MONITORING REPORT
PROYECTO FORESTAL MAVALLE EN PLANTACIONES DE CAUCHO NATURAL

Document prepared by Carbo Sostenible SAS

Date of issue (*3.0 20/12/2024*)

Monitoring Report Template (Version 1.1)	
Name of project	*Proyecto Forestal Mavalle en Plantaciones de Caucho Natural*
BCR Project ID	*PCR-CO-164-142-001*
Registration date of the project activity	*30/20/2019*
Project holder	*Mavalle S.A.S*
Contact	*Juan Andrés López* *Calle 77A # 12-60, of. 301* *jlopezsilva@carbosostenible.com* *57 (1) 2494098 - 57 3114814086*
Version number of the Project Document applicable to this monitoring report	*V 3.4* *24/01/2023*
Applied methodology	*BCR0001 Quantification of GHG Emission Reductions GHG REMOVAL ACTIVITIES, version 3.0, April 13, 2022*

Monitoring Report Template (Version 1.1)	
Project location (Country, Region, City)	*Colombia.* *Municipios de Puerto López y Puerto Gaitán – Departamento del Meta*
Project starting date	*01/10/2009*
Quantification period of GHG reductions/removals	*01/10/2009 to 31/10/2039*
Monitoring period number	*6*
Monitoring period	*03/10/2023 to 02/10/2024*
Amount of emission reductions or removals achieved by the project in this monitoring period	*146391.79 Ton CO_2e*
Contribution to Sustainable Development Goals	*SDG2, SDG6, SDG8, SDG12, SDG15*
Special category, related to co-benefits	*Not applicable*

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1 General description of the Project

The purpose of the Mavalle forestry project is to establish and manage 8,736.22 hectares of rubber plantations -Hevea brasiliensis- in areas previously dedicated to extensive cattle ranching in the municipalities of Puerto López and Puerto Gaitán (Department of Meta). To date, the project has planted and manages 8632.91 hectares

These plantations constitute a GHG removal system since the trees remain standing for a production shift of at least 30 years. The management system maintains 550 trees per hectare throughout the shift. For this project, the company selected two clones among the materials that have best performed in the soils and climate of the Colombian Orinoquia due to their productivity, adaptability and resistance, which are planted according to the characteristics of the sites eligible for planting.

1.1 Sectoral scope and project type

The project involves activities ARR (afforestation) in the AFOLU sector.

1.2 Project start date

01/10/2009

1.3 Project quantification period

 A year-long duration beginning on 03/10/2023 and ending on 02/10/2024.

Previous quantification periods, monitoring, and verifications were:
1. 01/10/2009 to 02/10/2019. Verification in October 2019.
2. 03/10/2019 to 02/10/2020. Verification in October 2020.
3. 03/10/2020 to 02/10/2021. Verification in October 2021.
4. 03/10/2021 to 02/10/2022. Verification in October 2022.
5. 03/10/2022 to 02/10/2023. Verification in October 2023.

The closest possible dates prior to the last day of the respective quantification period, operationally feasible, is the criterion used to establish the dates of the development of the plantations inventory.

Previous inventories were:
1. 25/09/2019 to 04/10/2019
2. 31/08/2020 to 30/09/2020
3. 04/09/2021 to 09/09/2021
4. 06/09/2022 to 14/09/2022

5. 08/09/2023 to 19/09/2022

1.4 Project location and project boundaries

Table 1 summarizes the plantation locations comprising the Mavalle Rubber Project. The project boundaries geodatabase is provided in annex 1. Technical, folder 1.4. Shapefile.

Table 1. Location, address, and coordinates of the nuclei of the Mavalle Forestry Project

Plantation names	Direction from Puerto López	Coordinates	
		Latitude	Longitude
Palomera	Km 47.5 on the Puerto López- Puerto Gaitán route, 10 km into the left bank from the area's central point.	4°13'40.77"N	72°34'59.61"O
Campo Bonito	Km 47.5 on the Puerto López- Puerto Gaitán road, turn right 2.5 km from the area's central point.	4°10'19.80"N	72°33'55.33"O
Agrocumare	Km 47.5 on the Puerto López- Puerto Gaitán road, entering the right bank at 12.5 km as the area's central point.	4°15'23.66"N	72°32'37.23"O
Panorama	Km 70 on the Puerto López- Puerto Gaitán road, turning right 3 km as the area's central point.	4°15'45.32"N	72°23'50.37"O
Taparitas	Km 90 on the Puerto López- Puerto Gaitán road, entering on the right bank 1 km away as the area's central point.	4°20'16.16"N	72°13'59.17"O
Agro Casuna	From Puerto López, it is 110 km to Puerto Gaitán, and then 27.5 km further on the Puente Arimena Road, entering on the right bank.	4°26'13.70" N	71°53'45.42" O
Agro Santa Helena	Puerto López – Puerto Gaitán: 110 km. From Puerto Gaitán, continue for 27.5 km along Puente Arimena Road and enter on the right bank.	4°24'29.56" N	71°53'22.91" O
Hevea Inversiones	From Puerto López, it's 110 km to Puerto Gaitán, then 27.5 km on the Puente Arimena Road on the right bank.	4°24'3.71" N	71°51'45.17"O
TSR20 Inversiones	Puerto López – Puerto Gaitán 110 km, from Puerto Gaitán 27.5km – on the Puente Arimena Road entering on the right bank	4°25'41.87" N	71°52'2.32" O
Hevea De Los Llanos	Puerto López – Puerto Gaitán is 110 km. From Puerto Gaitán, it is 1.5 km on the Rubiales Road, entering on the left bank at 24 km.	4°14′16.05" N	72°0′21.63" O
Plantaciones Santa Rita	Puerto López – Puerto Gaitán is 110 km. From Puerto Gaitán, it is 1.5 km on	4°12′52.59" N	71°59′00.99" O

Plantation names	Direction from Puerto López	Coordinates	
		Latitude	Longitude
	the Rubiales Road, entering on the left bank at 24 km.		

Chapter 8.1.5. the ADC tool indicates that measures to identify and manage overlaps between GHG projects include the technological functionalities of the records systems, such as files in KMZ format and coordinate information. As established in the Protocol on non-overlapping with other projects (2024), prepared by the Mavalle Data Science Department, the public information of the BCR platform was consulted, in which it has previously been identified that in the vicinity of the plantations of the Agrocumare properties, Palomera and Campo Bonito of the Mavalle project are lots of the CO2 ZERO PL ONE Forestry Project of COLCX.

To verify whether the plantations registered in this project overlap in any portion with the plantations of the Mavalle project, the cartographic information of the forestry projects in the municipalities of Puerto López and Puerto Gaitán registered in the COLCX and Biocarbon Registry platforms was downloaded.

The document "Procedimiento para determinar sobrelapamientos con otros proyectos 2024" (Protocol on non-overlapping with other projects (2024)) describes the steps and tools used for such determination. In summary, once the shape files of the two projects are downloaded from the platforms, they are processed with the Geoprocessing Intersect tool, which generates the shared boundary files. These are then analyzed with the KML to Layer Geoprocessing tool in an updated satellite base map.

The process with the ArcGIS and Google Earth Pro tools at larger and smaller scales allowed us to verify, on a larger scale, that between the polygons of the properties, there is an overlap of 15.5 m2 at the boundary of the Palomera property and two overlaps of 572 m2 and 74 m2 at the boundary of the Campo Bonito property. (Illustrations 2 and 3 of the document Report on non-overlapping with other carbon credit projects (2024).

Notwithstanding, the interpretation of the land use of these three overlapping areas indicates that they are natural vegetation not included within the Mavalle project's eligible area. Consequently, the report concludes that there is no double counting of Mavalle project's VCCs, considering the guidelines established in the Avoiding Double Counting BCR tool (version 2.0 of 2024).

The "2024 Non-Overlapping Report" study (Subfolder 1.1, Estimation of Removals, Folder 1, Technical) conducted by the Mavalle Data Science team concludes that while there are overlapping areas between the Palomera (15.5 m2) and Campo Bonito (572 m2 and 74 m2) properties and the COlCX project properties, these overlaps do not involve the rubber plantations within the eligible areas of the Mavalle project.

