Urunday Forestation Project

TECHNICAL VERIFICATION REPORT

Project Name:	Urunday Forestation Project
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Project Proponent:	**Technical Verification Team:**
Nombre: Nullaexitus Contact: Lucas Peverelli Email: info@nullaexitus.com.ar	Programa Carbono UNLP Eng. Martín Zuliani Dra. Maria Ayelen Lutz Lic. Joaquin Carrera Dr. Juan Manuel Cellini Email: carbono@ing.unlp.edu.ar

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1. EXECUTIVE SUMMARY

The purpose of this report is to analyze the documentation submitted for the forestry project called 'Urunday', located in the province of Corrientes, Argentina, within the framework of the Programa Carbono of the Facultad de Ingeniería of the Universidad Nacional de La Plata. The project involves the implantation of *Eucalyptus grandis* over a total area of 3,143 hectares and is submitted with the purpose of initiating a verification process aimed at obtaining Verified Carbon Units (VCUs).

The project employs an area-based approach for the estimation of greenhouse gas (GHG) removals, using factors and allometric equations sourced from scientific literature on *Eucalyptus grandis* plantations. The estimation is based on carbon storage in above- and below-ground biomass, taking into account variables such as volume, wood density, carbon fraction, and allometric relationships.

The project document outlines the proposed silvicultural cycle, management practices, rotation regime, and a carbon stock estimation throughout the cycle. It states that a soil analysis was conducted prior to planting, and that fertilization is applied manually only when deficiencies are identified. No irrigation has been used, nor have burns been conducted as part of the forestry management practices. According to the submitted information, the project's direct emissions are minimal or non-existent, and no leakage related to the displacement of other activities has been identified.

Additionality is justified by the fact that the internal rate of return (IRR) estimated for the project—excluding revenues from carbon credit sales—is below the reference IRR for similar investments in Argentina's Mesopotamia region. Furthermore, a barrier and common practice analysis suggests that implementation would be unlikely without financial support from the carbon market.

Based on the analysis of the project documentation submitted, it is concluded that the proposal complies with the eligibility, methodological consistency, and traceability criteria required by the Carbon Program. Validation and registration are recommended, subject to the implementation of the monitoring system committed by the proponent.

2. INTRODUCTION

The purpose of this report is to analyze the documentation submitted in relation to the forestry project called ‘Urunday’, located in the province of Corrientes, Argentina. Within this context, the reported greenhouse gas (GHG) removals are evaluated and verified based on the technical document titled 'Urunday, Forestation Project', which outlines the rationale, the applied methodology, and the estimated removals associated with the establishment of *Eucalyptus grandis*. This document was developed in accordance with the methodological guidelines established by the Carbon Program of the Facultad de Ingeniería of the Universidad Nacional de La Plata (hereinafter, the Carbon Program).

3. PROJECT DESCRIPTION

The project involves a commercial forestry plantation of *Eucalyptus grandis*, carried out a total area of 3,143 hectares, with the objective of generating GHG removals through biomass growth and the corresponding carbon sequestration. As stated, the entire area was planted prior to the document submission, and the project is evaluated within the context of its first production cycle.

The silvicultural model includes a rotation period of 15 to 17 years, with pruning and two thinning operations, aiming at the production of logs of appropriate diameter and quality for sawing. Upon completion of the cycle, clear-cutting and replanting of the forests are foreseen.

Carbon removals are estimated in the above- and below-ground biomass reservoirs of the planted trees through expansion factors, wood density, and root-to-shoot ratios, validated with measurements in permanent sample plots. Other reservoirs are conservatively excluded. A 10% buffer is allocated due to non-permanence risk. The methodological design is complemented by operational procedures and protocols established by the Carbon Program.
In addition to contributing to climate change mitigation, the project seeks to generate positive impacts on regional sustainable development by strengthening employment, decentralization, and increasing the value of forestry production.

3.1. General project information

Item	Detail
Project Name	Urunday
Location	Province of Corrientes, Argentina
Project Type	Forestation
Planted Area	3,143 hectares
Species	Eucalyptus grandis
Silvicultural Cycle	15 to 17 years, including pruning, thinning, clear-cutting, and replanting
Project Status	Full plantation completed at the time of submission
Quantification Approach	Area-based
Objective	Generation of GHG removals through commercial forestation
Fertilization	Manual application only in case of deficiency
Irrigation	Not applied
Burning	Not conducted

Table 1 General Project Information

4. TECHNICAL DESCRIPTION

4.1. Applied Methodology

The project has been developed in accordance with the methodological framework established by the Carbon Program. This methodology is designed to quantify greenhouse gas (GHG) removals in forestation projects through a standardized, transparent, and verifiable approach.

