

'LUMIN URUGUAY' FOREST PLANTATIONS ON DEGRADED GRASSLANDS UNDER EXTENSIVE GRAZING

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Table of Contents

1 General 3

1.1 Project Description 3

1.2 Project Category and Activity Type 4

1.3 Project Proponent(s) 4

1.4 Project Location 4

2 CLIMATE..... 6

3 Community 7

3.1 Social Monitoring Plan 9

4 Biodiversity 10

4.1 Biodiversity Monitoring Plan 12

1 GENERAL

1.1 Project Description

The main objectives of the project activity are the responsible wood production, conservation of natural resources, land restoration and carbon sequestration through afforestation. All practices follow FSC® forest management standard for responsible forest management, while enhancing biodiversity conservation by increasing the connectivity of forests and different ecosystems, generating income and job opportunities for local communities in rural areas of the centre-east region of Uruguay.

The project comprises a total of 18,988 hectares of land previously under extensive grazing by beef cattle, on which forest plantations for obtaining high-value, long-lived timber products and for sequestering large amounts of carbon dioxide from the atmosphere were established. The total area affected by the project is 44,854 hectares, if we include buffer zones, grasslands and native forests.

The forests were based mainly on *Eucalyptus grandis* and, to a lesser extent, on *Eucalyptus dunnii* and *Pinus taeda* plantations in rotations of 16 to 22 years, with pruning (at a minimum height of 9 m) and two to three thinning operations, to obtain knotless large diameter logs suitable for sawing and plywood production. Most of the plantations have already been carried out and the forests will be replanted after clear cutting. The first Lumin/Eucapine forest plantations in the Central-East region were carried out in 2006. The practices will be compatible with the FSC® standard for responsible forest management. Planted forests will remove carbon dioxide from the atmosphere and store it in different carbon pools (aboveground and underground biomass, soil organic carbon, waste and dead wood).

The baseline study determined that continuation of extensive grazing is the most likely use of the land. Additionality is demonstrated through the fact that the expected internal rate of return of the proposed project activity without considering carbon finance is lower than the benchmark internal rate of return for this type of investment in Uruguay. The inclusion of new project areas in this monitoring event is considered in its corresponding section.

The potential non-permanence of stored carbon was considered by the non-permanence risk analysis and buffer determination, and by the fact that a significant fraction of the sequestered carbon will be stored in long-lived products which will not be accounted.

As it was demonstrated during validation, the project implementation does not and did not cause any displacement of activities. The only activity in the project area prior to the start date is extensive grazing by beef cattle, which continues to occur after project start. This can be audited by the verification team during on site visit. It was also stated and validated in the PD that there was no need for a leakage management plan neither for leakage mitigation options. The information regarding aspects related to the non permanence risks of the project, it is presented as a separate document called "Non Permanence Risk Report".

The project will result in a significant contribution to sustainable development of Uruguay, mainly through: i) increased employment ii) an increase in the quality of employment iii) rural development (decentralization); iv) increased gross value of production; v) improved fiscal balance; vi) biodiversity preservation and vii) improvement and preservation of soil quality.

The total GHG emission reductions or removals generated in this monitoring period is shown in Table 1.

Table 1: Year that the emissions reduction took place (Vintage).

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2013	0	928.403	0	928.403
2014	0	1.129.772	0	1.129.772
2015	0	950.309	0	950.309
2016	0	1.056.117	0	1.056.117
2017	0	1.000.540	0	1.000.540
2018	0	558.691	0	558.691
2019	0	163.237	0	163.237
2020	0	352.996	0	352.996
Total	0	6.140.066	0	6.140.066

1.2 Project Category and Activity Type

This is an ARR project. The project is not a grouped project.

1.3 Project Proponent(s)

Organization name	LUMIN/EUCAPINE SRL
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1.4 Project Location

The project is located in the east of Uruguay, in the departments of Cerro Largo and Treinta y Tres. It comprises several sites, which are classified in 4 regions: 'Centurion', 'Octava CL', 'Ruta 7' and 'Ruta 8'; based on their geographic location. The areas are homogeneous in terms of soil type, climate, land use history and socio-economic conditions. The following map (Figure 1) shows the exact location of the project, and the cadastral units owned by LUMIN/EUCAPINE., where the project is located.