The maps resulting from the overlap analysis are presented below, showing that there is no overlapping in the project area, nor does this imply double counting:

Figure 1. Overlapping analysis area - La Palomera crop.
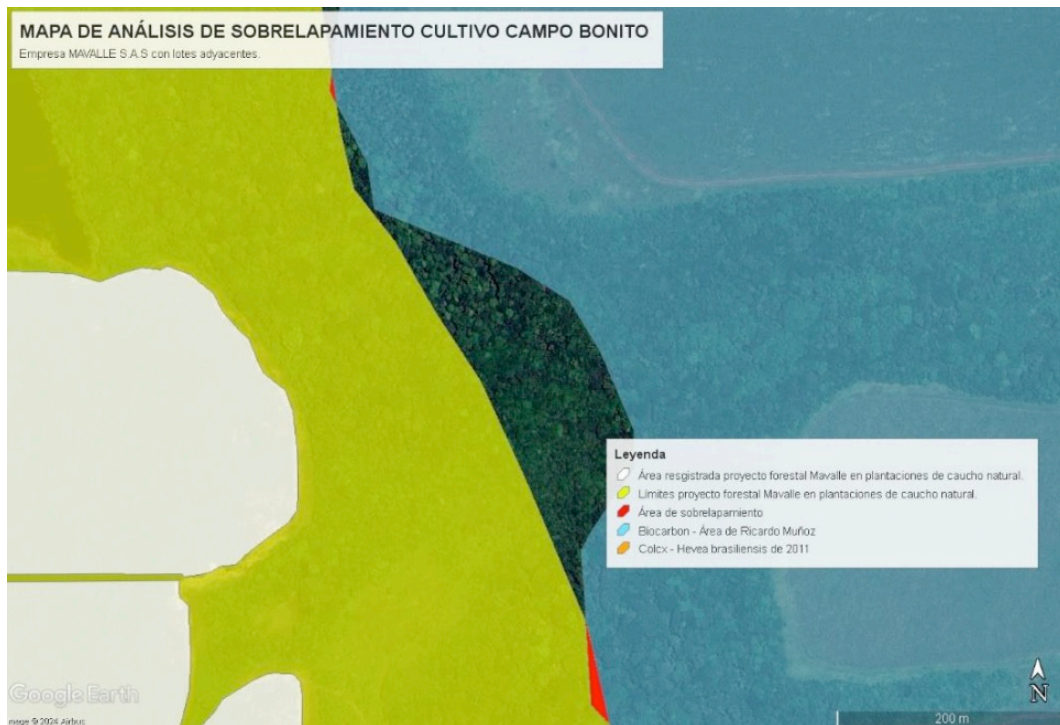
Figure 2. Overlapping analysis area – Campo Bonito crop.

1.5   Summary Description of the Implementation Status of the Project

The validated project document (PD) outlines the monitoring and management of the plantation, including execution status and operational details. This encompasses project boundaries—specifically the area of polygons assessed every five years—as well as the establishment of plantations and their silvicultural management practices, which include weed control, pruning, and fertilization.

According to the monitoring process for the sixth verification period, the following evaluations were noted:

- o - The total planted area is 8,632.91 hectares.
- o - The boundaries reported in 2019 during the validation and verification process remain unchanged.
- o - No new plantations have been established.
- o - The silvicultural practices implemented are summarized as follows:
  - o - Area undergoing weed control: 4,316.46 hectares.
  - o - Area with preventive pest control: 8,632.91 hectares.
  - o - Fertilizer applied to 2,987.37 hectares of plantations aged 4 to 7 years.
  - o - Soil amendments applied: 8,632.91 hectares.
  - o - Latex harvest conducted on 5,645.54 hectares of plantations aged 10 to 15 years.

The project involves establishing and managing two Hevea brasiliensis clones, identified as FX3864 and RRIM600, in 11 sites. As of August 31, 2024, 8,632.91 hectares have been planted, which is 98.81% of the total eligible areas, according to Table 2. The project's strata and substrates are determined by the clone, age, year of planting, and the type of clone.

Table 2: Distribution in nuclei by planting year of the area planted with two rubber clones at Mavalle Forestry Project.

Farm	Clon	Estrato 1 2009	Estrato 2 2010	Estrato 3 2011	Estrato 4 2012	Estrato 5 2013	Estrato 6 2014	Estrato 7 2017	Estrato 8 2018	Estrato 9 2019	Estrat 10 2020	Area total
Palomera	FX 3864	189.19	3.94	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	213.13
Campo Bonito	FX 3864	0.00	225.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	225.93
Agrocumare	FX 3864	0.00	133.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	133.86
Panorama	FX 3864	0.00	171.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	171.17
Taparitas	FX 3864	121.08	248.67	33.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	402.75
Palomera	RRIM 600	326.31	11.56	18.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	356.67
Campo Bonito	RRIM 600	417.10	5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	422.40

Farm	Clon	Estrato 1 2009	Estrato 2 2010	Estrato 3 2011	Estrato 4 2012	Estrato 5 2013	Estrato 6 2014	Estrato 7 2017	Estrato 8 2018	Estrato 9 2019	Estrat 10 2020	Area total
Agrocumare	RRIM 600	0.00	118.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	118.14
Panorama	RRIM 600	0.00	324.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	324.13
Taparitas	RRIM 600	282.22	446.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	728.52
Agrocasuna	FX 3864	0.00	0.00	0.00	0.00	0.00	0.00	23.76	0.00	0.00	0.00	23.76
Santa Helena	FX 3864	0.00	0.00	0.00	0.00	0.00	343.68	0.00	0.00	0.00	14.60	358.28
Hevea Inv.	FX 3864	0.00	0.00	0.00	0.00	215.30	128.53	70.62	0.00	25.11	33.20	472.76
TSR20	FX 3864	0.00	0.00	0.00	0.00	0.00	373.07	145.50	0.00	0.00	154.40	672.97
Hevea Llanos	FX 3864	0.00	0.00	0.00	0.00	0.00	0.00	146.73	457.38	19.99	0.00	624.10
Santa Rita	FX 3864	0.00	0.00	0.00	0.00	0.00	0.00	0.00	576.32	104.60	0.00	680.92
Agrocasuna	RRIM 600	0.00	0.00	0.00	0.00	0.00	0.00	87.97	0.00	0.00	0.00	87.97
Santa Helena	RRIM 600	0.00	0.00	0.00	0.00	0.00	209.18	0.00	0.00	0.00	0.00	209.18
Hevea Inv.	RRIM 600	0.00	0.00	0.00	0.00	670.20	153.55	81.12	0.00	0.00	42.10	946.97
TSR20	RRIM 600	0.00	0.00	0.00	105.77	0.00	349.58	130.43	0.00	0.00	12.20	597.98
Hevea Llanos	RRIM 600	0.00	0.00	0.00	0.00	0.00	0.00	115.64	420.72	0.00	0.00	536.36
Santa Rita	RRIM 600	0.00	0.00	0.00	0.00	0.00	0.00	0.00	325.18	0.00	0.00	325.18
TOTAL		1335.90	1689.00	71.80	105.77	885.50	1557.59	801.77	1779.60	149.70	256.50	8632.91

The forest inventory was carried out to estimate the biomass and the removal of greenhouse gases (GHG) from the project's plantations. The inventory shows 1,326,657 tons of CO_2 equivalent removed, of which 146,391 tons were removed during the monitoring period.

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

The methodology applied is BCR0001 Quantification of GHG Emission Reductions GHG REMOVAL ACTIVITIES, version 3.0, April 13, 2022.

The methodological tools employed in crafting this monitoring report are:
- Contributions of the SDG tool.
- Avoid double counting of emissions reductions/removals BCR Tool, Ver 2.0 | February 7, 2024.
- Sustainable Development Safeguards. SDS Tool. BCR Ver 1.1 | July 2024.
- Monitoring, reporting, and verification (MRV). BCR Ver 1.0 | February 13, 2023.
- Permanence and Risk Management. (PRM). BCR Tool Ver 1.1 |March 2024.

3 Registry or participation under other GHG Programs/Registries

The project has not been registered under any other GHG Program or Registry.

4 Contribution to Sustainable Development Goals (SGD)

The monitoring of the activities executed within the framework of the project that contribute to compliance with the SDG was carried out based on the guidelines defined by the BCR Standard. The SDG tool with the contributions report is presented in folder 9. ODS. The following table provides a summary of the contributions achieved by the project to the SGDs:

Selection of SDGs applicable to the project			
Sustainable Development Goal		**Target and Indicators**	**Project contribution**	**Synthesis of the project's contribution**
	Zero Hunger: Ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture	SDG 2	Yes	Production of 16.81 kg of honey produced by 4 groups of indigenous communities Establishment of 12 hectares of sustainable rice crop in one indigenous reserve territory.
	Water and Sanitation: Ensuring the availability and sustainable management of water and sanitation for all	SDG 6	Yes	The company's integrated water use management policy ensured an average of 64% of total monthly water usage comes from recycled sources.
	Decent Work and Economic Growth: Promoting Sustained, Inclusive and Sustainable Economic Growth, Full and Productive Employment and Work	SDG 8	Yes	1,201 people working in the company by sep-2024
	Responsible consumption and production: Ensuring sustainable consumption and production patterns	SDG 12	Yes	Recovery of 38 tons of recyclable waste

Selection of SDGs applicable to the project			
Sustainable Development Goal	**Target and Indicators**	**Project contribution**	**Synthesis of the project's contribution**
Life on Land: Protecting, restoring and promoting the sustainable use of terrestrial ecosystems, sustainably managing forests, combating desertification, halting and reversing land degradation and halting biodiversity loss	SDG 15	Yes	Area of natural rubber plantations on previously degraded land.