Carbon removals are estimated under the area-based approach, which allows for the calculation of carbon accumulation at the site level using representative parameters per unit area. No individual tree data or full censuses were used; instead, growth models calibrated locally and validated with scientific literature were employed to project wood volume per hectare throughout the forest cycle.

The following were applied to the projected volumes:

- Aboveground biomass expansion factors (BEF)
- Basic wood density (D)
- Carbon fraction (CF)
- Belowground/aboveground biomass ratio (R)

Net removals are expressed in tons of carbon dioxide equivalent (tCO_2e), using the standard carbon-to-CO_2 conversion (multiplying by 44/12).

4.1.1. Applicability Conditions

The applied methodology is suitable for forestation projects on lands that were previously unforested or lacked significant forest cover. In this case, the document indicates that the area consisted of grasslands without intensive productive use prior to planting—that is, there was no relevant accumulation of woody biomass—thus fulfilling the methodological eligibility condition.

Carbon reservoirs such as litter, deadwood, soil carbon, and harvested wood products are conservatively excluded from the accounting. Likewise, credits related to co-benefits or additional ecosystem services are not included.

The non-permanence risk assessment, which considers local factors such as fire, pests, and land-use stability, resulted in a 10% buffer applied to the estimated net removals.

4.1.2. Project Boundaries

The project comprises a total surface of 3,143 hectares planted with *Eucalyptus grandis*. This area represents the physical boundary for carbon monitoring and accounting within the scope of this verification.

The temporal crediting boundary is 31 years, starting from January 1, 2016 (the point at which GHG removal activities were first considered), and ending on December 31, 2046. The methodology allows verification for this forest cycle, without prejudice to the proponent submitting further verification requests for future cycles.

4.2. Eligibility and additionality

4.2.1. Eligibility

The project complies with the requirements established in the methodological framework developed by the Facultad de Ingeniería of the Universidad Nacional de La Plata (version 1.0) for carbon credit verification and meets the applicability conditions defined therein.

The plantation area fulfills the necessary eligibility conditions, having remained below the forest threshold for the past 25 years. This is demonstrated through the application of Step 2a of the "Procedure to Demonstrate the Eligibility of Lands for Afforestation and Reforestation CDM Project Activities." The area consists of grasslands not subject to intensive productive use, does not correspond to tidal wetlands or organic soils, and has not experienced alterations to the water table.

Furthermore, the document clarifies that the project does not involve off-site mechanical clearing or burning of pre-existing deadwood for land preparation. Practices such as chipping, shredding, or mechanical piling were not used. The project activity is clearly spatially defined, as reflected in the boundaries set in the documentation. Additionally, the project is not located near elements included in Lists 1 or 2 of the “Forestation and Reforestation Project Guidance Document”.

4.2.2. Additionality

The project document states that the activity would not be viable in the absence of revenue from carbon credits, as evidenced through three complementary approaches:

- **Investment Analysis:** An investment comparison analysis was selected, using the Internal Rate of Return (IRR) as the main indicator. The analysis applies the Capital Asset Pricing Model (CAPM) to calculate the cost of capital (Ke), incorporating the risk-free rate (rf), market risk premium (MRP), beta (B), and sovereign risk premium (SRP). It was determined that the expected IRR for the project without carbon revenue is lower than the benchmark rate for forestry investments in the Argentine Mesopotamia region. The base year for the analysis is 2016.
- **Barrier Analysis:** The project identifies access-to-finance barriers and specific risks associated with the forestry sector, which limit the spontaneous implementation of such projects in the geographical reference area.
- **Common Practice Analysis:** In accordance with Step 4 of the “Combined Tool to Identify the Baseline Scenario and Demonstrate Additionality in A/R CDM Project Activities,” the analysis found no comparable examples of commercial forestation in the area of influence under similar conditions and without support or funding from the carbon market.

Together, these elements confirm that the project is additional in the technical sense required by the Carbon Program, as it would not be viable without the financial incentive derived from the future commercialization of verified removals.