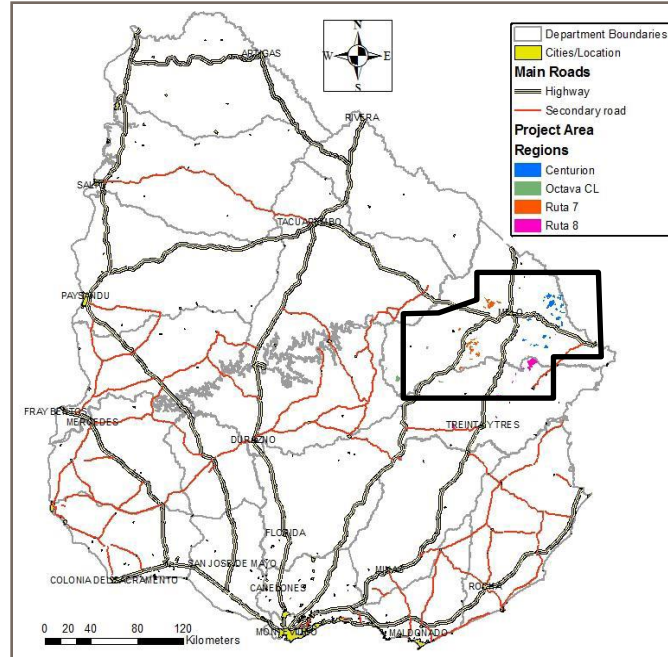


Figure 1. Map of Uruguay showing the location of the areas included in the proposed project activity (black frame).

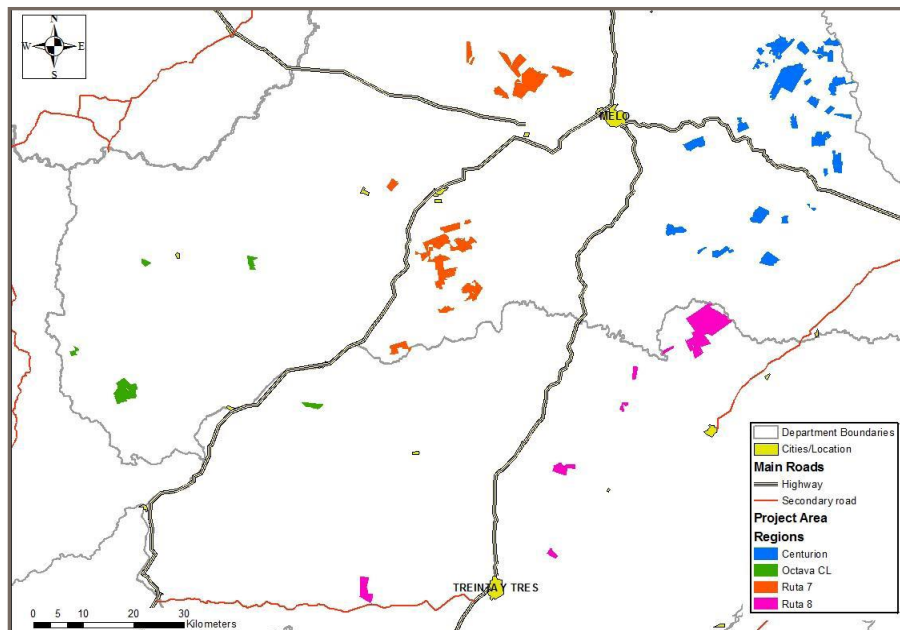


Figure 2. Map indicating the four project regions divided in four different colors.

Table 2. Project boundaries by region and species.

Region	<i>E. grandis</i> (ha)	<i>E. dunnii</i> (ha)	<i>P. taeda</i> (ha)	Total area (ha)
Centurión	5.885	746	678	7.310
Octava CL	5.065	657	818	6.540
Ruta 7	3.599	211	361	4.170
Ruta 8	554	122	292	968
Total area (ha)	15.103	1.735	2.149	18.988

The LUMIN/EUCAPINE project in the East region of Uruguay (former 'Weyerhaeuser Uruguay S.A.' project) has recently completed its 14th year. Around 90% of the total planted area was implanted between 2006 and 2012, and smaller areas were planted between 2014 and 2020.

