in the project area during the monitoring period was performed using the equation:

$$CSCN_P = \left(\frac{1}{t_2 - t_1}\right) x \left(A_1 - A_2\right)$$

Where:

$CSCN_P$	Change in the area with natural vegetation cover in the project area; ha/yr.
t_1	Initial year of the monitoring period
t_2	Year final of monitoring period
A_1	Area in natural vegetation cover in the project area at the beginning of the monitoring period; ha
A_2	Area in natural vegetation cover in the project area at the end of the monitoring period; ha.

and

$$EA_P = CSCN_P \, x \left(CBF_{eq} + cos_{eq} \right)$$

Where:

EA_P Annual emission in project area; tCO /ha/year$_{2e}$

$CSCN_P$ Change in the area with natural vegetation cover in the area of the project; ha/year

CBF_{eq} Carbon dioxide equivalent contained in total biomass; tCO /ha$_{2e}$

COS_{eq} Carbon dioxide equivalent contained in soils; tCO /ha$_{2e}$

For the monitoring period (2018-2021) changes in land use recorded an annual average of 187.6 ha and 54.8 ha for the Herbaceous and Dispersed strata, respectively. Which corresponds to 3,992.6 tCO2e/year emitted in Herbaceous stratum coverages, and 8,305.4 tCO2e/year in the Dispersed stratum (**Table 33**).

Table 33. Project emissions monitoring in Wetland areas, in the period 2018-2021.

Stratum	Year	CSCNp *(ha)*	CTeq *(tCO2e/ha)*	Project GHG emissions (tCO2e/year)
Herbaceous	2.018	180,43	21,28	3.826,2
	2.019	187,63		3.992,6
	2.020	187,63		3.992,6
	2.021	187,63		3.992,6
Dispersed	2.018	52,67	151,63	7.959,3
	2.019	54,78		8.305,4
	2.020	54,78		8.305,4
	2.021	54,78		8.305,4

Source: The Cataruben Foundation, 2023.

The step-by-step calculations can be reviewed in ***Annex 1*** */ 1.2. Wetlands / 3. Emissions /* 4. Emission reductions */ 1. Emissions_Wetlands V2 /* *Sheet 3. Monitoring_2021*.

15.2.2 Project emissions from forest deforestation

The estimation of deforestation in the project area during the monitoring period was calculated with the following equation:

$$CSB_{proy,año} = (\frac{1}{t_2 - t_1})\ x\ (A_{REDD+proy,1} - A_{REDD+proy,2})$$

Where:

$CSB_{proy,año}$ Annual change in the area covered by forest in the project area; ha/year

t_1 Initial year of the monitoring period; year

t_2 Final year of the monitoring period; year

$A_{REDD+proy,1}$ Area of forest in the project area at the beginning of the monitoring period; ha

$A_{REDD+proy,2}$ Area under forest, in the project area at the end of the monitoring period; ha

and

$$EA_{REDD+proy,año} = DEF_{REDD+proy,año}\ x\ TCO_{2eq}$$

Where:

$EA_{REDD+proy,año}$ Annual emission in the project area; tCO /ha$_2$

$DEF_{REDD+proy,año}$ Annual deforestation in the project area; ha

TCO_{2eq} Total carbon dioxide equivalent; tCO /ha$_{2e}$

In this regard, an average of 0.50 ha of forest was deforested annually in the project areas during the 2018-2021 period. This corresponds to 287.87 tCO2e/ha emitted into the atmosphere each year (**Table 34**).

Table 34. Monitoring of project emissions from forest deforestation, 2018-2021.

Year	**CSBproy**,*year* *(ha/year)*	**CTeq** *(tCO2e/ha)*	**Project GHG emissions (tCO2e/year)**
2.018	0,48	575,74	275,87
2.019	0,50		287,87
2.020	0,50		287,87
2.021	0,50		287,87

Source: The Cataruben Foundation, 2023.

