

'GUANARÉ' FOREST PLANTATIONS ON DEGRADED GRASSLANDS UNDER EXTENSIVE GRAZING

Document Prepared by Carbosur



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Table of Contents

1	Summary of Project Benefits	3
1.1	Unique Project Benefits	3
1.2	Standardized Benefit Metrics	4
2	General	7
2.1	Project Goals, Design and Long-Term Viability	7
2.2	Without-project Land Use Scenario and Additionality	34
2.3	Stakeholder Engagement	46
2.4	Management Capacity	60
2.5	Legal Status and Property Rights	63
3	Climate.....	65
3.1	Without-Project Climate Scenario	65
3.2	Net Positive Climate Impacts	65
3.3	Offsite Climate Impacts (Leakage).....	69
3.4	Climate Impact Monitoring	71
3.5	Optional Criterion: Climate Change Adaptation Benefits	89
4	Community.....	91
4.1	Without-Project Community Scenario	91
4.2	Net Positive Community Impacts	94
4.3	Other Stakeholder Impacts	98
4.4	Community Impact Monitoring	98
4.5	Optional Criterion: Exceptional Community Benefits	99
5	Biodiversity	101
5.1	Without-Project Biodiversity Scenario	101
5.2	Net Positive Biodiversity Impacts	103
5.3	Offsite Biodiversity Impacts	107
5.4	Biodiversity Impact Monitoring	108
5.5	Optional Criterion: Exceptional Biodiversity Benefits	115
	Appendices	116
	Appendix 1: Stakeholder Identification Table.....	116
	Appendix 2: Project Activities and Theory of Change Table.....	118

1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

Outcome or Impact Estimated by the End of Project Lifetime	Section Reference
1) Improve local production conditions and ecological environment, enhance the quality of life, create a good investment and environmental development and play a leading role in forestry sector	3-5
2) Provide experience of forest planting and forest management in degraded grasslands	3-5
3) Improve the ecological environment of the planted areas and the native forests surrounding the forest plantations	5
4) Create net positive benefits to the community and stakeholders of the project based on a comparison with the baseline scenario.	4

1.2 Standardized Benefit Metrics

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
GHG emission reductions or removals	Net estimated emission removals in the project area, measured against the without-project scenario	7,644,973 tCO ₂	3.2
	Net estimated emission reductions in the project area, measured against the without-project scenario	N/A	
Forest ¹ cover	For REDD ² projects: Estimated number of hectares of reduced forest loss in the project area measured against the without-project scenario	N/A	
	For ARR ³ projects: Estimated number of hectares of forest cover increased in the project area measured against the without-project scenario	18,576 ha	2.1
Improved land management	Number of hectares of existing production forest land in which IFM ⁴ practices are expected to occur as a result of project activities, measured against the without-project scenario	N/A	
	Number of hectares of non-forest land in which improved land management practices are expected to occur as a result of project activities, measured against the without-project scenario	N/A	
Training	Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities	330	2.3
	Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	20	2.3

¹ Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (*VCS Program Definitions*)

² Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (*VCS Program Definitions*)

³ Afforestation, reforestation and revegetation (ARR) - Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (*VCS Program Definitions*)

⁴ Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood and fuelwood (*VCS Program Definitions*)

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
Employment	Total number of people expected to be employed in project activities, ⁵ expressed as number of full-time employees ⁶	450	2.3
	Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	20	2.3
Livelihoods	Total number of people expected to have improved livelihoods ⁷ or income generated as a result of project activities	2,700	4
	Number of women expected to have improved livelihoods or income generated as a result of project activities	1,310	4
Health	Total number of people for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	2,700	2.3
	Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	1,310	4
Education	Total number of people for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	157	4.2
	Number of women and girls for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	5	4.2

⁵ Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers and community members that are paid to carry out project-related work.

⁶ Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region or economic territory (adapted from the UN System of National Accounts (1993) paragraphs 17.14[15.102];[17.28])

⁷ Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. *The Sustainable Livelihood Approach to Poverty Reduction*. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
Water	Total number of people who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	N/A. However, forestry practices applied in Guanáre/FAS project are the latest available technology and practices that prevents the laminar erosion or diminishes the leakage of fertilizers, preventing the translocation of sediments or nutrients into the river, which are used as drinkable water.	
	Number of women who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	N/A	
Well-being	Total number of community members whose well-being ⁸ is expected to improve as a result of project activities	10,442	4
	Number of women whose well-being is expected to improve as a result of project activities	5,469	4
Biodiversity conservation	Expected change in the number of hectares managed significantly better by the project for biodiversity conservation, ⁹ measured against the without-project scenario	18,576	5.2
	Expected number of globally Critically Endangered or Endangered species ¹⁰ benefiting from reduced threats as a result of project activities, ¹¹ measured against the without-project scenario	As much IUCN species as possible	5.2

⁸ Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Livelihoods, Health, Education and Water), and may also include other benefits such as strengthened legal rights to resources, increased food security, conservation of access to areas of cultural significance, etc.

⁹ Managed for biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation, e.g. enhancing the status of endangered species

¹⁰ Per IUCN's Red List of Threatened Species

¹¹ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

2 GENERAL

2.1 Project Goals, Design and Long-Term Viability

2.1.1 Project Proponent (G1.1)

The project is proposed by Guarané SA (hereinafter called Guarané) on behalf of itself and Guarané AARL, which are the owners of the land. Contact details of Guarané SA are the following:

Organization name	Guanaré SA
Contact person	Nelson Ledesma
Title	Forest Engineer, General Manager in Forestal Atlantico Sur (FAS)
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2.1.2 Project Objectives (G1.2)

The main objectives of the project activity are wood production, land restoration and carbon sequestration through afforestation. All practices follow FSC standard for sustainable forest management, while enhancing biodiversity conservation by increasing the connectivity of forests and generating income and job opportunities for local communities/ rural areas of Uruguay.

2.1.3 Physical Parameters (G1.3)

Topography of the area consists of rolling hills with less than 300 m altitude, with abundant water streams. The mean annual temperature is 18 °C, varying from 12 °C (July) to 25 °C (January). Night frosts occur during the winter (from mid-May to early October), with an average of 30 days with frost per year, with temperatures seldom falling below –5 °C. Annual precipitation in the area ranges from 1,100 to 1,300 mm, homogeneously distributed along the year, although periods of severe drought and severe water excess are rather frequent. Potential evapotranspiration is about 900 mm/year. Runoff and drainage are on average in the order of 300 mm/year, feeding an extensive network of rivers and the Guaraní Aquifer, one of the largest of the world.

Soils are generally not very deep, of medium-to-coarse texture, with low natural fertility. Dominant land cover in the area is grassland, with predominance of herbaceous vegetation (mainly grass species) with interspersed and not very abundant shrubs. The vegetation is highly determined by land use (grazing of cattle and sheep). Native vegetation before cattle was introduced in the XVII Century, was richer in shrubs and small trees, although grass and other herbaceous species were also abundant. In spite of high rainfall level and quite fertile and deep soils, trees appear naturally only at the side of rivers and streams, covering only 3 to 5 per cent of the land area. This has been attributed to the natural occurrence of frequent droughts which prevented slow growing trees from becoming established against an aggressive competition by grasses.

As it was stated above, the project area consists basically of grassland altered by many years of grazing. This would have caused a significant change in species, as well as some soil loss due to laminar erosion due to frequent over grazing. Due to the change in the regime of precipitation observed in recent years, with an increasing trend in both total precipitation and storm intensity, combined with the effects of overgrazing, particularly in dry periods, the soils in the project area would be subjected to increasing erosion and degradation pressures. The removal of vegetation by grazing cattle would also have caused a reduction in the annual inputs of organic carbon into the soil, thus causing a long-term reduction in the soil organic carbon content, which has been estimated at more than 20 per cent of the original soil organic carbon content.

This grazing-degraded grassland covers virtually all the project area. Associated with this, there are lowland, humid zones, with richer biodiversity and higher conservation value. The forests within the project boundaries will be planted on grazing-degraded zones, and it was designed with the objective of preserving the most valuable areas outside project boundaries but inside the land owned by “Guanaré/FAS”.

These conservation areas include natural forests alongside the rivers and minor water streams, composed by hydrophilic species close to the streams, and xerophytic species of shrubs and tall grasses surrounding them in a transition to the grasslands. These ecosystems have suffered alterations in the past, due to human intervention. Valuable tree species include *Salix humboldtiana*, *Sebastiana schottiana*, *Sapium sp.*, *Pouteria salicifolia* and *Erythrina crista galli*. Also, in the most humid areas *Lueha divaricata*, *Quillaja brasiliensis*, *Cupania vernalis*, *Ocotea acutifolia*, *Allophylus edulis*, *Sebastiana klotzschiana* and *Citharexylum montevidense* appear frequently. In intermediate zones, it is common to find *Schinus longifolius* and *Acanthosyris spinecens*, whereas the most common species in the drier zones are *Gochnatia malmei*, *Aloysia gratissima* and *Lithraea molleoides*.

Natural meadows found in this area are developed on hilly landscapes with shallow soils and a topography that determines a good drainage and runoff. Thus, meadows were affected by water deficit so vegetation is dominated by species with summer cycles; such as *Paspalum notatum*, *Setaria geniculata*, *Paspalum dilatatum* and *Axonopus compressus*. It can be found associated species providing forage in the rest of the year (*Stipa papposa*, *Stipa charruana*, *Briza minor*, *Aristida sp.*). Some larger sized species with more than 30 cm (*Baccharis trimera*, *Baccharis coridifolia*, *Eryngium paniculata* and *Eupatorium buniifolium*) could also be found.

On the other hand, favored by overgrazing, appears *Cynodon dactylon* which has been naturalized and has progressively colonized the soil, occupying the spaces left by species less resistant to trampling. Once established it gives no place, being considered as a noxious weed and as a sign of land degradation (decreased site productivity)

Guanaré/FAS project will be established with a long-term perspective, with the ultimate purpose of achieving long-term sustainability and improving soil quality. Sustainable timber and cattle production and climate change mitigation are part of Guanaré/FAS’s objectives. The selection of forest management practices based on uneven lengths rotation cycles in a region far from timber markets is only possible with the additional carbon financing

2.1.4 Social Parameters (G1.3)

Land use in the project area on influence is predominantly natural grasslands for extensive livestock production. Other land uses are cropland (rice fields) and native forest. Main settlements in the area are listed in 2.1.5 belonging to Cerro Largo and Treinta y Tres departments.

The four departments of the North of the country (Artigas, Rivera, Tacuarembó and Cerro Largo) present the lowest degrees of development (Veiga, 2016). In Cerro Largo the distribution by geographical area is mostly urban (87.8%), lower than the total number of the country and also of the interior; with a rural population that was approximately 10,481 people (remaining 12.1%) according to the results of the 2004 Census. One education indicator is the literacy rate that, according to the General Census of 1996, reached 93.4% of the population of 15 or more years in Cerro Largo, being below the average of the interior (95.6%) and the total country (96.8%) (Barrenechea et al., 2008).

Life expectancy at birth is not the demographic indicators that measure achievements in health matters. According to INE, Cerro Largo has one of the lowest values of this indicator, with an index of life expectancy at birth of 75.4 years for 2006, which places the department in the national context in 15th place in this area (out of 19), with a value lower than the national average (75.7 years). It should be noted that Cerro Largo has held this position at the national level since the nineties.

The UNDP carries out a worldwide Human Development Index (HDI), which consists of "a synthetic measure of the achievements of a society in terms of human development", and "seeks to quantify and combine in an aggregate index the achievements average that registers a country in three fundamental dimensions: to achieve a long and healthy life (health dimension), to acquire useful knowledge (education dimension) and to have the necessary resources to enjoy a decent standard of living (standard of living or access to resources)".

According to the Human Development Report in Uruguay 2005, considering the order of the departments according to its HDI, Cerro Largo was located (with data for the year 2002) in the 15th place. This is if we consider an approximation to the level of living dimension through GDP per capita; since if this approach is considered through the income of households, descends to the 16th position. Therefore, it is among the departments of least relative human development in the country (in previous HDI calculations, for 1991 and 1999 it held the 17th and 14th positions, respectively).

In terms of economy, the generation of value in Cerro Largo denotes a high primary specialization, higher than the average of the interior, centred on livestock (cattle and sheep), rice, forestry and dairy cattle to a lesser extent, which do not contribute to the boost of local development.

The main activities in the department of Cerro Largo are beef cattle ranching (62% of establishments declare cattle ranching as the main source of income, occupying 85% of the area of the department according to the 2000 Agricultural Census), and the sheep (15% of establishments, occupying just over 4% of the departmental area). In addition, they are responsible for 64% of rural employment.

Employment in agriculture is concentrated in beef cattle, which represents 64% of employment (5,800 jobs). However, cattle ranching is one of the activities that have the lowest rates of people employed per thousand hectares (employs five people per thousand hectares).

When referring to Treinta y Tres, the distribution by geographical area is mostly urban (89.7%), lower than the total of the country but higher than the interior; with a rural population that includes a total of 5,079 inhabitants (remaining 10.3%) (Barrenechea et al., 2008). Literacy indicator, according to the General

Census of 1996, reached In Treinta y Tres to 94.7% of the population aged 15 or more, being below the average of the interior (95.6%) and that of the total country (96.8%).

According to the IDH, Treinta y Tres is located in 13th place (out of 19), remaining at a low average level with respect to previous years (also 13th in 1999). Life expectancy at birth is one of the demographic indicators that measure achievements in health. According to the INE, Treinta y Tres has one of the lowest values of this indicator, with an index of life expectancy at birth of 75.4 years for 2006, which places the department in the national context in 15th place in terms of life expectancy at birth, with a value somewhat below the national average (75.7 years).

In the department of Treinta y Tres, the main activities are livestock (cattle and sheep) and rice. The dairy must also take into account the involvement of a number of producers that are not negligible and that make it a way of life without visualizing alternative alternatives to that activity (some 60 families).

In summary, communities in the area are not diverse, they share the same language, religious belief, livelihood system, history or culture. Their relationship with natural resource is through the main responsible of the economy, beef cattle breeding.

Rural poverty is the origin of the main social problems in Uruguay. The region where Guarané/FAS has developed its project is particularly affected by a lack of development. Rural poverty has caused the internal migration from rural towns to precarious urban settlements in Montevideo and other cities, increasing marginality, criminality, lack of education, drug-addiction and other social problems. The region around the project site has a dominance of an extensive livestock system of production, which is characterized with a very low productivity level, very low employment, and precarious working conditions and reduced opportunities for women and youth, among other problems. 'Guanaré/FAS' forest activity is expected to increase the gross value of production per unit area of land by six to eight folds, besides promoting a number of new activities which will multiply this impact.

2.1.5 Project Zone Map (G1.4-7, G1.13, CM1.2, B1.2)

The following map (**Figure 1**) shows the exact location of the project, and the cadastral units owned by Guarané/FAS, where the project will be located.