Date	Milestone(s) in the project's development and implementation
2005-2006	Started the baseline survey
2005-2006	The Project Design for Afforestation Operation was finished
2006	First forest projects were presented to Forest Directorate and EIA were presented to Environmental office
2006	First forest plantations were established over degraded grasslands
2007-2012	LUMIN/EUCAPINE continued presenting forest projects to Forest Directorate and EIA to Environmental office
2012-2019	Annual Biodiversity survey reports of the project was completed
2013	VCS Carbon sequestration project was validated and verified
2012-2020	Project was PEFC Certified
2020	Total area of the project became FSC Certified
2006-2020	Annual Community activities were performed
2008-2020	Intensive silvicultural activities started (pruning and, thinning)
2015-2020	First commercial thinning was implemented
2017	Weyerhaeuser Uruguay SA sold its assets to EUCAPINE SRL
February 2021	CCB Validation and second verification process (2013-2020) started

2 CLIMATE

The aim of the Monitoring Plan is to record and monitor a number of different parameters in order to ensure that the project followed the corresponding methodology in the validated and registered PD and that the inputs to the carbon calculations are both accurate and up-to-date.

Monitoring was done according to the consolidated methodology AR-ACM 0001 "Afforestation and reforestation of degraded lands" (version 05.2.0, EB 65).

Monitoring stage comprised gathering information, performing calculations and making estimations of GHG removals. In this monitoring event, it is ensured that commonly established principles of forest inventory and management were put into practice. All data gathered as part of the monitoring plan was archived electronically and will be kept at least for two years after the end of the crediting period.

Per vintage, net GHG Emission Reductions and Removals (tCO₂) are distributed in the following way:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2013	0	928.403	0	928.403
2014	0	1.129.772	0	1.129.772
2015	0	950.309	0	950.309
2016	0	1.056.117	0	1.056.117
2017	0	1.000.540	0	1.000.540
2018	0	558.691	0	558.691
2019	0	163.237	0	163.237
2020	0	352.996	0	352.996
Total	0	6.140.066	0	6.140.066

3 COMMUNITY

Communities in the project area or local communities are understood as those of any size that are adjacent to the project management unit (farm), and also those that are close enough to have a significant impact on the economy or environmental values of the management unit or to their economies, rights or environments are significantly affected by positive or negative management activities or by the biophysical aspects of the management unit (Source: FSC-STD-01-001 V5-0, adapted).

In Uruguay there are no indigenous communities, neither any type of communities living exclusively in the forest and its services. Communities reside in rural areas, towns, villages or even cities in the project area of influence. Capital cities are considered as part of the community analysis since the impact on the population, although not direct, all the services and activities related to the project end up affecting. All other communities that are within Treinta y Tres and Cerro Largo and close enough to be affected by the project, is part of the analysis. The project is in a rural area with very low population density.

Creation of employment

Creation of employment is one of the main social benefits of the project. Typically, a traditional extensive livestock production system employs 1.4-4.4 persons every 1,000 ha. Lumin/Eucapine project is expected to increase that figure by more than 8-10 times.

Beyond an increased number of direct and indirect jobs, the project is expected to contribute to the development of the region and the country pursuant the priorities defined by Uruguayan government (promotion of small family businesses, increase in exports, eradication of rural poverty, incorporation of technology, increased nationally added value, development of new productive chains and geographic decentralization of development) as follows:

Promotion of small family businesses and creation of several job opportunities

As it was mentioned above, 'Lumin/Eucapine' project activity will generate several job opportunities, creating nearly 230 job positions when the sustainable production be reached. The vast majority of employees will be hired by outsourced contractor companies. The majority of the outsourced contractor companies currently working with Lumin/Eucapine, are registered in Uruguay as "PYMES" (small and medium sized enterprises - SME), mostly family companies.

Also, it is expected that most of the small and medium enterprises meanwhile providing services for the forestry sector, will continue their own development, increasing capital, acquiring machinery and technology, and generating new jobs in the region.