Source: adapted from the BCR SDG Tool.

5 Compliance with Applicable Legislation

The Mavalle Forestry Project generally complies with national regulations related to its macro-processes: Commercial, Administrative, and Financial Management; Environmental, Human Talent, Industrial, Information Technology and Telecommunications; Information Security and Cybersecurity; and Security and Surveillance. In particular, the project related to GHG mitigation activities complies with the regulations contained in:

- Decree/Law 2811/1974. National Code of Natural Renewable Resources and of Protection of the Environment.
- Decree 1076 of 2015. Regulatory Decree of the Environment and Sustainable Development Sector. From this, the regulations on issuing all types of environmental permits, which, in this case, are administered by CORPORINOQUIA, are derived.
- Resolution 1447 of 2018, which regulates the monitoring, reporting and verification system for mitigation actions at the national level.
- Resolution 071641 of the Colombian Agricultural Institute (ICA), dated 07/15/2020, establishes the requirements and procedures for registering Forest Plantations.
- Final Minutes of Prior Consultation of December 13,2023 between Mavalle SAS and the Wacoyo Indigenous Community.

Evidence of compliance with these regulations can be found in folder 3. Environmental, subfolder Environmental Permits, and ICA Registry. In addition, the documentation

related to the registration of the project on the RENARE platform, the request for modification of the project phase and the information sent according to the circular of the Ministry of the Environment and Sustainable Development are presented in folder 5. Legal, subfolder RENARE.

According to the Final Act of the Prior Consultation Agreement, the section on the Compensation Plan specifies that the agreed compensation is $2,222,000,000 over the 30-year duration of the project. This amount must be adjusted annually according to the Consumer Price Index (CPI). To date, $792,000,000 has been executed, compensating for the 13 years since the project's establishment.

The remaining $1,430,000,000 will be implemented starting in 2024, beginning with a beekeeping project valued at $383,000,000. From 2025 onward, additional projects will be executed annually for the next 17 years, proportionate to the remaining balance, ensuring annual implementation

The procedure for identifying legal and other requirements establishes the guidelines and methodology for identifying, accessing, updating, disclosing, and evaluating the legal requirements that govern Mavalle's operations and processes and each of its projects. This procedure corresponds to PRO-GER-001, Ver.5 - 09/Jun/2022, found in folder 5. From this, the document MT-GER-001 NORMOGRAMA Ver.04 of June 30, 2024, is derived, which details all the laws, decrees, and regulations to which the company's operations are subject.

6   Climate change adaptation

In accordance with section 11.8 of the BCR Standard Version 3.4 (28/06/2024), the project links mitigation and adaptation to climate change, aiming to reduce GHG emission reduction and increase resilience to current and future impacts associated with climate change and climate variability. For this, the project has carried out the following actions:

a) Considers strategic lines proposed in the National Climate Change Policies and/or focuses aspects outlined in the regulations of the country where the project is implemented.

- The project considered the National Climate Change Policies, under the following strategic lines:
  - Territorial Strategies:

    Action line 2: Promoted comprehensive actions in the crops that helped the efficient use of the soil, and the conservation of the existing natural covers, and reduced vulnerability to climate change.

Action line 4: Promoted the maintenance and increase of plantation carbon stocks, and the closure of the agricultural frontier.

(b) Improves conditions for the conservation of biodiversity and its ecosystem services through the restoration or degraded areas with native species as part of environmental compensation for environmental permits granted by the competent environmental authority (CORMACARENA). (evidence: folders 1. Tecnico\1.4. Shapefile\PAJONALES\PALOMERA\COMPENSACIÓN FORESTAL; 1. Tecnico\1.4. Shapefile\PAJONALES\PANORAMA\COMPENSACIÓN FORESTAL; 1. Tecnico\1.4. Shapefile\PAJONALES\TAPARITAS\COMPENSACIÓN FORESTAL; 3. Ambiental\Política de protección al medio ambiente, file MNL-AMB-002 MANUAL DE PROTECCIÓN AMBIENTAL.pdf).

(c) Implement activities that generate sustainable and low-carbon productive landscapes. Rubber plantations represent a carbon sink and also constitute a sustainable productive landscape considering that rubber plantations established in previously degraded areas:

- contributes to land restoration by improving soil structure, stabilizing the land, and promoting biodiversity.
- avoids deforestation and prevents encroachment into primary forests, ensuring that the project adheres to sustainable land management principles.
- prevents further degradation by restoring vegetative cover, which reduces soil erosion, increases water infiltration, and enhances the resilience of the landscape to extreme weather events.

(Evidence: project activities implementation – rubber plantations established).

Also, considering that the project corresponds for activities in the AFOLU sector:

c) Reduces GHG emissions from agricultural activities, considering that the previous land use scenario was pasture. As a result of the project implementation, carbon sinks and GHG removals have increased (evidence: folder 1. Tecnico\1.1. Estimacion de remociones).

d) Incorporates practices and measures to strengthen climate change adaptation such as water management through rainwater harvesting and water recycling (evidence: folder 3. Ambiental, file 9.1 Indicadores Ambiental Agosto 2024.xlxs), practices to improve the soil conditions reducing its compaction, and conservation of natural covers around the project area (evidence: folders 1. Tecnico\1.4. Shapefile\PAJONALES\AGROCUMARE\RESERVA FORESTAL; 1. Tecnico\1.4. Shapefile\PAJONALES\CAMPO BONITO\RESERVA FORESTAL; 1. Tecnico\1.4. Shapefile\PAJONALES\PALOMERA\RESERVA FORESTAL; 1. Tecnico\1.4. Shapefile\PAJONALES\PANORAMA\RESERVA FORESTAL; 1. Tecnico\1.4. Shapefile\PAJONALES\TAPARITAS\RESERVA FORESTAL; 1. Tecnico\1.4.

Shapefile\VALORA\CASUNA\RESERVA FORESTAL; 1. Tecnico\1.4. Shapefile\VALORA\SANTA_RITA\REESERVA FORESTAL).

7   Carbon ownership and rights

In the MAVALLE Forestry project in Natural Rubber Plantations, Mavalle SAS is the proponent, and Carbo Sostenible SAS is the developer. These two companies signed an Emission Reduction Development and Commercialization Agreement to develop a Carbon Financing Project from Rubber Forest Plantations. (See Folder 5 Legal, Development, and Marketing Agreement subfolder)

The MAVALLE project involves planting and processing rubber trees on land owned by Pajonales and Valora. The Certificates of Land Tenure provided for the sixth monitoring period confirm this, as do the public deeds and property titles of the properties (refer to folder 5, Legal, subfolder Certificados de Libertad y Tradición). Table 3 provides cadastral information about the properties involved in the project.

Tabla 3. Cadastral information, Proyecto MAVALLE

Fase	Plantación	Predios Catastrales	Matrícula inmobiliaria
Phase 1: Premises of Pajonales Company. Planted from 2009 to 2014.	Agrocumare	Agroforestal	234-7638
		Los Venados	234-13643
		Los Arrecifes	234-7346
		Agrocumare	234-7637
	Campo Bonito	El Espejo	234-1633
	La Palomera	La Gruta	234-4179
		Palomera	234-1881
	Panorama	Panorama	234-3053
	Taparitas	Las Margaritas	234-1119
		El Álamo	234-5302
		El Maguey	234-5301
		Las Taparitas	234-5303
Phase 2: Premises planted from 2017 to 2020. Third-party companies.	Casuna	Agrocasuna	234-20642
		Santa Helena	234-20643
		Hevea Inversiones	234-19275
		TSR 20 Inversiones	234-19274
	Santa Rita	Hevea de Los Llanos	234-18184
		Santa Rita	234-18183

In all cases, the landowners have directed MAVALLE to execute the project, which involves developing carbon credits (see folder 5, Legal, subfolder Mandate Contracts).

8   Environmental Aspects

In folder 3, within the subfolder NNH Tool, Annex A of the Sustainable Development Safeguards Tool (SDS) (previously known as the No Net Harm Tool) is presented. In the section related to Environmental Due Diligence, the methods and actions implemented by MAVALLE are identified and described in accordance with its Environmental Protection Policy (See Protection Policy subfolder within folder 3 Environmental).