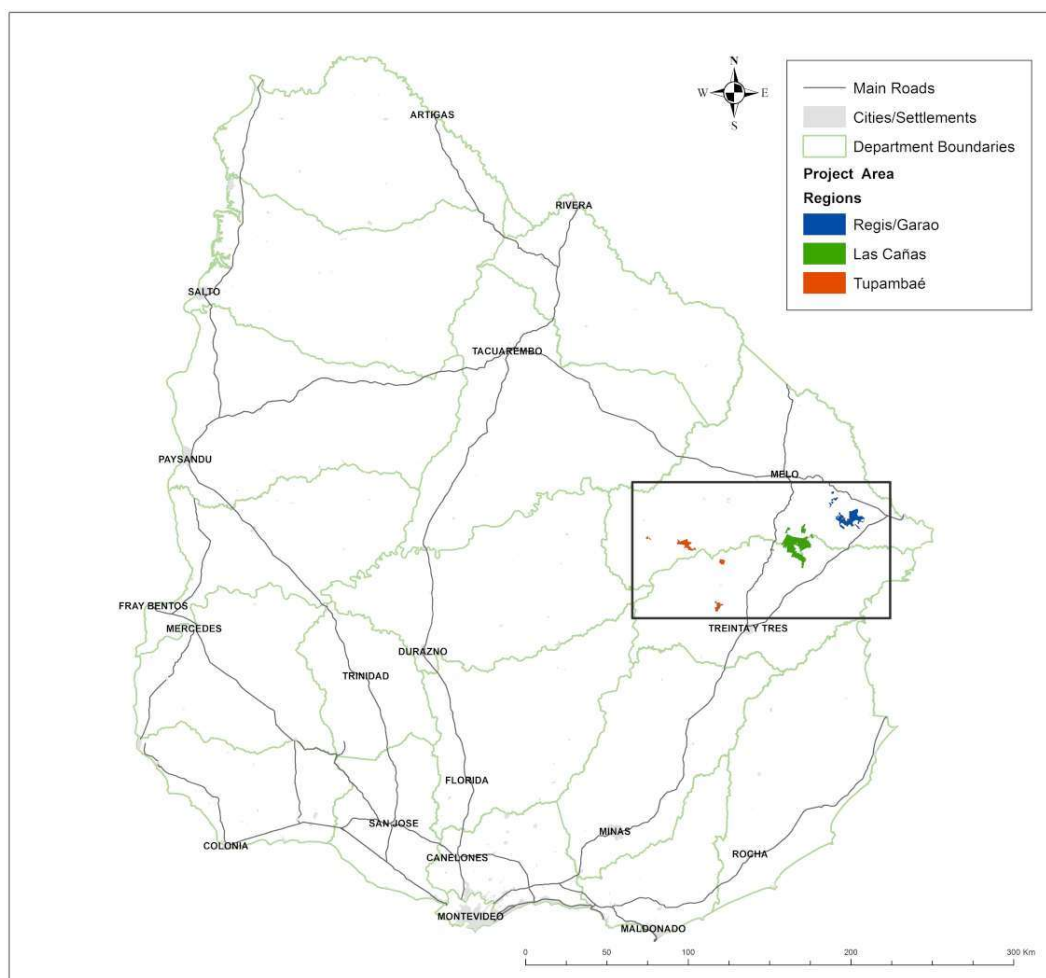


Figure 1. Map of Uruguay showing the location of the areas included in the proposed project activity (black frame).

For the purpose of defining the strata, the project area has been divided into three regions, which are shown from **Figure 2** to **Figure 5**. The areas are homogeneous in terms of soil types, climate, land use history and socio-economic conditions. The division into three regions is entirely based on geographic location.

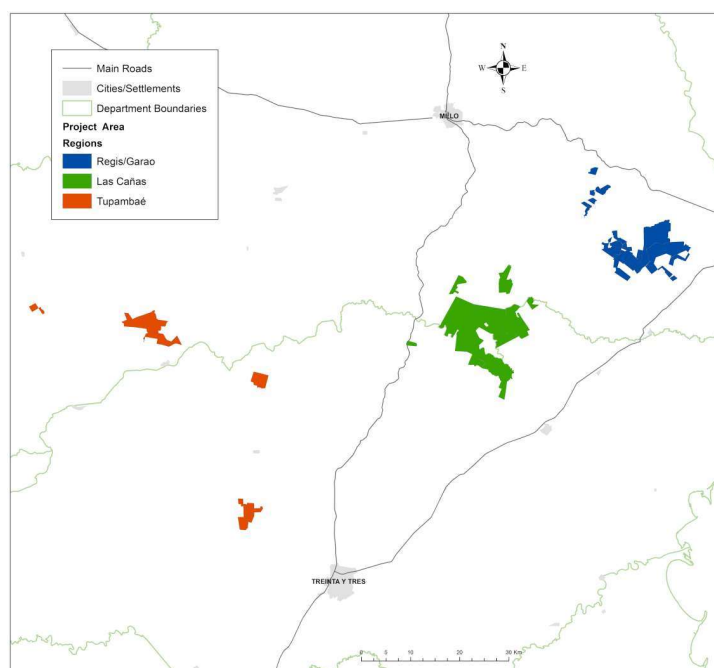


Figure 2. Map indicating the three project regions divided in three different colors.