Another positive aspect that is expected in the development of the productive chain associated with the forestry sector is the generation of a work culture that allows greater formalization of companies and also greater stability in jobs. At the same time, it is expected that the aspects related to the culture of occupational safety will increase considerably.

Lumin / Eucapine has been playing since 2018 a leadership role in the implementation of measures that address and improve the gender and equity perspective in the workplace inside and outside the organization, actively participating in UN women and getting involved in improvement processes proposed by UN Women.

Internationally tradable products

The entire production of Lumin/Eucapine project (wood and carbon credits) will have the national and international market as main final destination. Livestock meat and beekeeping is produced within Lumin/Eucapine property by local cattle breeders and their products are also internationally tradable.

Reduction of rural poverty

The main contribution of Lumin/Eucapine project activity to reduce rural poverty will be through employment formalization and the generation of high quality and stable employment, in a region of Uruguay with elevated levels of poverty. A study by Carámbula and Piñeiro (2006)¹, demonstrate that forestry projects oriented to the production of high value timber, generates high positive impacts in the eradication of poverty in rural areas and reverting the process of internal migration to big cities.

It may also allow settlement in small towns, with less dispersed and isolated rural territory, providing better access to services such as health and education.

More recent studies (see footnote 14) demonstrate the labor intensity in forest areas is higher than previous land use cattle grazing.

Incorporation of technology

The project incorporates the best available and affordable technology for optimizing wood productivity and quality through the selection of seeds, site preparation, plantation, weed and pest control, forest management and wood harvesting and logistics, and achieving sustainability objectives. Lumin/Eucapine has a program for applied research, continuously testing various practices in order to achieve continuous improvement over time and collaborates with other companies and public institutions in this regard.

It is also identified as a plus, the importance of generating local capacities over the years, most of the local enterprises will acquire and learn work methodology and international reference procedures, incorporating know-how and experiences in various topics associated with forestry production.

Increased nationally added value to forestry products

Lumin/Eucapine project will produce timber that can be used for high-value products. As discussed above, currently there are no wood industries located within a reachable distance from the project site. However,

¹ Carámbula, M. y Piñeiro, D. La Forestación En Uruguay: Cambio Demográfico y Empleo en Tres Localidades

the presence of Lumin/Eucapine and of other similar initiatives in the area are also seeking carbon finance (GFP, Guanaré and others) may induce in the future the establishment of industries in the region. And even in the case that no industries are developed, the saw logs and veneer logs produced by Lumin/Eucapine in the East region can be transported to its plywood mill in Tacuarembó or could be exported through Montevideo harbour at prices which will be higher than those that could be obtained by selling pulpwood, which is the traditional wood product exported from Uruguay.

These sustainable high quality wood, is a substitute of native forests logs that are illegally harvested in others parts of the world.

In addition, the forest management adopted by Lumin/Eucapine would increase the amount of carbon sequestered by trees, thus increasing the carbon embedded value in wood products.

Development of new productive value chains

Even though Lumin/Eucapine owns a plywood mill in the North region of Uruguay (City of Tacuarembó), as of December 2020 the company has no plans to invest in a new industry in the east region. Nevertheless, as mentioned above, the presence in the region of Lumin/Eucapine and its forest plantations, may contribute to promote the establishment of industrial investments in the area.

Geographic decentralization of development

As it was mentioned above, Lumin/Eucapine project will bring about a number of socio-economic benefits that will mostly impact on its surrounding area, which is currently one of the less developed ones in the country. This would create a development pole away from Montevideo and other areas which concentrate most of the economic activity in the country

Improve of local community's well-being.

Lumin/Eucapine has several programs in place to support and assist local communities in the project's area of influence. Public schools, social organizations, public institutions, such as local governments, firefighters, ministries, are fundamental strategic partners to implement lines of work and support projects in the long term.

Lumin/Eucapine is committed to promoting and improving the well-being of the community, often contributing material goods (firewood, tools, school supplies), staff time (educational presentations in schools, visits to places of value) and fundamentally collaboration in the search for programs that create local development opportunities. A complete and detailed list of programs, activities and supports is available to the audit team. In addition, LUMIN is actively participating in UN Women and getting involved in the improvement processes regarding gender issues proposed by UN Women.