9   Socioeconomic Aspects

The completion of Annex A of the Tool to describe the Social Safeguards of the MAVALLE project in subfolder 2.5 of folder 2 is presented. This considered the project's actions and activities in line with its Human Rights Policy and the Sustainable Development Goals adopted by the organization.

10   Stakeholders' Consultation

Mavalle maintains three primary communication channels with its stakeholders. The first channel is the company's website *www.mavalle.com/contactenos/,* which is aimed at the public. This platform allows for the submission of requests, complaints, claims, suggestions, and congratulations. Communication through this channel is governed by the Information Security and Cybersecurity Policy PLT-CIB-001, which can be found on the same page.

The second channel is the PQRR's system, which operates through calls or WhatsApp using the phone number 3223178124 t, emails to *pqrs@mavalle.com* and, *etica@mavalle.com* as well as through mailboxes located in various areas (Rubber production mill and Casuna, Santa Rita, Taparitas, Panorama, Campo Bonito, Palomera, Mavalle, and Agrocumare forest plantations) The procedure for receiving and processing PQRRRs is regulated by procedure PRO-GTH)018 Ver 02 (Folder 2. The Agricultural Director and/or the Head of Human Resources process complaints and petition rights directly.

Lastly, two public entities, the Colombian Agricultural Institute (ICA) and the Autonomous Corporation for the Sustainable Development of the Special Management Area of La Macarena (CORMACARENA), maintain constant verbal and written communication, given their responsibilities over the administration of forest plantations and the environmental management of the territory, respectively.

In 2024, a review of the PQRS Reception and Response records revealed two inquiries from national and international customers regarding the industrial and commercial aspects of the rubber harvested from the plantations and processed at the Mavalle plant. No other types of PQRs related to environmental, technical, forestry, or social issues existed. (Refer to folder 2 Social, subfolder 2.4 PQR's & Stakeholders – PQR's 20224).

Regarding the communication and consultation processes with CORMACARENA the document "Report on Effective Communication of Mavalle SAS with Cormacarena - Corporation for the Sustainable Development of the Special Management Area La Macarena." located in folder 2 Social, subfolder PQR's & Stakeholders, details the relationship between the company and the Corporation, communication strategies, results of the relationship process, challenges overcome, and recommendations for improvements.

As mentioned previously, the ICA is responsible for supervising the technical performance of the plantation, particularly those related to the detection of pests and diseases, and their management by Mavalle. Minutes of each monitoring and control process by ICA are issued on such evaluations. Those carried out during 2024 to the different forest nuclei are presented in Folder 2, subfolder 2.4. Stakeholders- ICA.

11 REDD+ Safeguards

The Project does nor correspond to a REDD+ project.

12 Special categories, related to co-benefits

The project does not apply to special categories.

13 Grouped Projects

The Project does not correspond to a grouped project.

14 Implementation of the Project

14.1 Implementation Status of the Project

The validated project document (PD) outlines the monitoring and management of the plantation, including execution status and operational details. This encompasses project boundaries–specifically the area of polygons assessed every five years–as well as the establishment of plantations and their silvicultural management practices, which include weed control, pruning, and fertilization.

According to the monitoring process for the sixth verification period, the following evaluations were noted:

- - The total planted area is 8,632.91 hectares.
- - The boundaries reported in 2019 during the validation and verification process remain unchanged.
- - No new plantations have been established.
- - The silvicultural practices implemented are summarized as follows:
  - - Area undergoing weed control: 4,316.46 hectares.
  - - Area with preventive pest control: 8,632.91 hectares.
  - - Fertilizer applied to 2,987.37 hectares of plantations aged 4 to 7 years.
  - - Soil amendments applied: 8,632.91 hectares.

- Latex harvest conducted on 5,645.54 hectares of plantations aged 10 to 15 years.

Table 4 summarizes the project's current operational status regarding establishing plantations in its eligible areas. From the start date, 01/10/2009, to 31/07/2024, 8632.91 hectares have been planted and are currently standing. Among these, 3979.42 hectares are planted with the FX3864 clone (46.09%) and 4653.49 hectares with the RRIM600 clone (53.90%). The current age range of the plantations varies from 4.3 to 15.2 years.

It was also determined that no new plantations were established for the project during the sixth annual monitoring period.

Table 4: Distribution of rubber planting area in nuclei by year at Mavalle Forestry Project. (Sixtht verification October 2024)

Predio	Clon	Estrato 1 2009	Estrato 2 2010	Estrato 3 2011	Estrato 4 2012	Estrato 5 2013	Estrato 6 2014	Estrato 7 2017	Estrato 8 2018	Estrato 9 2019	Estrat 10 2020	Area total
Palomera	FX 3864	189.19	3.94	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	213.13
Campo Bonito	FX 3864	0.00	225.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	225.93
Agrocumare	FX 3864	0.00	133.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	133.86
Panorama	FX 3864	0.00	171.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	171.17
Taparitas	FX 3864	121.08	248.67	33.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	402.75
Palomera	RRIM 600	326.31	11.56	18.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	356.67
Campo Bonito	RRIM 600	417.10	5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	422.40
Agrocumare	RRIM 600	0.00	118.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	118.14
Panorama	RRIM 600	0.00	324.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	324.13
Taparitas	RRIM 600	282.22	446.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	728.52
Agrocasuna	FX 3864	0.00	0.00	0.00	0.00	0.00	0.00	23.76	0.00	0.00	0.00	23.76
Santa Helena	FX 3864	0.00	0.00	0.00	0.00	0.00	343.68	0.00	0.00	0.00	14.60	358.28
Hevea Inv.	FX 3864	0.00	0.00	0.00	0.00	215.30	128.53	70.62	0.00	25.11	33.20	472.76
TSR20	FX 3864	0.00	0.00	0.00	0.00	0.00	373.07	145.50	0.00	0.00	154.40	672.97
Hevea Llanos	FX 3864	0.00	0.00	0.00	0.00	0.00	0.00	146.73	457.38	19.99	0.00	624.10
Santa Rita	FX 3864	0.00	0.00	0.00	0.00	0.00	0.00	0.00	576.32	104.60	0.00	680.92
Agrocasuna	RRIM 600	0.00	0.00	0.00	0.00	0.00	0.00	87.97	0.00	0.00	0.00	87.97
Santa Helena	RRIM 600	0.00	0.00	0.00	0.00	0.00	209.18	0.00	0.00	0.00	0.00	209.18
Hevea Inv.	RRIM 600	0.00	0.00	0.00	0.00	670.20	153.55	81.12	0.00	0.00	42.10	946.97
TSR20	RRIM 600	0.00	0.00	0.00	105.77	0.00	349.58	130.43	0.00	0.00	12.20	597.98
Hevea Llanos	RRIM 600	0.00	0.00	0.00	0.00	0.00	0.00	115.64	420.72	0.00	0.00	536.36
Santa Rita	RRIM 600	0.00	0.00	0.00	0.00	0.00	0.00	0.00	325.18	0.00	0.00	325.18

Predio	Clon	Estrato 1 2009	Estrato 2 2010	Estrato 3 2011	Estrato 4 2012	Estrato 5 2013	Estrato 6 2014	Estrato 7 2017	Estrato 8 2018	Estrato 9 2019	Estrat 10 2020	Area total
TOTAL		**1335.9**	**1689.0**	**71.80**	**105.77**	**885.50**	**1557.59**	**801.77**	**1779.60**	**149.70**	**256.50**	**8632.91**

The Department of Agricultural Techniques manages the plantation monitoring system. This department has established protocols for verifying, registering, and implementing activities to control biotic factors that may cause economic damage to the plantation and affect greenhouse gas reservoirs and sinks. The instructions outlined in INS-AGE-001 Ver 03 provide details on the evaluation and control aspects, which are reported and recorded in documents FOR-AGR-011 and FOR-AGR-12 (located in Folder 3, subfolder Pest Management under the ENVIRONMENTAL section).

Table 5 records the silvicultural activities carried out on the rubber plantation project. Monitoring for 6th verification.