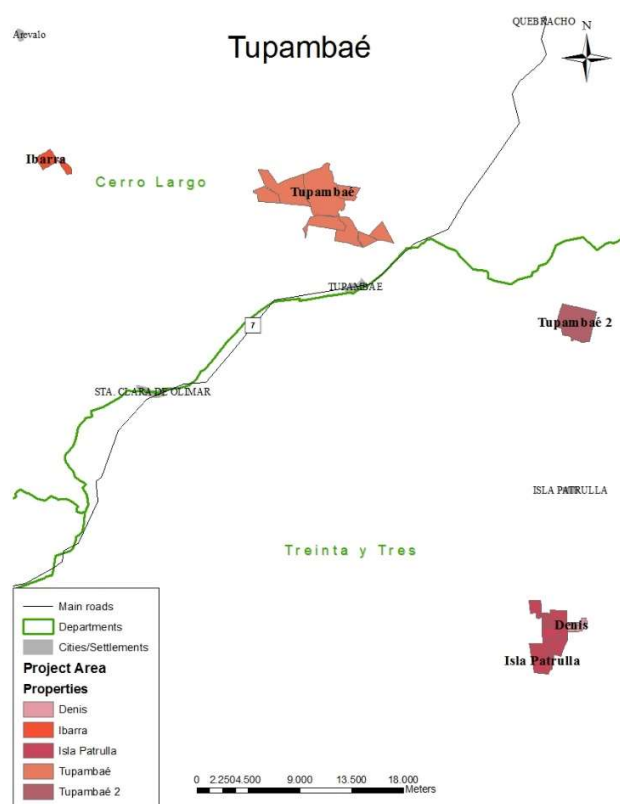


Figure 3. Location of properties which make up the region Tupambaé

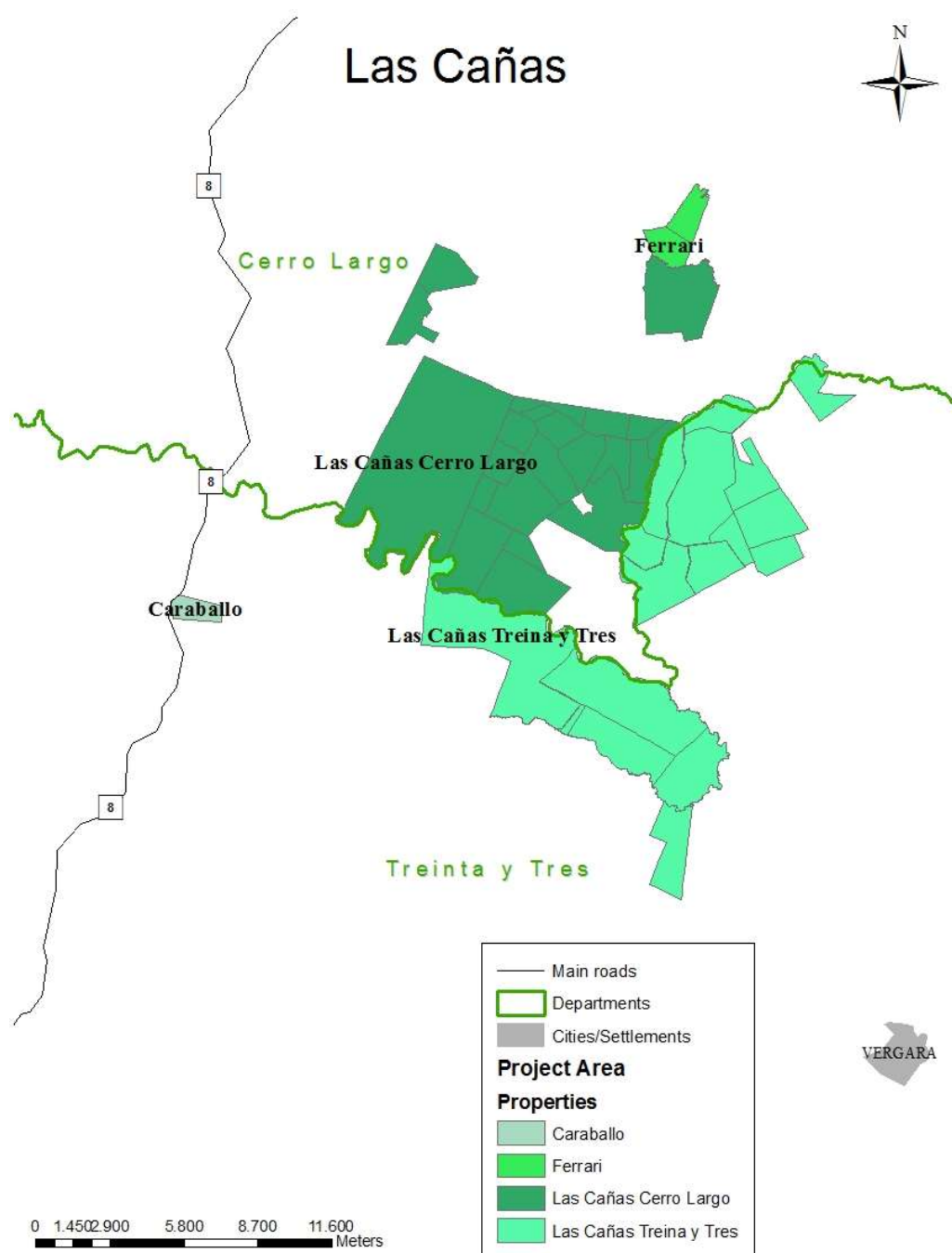


Figure 4. Location of properties which make up the region Las Cañas

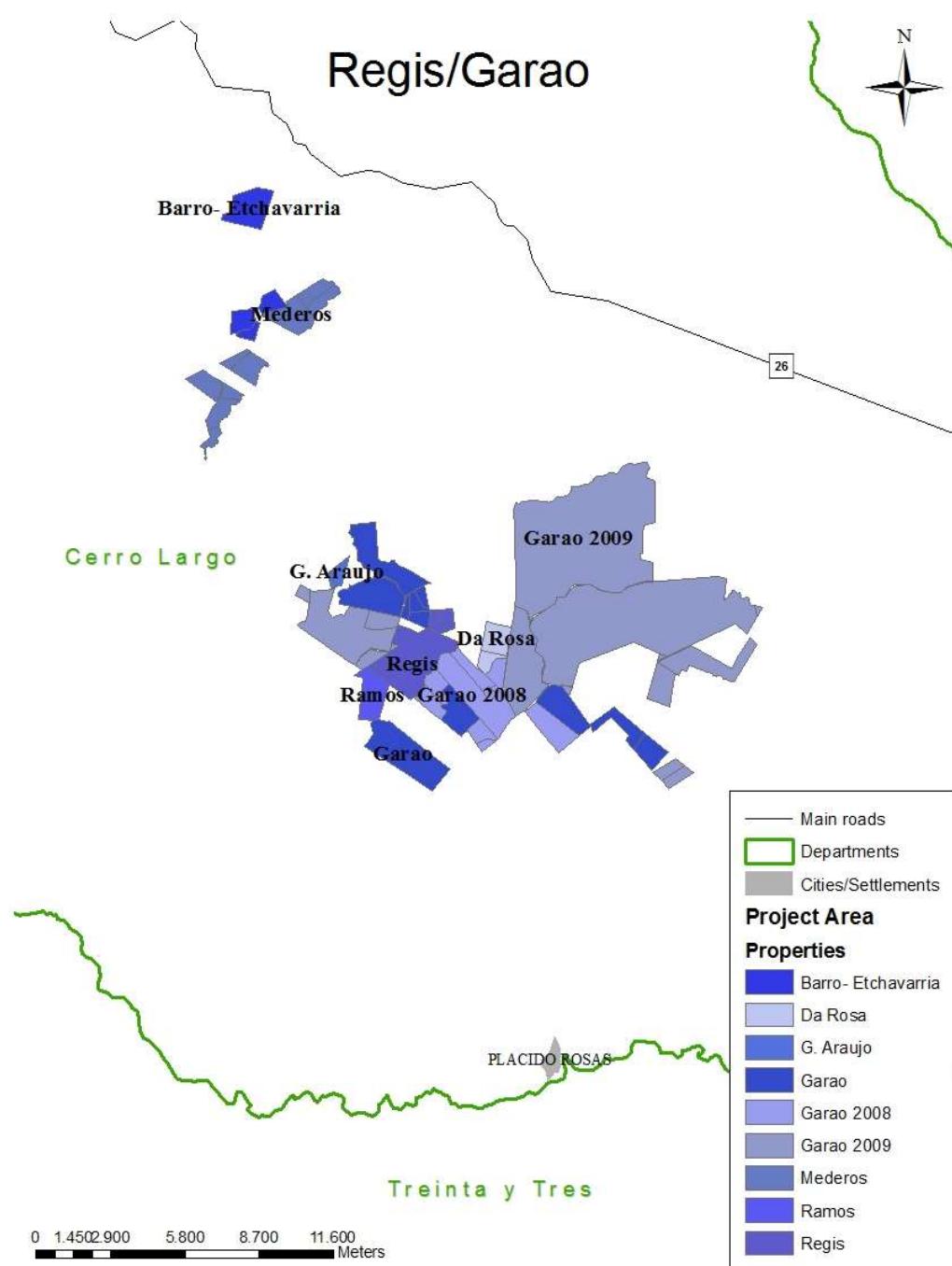


Figure 5. Location of properties which make up the region Regis/Garao

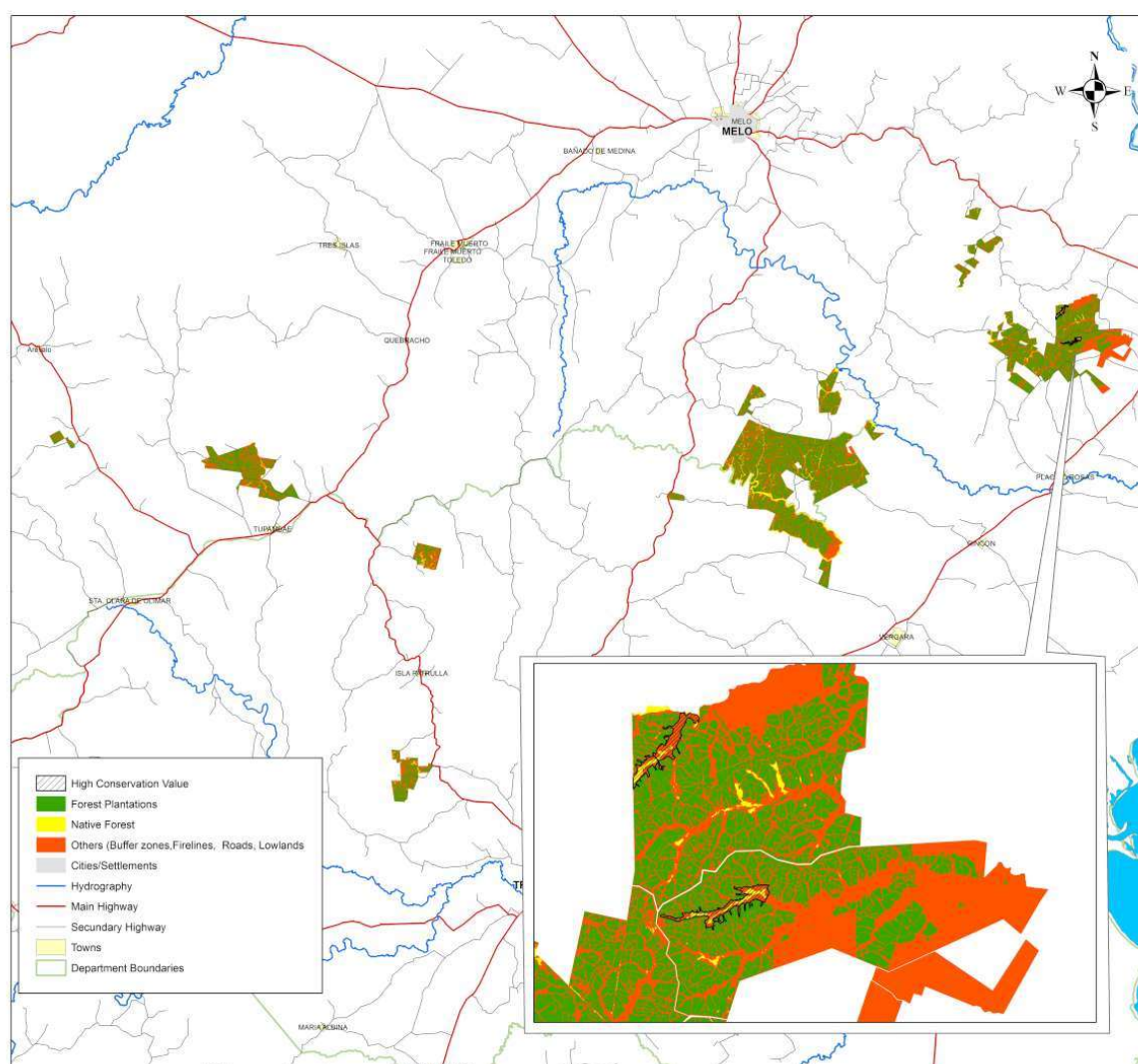


Figure 6. Guanaré/FAS Project Land Use

Location of communities

Communities in the project area or local communities are understood as communities 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 as that their economies, rights or environments are significantly affected by 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 in the forest. Communities reside in rural areas, towns, villages or even cities in the project area of influence. Large cities are not considered as part of the community analysis given that the population is big enough not to be affected by the project. 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. **Table 1** presents a summary of the census information of the area surrounding the project in an area of approximately 20,000 km².

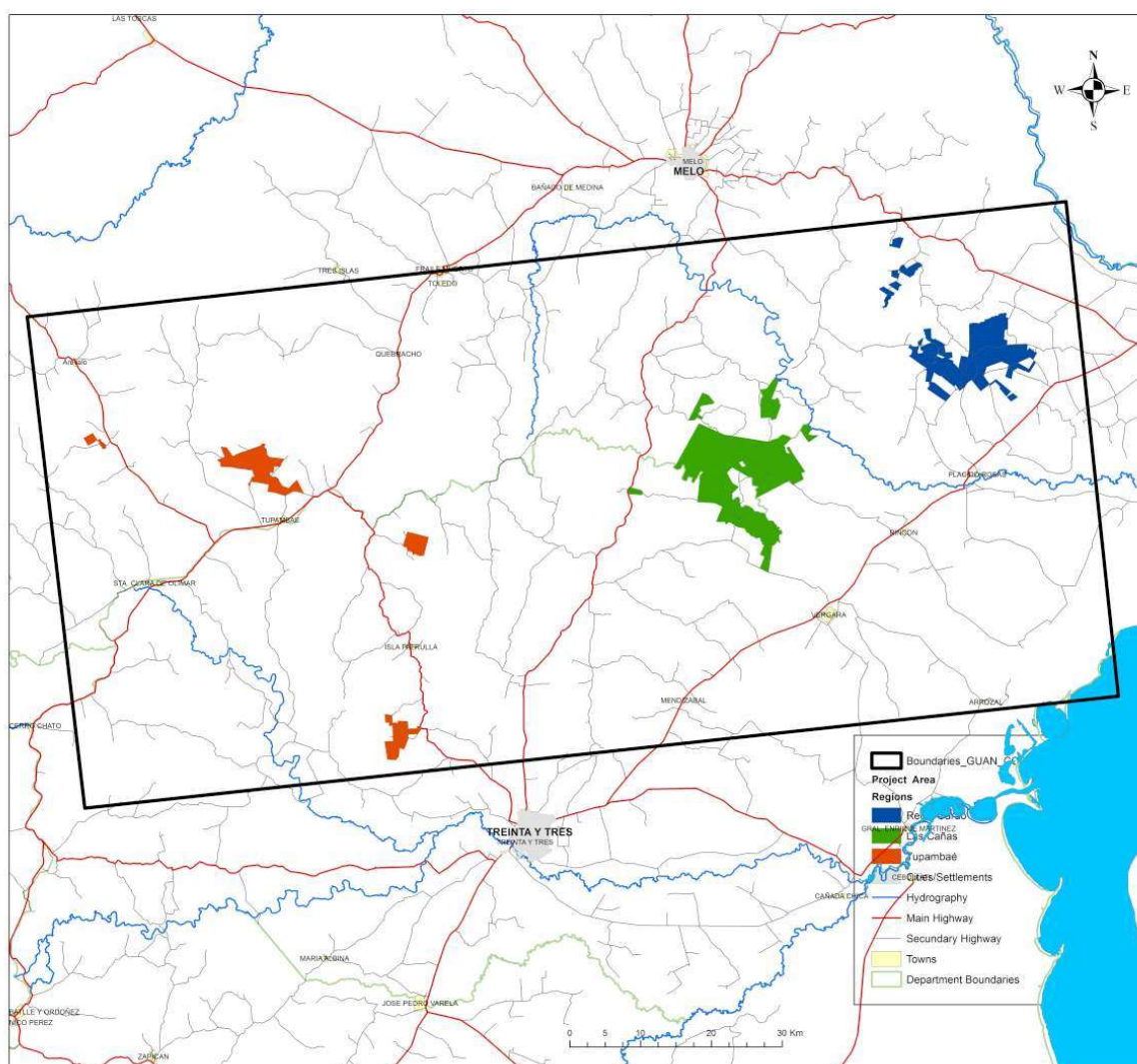


Figure 7. Location of properties which make up the Guanare project divided by region

Demarcation of the area of influence is done using a subjective but efficient method. Almost every community in Treinta y Tres and Cerro Largo is part of the analysis when the limit is put at 15km south to the southernmost farm, 15 km east to the eastern most farm, 15 km north to the northern most farm and 15km west to the western most farm. National route N° 7, N° 8, N°18 and N° 26 forms the structure of the area of influence and connects most of the communities identified below.

The city of Melo, with 50,578 inhabitants, is the biggest city in the area. The population density in the area is 2.0 inhabitants / km² (including the rural population), lower than the national average (18 hab / km²).

Table 1. Demographic Indicators from the project area

Town	Department	Population					
		Male	Female	Age class (years)			Total
				<20	20-64	>64	
Arevalo	Cerro Largo	43	39	43	34	5	82
Bañado de Medina	Cerro Largo	144	110	109	114	31	254
Cerro Chato	Treinta y Tres	810	851	674	859	128	1.661
Fraile Muerto	Cerro Largo	1.563	1.666	1.204	1.568	457	3.229
Isla Patrulla	Treinta y Tres	119	117	83	121	32	236
Maria Albina	Treinta y Tres	38	36	25	37	12	74
Melo	Cerro Largo	23.880	26.698	18.063	26.484	6.031	50.578
Mendizabal	Treinta y Tres	42	42	40	35	9	84
Placido Rosas	Cerro Largo	237	222	163	242	54	459
Quebracho	Cerro Largo	S/D	S/D	S/D	S/D	S/D	S/D
Rincon	Treinta y Tres	363	379	302	384	56	742
Rio Branco	Cerro Largo	6.541	6.915	4.686	7.333	1.437	13.456
Santa Clara de Olimar	Treinta y Tres	1.135	1.170	852	1.163	290	2.305
Treinta y Tres	Treinta y Tres	12.018	13.693	8.535	13.508	3.668	25.711
Tres Islas	Cerro Largo	113	98	91	109	11	211
Tupambae	Cerro Largo	608	561	451	586	132	1.169
Valentines	Treinta y Tres	87	91	64	95	19	178
Vergara	Treinta y Tres	1.983	2.003	1.435	2.068	483	3.986
Total		49.724	54.691	36.820	54.740	12.855	104.415
%		48%	52%	35%	52%	12%	100%

In the affected departments, according to the 2004 National Population and Housing Census, life expectancy at birth is 71.3 years for men and 79.0 years for women, similar figures for the national average. The urban population is 88% and the growth rate of the population is on average 0.1% per year. The birth and mortality rates are 1.6% and 1.0% per year, respectively, which evidences, in comparison with the rate of change of the population, the occurrence of an important emigration process.

The area in which the project focuses presents high poverty rates. The average income of the households of the affected departments was \$ 9,900 / month in 2004, 30% lower than the national average. As shown in **Figure 8**, in the census sections located around the project site, between 5 and 30% of households are below the poverty line.

Proporción de hogares bajo la línea de pobreza por segmento censal. Áreas Rurales.

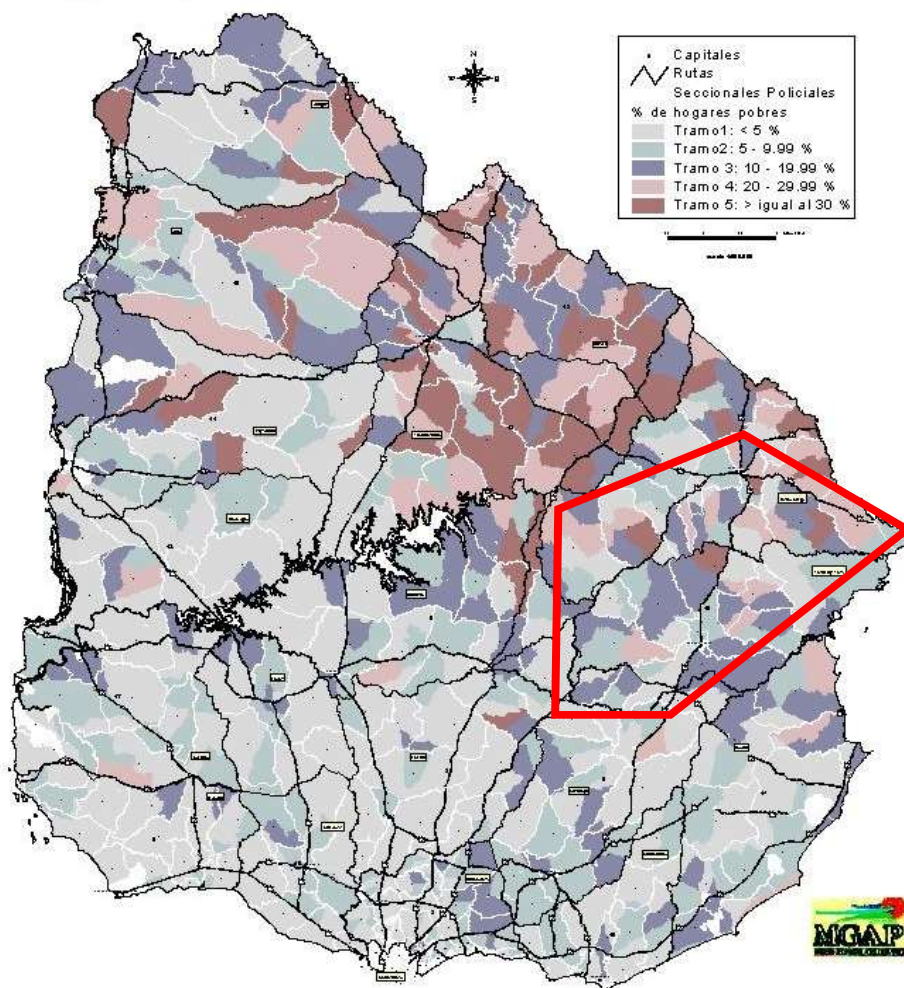


Figure 8. Proportion of households under poverty line in rural areas

2.1.6 Stakeholder Identification (G1.5)

Definition of stakeholder under this analysis is a person, group or organization that has interest or concern in Guarané/FAS. Stakeholders can affect or be affected by the organization's actions, objectives and policies. But not all stakeholders are equal. Primary stakeholders, which are essential for the operation of the organization, that is, all those who have a direct economic relationship with the company. Secondary stakeholders, which are those who do not participate directly in the company's activities, but who are nevertheless affected by it.

The project is located in the Center-east region of Uruguay, in the departments of Cerro Largo and Treinta y Tres. Excluding major cities, Melo and Treinta y Tres, there are 16 small to medium size populated centers

in the area of incidence and that are affected by project activities, so all the population in these cities/towns are identified as stakeholders (civil society).

Forest plantations needs to be approved by the government of Uruguay and by the local government (in the case of Cerro Largo), so the Uruguayan forestry bureau (Dirección General Forestal) and the National Directorate of the Environment (DINAMA) are also identified as stakeholders. In addition, VCSA and CCBA are also identified as stakeholders.

A group of Guarané/FAS supervisors and managers analyzed different stakeholders (localities, towns, cities). A list of stakeholders was developed, identified and prioritized according to the following criteria (see **Table 2**):

0- It is not from the area of Guarané/FAS influence.

1- Occasionally, services were used or measures were taken, but there are no Guarané/FAS fields in the area (for example: once a contractor lived there or the Mayor (Alcalde) was contacted).

2- It is in Guarané/FAS area of influence, that is, there are nearby fields or services used assiduously or negotiations are carried out (whether or not there are operations in the area)

3- Location affected or potentially affected by Guarané/FAS activities: very close to Guarané/FAS farms. Services are used regularly or procedures (tramites) are carried out, it is affected by the transit of trucks or vehicles.