3.1 Social Monitoring Plan

Lumin/Eucapine has several programs in place to support and assist local communities in the project's area of influence. The company has a "Social Monitoring and Management Plan" elaborated to monitor social impact of the project to communities and vice versa. The objective of this document is to describe how the company works to achieve a harmonious integration with local communities in the areas of influence of the activities, trying to avoid or minimize the possible impacts that may generate the activity of the company and seeking an active participation in objectives related to the welfare of the neighbors and local development.

4 BIODIVERSITY

The tables below describe all the changes in biodiversity resulting from project activities under the with-project scenario in the project zone during this monitoring period.

Change in Biodiversity	Increase in plant species
Monitored Change	Net actual positive direct impact that occurs as the result of project activities that have resulted in an increase in the number of native vegetational species in the project area.
Justification of Change	The factor contributing to the change is that forest plantation and native forest act as biological corridors. Methods and assumptions used to estimate or document the change are described in the Management and Monitoring Plan in the HCV areas. The results can be seen in the MR.

Change in Biodiversity	Increase in fauna species
Monitored Change	Forest plantation and native forest act as biological corridors, avoiding isolation or genetic drift. The implementation and maintenance of buffer zones between forest plantations and native forests of more than 20 meters, allow the development and, in some cases, the improvement of pastures. These pastures are habitat and biological corridors for many RAE fauna species
Justification of Change	The factor contributing to the change is that forest plantation and native forest act as biological corridors. Methods and assumptions used to estimate or document the change are described in the Management and Monitoring Plan in the HCV areas. The results can be seen in the text below.

In the following tables, there is a list of different indicators in different farms, demonstrating the improvement in the flora and fauna in the project area.

	2013	2014	2015	2016	2017	2018	2019	2020
D (Indice de Margalef)	21,92	18,7	19	19,1	18,3	19,2	18,4	18,4
S1 Riqueza estimada (aves) /10	14,8	13	15	13,8	14,1	14,6	14,1	12,4
Riqueza obs. (Verteb.exc.peces) /10	14,5	11,9	11,8	11,7	11,8	13,8	11,8	13,5
En peligro, amenazadas, casi amenazadas, CITES I	12	10	6	6	9	7	10	9
Poco comunes, escasas y raras	30	25	18	23	23	23	25	25
Índice de Shannon X 10	46,453	45,364	43,442	42,493	42,459	42,763	42,222	43,055
EPC				18	21	19	21	18

Table 3. Biodiversity indicators for Gallo-Doroteo Farm

	2012	2013	2014	2015	2016	2017	2018	2019
D (Indice de Margalef)	19	19,3	19,2	17,4	16,8	17,5	17,7	16,8
H' (Indice de Shannon)X10						41,8190624	41,938302	42,117511
S1 Riqueza estimada (aves) /10	12,7	12,5	13,1	14	11,9	14,1	13,2	11,5
Riqueza obs. (Verteb.exc.peces) /10	12,4	11,4	12	11	10,4	12,5	12	11,5
Amenazadas y casi amenazadas	10	15	13	7	5	8	9	7
Poco comunes, escasas y raras	25	30	30	22	22	25	30	27
EPC						20	18	17

Table 4. Biodiversity indicators for Macachin Farm

	2013	2014	2015	2016	2017	2018	2019	2020
D (Indice de Margalef)	19	19,3	17,1	19,2	19,9	18,8	17	16,3
H' (Indice de Shannon)X10						41,3707257	41,5016178	41,426895
S1 Riqueza estimada (aves) /10	12,7	12,5	11	12,3	14,1	13,6	12	10,1
Riqueza obs. (Verteb.exc.peces) /10	12,4	11,4	9,7	11,8	12,5	11,6	10,6	11,3
En peligro, Amenazadas y casi amenazadas	10	15	11	11	12	7	9	12
Poco comunes, escasas y raras	25	30	23	25	32	24	29	25
EPC						17	19	22

Table 5. Biodiversity indicators for Paso Real Farm

The Management and Monitoring Plan of the HCV areas, as well as the Monitoring Report document for the three HCV areas is available for the auditors during the validation and verification period.