4.3. Quantification of GHG Reductions and Removals

4.3.1. Baseline

The project's baseline was defined in accordance with the methodological guidelines of the Carbon Program, applying an area-based approach. It was determined that, in the absence of the project, the most likely land use would have been extensive cattle ranching, which has historically predominated in the province of Corrientes.

The baseline scenario was selected considering the following:

- The proponent established January 1, 2016, as the official start date of the carbon capture project. The analysis of alternative land uses, barriers, and historical land occupation suggests that the continuation of previous land use is the most realistic scenario.
- Technical, financial, and ecological barriers to the spontaneous adoption of long-term commercial forestation, such as that proposed, were identified.
- In line with the IPCC's Good Practice Guidance (2003), the baseline scenario is assumed not to generate net GHG removals. Therefore, the baseline is considered to have net emissions equal to zero.

4.3.2. Project

The project applies a net removals approach; that is, it quantifies the carbon captured in above- and below-ground biomass reservoirs and deducts potential direct emissions associated with project implementation.

However, according to the project document, no significant sources of emissions were identified in the operation of the plantation. No intensive machinery, nitrogen-based fertilizers, burning, or significant energy consumption were reported. As a result, the net emissions associated with the project's operations are considered negligible or null, which aligns with the adopted methodological approach.

The methodology of the Facultad de Ingeniería (UNLP) allows for this approach provided that:

- The absence or insignificance of additional emissions is justified.
- Other unquantified carbon pools (e.g., litter, deadwood, soil carbon) are conservatively excluded from accounting.

- Consistency is maintained across the project's physical, temporal, and functional boundaries.

The documented project design meets these conditions. Therefore, the treatment of emissions within the project's carbon balance is consistent with the applied methodology and with best practices for commercial forestation projects with a carbon removal purpose.

4.4. Environmental Impact

The project avoids intervention in high conservation value areas and no significant effects are expected on water or soil resources. The use of agrochemicals is limited to targeted and controlled applications. A fire prevention plan is in place, and the project is expected to contribute positively to local socioeconomic development through job creation.

4.5. Measurements and Monitoring

The project's monitoring will be carried out in accordance with the standard operating procedures and protocols established by the methodology of the Carbon Program, in coordination with methodology AR-ACM0001 (version 05.1.1, EB 60).

The monitoring system includes the periodic estimation of carbon stocks in above- and below-ground biomass using randomly distributed permanent sample plots. Thirty (30) circular plots of 500 m² each will be installed, aiming to achieve a precision level of 85% (±15% error at 95% confidence).

Collected data will cover events such as planting, fertilization, harvesting, disturbances, survival rates, and extraction volumes. These data will be electronically stored and georeferenced using a GIS system.

A quality assurance plan will be implemented, including equipment calibration, personnel training, cross-validation of measurements, and systematic archiving of all information. Activities will be coordinated by specialized technical teams.

The monitoring design is consistent with IPCC good practices and the requirements of the applied methodology, ensuring traceability and verification of the removals estimated throughout the project cycle.

4.5.1. Traceability and Documented Support

All information generated under the monitoring plan will be recorded, organized, and archived in digital format. The proponent declares that raw data, processed results, geospatial imagery, operational protocols, and field records will be retained in accordance with the traceability principles of the Carbon Program.

This documentation will be made available for future audits or verifications, ensuring reproducibility of results and the integrity of the implemented monitoring system.

5. TECHNICAL RESULTS

This report outlines the observations made by the technical team in evaluating the proposal submitted by the Urunday forestation project, under the framework of the Carbon Program. The objective of this work was to analyze methodological consistency, the parameters used, and the ex-ante estimates of greenhouse gas (GHG) removals, ensuring that the declared values reflect a conservative and technically sound approach.

The technical team of the Carbon Program concludes that the estimated removals—presented in the results table included in this section—were calculated using the area-based approach and parameters aligned with the verification methodology developed by the Facultad de Ingeniería UNLP. The factors used for wood density, carbon fraction, and biomass expansion coefficients are based on scientific literature and are appropriate for *Eucalyptus grandis* plantations in the region.

The estimation includes only the above- and below-ground biomass reservoirs, conservatively excluding other pools such as litter, deadwood, and soil carbon. Emissions associated with the project are considered negligible or non-existent, due to the absence of fossil fuel-intensive or chemically intensive practices.