"Base" - Departmental Cities / Capitals: there is no direct impact, but services are used and interested parties are known

Based on this analysis, different actions strategies were developed. The Social Advisors, Luján Jara and Gustavo Pellerey worked in places identified with 2, 3 and the Cities / Capitals identified as "Base"

Table 2. Stakeholders (localities, towns, cities) identification and categorization

Localidades en el área de influencia de FAS según "Categoría" (Ver Gestión y Monitoreo)			
Localidad	Depto.	Categoría	Contacto Referente de la zona por FAS
Arbolito	Cerro Largo	3	Jiordano Rocha
Arévalo	Cerro Largo	1	Carlos Balparda
Cerros de Amaro	Treinta y tres	2	Jiordano Rocha
Isla Patrulla	Treinta y tres	3	Carlos Balparda
La Calavera	Treinta y tres	2	Jiordano Rocha
La Micaela	Cerro Largo	3	Freddy Araújo
Las Cañitas	Cerro Largo	1	Carlos Balparda
María Albina	Treinta y tres	2	Carlos Balparda
Melo	Cerro Largo	base	Carlos Balparda
Montecito	Cerro Largo	1	Carlos Balparda
Plácido Rosas	Cerro Largo	3	Carlos Balparda
Rincón	Treinta y tres	3	José Zarazola
Santa Clara del Olimar	Treinta y tres	3	Carlos Balparda
Tupambaé	Cerro Largo	3	Carlos Balparda
Vergara	Treinta y tres	3	José Zarazola

Part of the actions taken includes the visit, once a year or as demanded, of Guarané/FAS employees to neighbors living close to the project area. During these visits, Guarané/FAS employees must complete the form shown in **Figure 16**.

As a summary, stakeholders are identified in five groups:

- Public Sector: National Government, Local Government, Uruguayan General Forestry Bureau (Dirección General Forestal- DGF), National Directorate of the Environment (DINAMA), Environmental Ministry (MVOTMA); Firefighters, public health centers, among others
- Private Sector: Society of Forest Producers (SPF), forest contractors' companies, other forest companies, cattle breeders
- Civil Society: communities in small cities, towns and villages as well as Guarané/FAS workers
- ONG's
- Education/ Research: INIA, FAGRO, Rural Schools, LATU

Forestal Atlantico Sur (FAS) is the property manager of Guarané/FAS. The company is in charge of the project administration and overall management. Their activities also include the certification of the forest plantation against FSC, ISO or VCS. As a consequence of knowing their responsibilities against any stakeholders, they have formed an internal team with standardized procedures to manage and attend all stakeholders concerns.

Their first steps is the detection and permanent actualization of the neighbors to Guarané/FAS farms. A detailed spreadsheet file with all neighbors (name, address, telephone number) is available in Guarané/FAS. Guarané/FAS also has a list of all identified stakeholders in the area of influence, that is permanently consulted for communication with them. For the case of Cerro Largo and Treinta y Tres, there 79 identified actors, distributed in eight categories: public sector, police, NGOs, teaching centers, firefighters, commerce, clinic, neighbor. Full list of stakeholders with contact information is available during validation or verification processes.

2.1.7 Stakeholder Descriptions (G1.6, G1.13)

As it is presented in the text above, stakeholders are grouped in five major categories and in primary or secondary stakeholders. This categorization will be used for stakeholder's description.

The public sector is present in the project lifetime at different levels. Identification of stakeholders such as the National Government (tax agency, etc.), local government, Uruguayan General Forestry Bureau (Dirección General Forestal- DGF), National Directorate of the Environment (DINAMA), Environmental Ministry (MVOTMA) is elemental for the establishment of the project. General Forestry Bureau and National Directorate of the Environment are the agencies that gives the approval for the forest establishment. The approval is given by complying with multiple requirements, the most important one is the accomplishment of national decree N° 349/005 "Environmental Impact Assessment". The environmental approval also needs to be maintained through the project lifetime and DINAMA is always present in Guarané/FAS's daily

work. Local government are also an important stakeholder in the public category. After the recent law N°18.308, local governments, such as Intendencia de Cerro Largo and Intendencia de Treinta y Tres, has the legal authority over national government for territorial order. Intendencias has the power to allocate or not new areas for forestry production. In the case of Cerro Largo, the Intendencia has prohibited afforestation activities. In the case of Guarané/FAS, very good relations are maintained with public sector, for the professional work applied to comply with all regulations and for the proactive effort done to promote good forestry practices. Firefighters are also part of the public sector stakeholders, and their involvement to the project is permanent, given the constant interaction to monitor forest and awareness work on civil society about forest fires. But also, when disturbances event take place, and firefighters and army make presence to combat and mitigate fires. Following is a list of stakeholders identified by Guarané/FAS in Cerro Largo, Treinta y Tres and Montevideo.

Table 3. Stakeholders identified by Guarané/FAS in Cerro Largo, Treinta y Tres and Montevideo

Institution	Department	Name	City/Town/Farm	Phone	E-Mail	Scope
Seccional 10º Arbolito	Cerro Largo	Nestor Tejera, Leonardo Cardozo	Arbolito	Confidential	Confidential	Police
Alcaldías	Cerro Largo	Luis Segui	Arbolito	Confidential	Confidential	Public
Municipio de Arbolito	Cerro Largo	Luis Segui	Arbolito	Confidential	Confidential	Public
Policlínica Municipal	Cerro Largo	Angélica Silvera	Arbolito	Confidential	Confidential	Clinic
Alcaldías	Cerro Largo	José Eduardo Lucas Cruz	Arévalo	Confidential	Confidential	Public
Alcaldías	Cerro Largo	Graciela Echenique	Fraile Muerto	Confidential	Confidential	Public
Policlínica La Micaela	Cerro Largo	Gladys Araujo	La Micaela	Confidential	Confidential	Clinic
Oficina Municipal de Tránsito	Cerro Largo	Sandra Rivero	Melo	Confidential	Confidential	Public
Escuela Técnica Superior (ex UTU)	Cerro Largo	Carlos Vaz, Victoria Maguna, Iliana Icase	Melo	Confidential	Confidential	Public
Intendencia Municipal de Cerro Largo	Cerro Largo	Ec. Luis Sergio Botana	Melo	Confidential	Confidential	Public
Junta Departamental de Cerro Largo	Cerro Largo	Ary Ney Sorondo	Melo	Confidential	Confidential	Public
Policlínica Municipal	Cerro Largo	Paola Rocha	Placido Rosas	Confidential	Confidential	Clinic
Seccional 13 Placido Rosas	Cerro Largo	Fabrizio Díaz	Placido Rosas	Confidential	Confidential	Police
Alcaldías	Cerro Largo	Diego Fernandez	Placido Rosas	Confidential	Confidential	Public
Alcaldías	Cerro Largo	Jorge Pereira, Blanca Morales	Placido Rosas	Confidential	Confidential	Public
Policlínica Rincón	Cerro Largo	Elizabeth Aristimuño	Rincón	Confidential	Confidential	Clinic
Seccional Nº 3 Pueblo Rincón	Cerro Largo	Cristian Duarte, Germán Castro	Rincón	Confidential	Confidential	Police
Junta Local Rincón	Cerro Largo	Pablo Manini	Rincón	Confidential	Confidential	Public
Policlínica ASSE	Cerro Largo	José Luis Cunha, Nelly Iza, Emilia Mastropierro	Tupambaé	Confidential	Confidential	Clinic
Seccional 8º Tupambaé	Cerro Largo	Pedro Alvarez, Sebastián Sanchez (entrevistado)	Tupambaé	Confidential	Confidential	Police
Alcaldías	Cerro Largo	Douglas Lucas	Tupambaé	Confidential	Confidential	Public
As Civil Uruguay Trabaja - Tpbáe Plan	Cerro Largo	Hilda Madruga	Tupambaé	Confidential	Confidential	Public with Agreement
Juzgado de Paz Tupambaé	Cerro Largo	Hugo Prieto Morales	Tupambaé	Confidential	Confidential	Public
Ministerio de Interior	Montevideo	Crio. Mayor Leandro Palomeque	Montevideo	Confidential	Confidential	Public
Congreso Nacional de Intendentes	Montevideo	Dr. Marne Osorio	Montevideo	Confidential	Confidential	Public
MGAP Dirección Recursos Naturales	Montevideo	Ing. Agr. Mariana Hill	Montevideo	Confidential	Confidential	Public
MGAP Director General Forestal	Montevideo	Ing. Pedro Soust	Montevideo	Confidential	Confidential	Public
M.V.O.T.M.A. / DINAMA	Montevideo	Director Ing. Quim Alejandro Nario / Ing. Beatriz Neves	Montevideo	Confidential	Confidential	Public
Ministerio de Trabajo y Seguridad Social	Montevideo	Inspector General Gerardo Rey	Montevideo	Confidential	Confidential	Public
Cooperativas Agrarias Federadas	Montevideo	Virginia San Martín	Montevideo	Confidential	Confidential	Public
Camara de Industrias del Uruguay	Montevideo	Gabriel Murara	Montevideo	Confidential	Confidential	Public
Facultad de Agronomía (FAGRO)- Departamento Forestal	Montevideo	Irisity/ Daniluk / Aguerre / Ferrazini	Montevideo	Confidential	Confidential	Public
Grupo de Desarrollo de Estándares (+ENR) - FAGRO /Dpto Ftal	Montevideo	Irisity / Aguerre/Ferrazini	Montevideo	Confidential	Confidential	Public
MGAP / Dirección General de Servicios Agrícolas	Montevideo	Ing. Montes	Montevideo	Confidential	Confidential	Public
Comisaría 4ta Sección	Treinta y Tres	Alcides Morales, Martín Gadea	Cerros de Amaro	Confidential	Confidential	Police
Policlínica Municipal	Treinta y Tres	Lilian Bueno	Cerros de Amaro	Confidential	Confidential	Clinic
Seccional Policial 4ta	Treinta y Tres	José Luis Charquero	Isla Patrulla	Confidential	Confidential	Police
Policlínica Municipal	Treinta y Tres	Graciela Martirena	Isla Patrulla	Confidential	Confidential	Clinic
Policlínica Municipal	Treinta y Tres	Leticia Rosas	La Calavera	Confidential	Confidential	Clinic
Sala Auxiliar ASSE	Treinta y Tres	Dra. Elisa Morales	Sta. Clara de Olimar	Confidential	Confidential	Clinic
Municipio	Treinta y Tres	Oscar Viera, Judith Jiménez, Walter Fonseca (entrevistado)	Sta. Clara de Olimar	Confidential	Confidential	Public
Seccional Policial 8va	Treinta y Tres	Crio. Victor Rodriguez, Sgo. Carmen Díaz	Sta. Clara de Olimar	Confidential	Confidential	Police
M.V.O.T.M.A.	Treinta y Tres	Daniela Lemes	Treinta y Tres	Confidential	Confidential	Public
Intendencia Municipal de Treinta y Tres	Treinta y Tres	Dr. Dardo Sánchez	Treinta y Tres	Confidential	Confidential	Public
Junta Departamental de Treinta y Tres	Treinta y Tres	Guzman Contreras	Treinta y Tres	Confidential	Confidential	Public
Cuartelillo de Bomberos Vergara	Treinta y Tres	Suf Of May Yubert Pérez, Rodrigo Machado bombero	Vergara	Confidential	Confidential	Firefighters
Oficina Turismo	Treinta y Tres	Victoria Silvera	Vergara	Confidential	Confidential	Public
Municipio de Vergara	Treinta y Tres	Alc Fidencio González, Dario Pereira	Vergara	Confidential	Confidential	Public
Seccional 9º Vergara	Treinta y Tres	Crio Daniel Fleitas	Vergara	Confidential	Confidential	Police
Policlínica Mpal Ma Albina	Treinta y Tres	Victoria Delgado	Villa María Albina	Confidential	Confidential	Clinic
Subcomisariado Seccional nro 7	Treinta y Tres	Julio Cesar Segovia	Villa María Albina	Confidential	Confidential	Police

Private sector is another stakeholder group identified by Guanaré/FAS. The “Sociedad de Productores Forestales - SPF” (Society of Forest Producers) is the entity that nucleates the private forestry sector. Nelson Ledesma, General Manager of Guanaré/FAS, is part of the directorate of the SPF. There are also other primary stakeholders in the private sector identified by Guanaré/FAS. All forest contractor’s companies that have been hired by the project developer are part of the groups with direct incidence. Small to medium enterprises providing services for land preparation, ant control, pruning, thinning or clear-cuts are identified stakeholders. Other forestry companies are present in the project area of influence. The relation between them is formally happening through the Sociedad de Productores Forestales, but also informally on the field. Uruguayan culture in isolated areas includes the assistance to colleagues in any matter, which is the case of forestry workers (or other sectors workers) among themselves.

Table 4. Private sector stakeholders identified by Guanaré/FAS in Cerro Largo, Treinta y Tres and Montevideo

Institution	Department	Name	City/Town	Phone	E-Mail	Scope
Parador Arbolito	Cerro Largo	Lidia Da Costa	Arbolito	Confidential	Confidential	Commerce
Hotel Crown	Cerro Largo	Sr. Enrique López	Melo	Confidential	Confidential	Commerce
Almacen Don Juan	Cerro Largo	Carlos Saravia	Tupambaé	Confidential	Confidential	Commerce
Parador Rosil	Cerro Largo	Mario Marengo	Tupambaé	Confidential	Confidential	Commerce
Estacion de Servicio ANCAP	Cerro Largo	Jorge Peretti	Tupambaé	Confidential	Confidential	Commerce
Farmacia Santa Higinia	Cerro Largo	Danée Viera Coteló	Tupambaé	Confidential	Confidential	Commerce
Bren S.A	Montevideo	Ignacio Arcos Perez	Montevideo	Confidential	Confidential	Contractor
Pinalook S.A	Montevideo	Jorge Lorenzo	Montevideo	Confidential	Confidential	Contractor
Cendan LTDA	Montevideo	Ruben Cendan	Montevideo	Confidential	Confidential	Contractor
Almacén	Treinta y Tres	Daniel Oyambure	Isla Patrulla	Confidential	Confidential	Commerce
Autoservice Minimar	Treinta y Tres	Angélica Ferreira	Sta. Clara de Olimar	Confidential	Confidential	Commerce
Pizzeria Km0	Treinta y Tres	Marisol Mieres	Vergara	Confidential	Confidential	Commerce
Ex Almacén el Milagroso	Treinta y Tres	Carlos Barbat	Villa María Albina	Confidential	Confidential	Commerce

Civil society is the third detected group of stakeholders to the project. Civil society are residents in small towns in the area of incidence to the project and neighbors to the project sites. Neighbors are key actors for the project development. Their continuous presence in the area of influence makes this group a relevant player when project impact is assessed. Many positive but also negative effects are being monitored in such neighbors. Civil society has a claim/complaint forms that can be used to express their concerns about any activity implemented by Guanaré/FAS, see section 2.3.7 and 2.3.8. There is no formal mechanism established to identify neighbors, but once there is at least one interaction, the company keeps contact of the person with periodic monitoring visit.

Table 5 shows the identified actors of the civil society that are part of the permanent consultation group. The list includes all the neighbors visited in the year 2018.