Table 5. Plantation Management Activities. Sixth verification

Age (Years)	Area (ha)	Weed control manual (ha)	Weed control chemical (ha)	Pest control preventive (ha)	Pest control curative (ha)	Fertilization (ha)	Liming (ha)	Latex harvest (ha)
15	1,335.9	667.95	667.95	1,335.9	x	x	1,335.9	1,335.9
14	1,689	844.5	844.5	1,689	x	x	1,689	1,689
13	71.8	35.9	35.9	71.8	x	x	71.8	71.8
12	105.77	52.88	52.88	105.77	x	x	105.77	105.77
11	885.5	442.75	442.75	885.5	x	x	885.5	885.5
10	1,557.58	778.79	778.79	1,557.58	x	x	1,557.58	1,557.58
7	801.77	400.89	400.89	801.77	x	801.77	801.77	0
6	1,779.6	889.8	889.8	1,779.6	x	1,779.6	1,779.6	0
5	149.6	74.8	74.8	149.6	x	149.6	149.6	0
4	256.4	128.2	128.2	256.4	x	256.4	256.4	0
TOTAL	**8,632.91**	**4,346.16**	**4,346.16**	**8,632.91**	**X**	**2987.37**	**8,632.91**	**5,645.54**

For the verification procedures of the areas effectively planted that remain standing, aerial images are utilized. The "PRO-AGR SATELLITE MONITORING OF NATURAL RUBBER PLANTATIONS" (located in Folder 1, under the subfolder PROCEDURES) outlines the procedure for monitoring changes in the project boundaries using the Geographic Information System. Additionally, the internal report "SATELLITE MONITORING REPORT OF FOREST PLANTATIONS - 2024" prepared by Mavalle is available in the same folder (Folder 1) under the subfolder SATELLITE MONITORING.

This report is based on the interpretation of the following Satellite Scenes: LC08_L1TP_007057_20240512_20240521_02_T1, satellite path 7, row 57 for the forest plantations at Palomera, Agrocumare, Campo Bonito, Panorama and Taparitas premises and LC09_L1TP_006057_20240903_20240903_02_T, satellite path 6, row 57 for the plantations at Casuna and Santa Rita premises, the report found no changes in the crop compared to the digitalization carried out in 2023 (subfolder 1.3, folder 1 Técnico, and the maps in the subfolder Mapas). The Agricultural Directorate of Mavalle relied on this information to issue certification regarding the maintenance of the project's areas and boundaries (refer to the file Informe de Areas 2024 in Folder 1, under the subfolder 1.1. Estimación de Remociones).

The prevention and control of forest fires fall under the responsibility of the Environmental Area of the Department of Agricultural Techniques. This process follows the guidelines outlined in the Fire Control Plan (refer to Folder 3. ENVIRONMENTAL, subfolder Environmental Emergency Response Plan, file PLN-AMB-001 FOREST FIRE RISK MANAGEMENT PLAN) to determine if fires have caused damage to the plantation's biomass and carbon reserves.

Based on the review of the records for the sixth monitoring period, the project's limits have remained the same, as previously established. Additionally, no biotic or abiotic events occurred during this period that affected the plantations or impacted the MAVALLE project's carbon reservoirs.

The project's design evaluated the potential for leakage due to cattle displacement, concluding that the project does not generate this type of leakage. Therefore, monitoring for this is not required. (See PDD Fugas, page 104).

Following the PRM BCR Tool (Ver 1.1.| March 20249) regarding the monitoring of permanence, the MAVALLE project annually carries out the satellite evaluation procedure of the plantations. Their results allow us to establish the stability of the extension of rubber plantations and, therefore, their permanence. The risk analysis concludes that forest fires are the main factor that would impact the permanence of forest masses. This risk is managed by implementing the fire prevention and control program in charge of the Environmental Area. (See PLN-AMB-001 Ver 10. Forest Fire Risk Management Plan) as well as the Environmental Emergency Response Plan (See PLNN-AMB-003 Ver 04), both in folder 3 Environment, subfolder Environmental, Emergency Response Plan.

Finally, the risk analysis shows that pests and diseases can impact the long-term health of the forest. The Department of Agricultural Techniques is responsible for monitoring this, using the FOR-AGR-011 and FOR-AGR-012 forms during the rainy and dry seasons, respectively. Find more information in Folder 3, under the subfolder Pest Management.

The project addresses the uncertainty related to the quality and applicability of the parameters used to calculate the removals achieved by the species over a specific period. This is carried out in line with the guidelines proposed since the second verification in 2020.

To estimate the aboveground and underground biomass of Hevea brasiliensis trees, we utilize the allometric model developed by Moreno and colleagues in 2005 specifically for rubber plantations. This model was created using data from rubber plantations in Puerto López, Meta, with tree ages ranging from 0 to 15 years.
Given the quality of the source used for estimating the biomass from the second verification, and therefore, for the present one, the application of a 0% discount was considered indicative of the absence of uncertainty

14.2 Revision of monitoring plan.

The PDD monitoring plan was last updated in January 2023, Ver. 3.4. During this monitoring period, the monitoring plan was not revised.

14.3 Request for deviation applied to this monitoring period

Does not apply.

14.4 Notification or request of approval of changes

Does not apply.

15 Monitoring system

15.1 Description of the monitoring plan

The monitoring plan considers three different aspects. The first is related to establishing, managing, and harvesting the plantation's products. The second aspect considers the long-term sustainability of the area and the project's boundaries. The third one involves the yearly measurement of greenhouse gas removal. These aspects are explained in detail in the PDD, following its report on the conceptualization and guidelines of BCR's MRV. Particularly for the sixth verification the following information details each one of the requirements of the MRV tool:(a). Data and information to estimate GHG reductions or removals during the quantification period.
The estimation of the annual removals is based on the standing biomass of *Hevea brasiliensis* trees planted in the project's eligible areas. Sampling uses temporary plots of fixed area to calculate the existing biomass. In these plots, the number of standing trees is counted along with the dasometric measurements required by the allometric model used to calculate the biomass. It ensures all sampling plots are treated similarly by training the inventory groups to follow the procedure established in the Instructions for Carbon

Inventories in Forest Plantations. INS-AGR-008 Vr 00 and their corresponding registration formats. (See folder 1. TECHNICAL, PROCEDURES subfolder, PRO-AGR FILE PROCEDURE FOR MEASURING PLOTS IN CARBON INVENTORY OF FOREST PLANTATIONS).

(b). Data and supplementary information for determining the baseline or reference scenario.
To establish the project's baseline, Landsat satellite images were analyzed to identify the presence of gallery forests, plantations, fallows, pastures, crops, and water in the area of interest. The pastures identified are natural pasture savannas historically used for extensive livestock production. The sources of information used to determine the baseline are listed in Table 6.

Table 6. Landsat satellite imagery used in baseline analysis.

Imagen	Año	Código
LandSat	1988	p007r57_4t19880111
LandSat	2002	p007r057_7t20021213
LandSat	2003	*p007r057_20030104*
LandSat 7	2005	l71007057_05720050314 y l71007057_05720050330
LandSat 7	2008	l71007057_05720080102 y l71007057_05720080203
LandSat 7	2010	l71007057_05720100123 y l71007057_05720090221

The same images confirmed that the eligible areas of the properties to be planted had no forest cover for at least ten years before planting.

(c). Specify all potential emissions that occur outside the project boundaries attributable to the activities of the GHG project (leakage).

As clearly stated in the validated PD, Project activities do not cause leaks.

(d). Information related to the assessment of environmental effects of the project activities.
The Environmental Indicators Report (FOR-SG-011) and the Environmental Compliance Report found in the Environmental Folder, document the project's environmental performance.

(e). Procedures established for managing GHG reductions or removals and related quality control for monitoring activities.
Circular fixed-area sampling plots are used to monitor changes in carbon stocks and calculate removals annually. These plots include an inventory of standing trees along with their measurements. The sampling plots are randomly selected without replacement based on the project's identified strata and sub-strata. A record is drawn up of this plot draw that

guarantees that the formal process was carried out in accordance with what was considered for a randomized process without replacement. (See the minutes in 1.1. of the technical folder 1).

The coordinates of the center of each inventory plot are used to place a stake in the field, marking the center point from which the trees within an 11.96-meter radius are identified. Detailed instructions for assembling and measuring inventory plots can be found in the "TECHNICAL, PROCEDURES" subfolder under the file "PROCEDURE FOR MEASURING PLOTS IN CARBON INVENTORY OF FOREST PLANTATIONS" (See Folder 1).

The inventory procedure involves setting up temporary plots. For biomass assessment, it follows the Biocarbon Standard Methodology with a 10% error margin and a 90% confidence level. The sampling error is determined as part of the QA/QC process.

The QA/QC procedures to be followed to maintain adequate consistency of the quantitative information related to the plantation and the carbon inventory for the current crediting period include:

1. Daily control of the measurements in the field by the Operations Engineer who supervises the development of all the inventory activities
2. Inventory personnel are trained and skilled in fieldwork and data analysis.
3. 3- Levels of checking during data processing
    1. Check during the transcription of field data to the electronic medium (Excel). Suspicious data leads to remeasurement of trees with inconsistent information.
    2. Checking by the Operations Engineer; suspicious data lead to the remeasurement of the plot.
    3. 10% of the data is reviewed by the Director of Operations, suspicious data lead to the review of the entire inventory.
4. Internal Auditing: 10% of the sampling plots is remeasure by an independent team. Data comparison among the original and the remeasures verify if differences are not bigger than 5%.