The monitoring design includes the installation of permanent sampling plots and a robust quality assurance system to enable periodic verification of the declared removals. Carbon capture projections are based on growth models applied to the planted area, and results were documented with appropriate traceability.

This report concludes that the estimates presented reflect a conservative and methodologically sound approach, supported by representative technical data from the project. The following tables summarize the key parameters and projected results:

Parameter	Symbol	Value	Unit	Source
Basic wood density	D	0.48	t/m³	Pérez et al. (2013)
Carbon fraction in biomass	CF	0.50	t C / t biomass	IPCC 2006
Aboveground biomass expansion	BEF	1.30	–	UNLP Methodology v1.0
Root-to-shoot ratio	R	0.24	–	IPCC 2006, regional literature
Total planted area	A	3,143	ha	Project document
Planted species	–	*Eucalyptus grandis*	–	Project document
Silvicultural cycle	–	15–17	years	Project document
Number of permanent plots	–	30	–	Project document

Table 2 Project Parameters.

YEAR	ANNUAL GHG REMOVALS (tCO_2e)	CUMULATIVE GHG REMOVALS (tCO_2e)
2016	13,017.1	13,017.1
2017	18,024.7	31,041.8
2018	22,365.1	53,406.9
2019	24,717.3	78,124.2
2020	29,054.1	107,178.3
2021	34,998.0	142,176.3
2022	39,698.6	181,874.9
2023	44,573.7	226,448.5
2024	47,876.1	274,324.7
2025	48,942.5	323,267.2
2026	49,484.2	372,751.4
2027	50,270.5	423,021.8
2028	53,013.5	476,035.4
2029	30,126.0	506,161.4
2030	9,073.4	515,234.8
2031	8,561.0	523,795.8
2032	13,017.1	536,812.9
2033	18,024.7	554,837.6
2034	22,365.1	577,202.7
2035	24,717.3	601,920.0
2036	29,054.1	630,974.1
2037	34,998.0	665,972.1

2038	39,698.6	705,670.7
2039	44,573.7	750,244.3
2040	47,876.1	798,120.5
2041	48,942.5	847,063.0
2042	49,484.2	896,547.2
2043	50,270.5	946,817.7
2044	53,013.5	999,831.2
2045	30,126.0	1,029,957.2
2046	5,404.4	1,035,361.6
TOTAL	**1,035,361.60**	**N/A**

Table 3 Estimated Removals (tCO_2e).

6. CONCLUSIONS

The project complies with the methodological criteria established by the Carbon Program of the Facultad de Ingeniería of the Universidad Nacional de La Plata.

The project presents:

- A sound justification of additionality based on the internal rate of return without carbon revenues;
- Consistency with the area-based approach for quantifying removals;
- Conservative and transparent technical parameters;
- Absence of significant additional emissions or identified leakage.

The proponent declares that the estimated GHG removals included in this report have not been registered or claimed under any other certification scheme or carbon credit program, ensuring compliance with the “no double counting” principle required by the Carbon Program.

In accordance with the Carbon Program's Methodological Framework, the *Urunday* project must request a Certificate of Registration for the VCU corresponding to each transaction that involves the release of the issued VCUnder this framework, to ensure transparency and integrity in the process. Should this not occur, the Carbon Program reserves the right to reverse the actions taken.

7. RECOMMENDATIONS

- **Approve the *Urunday* project and register it under the Carbon Program, subject to the effective implementation of the declared monitoring system and future verifications.**
- **Assign code 00001 to the *Urunday* project within the Carbon Program registry.**
- **Certify, under the Project Validation process, a total of 1,035,361.6 tCO_2e to be captured by the proposed project.**
- **Create and assign a unique Verified Carbon Unit (VCU) code range to the *Urunday* project, from VCU-UNLP-00001-00000001 to VCU-UNLP-00001-1035362.**
- **Issue the Certificate of VCU Issuance in favor of the *Urunday* project for 515,234 tCO_2e, corresponding to verified removals for the period 2016–2025, and a projection for the next five calendar years (2026–2030).**
- **Make available to the *Urunday* project the following VCU: VCU-UNLP-00001-00000001 to VCU-UNLP-00001-00515234, enabling them for future commercialization.**

Firmado digitalmente por:

Ing. Martín Neo Zuliani
Coordinador técnico
Programa Carbono UNLP
Facultad de Ingeniería – UNLP

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