Table 5. *Civil society stakeholders list*

Nombre	Institución	Contacto	Campo de influencia (Guanaré)	Seccional
Sergio Fernandez Loza		Confidencial	Aigua	
Hugo Bustamante		Confidencial	Aigua	
Victor Lago	Seccional 3°	Confidencial	Azotea Ramirez	3° Treinta y Tres
Cecilia Brogliatti	Escuela N° 61 Rincón	Confidencial	Azotea Ramirez	
Elvira Pereira		Confidencial	Barros	12° Cerro Largo
Felipe Ferraro		Confidencial	Burgos	12° Cerro Largo
Mª Esther Antunez		Confidencial	Burgos	12° Cerro Largo
Sony Gladys Leyviera		Confidencial	Burgos	12° Cerro Largo
Gonzalo Lados		Confidencial	Campanero/Campanerito	
Carlos Peña		Confidencial	Campanero/Campanerito	
Julio Cesar Iturburu		Confidencial	Campanero/Campanerito	
Julio Peña		Confidencial	Carape	
Wanderey Gallo	SECCIONAL 13° Placido Rosas	Confidencial	Casas	
Graciela Rodríguez	Escuela N°29 Placido Rosas	Confidencial	Casas	13° Cerro Largo
Eloy Martinez		Confidencial	Casco Azul	
Robert Galeano		Confidencial	Casco Azul	
Elbio Denis		Confidencial	Casco Azul	
Diego Pereira		Confidencial	cuchillas 1	
Raquel Maza	Escuela 91	Confidencial	cuchillas 2	
Horacio Gutierrez		Confidencial	cuchillas 2	
Claudia Bitancurt		Confidencial	Curva	
Roberto Gonzalez		Confidencial	Curva	
Alexandra Martinez	Escuela N° 95 Arroyo Malo	Confidencial	Delleplane	
Laura Fernandez	Escuela N°16 Don Carlos	Confidencial	Don Carlos	
Andres Sabeta		Confidencial	Echeverria	
Fernando Correa	Seccional 4°	Confidencial	El Gavilan	4° Treinta y Tres
Martha Susana Montiel		Confidencial	El Gavilan	
Enrique Casteris		Confidencial	El Juncal	
Violeta Arvelo Hernandez		Confidencial	El Metal	3° Lavalleya
Marcia Acosta		Confidencial	El Metal	3° Lavalleya
Alfredo Aviaga		Confidencial	El Metal	3° Lavalleya
Maria Ocampo		Confidencial	El Metal	3° Lavalleya
Berto Ramos		Confidencial	El Metal	3° Lavalleya
Mª del Verdun Pelua Ximeno		Confidencial	El Metal	6° Lavalleya
Oclesio Varzola		Confidencial	El Metal	6° Lavalleya
Alfredo Sanchez		Confidencial	El Metal	
Violeta Arevalo	Secc 3ra	Confidencial	El Metal	
Guadil de León		Confidencial	El Metal	
Maria Isabel Martinez	Escuela N°64	Confidencial	El Orejano	
Maria Inés Martinez	Escuela N°64	Confidencial	El Orejano	
Alfredo Aviaga		Confidencial	El Orejano	
Nelson Aguirre		Confidencial	El Orejano	
Antonio Almeida		Confidencial	El Yugo	4° Cerro Largo
Junior Gonzalez		Confidencial	El Yugo	4° Cerro Largo
Paulo Martins		Confidencial	El Yugo	4° Cerro Largo
Yaqelin Denis	Escuela N° 21	Confidencial	El Yugo	4° Treinta y Tres
Juan Casuriaga	Escuela N° 67	Confidencial	El Yugo	Treinta y Tres
V Falchetti		Confidencial	Espinillo	
Alison Gomez		Confidencial	Espinillo	
Marianela Garcia		Confidencial	Espinillo	
José Moreira		Confidencial	Ferrari	
Niber Barboza	Empleado Municipio Arbolito	Confidencial	Ferrari	
Matias Gonzalez		Confidencial	Ferrari	
Carmelo Gonzalez		Confidencial	Gonzalez Araujo	
Yonathan Antunez		Confidencial	Gonzalez Araujo	
Nelson Pereira		Confidencial	Horizonte	
Nelson Casas		Confidencial	Horizonte	
Alexandra Ojeda		Confidencial	Iacovazzo	11° Treinta y Tres
Lidia Crossa	Escuela N° 15/ Liceo Rural	Confidencial	Jean Palacios	11° Zapican
Gladys Araujo Silva	Políclinica	Confidencial	La Micaela	
Jesus Eduardo Nuñez		Confidencial	La Micaela	
Michela Rivero	Escuela N° 72 La Micaela	Confidencial	La Micaela	
Camilo Mederos		Confidencial	La Micaela	
Carlos Maria Barros		Confidencial	La Micaela	
Fernando Brum	Escuela N° 32 Godoy	Confidencial	La Ratona	
Miriam Lago	Escuela N° 35	Confidencial	Las Cañas	10° Cerro Largo
Ricardo Peña	Seccional 10° Arbolito	Confidencial	Las Cañas	10° Cerro Largo
Adela Centurion	Escuela N° 31 Las Caperuzas	Confidencial	Las Caperuzas	
Priscilla Urioste		Confidencial	Las Gargantas	6° Lavalleya

Nombre	Institución	Contacto	Campo de influencia (Guanaré)	Seccional
Edward Maguna	SECCIONAL 6° Barriga Negra	Confidencial	Las Gargantas	6° Lavalleja
Claudia Adelina Rodriguez Alonso		Confidencial	Las Gargantas	6° Lavalleja
Sergio Fernandez		Confidencial	Las Gargantas	6° Lavalleja
Gabriela Madrid	Escuela N°57	Confidencial	Las Gargantas	
Selso Perez		Confidencial	Las Gargantas	
Gustavo Aviaga		Confidencial	Las Gargantas	
Julio Cesar Miraballes	Secc 6ta	Confidencial	Las Gargantas	
Luis Alberto Silva Diaz		Confidencial	Lomas Blancas	
Juana Teresa Silva Diaz		Confidencial	Lomas Blancas	
Rosa Velazquez	Escuela N°64	Confidencial	Lomas Blancas	
Homero Silveira		Confidencial	Los Molles	
Florencia Luca		Confidencial	Luce	
Wasinton Umpierrez		Confidencial	Marmaraja	
Nelson Fernandez		Confidencial	Marmaraja	
Santiago de Barbieri		Confidencial	Marmaraja	
Karen Campelo		Confidencial	Mederos	13° Cerro Largo
Ana Maria Pereira		Confidencial	Mederos	13° Cerro Largo
Mª Eugenia Araujo		Confidencial	Mederos	13° Cerro Largo
Alejandra Cidade	Escuela N° 62	Confidencial	Olimar chico	11° Zapican
Manuel Echeverria		Confidencial	Paiva	4° Treinta y Tres
Paola Rodriguez		Confidencial	Puntas de Barriga Negra	
Sergio Fernandez			Puntas de Barriga Negra	
Gabil de Avila		092 951348	Ramos	13° Cerro Largo
Hugo Vergara		099 705737	Ramos	13° Cerro Largo
Coralio Dario Gonzalez		094 191638	Ramos	13° Cerro Largo
Ana Carina Lauz	Escuela N°95	094 048681-44505086	Retamosa	
Karina Lucas	Escuela N°76	099 218666-44505094	Retamosa	
Karina Lucas	Escuela N°76	099 218666 4450 5094	Retamosa	
Brenda Fernandez		098 358429	Roble Dorado	7° Lavalleja
Mabel Aviga		099 499496	San Francisco	
Juvenal Legizamon		092 505641	San Francisco	
Antonio Sosa		098 414046-098414048	San Francisco	
Rosendo Rotela		4442 7040	Santa Clara	
Wilson Caseres		095 222869	Santa Clara	
Luis Rotela		444 26572-099847334	Santa Clara	
Santa Clara Solana		4470 2349	Santa Paula	
Roberto Fernandez		098 854610	Santa Paula	
Walter Cruz		--	Santa Paula	
Alberto Heber		099 686942	Santa Paula	
Fernando Piriz		099 892526	Santa Paula	
Luicia Ereo		092 203539	Santa Paula	
Karina Santos		098 139064	Santa Paula	
Gladys Ferreira		098 545159	Santa Paula	
Nestor Pereyra		099 299572	Santa Paula	
Nelly Umpierrez		0440 6013	Santa Paula	
Jaime Techera		098 923062	Santa Paula	
Dalana Correa	Escuela N° 51	4470 2587	Santa paula	
Graciela Perez	Escuela N°42 Parralle	098 855297	Santa Sabrina	
Rudy Monteiro		099 415921	Santa Sofia	13° Cerro Largo
Rudy Monteiro		098 815709	Santa Sofia	
Judy Alegre		099 492533	Santa Susana	
Laura Techea		095 975261	Techera	
Ruben sequeira		099 800146	Tupambae	
Sandra Fernandez		091 678441- 091 036955	Tupambae	
Guillermo Escoto		099 049717	Tupambae	
Juan Antonio Godiño		4640 4147	Tupambae	
Luis Pablo Barboza		091 036955-46404192	Tupambaé	8° Cerro Largo
Juan Antonio Godiño		4640 4147	Tupambaé	8° Cerro Largo
Rodolfo Arancet		098 125253	Tupambaé	8° Cerro Largo
Gustavo Cejas		092 885185	Tupambaé	8° Cerro Largo
Enique Marin		4640 4085	Tupambaé	8° Cerro Largo
Claudia Amaral	CAIF	4688 9301	Tupambaé	
Nidia Sainz		099 866214	Valentines Fas	
Julio Diego Goday		098 235944	Valentines Fas	
Carlos Grover		099 770296	Valentines Fas	
Maria Denis Ocampo		094 017900	Verdún	13° Lavalleja
Juan Carlos Toledo		099 815220	Verdún	4° Lavalleja
Ruben Martinez		098 052757	Yanucal	
Antonio Zito		099 936680	Zito	

NGOs are present in that region. There is no formal method to identify NGO because they are very well known and with strong activity when referring to forestry in Uruguay, especially environmental NGOs. Guarané/FAS also has a list of NGOs that has been in contact with the company and to which Guarané/FAS have interest to be present in any organized activity. The following table shows the identified NGOs in Cerro Largo, Treinta y Tres and Montevideo.

Table 6. List of NGOs in Cerro Largo, Treinta y Tres and Montevideo

Institution	Department	Name	City/Town/Farm	Phone	E-Mail	Scope
Mano Amiga	Cerro Largo	Katerin Maubrigades	Melo	Confidential	Confidential	NGO
Tupambaé Plan	Cerro Largo	Ana María Tisnes - María Luisa Lucas	Tupambaé	Confidential	Confidential	NGO
REDES Amigos de la Tierra	Montevideo		Montevideo	Confidential	Confidential	NGO
CEUTA	Montevideo	Alberto Gomez Perazzoli	Montevideo	Confidential	Confidential	NGO
Federacion Rural	Montevideo	Jorge Riani	Montevideo	Confidential	Confidential	NGO
Retema	Montevideo	Ing. Carolina Ramirez	Montevideo	Confidential	Confidential	NGO
Asociacion rural de Uruguay	Montevideo	Dr. Vet Pablo Zerbino	Montevideo	Confidential	Confidential	NGO
Red Uruguaya de ONG's Ambientalistas	Montevideo	Graciela Salaberry	Montevideo	Confidential	Confidential	NGO
Centro Latino Americano de Ecología Social - CLAES	Montevideo	Eduardo Gudynas	Montevideo	Confidential	Confidential	NGO
PIT-CNT / SOIMA	Montevideo	Fernando Oyanarte Sr. Hugo De los Santos	Montevideo	Confidential	Confidential	NGO
RAPAL	Montevideo	María Cárcamo	Montevideo	Confidential	Confidential	NGO
Mov. Mundial por los Bosques Tropicales	Montevideo	Winfriedus Overbeek	Montevideo	Confidential	Confidential	NGO
ONG Vida Silvestre	Montevideo	Enrique González	Montevideo	Confidential	Confidential	NGO
GEO Treinta y Tres Grupo Eto-ecologista Olimareño	Treinta y Tres	Esc. Ricardo Ramirez	Treinta y Tres	Confidential	Confidential	NGO
Cooperativa Agraria Quebrada de los Cuervos	Treinta y Tres	Eduardo Gonzalez	Treinta y Tres	Confidential	Confidential	NGO
ONG Grupo Envira	Treinta y Tres	Esc. José Luis Cuello Nuñez	Vergara	Confidential	Confidential	NGO
Entidad Naturista Vergarense de Investigación Y Resguardo Ambiental "ENVIRA"	Treinta y Tres	Dr. Jorge Pirez Bello	Vergara	Confidential	Confidential	NGO

The last group of stakeholders are the investigation institution and educational centers. Many rural schools are present in the area of influence and Guarané/FAS has a strong commitment to support their activities.

Table 7. List of educational centers in project's area of influence (Cerro Largo and Treinta y Tres)

Institution	Department	Name	City/Town/Farm	Phone	E-Mail	Scope
Escuela N° 35 Arbolito	Cerro Largo	Miriam Lago	Arbolito	Confidential	Confidential	Teaching center
Escuela Arroyo Malo	Cerro Largo	Daiana Ferreira	Arroyo Malo	Confidential	Confidential	Teaching center
Escuela N° 72 La Micaela	Cerro Largo	Michele Rivero	La Micaela	Confidential	Confidential	Teaching center
Escuela N° Plácido Rosas	Cerro Largo	Graciela Rodriguez	Plácido Rosas	Confidential	Confidential	Teaching center
Escuela N° 67	Cerro Largo	Patricia Carrero	Rincón	Confidential	Confidential	Teaching center
Liceo Tupambaé	Cerro Largo	Maximiliano Álvarez	Tupambaé	Confidential	Confidential	Teaching center
Escuela N° 9 Tiempo Completo Tupambaé	Cerro Largo	Yelsi Olivera	Tupambaé	Confidential	Confidential	Teaching center
Escuela N° 67	Treinta y Tres	Marisol Daer	Cerro de Amaro	Confidential	Confidential	Teaching center
Escuela N° 3	Treinta y Tres	Fanny García	Isla Patrulla	Confidential	Confidential	Teaching center
Escuela N° 12	Treinta y Tres	Patricia Sasía	La Calavera	Confidential	Confidential	Teaching center
Escuela Agraria	Treinta y Tres	Ing. Agr. Virginia Olivera	Sta. Clara de Olimar	Confidential	Confidential	Teaching center
Liceo	Treinta y Tres	Gioconda Pérez, Andrea Silvera (entrevistada)	Sta. Clara de Olimar	Confidential	Confidential	Teaching center
Escuela N° 47	Treinta y Tres	José Arismendi, Ana Claudia Suarez	Sta. Clara de Olimar	Confidential	Confidential	Teaching center
Escuela N° 19	Treinta y Tres	Sandra Gómez	Sta. Clara de Olimar	Confidential	Confidential	Teaching center
Liceo Vergara	Treinta y Tres	Isabel Carrasco	Vergara	Confidential	Confidential	Teaching center
Liceo Vergara	Treinta y Tres	Yanet Salaberry	Vergara	Confidential	Confidential	Teaching center
Escuela Agraria Vergara	Treinta y Tres	Guillermo Sensian, Andrea Souza	Vergara	Confidential	Confidential	Teaching center
Escuela N° 24	Treinta y Tres	Juán Casuriaga	Villa María Albina	Confidential	Confidential	Teaching center

2.1.8 Project Activities and Theory of Change (G1.8)

The main contribution of Guarané/FAS project activity is the eradication of rural poverty through the generation of high quality and stable employment, in a region of Uruguay with elevated levels of poverty. Creation of employment is one of the main social benefits of the project. Typically, an extensive livestock production system employs 1.4 persons every 1,000 ha. Guarané/FAS project is expected to multiply that figure by more than 20.