(f). Description of methods defined for the periodic calculation of GHG reductions or removals and leakage.

The number of inventory plots is determined based on data from previous biomass inventories conducted on the plantation. This allows the number of data points to increase

over time, including average values and standard deviation. These two factors form the basis for calculating the sample size for monitoring.

The inventory involves measuring the perimeter of trees of various ages. This, along with equations from the literature[1], helps estimate the biomass per tree and the variation between trees of similar age. Because the project area is relatively homogeneous and well-stratified by clone/age, the sampling results can be easily applied to future plantations and subsequent monitoring. The Winrock (2014) sample calculator determines the inventory plots needed to estimate biomass and carbon content, as outlined in several A/R CDM methodologies.

The average biomass value for each stratum in Winrock was calculated using the standard deviation obtained from the inventories of the five previous monitoring sessions. This data was collected from 9223 trees across 400 sampling plots. You can find the specific information in the files "Biomass by Ages 2024.xlsx" and "Estimation of Biomass 2024.xlsx," located in Folder 1, under the subfolder "ESTIMATION OF BIOMASS AND CARBON." These values are documented in Table 7.

Table 7. Input values, area, age, mean biomass, and standard deviation for the Winrock sampling plot calculator (2014)

Plantación Clon/Año	Área (ha)	Edad (2024)	Biomass T/ha	D.S
3864 2009	310,27	15,2	133,18	26,64
3864 2010	783,56	14,2	136,51	13,62
3864 2011	53,00	13,2	127,46	15,79
3864 2013	215,30	11,3	107,04	21,69
3864 2014	845,28	10,3	102,79	20,93
3864 2017	386,61	7,3	57,00	6,59
3864 2018	1033,70	6,3	45,59	7,53
3864 2019	149,60	5,3	26,87	5,07
3864 2020	202,10	4,3	15,96	9,53
RRIM600 2009	1025,63	15,2	133,18	26,64
RRIM600 2010	905,44	14,2	120,49	18,39
RRIM600 2011	18,80	13,2	116,79	15,34
RRIM600 2012	105,77	12,2	98,21	12,31

[1] El PD validado indica que para la estimación de la biomasa aérea y subterránea se emplea el modelo descrito en: Moreno, J.A. *et al*. (2005). Modelo alométrico general para la estimación del secuestro de carbono por plantaciones de caucho *Hevea brasislensis Mull Arg* en Colombia. Revista Colombia Forestal Vol. 9 No.18.

RRIM600 2013	670,20	11,3	101,57	11,97
RRIM600 2014	712,30	10,3	92,31	11,95
RRIM600 2017	415,16	7,3	49,42	4,45
RRIM600 2018	745,90	6,3	36,93	11,76
RRIM600 2020	54,30	4,3	6,59	5,83
Total	**8632,91**			

Based on the given factors, Winrock recommends using 20 sampling plots distributed by stratum/substratum, with a 10% margin of error and a 90% confidence level, as indicated in the Winrock Plots column of Table 7. This number includes a 10% margin of safety. Due to the uncertainty associated with the standard deviation used in the calculation, which corresponds to the previous five samplings, the number was adjusted to 2.18. In strata, where the calculator estimates that sampling plots are not required, at least one plot was considered for assembly and measurement. The actual number of plots used in monitoring is recorded in the Effective Plots column of Table 8.

Table 8. Number of plots utilized to monitor changes in biomass for the Mavalle Project. Sixth's verification.

. Plantación Clon/Año	Área (ha)	Plots Winrock (n)	Efective plots (n)	% Área
FX 3864 2009	310.27	1	2	0.029
FX 3864 2010	783.56	2	4	0.023
FX 3864 2011	53.00	0	1	0.085
FX 3864 2013	215.30	1	2	0.042
FX 3864 2014	845.28	3	6	0.012
FX 3864 2017	386.61	0	1	0.009
FX 3864 2018	1033.70	1	2	0.030
FX 3864 2019	149.70	0	1	0.022
FX 3864 2020	202.20	0	1	0.053
RRIM600 2009	1025.63	6	12	0.030
RRIM600 2010	905.43	3	6	0.239
RRIM600 2011	18.80	0	1	0.043
RRIM600 2012	105.77	0	1	0.013
RRIM600 2013	670.20	1	2	0.013
RRIM600 2014	712.31	1	2	0.011
RRIM600 2017	415.16	0	1	0.012
RRIM600 2018	745.90	1	2	0.012
RRIM600 2020	54.30	0	1	0.082
Total	**8632.91**	**20**	**48**	**0.025**

g) The assignment of roles and responsibilities for monitoring and reporting the variables relevant to calculating reductions or removals.

On August 29th, a representative from Carbo Sostenible conducted a theoretical and practical training session in preparation for the monitoring development. The training included the carbon certificate project, assembly and measurement procedures for sampling plots, and the corresponding record-keeping and quality assurance processes. Carbo Sostenible had previously agreed with the Agricultural, Environmental, and Social Mavalle's departments on the content of the necessary reports required for the Monitoring Report and Audit development. (Refer to Folder 1, TECHNICAL, subfolder CARBON TRAINING.).
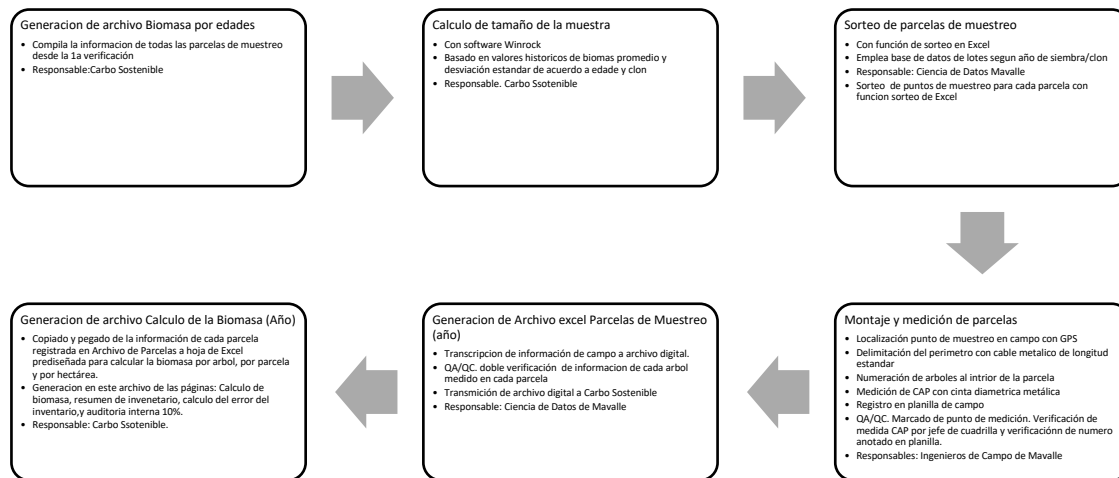
Eight working groups were employed During inventory development between August 29 and September 12, 2024. The individuals responsible for assembling and measuring the plots, as recorded in the database of measurement of the sampling plots, were Eng. Oliver Pineda (plots 1, 2, 8, 9, 13, 14, 16, 31, 32, 33, 3, 4, and 35), Mr. Juan D. Vargas (plots 3 and 24), Mr. Felipe Serrano (plots 4, 5, 6, 21, 26, 27, 43, 44, and 45), Mr. Jorge Jiménez (plots 7, 23, 25, 28, 29, 30, 42, and 48), Mr. Iván Cuellar (plots 10, 11, 12, 15, 36, 41, 46, and 47), Mr. José Chilatra (plots 17, 18, and 19), Mrs. Gloria Orozco (plots 20 and 22), and Mr. Fabián Reyes (plots 37, 38, 39, and 40). The transfer of the information from the field sheets to the digital file "Biomasa Sample Plots 2024.xls" was carried out by Engineer Gina Holguín, an intern in the Data Science Area.

The internal audit process was carried out following the quality assurance procedure. Engineers Andrés Clavijo, Jhojan Solano, and Gina Holguín from the Department of Agricultural Techniques of Mavalle reviewed five selected plots identified with numbers 2, 21, 33, 35, and 41. The results of the audit are recorded in the "Audit 10% of the Biomass Estimate 2023" file (located in Folder 1, subfolder ESTIMATION OF BIOMASS AND CARBON, FILE Biomass Estimation 2024. xlsx). It was concluded that the measurements of the trees' CAPs during the inventory and the count of trees in each plot were taken correctly and recorded.