Step-by-step calculations can be reviewed in ***Annex 1*** */ 1.3. REDD+ / 2. Emisions* / 3. Emissions reduction */ 1. REDD+ Emissions V2 /* *Page 4. R_Monitoreo_2021*.

15.3 Leakage

To identify the leakage area, a spatial proximity analysis is performed with respect to the deforestation centers in the baseline, with the objective of determining the optimal region where deforestation events (BCR0002) and transformation of natural vegetation cover (BCR0004) occur and where it is possible that emissions are displaced by the presence of the project. It should be noted that the analysis considers the environmental drivers/detriment factors in the generation of emissions displacement, also excluding areas with restricted access to deforestation and natural vegetation cover transformation agents. For more information review the Map Package where the leakage area and respective procedure are identified.

From the above, for BCR0002 a leakage belt is defined with a buffer of 250 meters from the edge of the Property, this belt has an area of 28,090 hectares, within which all forest areas are quantified for the temporal limits of the baseline and the monitoring period.

While for BCR0004, a leakage belt is delimited with a buffer of 600 meters from the edge of the property, this belt has an area of 66.081 hectares, within which all natural

vegetation cover that according to the methodology item 10.3 meet the eligibility criteria are quantified, for the temporal limits of the baseline and the monitoring period.

15.3.1 Emissions from conversion of Wetlands into Leakage Areas

The quantification of GHG emissions that took place in the wetland leakage area, due to the implementation of project activities during the monitoring period, were calculated by applying the following equations:

$$CSCN_f = \left(\frac{1}{t_2 - t_1}\right) x \left(A_{f,1} - A_{f,2}\right)$$

Where:

$CSCN_f$	Change in natural vegetation cover area in the leakage area; ha/yr.
t_1	Initial year of the monitoring period
t_2	Year final of monitoring period
$A_{f,1}$	Superficiency in natural vegetation cover in the leakage area at the beginning of the monitoring period; ha
$A_{f,2}$	Surface area in natural vegetation cover in the leakage area at the end of the monitoring period; ha

and

$$EA_f = \left[CSCN_f \, x \left(CBF_{eq} + cos_{eq}\right)\right] - EA_{f,lb}$$

Where:

EA_f	Annual emission in leakage area; tCO /ha/year$_{2e}$
$CSCN_f$	Change in natural vegetation cover area in the leakage area; ha/yr.
CBF_{eq}	Carbon dioxide equivalent contained in total biomass; tCO /ha$_{2e}$
COS_{eq}	Equivalent carbon dioxide contained in soils; tCO /ha$_{2e}$
$EA_{f,lb}$	Annual emission in the area of leakage in the baseline scenario; tCO$_{2e}$

As a result, for the monitoring period, changes in wetland land use were recorded only in the herbaceous stratum (**Table 35**). With an average of 426.75 ha transformed annually, representing 9,081.10 tCO2e emitted to the atmosphere. However, when compared to baseline values, they do not represent an increase in GHG emissions in the leakage area.

Table 35. Monitoring of emissions from wetland transformation in the Leakage Area for the period 2018-2021.

Stratum	**Year**	**CSCNf** *(ha/year)*	**CTeq** *(tCO2e/ha)*	**EAf**,*lb (tCO2e)*	**GHG emissions in Leakage** *(tCO2e/year)*
Herbaceous	2.018	410,38	21,28	26.785,98	-18.083
	2.019	426,75		26.793,01	-17.712
	2.020	426,75		25.772,10	-16.691
	2.021	426,75		24.790,09	-15.709
Dispersed	2.018	-45,20	151,63	4.025,35	-10.855
	2.019	-47,00		3.859,19	-10.986
	2.020	-47,00		3.557,97	-10.684
	2.021	-47,00		3.280,26	-10.407

Source: The Cataruben Foundation, 2023.