Project activity consists in the establishment of forest on land that had previously been under grassland for more than 300 years. It was developed under the VCS scope 14: "Agriculture, Forestry and Other Land Use" as an "Afforestation, Reforestation and Revegetation project. 'Guarané' afforestation on degraded grazing land is a single GHG Project.

The project comprises a total area of 18,576 ha with a long history of grazing by beef cattle, activity that have caused soil erosion and land degradation. Forest plantation for obtaining pulp and saw wood and removing carbon dioxide from the atmosphere are being established since 2006.

The project activity is implemented on degraded land, which is expected to continue to degrade in the absence of the project and hence the land cannot be expected to revert to a non-degraded state without human intervention.

Forests consist of *Eucalyptus grandis* and to a lesser extent *Eucalyptus dunnii* and Pinus taeda plantations managed with a rotation length of 16 to 22 years. The plantations are established on land previously used for cattle grazing. The implementation of the project activity will not cause any displacement of cattle.

The main objectives of the project activity are wood production, land restoration and carbon sequestration through afforestation. Forest plantation has been completed by year 5 of project and forest will be replanted after clear-cut harvest. Project crediting period is 60 years and project lifetime is 100 years. All practices will be compatible with FSC standard for sustainable forest management.

Planted forests will remove carbon dioxide from the atmosphere and store it in different carbon pools (living above-ground and below-ground biomass, soil organic carbon, litter and dead wood). All these carbon pools will be accounted towards issuance of VCUs. However, due to methodology provisions, only above ground biomass, litter and dead wood will be monitored.

In the fields where FORESTAL ATLÁNTICO SUR operates, environmental assessments and impact surveys are carried out by a team of experts. Based on the results obtained in these studies, management and monitoring plans have been developed for the restoration of natural systems which may have been affected by previous practices (agricultural, farming, forestry or other activities), the conservation of natural resources and values in the influence areas (flora, fauna, soils and hydric resources) and the prevention or mitigation of environmental impact caused by forestry operations.

2.1.9 Climate, Biodiversity and Community Benefits Assessment Period (G1.9)

The time period over which changes in GHG emissions, climate change adaptive capacity and resilience, biodiversity and community well-being resulting from the project activities are monitored is 24 April 2006 to 24 April 2066.

2.1.10 Differences in Assessment Periods (G1.9)

There is no difference between the GHG emissions accounting, climate adaptive capacity and resilience, community and biodiversity assessment periods.

2.1.11 Implementation schedule (G1.9)

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	Guanaré/FAS continued presenting forest projects to Forest Directorate and EIA to Environmental office
2012-2019	Annual Biodiversity survey reports of the project was completed
2006	Project was FSC Certified (not all the area)
2013	Total area of the project became FSC Certified
2006-2019	Annual Community activities were performed
2008-2019	Silvicultural activities started (pruning and, thinning)
2015-2019	First commercial thinning was implemented
2013	VCS Carbon sequestration project was validated and verified

2.1.12 Risks to the Project (G1.10)

Identify Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
Fire	The risk of fires in commercial forests plantations in Uruguay is very low due to reduced population density and a very humid climate. Normally forest fires in Uruguay only occur in summer in the coastal areas of the South and Southeast	In compliance with national regulations, Guanaré/FAS has implemented an extensive plan to prevent forest fires. There are many preventive activities such as: i) establishment of a network of firebreaks surrounding forests blocks with an area not larger than 50 ha; ii) the

	of the country, associated with the tourism activity. In spite of prevention activities, fires can happen. In that case, equipment and staff (own and contracted) is ready and trained for fire fighting.	introduction of cattle in early stages of the forestation for maintaining pastures short and green, thus reducing the volumes of fuel; iii) permanent surveillance of the project area, particularly at times of medium to high risk of fire; iv) burning as possible technique for cleaning fields is particularly excluded; vi) warning signs with risk of fire are placed next to forest sites; vii) transit of non-authorized hunters, hikers or campers is forbidden; viii) fire extinguishers must set in vehicles (including tractors) that circulate in the property; viii) PAIF program to detect and prevent fires during summer was implemented since 2013¹²
Diseases and Insects	There could be diseases and insects that may damage the planted trees, but the diseases and insects will be prevented by routine overseeing.	Upon routine overseeing, the diseases will be treated immediately by biological control once occurred. The chemical pesticides are allowed to be used only if there is a serious pest problem erupted in the project area, and the pesticides will be used in accordance with the National Pesticides Policy and FSC standard
Wind	Another risk is related to an eventual increase in felling off or damage to trees by wind storms. Intensive thinning of eucalypt plantations is known to increase the risk of wind damages due to the opening of wide spaces within the forest that may channel the wind and increase its speed, aggravated by the vulnerability of tall trees. There is no information on an eventual increase in this vulnerability in thinned stands with very tall trees such as those with ages 20 or more, but there have been some cases of plantations losses due to strong wind storms	High density initial plantation. Thinned density never below 150 trees per hectare

¹² PAIF: <http://www.spf.com.uy/institucional-actividades-incendios-forestales>
<https://www.fas.com.uy/en/sustainability/forest-managment-plan/fire-prevention>

Frost	Night frosts occur during the winter (from mid-May to early October), with an average of 30 days with frost per year, with temperatures seldom falling below – 5 °C.	Those areas imposing restrictions to tree growth or with high vulnerability to frost were excluded; soils occupying low areas were excluded because of risk of frost. Pine or E. dunnii were planted in lower areas to prevent frost damage.
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Uruguay is one of the countries in the world with lowest risks of natural disasters. This small nation home to few, if any, natural disasters. There is occasional flooding, but not the sort of thing that makes international headlines for its massive destruction. There are no earthquakes, hurricanes, volcanic activity, etc. There are also no nuclear plants in the country.

2.1.13 Benefit Permanence (G1.11)

Creation of employment is one of the main social benefits of the project. Typically, an extensive livestock production system employs 1.4 persons every 1,000 ha. Guarané/FAS project is expected to multiply that figure by more than 10.

Beyond an increased number of 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.

‘Guanaré’ project activity will generate several job opportunities, creating nearly 1,000 job positions when the sustainable production be reached. The vast majority of employees will be hired by contractors. The majority of the outsourced contractor companies currently working with Guarané, are registered in Uruguay as “PYMES” (small and medium sized companies), mostly family companies.

The entire production of Guarané/FAS project (wood, meat and carbon credits) will have the international market as the final destination

The main contribution of Guarané/FAS project activity to the eradication of rural poverty will be through 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)¹³, 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. Another study by CPA Ferrere (<https://www.cpa ferrere.com/en/>) done in 2017, informed that the total number of direct employees per hectare in forestry is 32 employees every 1000 hectares, while in beef production, the number of employees every 1000 hectares is 6¹⁴.

¹³ Carámbula, M. y Piñeiro, D. La Forestación En Uruguay: Cambio Demográfico y Empleo en Tres Localidades

¹⁴ http://www.spf.com.uy/data/paginas/Informe_Impacto_Cadena_Forestal_CPA_Ferrere_22-11-17.pdf

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. Guanáré/FAS 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.

Guanaré/FAS 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, the presence of Guanáré/FAS and of other similar initiatives in the area which have already secured (Posco Uruguay) or are also seeking carbon finance (GFP, Weyerhaeuser 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 Guanáré/FAS 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.

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

Guanaré/FAS has no plans to not invest in the industry sector. Nevertheless, as mentioned above, Guanáré/FAS forest plantation may contribute to promote the establishment of industrial investments in the area.

As it was mentioned above, Guanáré/FAS 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

In the fields where FORESTAL ATLÁNTICO SUR operates, environmental assessments and impact surveys are carried out by a team of experts. Based on the results obtained in these studies, management and monitoring plans have been developed for the restoration of natural systems which may have been affected by previous practices (agricultural, farming, forestry or other activities), the conservation of natural resources and values in the influence areas (flora, fauna, soils and hydric resources) and the prevention or mitigation of environmental impact caused by forestry operations.

Monitoring tasks include, in particular, regular assessments of the effects of forestry operations on the soil, pollution and ecosystems. On the other hand, studies of the fauna are being carried out with the purpose of determining the effect of these operations in the species composition and distribution in the country and the possibility of controlling harmful species such as the wild boar.

A wide range of ecosystems can be found in several parts of the country, from different types of native forests, wetlands, grasslands, stony fields, among others. Guanáré/FAS 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.

In "Santa Sofía", Garao, north of Plácido Rosas, province of Cerro Largo, there are complex ecosystems composed of primary swamp forests or "capones" associated to rain forests considered rare in the country and located in patches that add 186,9 ha. Since the end of 2013, this area has been considered of High

Conservation Value since it is an area with exceptional characteristics, with relictual patches of flora from Brazil and mainly due to the diversity of flora species present.

Since 2012, Guanaré/FAS has been involved in several publications related to the fauna and flora of our country. In that year the first field manual sponsored by the company was published and later new publications were added, in addition to a brief manual on the wild boar. Its last edition was jointly published with the authors Raúl Lombardi and Giancarlo Geymonat, the Ministry of Tourism, and UTE with the name "Fauna and Flora of the Forests of Uruguay".

2.1.14 Financial Sustainability (G1.12)

Project has secured more than 80% of funding needed to cover the total cash out before the project reaches breakeven. This has been demonstrated in the validation and verification process under VCS in attached Excel file and Memorandum prepared by Pedro Aramendía, CFO of Guanaré: total cost of purchased land and plantation costs in 2013, represented 87% over the highest level of accumulated cash out in 'Guanaré' afforestation cash flows. The most reliable and substantial demonstration are Guanaré's financial statements, in which it can be seen that the company has an enormous capital in assets (land and standing trees), demonstrating that funding for Guanaré project has already been secured, in other words the funding needed to implement Guanaré project has already been available and has already been executed. Guanaré is in good financial health.

The cash flow estimated for the afforestation activity in the project site without the financial benefits from the carbon credits will be available for the validation team as part of the PD documentation. The cash flow included all relevant costs and revenues along the crediting period.

Five cash flows were developed –one cash flow per region –in order to estimate the IRR. Three of them are consistent with three of the forest regions delineated before (Regis/Garao, Las Cañas and Tupambaé), two of the cash flows matched with the fourth region missing (Cerro Chato/Valentines). In this region it was necessary to estimate two IRRs since part of this region is projected to have a rotation length of 16 years, while the other would have 22 years as the rest of the regions.

The estimated IRRs for afforestation without carbon finance in the project area are 6.4% for Tupambaé region, 5.5% for Regis/Garao region, 6.9% for Las Cañas region, 9.0% for Cerro Chato/Valentines (22-year rotation length) and 8.3% for Cerro Chato/Valentines (16-year rotation length).

The estimated IRRs for afforestation in the project area without profits from carbon credits are therefore lower than the estimated benchmark IRR (10.9% and 12.2%).

It is again concluded that the continuation of the pre-project land use is the baseline scenario. A sensitivity analysis was made to make the conclusion that the project activity does not meet the benchmark more robust.

2.1.15 Eligibility Criteria for Grouped Projects (G1.14)

This is not a Grouped Project

2.1.16 Scalability Limits for the Grouped Projects (G1.15)

This is not a Grouped Project

2.1.17 Risk Mitigation Approach for Grouped Projects (G1.15)

This is not a Grouped Project

2.2 Without-project Land Use Scenario and Additionality

2.2.1 Land-Use Scenarios without the Project (G2.1)

The baseline scenario was defined by using the “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities”, version 01. Since only one stratum was identified for the baseline scenario, the procedure is only applied once

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. In addition, barriers analysis and common practice analysis showed that afforestation in the area of the proposed project activity is not likely to occur without carbon financing

2.2.2 Most-Likely Scenario Justification (G2.1)

The most-likely scenario is the same as baseline scenario, please refer to section 2.2.1 for detailed information

2.2.3 Additionality (G2.2)

Additionality has been demonstrated through application of Steps 0 to 2 above and through Common Practice Analysis in Step 4 (in this section below). Despite the fact that sub-step 2c resulted in only one land use scenario and according to the “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities” it is the baseline scenario, the investment analysis was conducted in the afforestation activity to reinforce the conclusion that forest activity in the area was not meant to be developed without being registered in a carbon scheme and generating carbon certifies.

Investment analysis

Sub-step 3a. Determine appropriate analysis method

The Investment analysis will not determine which of the remaining land use scenario is the most economically or financially attractive because there is only one land use scenario remaining. However, it will demonstrate that the IRR for each location does not reach the benchmark IRR.

Option III, benchmark analysis is selected.

Sub-step 3b. Apply benchmark analysis

The benchmark is to represent standard returns in the market, considering the specific risk of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer.

The IRR is selected as the indicator for the benchmark analysis. The Capital Asset Pricing Model (CAPM) is used to estimate the expected internal rate of return on unleveraged project activity that compensates the investor on risk and time value of money (k_e)

For a developing country, k_e is determined according to the following equation:

$$k_e = r_f + [E(R_m) - r_f]\beta + prs$$

Where:

k_e = project cost of capital (benchmark project IRR, %)

r_f = risk free rate (%)

$[E(R_m) - r_f]$ = premium for market risk (%)

β = systematic risk of the project activity (dimensionless)

prs = premium for sovereign risk (%)

The estimation of the benchmark IRR was done for each one of the years the investment analysis was developed. Four of the investment analysis were done in the year 2006; Tupambaé, Regis/Garao, Las Cañas and Cerro Chato/Valentines (22 year rotation) and investment decision of Cerro Chato/Valentines (16 year rotation) on the year 2007.

Determination of the risk free rate r_f

The chosen value for r_f is the yield of 30-year US Treasury bonds.

r_f equals 4.9%, 4.8% in 2006 and 2007 respectively in accordance with the US Department of the Treasury

(<http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2006>).

Determination of the premium for market risk $[E(R_m) - r_f]$

The arithmetic average annual premium for market risk with respect to US Treasury bonds is selected. It is a conservative value, from a well-documented source (Damodaran, 2011) who calculated the premium for market risk for the period from 1928 to 2011 (a period of 20 years before the project initiation was selected). The following procedure was followed to obtain the selected value for this parameter:

Go to <http://pages.stern.nyu.edu/~adamodar/>

1. Click Valuation Icon
2. Go to point 3. TOPIC

3. Click Datasets icon
4. Go to Data sets chart
5. Click historical Returns on stocks, Bonds and Bills – United States

Other possible sources for premium for market risk would yield a similar result. These include:

- Ibboston Associates (www.ibboston.com)
- Barra (www.barra.com)
- Bloomberg (www.bloomberg.com)

The estimated values are 5.6% and 4.8% (set it in chronological order)

Determination of the systematic risk of the project activity: ☐

It has to be considered that systematic risk of forestry activities depends greatly on the markets where the industries are located. As an example, average unleveraged β values for paper/wood/forestry sectors for the year 2006 are estimated to be 0.82 (USA), 1.27 (emerging markets), 1.04 (Japan), 0.75 (Europe) and 1.09 (Australia/Canada) by the New York University L.N. Stern School of Business (Damodaran 2011).