Due to previous land use (long-term extensive livestock production), ecological structure of most project sites was relatively homogenous, with low biodiversity. Lumin/Eucapine implemented afforestation activities with scientific and reasonable configuration method, with no burning and slash. The row site preparation will protect the existing vegetation as much as possible. Therefore, the implementation of this project will not decrease biodiversity of project sites.

Ecotones and buffer areas are very important areas from the point of view of biodiversity and its conservation. In them, and during annual monitoring, the biggest number of fauna species are registered in relation inside each farm. At the same time, they act as biological corridors, avoiding isolation or genetic drift. The implementation and maintenance of buffer zones between forest plantations and native forests of more than 20 meters, allow the development and, in some cases, the improvement of pastures. These pastures, connected with other environments are habitat and generate biological corridors for many RAE fauna species.

In all the biodiversity surveys conducted by Lumin/Eucapine, strict pasture species have been detected in forest lands, coinciding with the forest plantation lands that present protected areas and buffer areas correctly established and managed.

A wide range of ecosystems can be found in several parts of the project area, from different types of native forests, wetlands, grasslands, stony fields, among others. LUMIN/EUCAPINE carries out a characterization of the environment in each of the facilities locations and assesses the environmental features, flora and fauna, and defines the conservation areas and the necessary measures for their protection. LUMIN/EUCAPINE has identified the following sites as HCV, Paso Real, Macachin and Gallo Doroteo.

Lumin/Eucapine Project is certified by the responsible forest management FSC® (Forest Stewardship Council®), so it has a commitment with FSC values. One of them is the prohibition of introduction of genetically modified organisms in forestry operations.

4.1 Biodiversity Monitoring Plan

The following criteria will be used for the categorization of forest properties in LUMIN/EUCAPINE, pointing to the greater efficiency in the application of conservation measures and considering human and economic resources availability for their management and monitoring.

- 1) Presence of SNAP (National System of Protected Areas) or high value areas for HCVA conservation according to the definition originally developed by the FSC for High Conservation Value Forests (BAVCs) in the certification of forest ecosystems.
- 2) Biogeographic representativeness
- 3) Representativeness of watersheds.
- 4) Presence of threatened species of flora or fauna at the international or regional level according to the International Union for the Conservation of Nature.
- 5) Presence of endangered species of flora or fauna at the international or regional level according to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).
- 6) Connectivity of the areas.
- 7) Estimated wealth (Chao 1)
- 8) Special landscape value
- 9) Effective total area of natural areas
- 10) If there are still conflicts in the categorization of the areas after the application of these criteria, indexes of similarity between communities can be applied (Greig-Smith)

Based on the aforementioned criteria, the properties selected as representative are surveyed (monitored) in greater depth to clearly determine its habitats values with precise identification of their attributes in order to define conservation plans.

The monitoring studies would be applied over farms with HCVA or HCVF, presence of natural environments or species of particular study interest or farms with high species richness values. These studies involve annual surveys, calculation of diversity indexes, spatial distribution, indicator species, wealth estimation, etc.

The follow-up studies would be applied to the rest of the representative farms. These studies involve biennial or triennial surveys, calculation of species richness, distribution of species and indicator species.

The categorizations made are subject to changes due to the entry of higher priority properties (more representative) or changes in management or anthropogenic activity that may change their condition.

Fauna Monitoring Plan

Fauna biodiversity plans are performed in most representative farms belonging to LUMIN/EUCAPINE by using Environmental indicators that describe the impact on the environment.

The fauna monitoring reports are done once a year in LUMIN/EUCAPINE representative farms, where biologists deliver detailed reports like the one shown in figure 17.



Figure 3 Example of fauna monitoring report

Flora Monitoring Plan

The works allowed to increase considerably the knowledge on flora and fauna of the country and especially of the northeast region.

Biologists identified and georeferenced populations of priority species for conservation, SNAP, some of them new for Uruguayan flora.

The conservation of these species has been possible thanks to the control work done on the environments where they live, through an adequate rational management of them, with a rigorous permanent monitoring.

According to the surveys and subsequent monitoring carried out, properties that have particular attributes stand out and are classified as "Farms with AREAS OF HIGH VALUE OF CONSERVATION (HVC)."