The step-by-step calculations can be reviewed in ***Annex 1*** */ 1.2. Wetlands / 3. Emissions /* 4. Emission reductions */ 1. Emissions_Wetlands V2 /* *Sheet 3. Monitoring_2021*.

15.3.2 Emissions from deforestation of forests in areas of leakage

The following equations were used to calculate emissions from deforestation in the leakage area:

$$CSB_{f,año} = (\frac{1}{t_2 - t_1}) \; x \; (A_{f,1} - A_{f,2})$$

Where:

$CSB_{f,año}$ Annual change in area covered by forest in the area of leakage; ha/year

t_1 Initial year of the monitoring period; year

t_2 Final year of the monitoring period; year

$A_{f,1}$ Area in forest, in the leakage area at the beginning of the monitoring period; ha

$A_{f,2}$ Area under forest, in the leakage area at the end of the monitoring period; ha

and

$$EA_{f,año} = (DEF_{f,año}\, x\, TCO_{2eq}) - EA_{lb,f,año}$$

Where:

$EA_{f,año}$ Annual emission in the leakage area; tCO /ha$_2$

$DEF_{f,año}$ Annual deforestation in the area of leakage; ha

TCO_{2eq} Total carbon dioxide equivalent; tCO /ha$_{2e}$

$EA_{lb,f,año}$ Annual emission from deforestation in the area of leakage in the baseline scenario; tCO$_{2e}$

Thus, for the 2018-2021 period in the Leakage area, an average annual forest deforestation of 1.50 ha was recorded, representing 864 tCO2e emitted annually. However, this scenario does not represent an increase in GHG emissions due to the implementation of REDD+ activities, since it does not exceed the values presented in the baseline (**Table 36**).

Table 36. Monitoring of emissions from forest deforestation in the leakage area for the period 2018-2021.

Year	**CSB** *f,year (ha/year)*	**CTeq** *(tCO2e/ha)*	**EAf**,*lb (tCO2e)*	**GHG emissions in Leakage** *(tCO2e/year)*
2.018	1,44	575,74	14.118,15	-13.290,53
2.019	1,50		14.681,27	-13.817,66
2.020	1,50		14.681,27	-13.817,66
2.021	1,50		14.681,27	-13.817,66

Source: The Cataruben Foundation, 2023.

Step-by-step calculations can be reviewed in ***Annex 1*** / *1.3. REDD+* / *2. Emissions* / 3. Emissions reductions / *1.Emisions_REDD+ V2* / *Sheet 4. R_Monitoreo_2021*.

15.4 Net reductions/removals of GHG emissions

The net emissions reduction calculation is estimated from the ratio between baseline GHG emissions, project emissions and emissions due to leakage, taking into account the following equation:

$$RE = (t_2 - t_1)\, x\, (EA_{lb,año} - EA_{proy,año} - EA_{f,año})$$

Where:

RE	Net reduction of GHG emissions; tCO_{2e}
t_2	Final year of monitoring period; year
t_1	Initial year of the monitoring period; year
$EA_{lb,año}$	Annual emission in the baseline scenario; tCO_{2e}
$EA_{proy,año}$	Annual emission in the project area for the monitored period; tCO_{2e}
$EA_{f,año}$	Annual emissions in the leakage area for the period monitored; tCO_{2e}

For the monitoring period, there was no significant increase in GHG emissions in the leakage area, so the values recorded as negative were taken as zero (0) in the final calculations to avoid overestimations at the time of applying the equation. Also, given that the start date of the monitoring period was 01/15/2023, an adjustment was made in the calculation of net GHG reductions to 11.5 months during the first year of quantification.

Thus, **Tables 37 and 38** summarize the emission reductions for the first monitoring period of the project. With a reported **121,016 tCO2e** from avoided wetland transformation and **683,935 tCO2e** from REDD+ activities. For a total of **804,951 tCO2e** as a result of the implementation of project activities.

Table 37. Project emission reduction report for avoided transformation in wetlands (2018-2021).