Uruguay is an emerging market. The average value of β for these markets (considering Paper & Related Products and Forestry) for the period 2006-2007 was 1.27. However, for the purpose of this analysis a more conservative value of 0.88 was selected, which corresponded to an Argentinean company (Celulosa Argentina) in 2006. For 2007, since there was no value reported for the same company or similar, the 2006 value was selected. This value was derived by the following procedure:

1. Go to <http://pages.stern.nyu.edu/~adamodar/>
2. Click Valuation Icon
3. Go to point 3. TOPIC
4. Click Datasets icon
5. Second chart (individual company information)

There are other possible sources for obtaining a suitable β value would yield similar results. These include:

6. Ibboston Associates (www.ibboston.com)
7. Barra (www.barra.com)
8. Bloomberg (www.bloomberg.com)

Determination of Premium for Sovereign Risk, prs

Sovereign risk reflects the amount of additional market risk for public bonds from one country as compared to the reference case (in this case, the US). The difference in yield between bonds issued by the US Treasury and those from another country constitutes the Premium for Sovereign Risk. Average premium for sovereign risk for Uruguay for year 2006 was calculated at 2.36, and in 2007 was 1.82 percentage points. Reputable and public sources of information were used¹⁵.

Calculation of benchmark Internal Rate of Return for the afforestation activity

$$k_e = r_f + [E(R_m) - r_f] \beta + prs$$

$$2006 \text{ Values: } k_e = 4.9 + [(5.6) \cdot 0.88] + 2.36 = 12.2\%$$

$$2007 \text{ Values: } k_e = 4.8 + [(4.8) \cdot 0.83] + 1.82 = 10.9\%$$

In conclusion, the benchmark IRR for an afforestation activity without carbon finance in the project area is estimated to be **12.2%** (2006) and **10.9%** (2007).

Sub-step 3c. Calculation and comparison of IRR

The cash flow estimated for the afforestation activity in the project site without the financial benefits from the carbon credits will be available for the validation team as part of the PD documentation. The cash flow included all relevant costs and revenues along the crediting period.

Five cash flows were developed –one cash flow per region –in order to estimate the IRR. Three of them are consistent with three of the forest regions delineated before (Regis/Garao, Las Cañas and Tupambaé), two of the cash flows matched with the fourth region missing (Cerro Chato/Valentines). In this region it was necessary to estimate two IRRs since part of this region is projected to have a rotation length of 16 years, while the other would have 22 years as the rest of the regions.

The estimated IRRs for afforestation without carbon finance in the project area are 6.4% for Tupambaé region, 5.5% for Regis/Garao region, 6.9% for Las Cañas region, 9.0% for Cerro Chato/Valentines (22-year rotation length) and 8.3% for Cerro Chato/Valentines (16-year rotation length).

The estimated IRRs for afforestation in the project area without profits from carbon credits are therefore lower than the estimated benchmark IRR (10.9% and 12.2%).

It is again concluded that the continuation of the pre-project land use is the baseline scenario. A sensitivity analysis was made to make the conclusion that the project activity does not meet the benchmark more robust.

Sub-step 3d. Sensitivity analysis

The sensitivity analysis was performed by using the Montecarlo simulation method (Fischman 1996). Probability density functions for several parameters used for estimation of the cash flow were defined, and 1,000 estimates of the IRR were made for random combinations of those parameters. The analysis showed

¹⁵ www.rafap.com.uy

that the probability of the IRR of being lower than the benchmark for the three locations where the project activity is being held is 100%. Thus, the conclusion above is again highly robust.

Following is the summary (table and graph showing the distribution of the simulated IRR values for the 1,000 runs) of the results obtained by the Montecarlo simulation for each location (assumptions made for the simulation can be found at annex):

Summary:

Entire range is from 6,0% to 7,7%

Base case is 5,5%

After 1.000 trials, the std. error of the mean is 0,0%

Statistics: Forecast values

Trials 1.000

Mean 6,7%

Median 6,7%

Mode ---

Standard
Deviation 0,3%

Variance 0,0%

Skewness 0,3316

Kurtosis 2,67

Coeff. of
Variability 0,0462

Minimum 6,0%

Maximum 7,7%

Range Width 1,8%

Mean Std. Error 0,0%

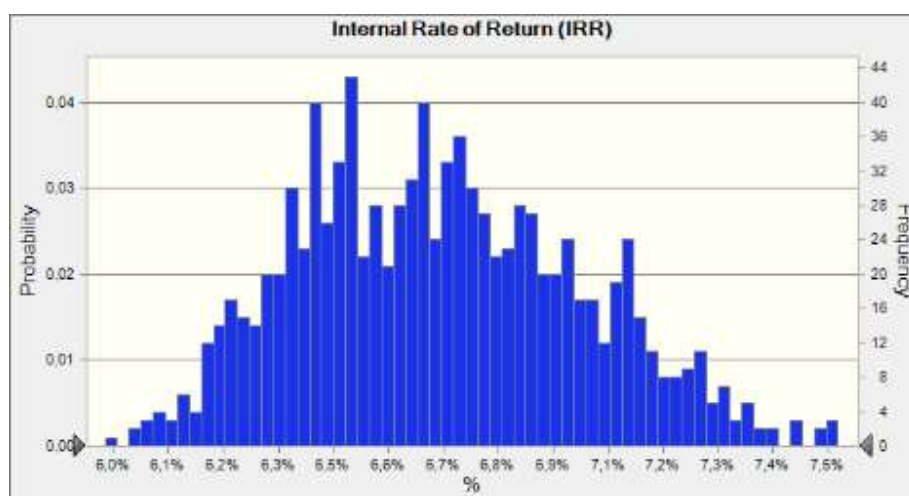


Figure 9. Outcomes of the sensitivity analysis for Regis/Garao Region

Summary:

Entire range is from 8.0% to 9.8%

Base case is 6.9%

Benchmark (2006) 12.2

After 1.000 trials. the std. error of the mean is 0.0%

Statistics: Forecast values

Trials 1.000

Mean 8.8%

Median 8.8%

Mode ---

Standard Deviation 0.3%

Variance 0.0%

Skewness 0.1153

Kurtosis 2.60

Coeff. of Variability 0.0365

Minimum 8.0%

Maximum 9.8%

Range Width 1.7%

Mean Std. Error 0.0%

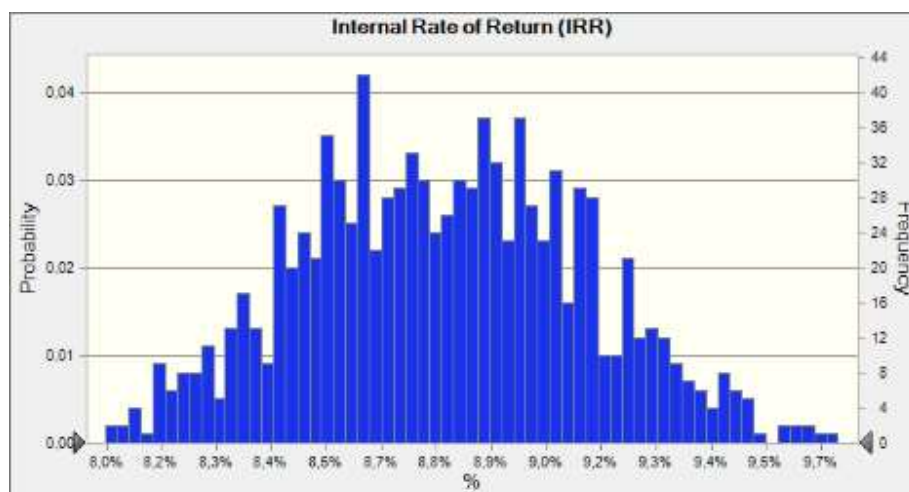


Figure 10. Outcomes of the sensitivity analysis for Las Cañas Region

Summary:

Entire range is from 9.6% to 11.5%

Base case is 9.0%

Benchmark (2006) 12.2

After 1.000 trials, the std. error of the mean is 0.0%

Statistics: Forecast values

Trials 1000

Mean 10.48%

Median 10.47%

Mode ---

Standard Deviation 0.32%

Variance 0.00%

Skewness	0.18
Kurtosis	2.77
Coeff. of Variability	0.03
Minimum	9.56%
Maximum	11.51%
Range Width	1.95%
Mean Std. Error	0.01%

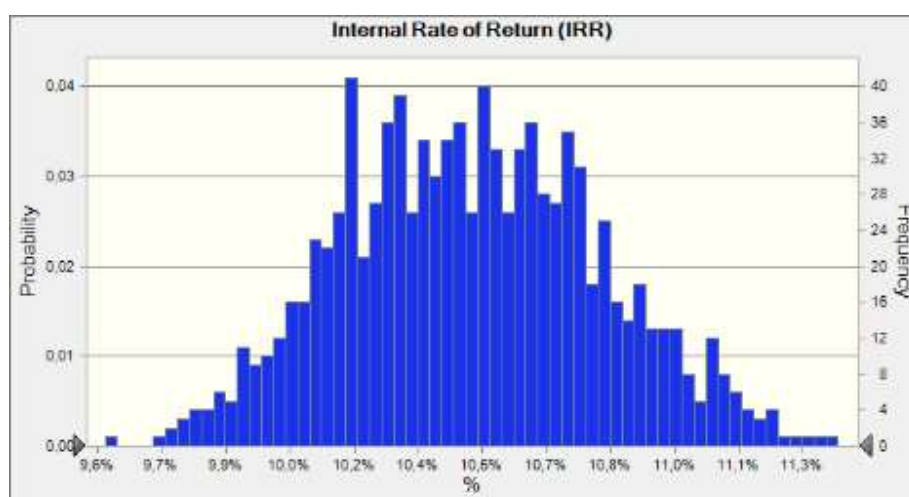


Figure 11. Outcomes of the sensitivity analysis for Cerro Chato/valentines Region (22 years rotation)

Summary:

Entire range is from 8,9% to 10,6%

Benchmark (2007) 10.9%

Base case is 8,3%

After 1.000 trials, the std. error of the mean is 0,0%

Statistics: Forecast values

Trials 1.000

Mean 9,7%

Median 9,7%

Mode	---
Standard Deviation	0,3%
Variance	0,0%
Skewness	0,2534
Kurtosis	2,66
Coeff. of Variability	0,0327
Minimum	8,9%
Maximum	10,6%
Range Width	1,7%
Mean Std. Error	0,0%

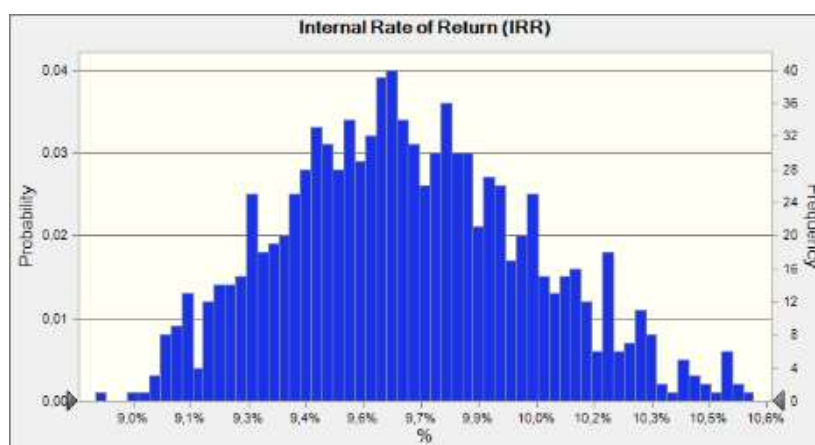


Figure 12. Outcomes of the sensitivity analysis for Cerro Chato/valentines Region (16 years rotation)

Summary:

Entire range is from 6.9% to 8.3%

Base case is 6.4%

Benchmark (2006) 12.2

After 1.000 trials, the std. error of the mean is 0.0%

Statistics: Forecast values

Trials 1.000

Mean	7.6%
Median	7.5%
Mode	---
Standard Deviation	0.3%
Variance	0.0%
Skewness	0.2524
Kurtosis	2.56
Coeff. of Variability	0.0341
Minimum	6.9%
Maximum	8.3%
Range Width	1.4%
Mean Std. Error	0.0%

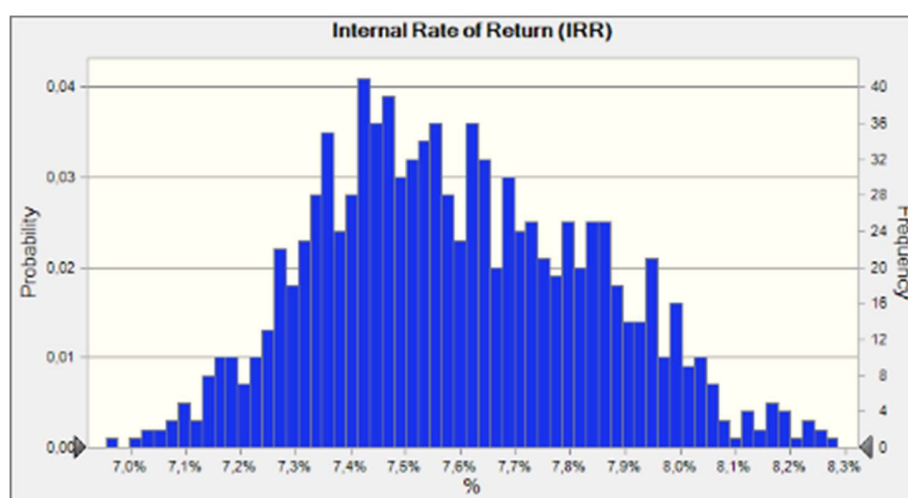


Figure 13. Outcomes of the sensitivity analysis for Tupambaé Region

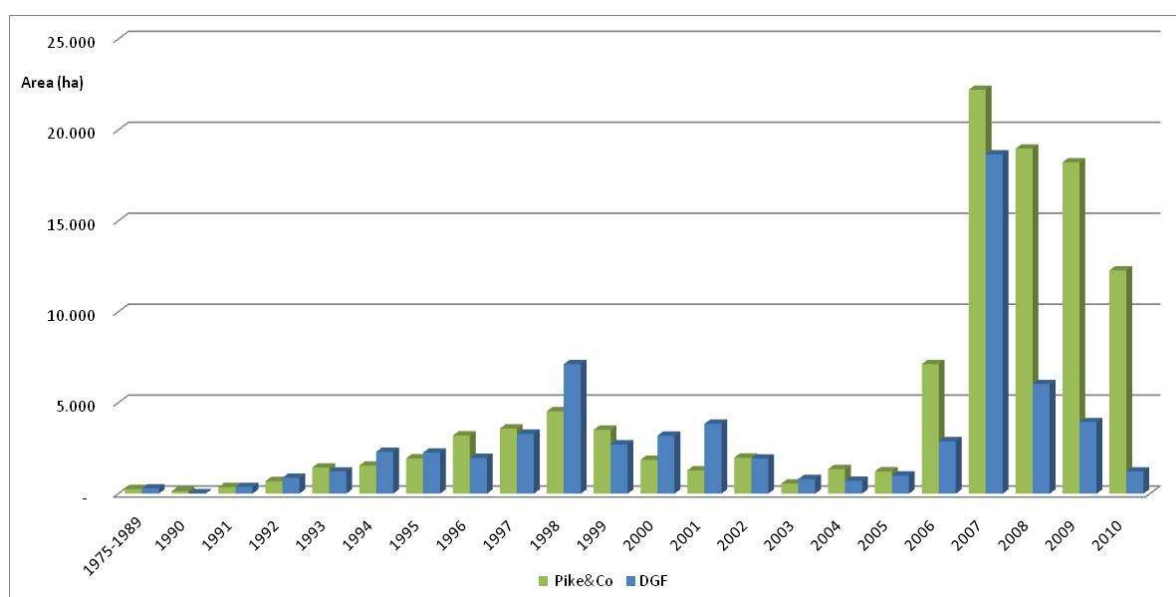
Step 4. Common practice analyses

In spite of a large extension of forest priority soils in the Departments of Treinta y Tres and Cerro Largo, the forest promotion policy implemented in 1987 resulted in only a limited extent of afforestation. This represented a very different scenario from that in the other forest regions of the country. As it was explained above, the reasons for this lack of response are to be found in the long distances to wood delivery points (industries or ports) and in the poorer quality of the soils as compared to the North and West regions.