The process for assembling and measuring plots was strictly followed as outlined in the PRO-AGR PROCEDURE FOR MEASURING PLOTS IN CARBON INVENTORY OF FOREST PLANTATIONS (found in Folder 1. TECHNICAL, subfolder PROCEDURES) along with the corresponding formats for recording information in the field and office. Carbo Sostenible checked the inventory results and performed the calculations for estimating biomass, carbon, and CO2. Data and calculus are available in the Biomass Estimation 2024 file (in Folder 1. TECHNICAL, subfolder ESTIMATION OF BIOMASS AND CARBON, Biomass Estimation 2024. xlsx). Additionally, the database containing the field spreadsheets transcribed in the office, including information on their location, coordinates, and responsible leader, can be found in the file Biomass Sample Plots 2024.xlsx (in Folder 1. TECHNICAL, subfolder SAMPLE POINTS).

The following flowchart outlines the process of data generation, aggregation, recording, calculation, reporting, organization, and QA/QC points.

The format for the presentation of the Monitoring Report indicates in numeral 15.1 that

Generacion de archivo Biomasa por edades	Calculo de tamaño de la muestra	Sorteo de parcelas de muestreo
• Compila la informacion de todas las parcelas de muestreo desde la 1a verificación • Responsable:Carbo Sostenible	• Con software Winrock • Basado en valores historicos de biomas promedio y desviación estandar de acuerdo a edade y clon • Responsable. Carbo Ssotenible	• Con función de sorteo en Excel • Emplea base de datos de lotes segun año de siembra/clon • Responsable: Ciencia de Datos Mavalle • Sorteo de puntos de muestreo para cada parcela con funcion sorteo de Excel

Generacion de archivo Calculo de la Biomasa (Año)	Generacion de Archivo excel Parcelas de Muestreo (año)	Montaje y medición de parcelas
• Copiado y pegado de la información de cada parcela registrada en Archivo de Parcelas a hoja de Excel prediseñada para calcular la biomasa por arbol, por parcela y por hectárea. • Generacion en este archivo de las páginas: Calculo de biomasa, resumen de inveentario, calculo del error del inventario,y auditoria interna 10%. • Responsable: Carbo Sostenible.	• Transcripcion de información de campo a archivo digital. • QA/QC. doble verificación de informacion de cada arbol medido en cada parcela • Transmición de archivo digital a Carbo Sostenible • Responsable: Ciencia de Datos de Mavalle	• Localización punto de muestreo en campo con GPS • Delimitación del perimetro con cable metalico de longitud estandar • Numeración de arboles al intrior de la parcela • Medición de CAP con cinta diametrica metálica • Registro en planilla de campo • QA/QC. Marcado de punto de medición. Verificación de medida CAP por jefe de cuadrilla y verificaciónn de numero anotado en planilla. • Responsables: Ingenieros de Campo de Mavalle

the PH must "*Provide evidence and demonstrate that the verified carbon credits are quantified, monitored, reported, and verified, through application of the BCR Tool "Monitoring, reporting and verification (MRV)".* In turn, the MRV tool indicates in its numeral 9 that "*The monitoring procedures shall provide all relevant information and data",* including nine items which are reviewed in the next table.

Requirements	Evidence / Demonstration
a. Confirmation that the applicability conditions of the applied methodology were met.	It is an afforestation project, with the native species *Hevea brasiliensis*, of flat areas previously dedicated to extensive cattle ranching on acid sandy oxisols of low productivity. The project was validated in 2019.
b. A complete description of the monitoring system, including data collection, procedures.	See Chapter 15.1. literal e and f
c. Information about data generation, aggregation, recording, calculation and reporting;	See Chapter 15.1. literal e and f
d. Organizational structure, roles and responsibilities of personnel, and emergency procedures for the monitoring procedure;	See Chapter 15.1. literal g
e. Parameters used to calculate baseline, project emissions reductions, and leakage as well as other relevant parameters required by the applied methodology and the monitoring plan;	See Chapters 15.2.1. and 15.2.2
f. Processes related to models and methods used to sampling and quality control	See Chapter 15.1. literal f.

g. Specific information on how data and parameters will be monitored during the monitoring period	See Chapter 15.

15.2 Data and parameters to quantify the reduction of emissions

15.2.1 Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data parameter	Ai				
Date unit	ha				
Description	Stratum i área.				
Source of data	MAVALLE PLANTING PLAN				
Values	**Año**	**FX3864**	**RRIM 600**	**TOTAL**	
		ha	**ha**	**ha**	
	2007	0	0	0	
	2008	0	0	0	
	2009	310,27	1025,63	1335,9	
	2010	783,56	905,44	1689,0	
	2011	53,00	18,8	71,8	
	2012	0	105,77	105,77	
	2013	215,3	670,2	885,5	
	2014	845,28	712,3	1557,58	
	2015	0	0	0	
	2016	0	0	0	
	2017	386,61	415,16	801,77	
	2018	1033,7	745,9	1779,6	
	2019	170,55	82,3	252,83	
	2020	202,12	54,33	256,22	
	TOTAL	4000,39	4735,81	8735,97	
	%	**45,79**	**54,21**	**100,0**	
Use for the data	Calculation of project removals (Ex-ante)				
Justification for the selection of the data or description of the measurement methods and procedure applied.	Monitoring of strata and field boundaries is conducted using the Geographic Information System (GIS), which allows the integration of data from various sources, including GPS coordinates and Remote Sensing data.				
Additional Comments	The total planned hectares of the RRIM 600 clone in the PDD is an *ex-ante* value. The 82.3 ha stand has not yet been planted				

Data/parameter:	Carbon Fraction in Biomass
Date unit	g/cm3

Description	It is used to estimate the carbon content per unit of biomass
Source of data	IPCC, default value
Value	0.47
Use for the data	Calculation of biomass carbon content.
Justification for the selection of the data or description of the measurement methods and procedure applied.	
Additional Comments	NA

Data/parameter:	CO_2 e
Data unit	adimensional
Description	Se emplea el factor 3.667 (44/12) para convertir el carbón almacenado en el árbol a CO_2
Source of data	IPCC, default value
Value	3.667
Use for the data	Calculation of CO2 eqv in the biomass
Justification for the selection of the data or description of the measurement methods and procedure applied.	
Comentarios	NA

15.2.2 Data and Parameters Monitored

Data parameter	A
Data unit	ha
Description	Total project area according to GIS database
Measured/calculated/default	Calculated
Source of data	Database of GIS
Value of monitored parameter	8632.1
Data use for	Project
Monitoring equipment	GIS and complementary software
Measuring/Reading/Recording frequency	Continuously during site preparation, planting, boundaries, and area verification
Calculation method (if applicable)	NA
Equipo para el monitoreo	GPS and/or Applications on mobile phones.
QA/QC procedures applied	SOP for GIS operation - Boundary Control

Data parameter	Ai
Data unit	ha
Description	Area of each stratum
Measured/calculated/default	Calculated
Source of data	GIS database on each polygon of the lots that constitute the project

	Plantación Clon/Año	Área (ha)	
Values of the monitored parameter	3864 2009	310.27	
	3864 2010	783.56	
	3864 2011	53.00	
	3864 2013	215.30	
	3864 2014	845.28	
	3864 2017	386.61	
	3864 2018	1033.70	
	3864 2019	149.60	
	3864 2020	202.10	
	RRIM600 2009	1025.63	
	RRIM600 2010	905.44	
	RRIM600 2011	18.80	
	RRIM600 2012	105.77	
	RRIM600 2013	670.20	
	RRIM600 2014	712.30	
	RRIM600 2017	415.16	
	RRIM600 2018	745.90	
	RRIM600 2020	54.30	
	Total	**8632.91**	
Data use for	Project boundaries and strata area calculation		
Monitoring equipment	GIS and complementary software		
Measuring/Reading/Recording frequency	Continuously during forestry operations		
Calculation method (if applicable)	NA		
QA/QC procedures applied	SOP for GIS operation- Boundaries and area control.		