Year	Baseline GHG emissions *(tCO2e)*	Project GHG emissions *(tCO2e)*	GHG emissions in Leakage *(tCO2e)*	Net reduction of GHG *(tCO2e)*
2.018	41.411,53	11.785,55	0,00	29.626
2.019	42.985,68	12.297,97	0,00	30.688
2.020	42.760,65	12.297,97	0,00	30.463
2.021	42.536,92	12.297,97	0,00	30.239
Total	**169.694,78**	**48.679,46**	**0,00**	**121.016**
Estimated annual average	**42.423,69**	**12.169,86**	**0,00**	**30.254**

Source: The Cataruben Foundation, 2023.

Table 38. Report on avoided deforestation emissions reductions from avoided deforestation in forests (2018-2021).

Year	Baseline GHG emissions *(tCO2e)*	Project GHG emissions *(tCO2e)*	GHG emissions in Leakage *(tCO2e)*	Net reduction of GHG *(tCO2e)*
2.018	155.075,36	275,87	0,00	154.799
2.019	170.180,67	287,87	0,00	169.893
2.020	177.087,32	287,87	0,00	176.799
2.021	182.732,19	287,87	0,00	182.444
Total	**685.075,53**	**1.139,48**	**0,00**	**683.935**
Estimated annual average	**171.268,88**	**284,87**	**0,00**	**170.984**

Source: The Cataruben Foundation, 2023.

15.5 Comparison of actual emission reductions with project document estimates

The actual net emissions reduction recorded in the monitoring period 2018-2021, presented differences compared to the emissions projection calculated in the baseline scenario.

Thus, the results for avoided transformation in wetland ecosystems were 10.86% less than initially projected. On the other hand, the reduction in GHG

emissions from avoided deforestation of forests presented an additional 23.76% compared to the initial scenario **(Table 39**).

These differences are mainly due to the emissions scenario in the leakage area and the actual decrease in land use changes in wetlands and forests, compared to what was initially projected for this monitoring period.

Table 39. Comparison of estimated and reported GHG emission reductions in the monitoring period (2018-2021).

	Wetland Transformation			REDD+ Activities		
Year	**Estimated net GHG reduction** *(tCO2e)*	**Net reduction of GHG** *(tCO2e)*	**Difference** (%)	**Estimated net GHG reduction** *(tCO2e)*	**Net reduction of GHG** *(tCO2e)*	**Difference** (%)
2.018	32.958	29.626	-10,11%	124.091	154.799	+24,75%
2.019	34.332	30.688	-10,61%	137.013	169.893	+24,00%
2.020	34.269	30.463	-11,11%	143.229	176.799	+23,44%
2.021	34.200	30.239	-11,58%	148.310	182.444	+23,02%
TOTAL	**135.759**	**121.016**	**-10,86%**	**552.643**	**683.935**	**23,76%**

Source: The Cataruben Foundation, 2023.

15.6 Comments on the difference with the estimated value in the recorded project document

The differences presented between the baseline scenario and the monitoring are mainly influenced by the behavior of GHG emissions for the leakage area. The above, taking into account that a 10% increase in emissions had been projected due to the implementation of project activities; however, the monitoring evidences that in the period 2018 - 2021 the changes in land use in forests and wetlands in the leakage areas did not intensify, so emissions are equivalent to zero (0).

On the other hand, the Wetland component shows a lower result compared to the estimated emissions reduction for the first monitoring period, due to a lower reduction in land use changes compared to the projected baseline scenario (87%), mainly in the dispersed stratum, which are due to natural cover

transformation events and cover transitions as a result of ecological succession, since these ecosystems are dynamic and their composition and structure change over time.

History of the document

Version	Date	Nature
2.1	03/09/2023	Updated version
2.2	15/12/2023	Emission quantification update for REDD+ Activities excluding Degradation
Nature of the document: Regulatory Type of document: guide, form Function: Verification register and issuance of CCVs		