Data/parameter	Ap.i
Data unit	m ^{2}
Description	Temporary sampling plot area.
Measured/calculated/default	Calculated
Source of data	Field record
Value of the monitoring parameter	450
Data use for	Calculation of the number of trees per unit of surface area and the standing biomass.
Monitoring equipment	Steel cable of standard length (11.96 m) and a stake. Cable is calibrated at the standar length. Daily review of the length during inventory.
Measuring/Reading/Recording frequency	Each time, the forest biomass inventory is developed.
Calculation method (if applicable)	Ap.i=Pi*r^2

QA/QC procedures applied	SOPs for the establishment and measurement of temporary sampling plots for biomass inventory

Data/parameter	DBH /CBH
Data unit	cm
Measured/calculated/default	Measured
Source of data	Field measurements
Value of the monitoring parameter	NA
Data use for	Calculation of the average del DBH/CBH of the plot
Monitoring equipment	Diametric metallic tape, Lufkun 6mm*2m Executive diameter pocket tape. No calibration required and a 1.30 m long wood stake.
Measuring/Reading/Recording frequency	Each time, the forest biomass inventory is developed.
Calculation method (if applicable)	Average DBH/CBH =(Sum(DBH_1/$CBH_{1...}$ DBH_n/CBH_n)) / n
QA/QC procedures applied	SOPs for the establishment and measurement of temporary sampling plots for biomass inventory

Data/parameter	lat./lon.
Data unit	Degrees, minutes and seconds
Descripción	Location of each temporary sampling plot
Source of data	GPS
Value of the monitoring parameter	NA
Data use for	The precise location of the central point of the sampling plot
Monitoring equipment	GPS or cell phone application
Measuring/Reading/Recording frequency	Each time, the forest biomass inventory is developed.
Calculation method (if applicable)	NA
QA/QC procedures applied	SOPs for the establishment and measurement of temporary sampling plots for biomass inventory

Data/ parameter:	n
Data unit	Number
Description	Trees counted and measured in the sampling plot
Source of data	Field measurements
Value of the monitoring parameter	NA
Data use for	Calculating the plot and stand biomass.
Monitoring equipment	NA
Measuring/Reading/Recording frequency	Each time, the forest biomass inventory is developed.
Calculation method (if applicable)	NA
QA/QC procedures applied	SOPs for the establishment and measurement of temporary sampling plots for biomass inventory

16 Quantification of GHG emission reduction / removals

16.1 Baseline emissions

The PDD indicates that baseline emissions and/or removals are quantified in accordance with section 5.4 of the AR-ACM0003 methodology as follows:

$$\Delta C_{BSL,\,t} = \Delta CTREE\_BSL,\,t + \Delta CSHRUB\_BSL,t + \Delta CDW\_BSL,t + \Delta CLI\_BSL,t$$

$\Delta C_{BSL,t}$ *Baseline GHG sink net removals in year t; tCO2-e*

$\Delta C_{TREE\_BSL,\,t}$ *Change in carbon stock in baseline tree biomass within project boundary in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in CDM A/R project activities"; t CO2-e*

$\Delta C_{SHRUB\_BSL,t}$ *Change in carbon stock in reference shrub biomass within project boundaries, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in MDL A/R project activities"; t CO2-e*

$\Delta C_{DW\_BSL,t}$ *Change in carbon stock in baseline of deadwood biomass within project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in deadwood and litter in CDM A/R project activities"; t CO2-e*

$\Delta C_{LI\_BSL,t}$ *Change in carbon stock in basal leaf litter biomass within project boundaries, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in CDM A/R project activities"; t CO2-*

$\Delta C_{SHRUB\_BSL,t}$ *Change in carbon stock in reference shrub biomass within project boundaries, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in MDL A/R project activities"; t CO2-e*

$\Delta C_{DW\_BSL,t}$ *Change in carbon stock in the baseline of deadwood biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in deadwood and litter in CDM A/R project activities"; t CO2-e*

$\Delta C_{LI\_BSL,t}$ *Change in carbon stock in the baseline of deadwood biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in deadwood and litter in CDM A/R project activities"; t CO2-e*

The Project Development Document (PDD) indicates that the project is located in non-floodable savannahs with primarily natural pastures and minimal shrub or tree vegetation. These areas are periodically affected by fires, which help renew the vegetation for livestock production. Furthermore, the site preparation for planting does not involve practices that generate emissions, resulting in an estimated baseline of zero emissions.

16.2 Project emissions/removals

The PDD indicates that the allometric model developed by Moreno and collaborators estimates the biomass per individual tree from the CAP. This model integrates aboveground and underground biomass.

$$B\ tree = (0.00411323 * CAP^{2.59558}) + (0.00217582 * CAP^{2.35688}).$$

The average tree biomass of the sampling plot is calculated by taking the average of the total trees counted in the sampling plot:

$$B\ tree\ avg = Average\ (B\ tree\ 1……………..B\ tree\ n).$$

The number of trees per hectare estimated from the trees counted in the sampling plot is calculated by:

$$N\ trees/ha = n\ plot\ trees * 22,2.$$

The estimated biomass per hectare from the sampling plot is determined by:

$$B\ ha = B\ tree\ avg * N\ tree/ha.$$

The average biomass per stratum/substratum is calculated with:

$$B\ stratum\ average = Average\ (B\ ha\ 1…………………..B\ ha\ n).$$

The total biomass of the stratum is estimated based on:

$$B\ total\ stratum = B\ stratum\ average * stratum\ total\ area\ (ha).$$

The total biomass of the project is determined by:

$$B\ total\ project = Sum\ (B\ total\ stratum\ 1\ ………..B\ total\ stratum\ n)$$

The carbon fraction for each stratum and the total project is calculated by multiplying the biomass by 0.47.

CO_2 equiv is calculated by multiplying the fraction of carbon by the value of the quantum yield of photosynthesis.

Table 9 below provides a summary of the greenhouse gas (GHG) removal results accumulated by the project, based on the sampling conducted during the sixth monitoring period. (Refer to Archive Estimation of Biomass 2024.xls, Calculation of Removals sheet, Folder 1, Biomass Estimation subfolder).

Table 9. GHG removals from the Mavalle Forestry Project. Monitoring for the sixth verification, September 2024.

Plantación Clon/Año	Area (ha)	Biomasa	Biomasa T	Carbono	CO2
		Ton /ha	Ton	Ton	Ton
3864 2009	310,27	149,27	46313,01	21767,12	79820,01
3864 2010	783,56	152,68	119637,34	56229,55	206193,75
3864 2011	53,00	141,61	7506,15	3527,89	12936,77
3864 2013	215,30	109,32	23535,74	11061,80	40563,62
3864 2014	845,28	97,88	82735,26	38885,57	142593,40
3864 2017	386,61	43,31	16744,40	7869,87	28858,80
3864 2018	1033,70	32,47	33565,66	15775,86	57850,08
3864 2019	149,60	26,03	3894,58	1830,45	6712,27
3864 2020	202,10	14,95	3021,61	1420,16	5207,72
RRIM600 2009	1025,63	121,75	124870,26	58689,02	215212,64
RRIM600 2010	905,44	133,91	121250,10	56987,55	208973,33
RRIM600 2011	18,80	120,13	2257,97	1061,25	3891,59
RRIM600 2012	105,77	105,00	11105,78	5219,72	19140,70
RRIM600 2013	670,20	100,50	67355,14	31656,91	116085,91
RRIM600 2014	712,30	96,73	68902,10	32383,99	118752,08
RRIM600 2017	415,16	32,42	13459,03	6325,74	23196,51
RRIM600 2018	745,90	31,20	23272,57	10938,11	40110,05
RRIM600 2020	54,30	5,96	323,71	152,14	557,91
Total	**8632,91**		769750,42	361782,70	1326657,15

The emissions removed during the sixth monitoring period were calculated by subtracting the total emissions removed by the project up to that point from the total emissions removed up to the end of the fifth monitoring period. Records show that the total emissions removed up to the end of the fifth monitoring period were 1180265.62. Therefore, the emissions removed during the sixth monitoring period amounted to 146391.79 tons of CO_2 equivalent.

16.3 Leakages.

As previously mentioned, the estimated leaks caused by the project are zero, so monitoring is not included (14.1).

16.4 Net GHG Emission Reductions / Removals

Table 10 summarizes net greenhouse gas (GHG) emission reductions and removals during the sixth monitoring period.

Table 10. Net greenhouse gas emissions by Mavalle rubber plantations project during the sixth monitoring period.

Year	Baseline emissions/removals (tCO₂e)	Project emissions/removals (tCO₂e)	Leakage emissions (tCO₂e)	Net GHG emission reductions/removals (tCO₂e)
Year A (03-10-2023 to 02-10-2024)	*0*	*146391.79*	*0*	*146391.79*
Total	*0*	*146391.79*	*0*	*146391.79*

16.5 Comparison of actual emission reductions with estimates in the Project Document

The ex-ante estimates of the project's removals, found in the file 'Ex-ante estimate 2019. xls' (located in Folder 1, Technician, Biomass and Carbon Estimation subfolder), indicates that by 2024, the removals due to the project would be 150867.71 tons of CO2 equivalent. The record of net removals achieved during the sixth monitoring period is 146391.79 tons. Therefore, the difference of 4475.92 tons is equivalent to 2.96%. This difference is not significant and could be attributed, among other factors, to the ex-ante model not considering the differential productivity due to the clones, which is observed in the field.

16.6 Remarks on the difference from the estimated value in the registered project document

Does not apply as no removals increased over the PDD ex-ante estimation, and the reduction was not significant.