The relatively small area that was forested in the NE region (Cerro Largo and Treinta y Tres) during the period 1987-2005 was in response to the existence of a plantation subsidy, the availability of soft credits from Banco de la República and the exemption of all income and land taxes. As the subsidies were gradually decreased since 2002 until their complete suppression in 2005, the rate of plantation also declined (see **Figure 14**). The soft credits and several of the tax exemptions were also eliminated between 2003 and 2005.

The subsidies, depending on the year, had a value of up to US\$ 200 per hectare affected to the plantations (including plantations and servicing areas, which normally amount to 50 to 60 per cent of the effectively planted areas). The value of the subsidy was equivalent to more than 50 per cent of the price of the land.

The soft credits for forest planting provided by Banco de la República had low interest rates (LIBOR plus 1.5 to 2.0 per cent per year) and a grace period of 10 years for both principal and interests. They were conceived for short rotation cycles (i.e., 10 years), clearly not appropriate for the NE region of Uruguay due to the relatively low value of pulpwood (the only product that can be obtained in such a short period). And when the time of repayment came for plantations made in the early 1990's, forest owners were forced to renegotiate their debts with the bank because they just could not sell their wood. Many were even forced to sell their properties later. It must be also noted that, after the sharp decline in the LIBOR occurred in 2001, the Banco de la República unilaterally decided to change the rules and applied a value higher than LIBOR for calculating the interest rates. This aggravated the situation of debtors. This line of soft credits was gradually modified after 2002 and was later phased out.



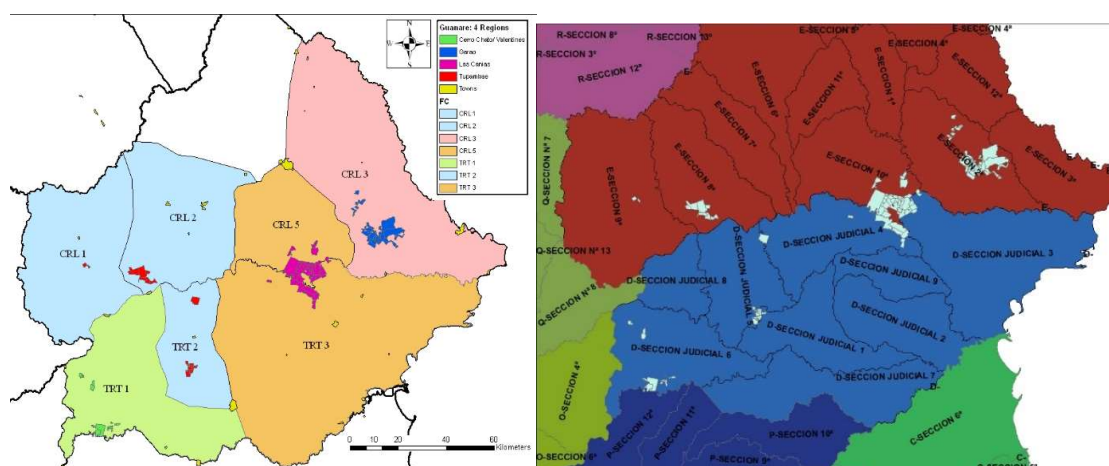


Figure 14. Above: historical annual forest plantation rates in the region of the project according to two sources of information (private data from Pike & Co. and official statistic from Forest General Directorate); Lower left: map with a detail of project area and the geographic units (“foricenters”) included in Pike & Co’s statistics reported in the graph above; Lower right: map with a detail of project area and the geographic units (“Judicial sections”) included in DGF’s statistics reported in the graph above. Statistics from both sources have almost exact consistency with regard to the areas of land covered.

The situation after 2005 corresponded to a completely different scenario. The rate of plantation in the region increased sharply, in spite of a lack of policy incentives. This increase is highly associated to the consideration of carbon finance by investors. As shown in **Table 8**, 94 per cent of the forests planted during the period 2006-2011 corresponding to a total of more than 77,000 ha, are either procuring or have already achieved registration under carbon programs (CDM, CCX and VCS).

Table 8. Forest area planted between 2006 and 2011, by owner, in Guanaré/FAS project region.

Company Name	Eucalyptus	Pinus	Total	Seeking Carbon finance
'Guanaré'	22,605		22,605	Yes (VCS)
GFP	332	19,806	20,138	Yes (VCS)
Weyerhaeuser	15,723	2,142	17,865	Yes (VCS)
RMK	4,446		4,446	Yes (CCX)
Pradera Roja	3,826		3,826	Yes (VCS)
Others	1,776		1,776	Not known
Posco Uruguay	1,432		1,432	Yes (CDM)
Caja de Jubilaciones Profesionales	1,327		1,327	Not known
ITAA	1,186		1,186	Yes (VCS)
Bulgheroni	906		906	Not known
San Ignacio	850		850	Yes (VCS)
Tierras Forestales	501		501	Not known
Fernández	187		187	Not known
Yandian	107		107	Not known
Agrosocio Brasileiro	72		72	Not known
Saps Krazemblum	53		53	Not known
Total	55,328	21,948	77,276	94%

The common practice analysis was done following the requirements set in the Step 4 of the “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities”. It was analyzed in it, to which extent similar forestation activities to the one proposed have been implemented previously or are currently underway. Similar forestation activities are defined as that which are of similar scale, take place in a comparable environment, inter alia, with respect to the regulatory framework and are undertaken in the relevant geographical area.

Throughout the analysis is concluded that there are similar forest activities (in terms of scale, species, etc) in the area (**Table 8**). However, 94% of those companies established in the area are seeking carbon finance. There was not identification of similar forest activities without requiring carbon finance (paragraph 33 of the tool). Therefore, there is no need to compare the proposed project activities to others (paragraph 34 of the tool). In conclusion, similar activities cannot be observed, then the project activity is not the baseline scenario, and hence it is additional.

2.2.4 Benefits to be used as Offsets (G2.2)

Community benefits: To maximize the socio-economic benefits, the afforestation design include forests managed with pruning (to a minimum height of 12 m) and two to three thinning operations, to obtain knot-free, high-diameter logs suitable for saw-milling and veneering. This will result in a significant community benefits, mainly through increased employment and quality of employment and rural development (decentralization). In addition, there is also an increase (in relation to cattle production) in the number of job opportunities for women, in activities such as nurseries, planting, pruning and others. This would help to improve the stability of rural families. Forestry workers in Uruguay normally return home after each workday, which is a big improvement over the situation of the livestock sector, which strongly depends on workers residing on farms, away from their families.

Biodiversity benefits: The establishment of forest plantations designed to preserve high biodiversity value areas (such as native forests, wetlands and low areas under grassland) has proved to be effective in Uruguay. Since large-scale forest planting started in the 1990s, several surveys (mostly conducted by independent scientists on behalf of forest companies) have found a proliferation of birds, frogs, and mammals, some of which had been considered as extinct or endangered. These studies also allowed finding at least three new species (two birds and one frog) which had never been reported before in the country. One of them is a case of a completely new species. The project activity would produce similar impacts. After the afforestation project is fully launched, it not only produces positive benefits to soil erosion control, but also has far-reaching significance to wildlife resources protection. Harvesting of natural forests is prohibited in all the area.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

The VCS Project Description and monitoring report has been published in the VCS website. The full CCB project documentation will be published also in VCS and CCB’s website for public comments, as well as the project summary in Spanish version. Local communities and other stakeholders can easily access it from the website.

Also, the full project documentation will be published on Guanaré/FAS website for public comments.

All the Environmental Impact Assessment that Guarané/FAS presented to MVOTMA/DINAMA, are published on DINAMA's website (<http://mvotma.gub.uy/participacion-ciudadana-ambiente/manifiestos-de-ambiente>) .

2.3.2 Dissemination of Summary Project Documents (G3.1)

Along with the project implementation, the project documentation will be published on VCS and CCB website for all stakeholders, so that they can obtain the detailed project information and development progress. Also, the summary of project description in local language will also be disseminated to local communities through local government, as long as the summary of monitoring reports during each verification.

Also, the full project documentation will be published on Guarané/FAS website for public comments, together with specific brochures describing the project characteristics and benefits.

2.3.3 Informational Meetings with Stakeholders (G3.1)

A group of Guarané/FAS supervisors and managers analyzes different stakeholders (localities, towns, cities). A list of stakeholders was developed, identified and prioritized according to the following criteria (see **Table 9**):

0- It is not from the area of Guarané/FAS influence.

1- Occasionally, services were used or measures were taken, but there are no Guarané/FAS fields in the area (for example: once a contractor lived there or the Mayor (Alcalde) was contacted.

2- It is located in Guarané/FAS area of influence, that is, there are nearby fields or services used assiduously or negotiations are carried out (whether or not there are operations in the area)

3- Location affected or potentially affected by Guarané/FAS activities: very close to Guarané/FAS farms. Services are used regularly or procedures (tramites) are carried out, it is affected by the transit of trucks or vehicles.

"Base" - Departmental Cities / Capitals: there is no direct impact, but services are used and interested parties are known

Based on this analysis, different actions strategies were developed. The Social Advisors, Luján Jara and Gustavo Pellerey worked in places identified with 2, 3 and the Cities / Capitals identified as "Base"

Table 9. List of stakeholders identified and prioritized by affected status.

Localidades en el área de influencia de FAS según "Categoría" (Ver Gestión y Monitoreo)			
Localidad	Depto.	Categoría	Contacto Referente de la zona por FAS
Arbolito	Cerro Largo	3	Jiordano Rocha
Arévalo	Cerro Largo	1	Carlos Balparda
Cerros de Amaro	Treinta y tres	2	Jiordano Rocha
Isla Patrulla	Treinta y tres	3	Carlos Balparda
La Calavera	Treinta y tres	2	Jiordano Rocha
La Micaela	Cerro Largo	3	Freddy Araújo
Las Cañitas	Cerro Largo	1	Carlos Balparda
María Albina	Treinta y tres	2	Carlos Balparda
Melo	Cerro Largo	base	Carlos Balparda
Montecito	Cerro Largo	1	Carlos Balparda
Plácido Rosas	Cerro Largo	3	Carlos Balparda
Rincón	Treinta y tres	3	José Zarazola
Santa Clara del Olimar	Treinta y tres	3	Carlos Balparda
Tupambaé	Cerro Largo	3	Carlos Balparda
Vergara	Treinta y tres	3	José Zarazola

Part of the actions taken includes the visit, once a year or as demanded, of Guarané/FAS employees to neighbors living close to the project area. During these visits, Guarané/FAS employees must complete the form shown in Figure 15.

 FORESTAL ATLÁNTICO SUR		FORMULARIO VISITA A VECINOS		Código: FOR-15 Versión: 02 Fecha: 12/2016 Página: 1 de 1	
FECHA		/ /			
PREDIO DE FAS CERCANO					
NOMBRE Y APELLIDO DEL ENTREVISTADO					
OTRAS PERSONAS (Nombres)					
Nombre del Establecimiento/ Institución/ Comercio					
DIRECCIÓN / UBICACIÓN					
LOCALIDAD / DEPARTAMENTO					
TELÉFONO/S DE CONTACTO					
DIRECCIÓN DE CORREO ELECTRÓNICO					
En relación a los predios de FAS, ¿conoce usted algún LUGAR DE ESPECIAL INTERÉS PARA SU CONSERVACIÓN, como áreas naturales o elementos de interés histórico- cultural?					
¿QUIERE UD. REALIZAR ALGUNA SUGERENCIA, RECLAMO, DENUNCIA, OBSERVACIÓN O COMENTARIO?					
INFORMACIÓN ENTREGADA					
¿Se entregan nombres y teléfonos de contacto?		SI		NO	
¿Se entrega carta/folleto presentación?		SI		NO	
Se le comunica que en el / los predios _____ cercanos a su propiedad, se están realizando actividades de: <u>cosecha, carga, plantación,</u> <u>mantenimiento, otros (_____).</u> (marcar lo que corresponde) EN CASO DE CUALQUIER INCONVENIENTE O SUGERENCIA AGRADECEMOS SE COMUNIQUE CON NOSOTROS.					
NOMBRE Y FIRMA DEL ENTREVISTADO			NOMBRE Y FIRMA DEL ENTREVISTADOR		

Figure 15. Form to be completed during visits to neighbors

Also, during these visits, stakeholders can complete the “complaints and claims form” shown in **Figure 16**. The information is collected, processed and recorded in Guanáre/FAS .

 FORESTAL ATLÁNTICO SUR		FORMULARIO QUEJAS / RECLAMOS		Código: FOR-16 Versión: 01 Fecha: 06/2017 Página: 1 de 1
Este es un documento administrativo a completar por la Gerencia o quien ésta designe.				
Queja # ____		Año ____		
TÍTULO DEL CONFLICTO (queja, reclamo, denuncia u otro)				
Fecha del PRIMER CONOCIMIENTO del asunto		Fecha de PRIMERA ATENCIÓN al asunto		
Descripción del ASUNTO planteado				
Descripción del TRATAMIENTO dado al asunto (incluir fechas)				
FINALIZACIÓN del Asunto (Resolución / Estado)				
Fecha de CIERRE				

Figure 16: Stakeholders and communities' complaints and claims form

2.3.4 Community Costs, Risks and Benefits (G3.2)

Information about potential costs, risks and benefits to communities is not applicable to this project. As it is described in section 2.1.5. local communities in Uruguay are not entirely depending on forest, they reside in populated centers with multiple businesses. Communities are not asked to participate directly with the project. Projects' potential risks, costs and benefits are, for example, indirectly transmitted to communities through the increase of labor demand for particular activities (forest implantation). In other words, communities can perceive projects costs, risks and benefits in an indirect way, through market

2.3.5 Information to Stakeholders on Validation and Verification Process (G3.3)

National legislation in Uruguay does not obligate to projects owners with activity in the VCS or CCB Standard to communicate about the validation or verification process to any stakeholders, not even to national or regional government.

However, the company decides to actively communicate about this process, so any stakeholder can be informed and comment about it. The description of the validation and verification process was informed in detail to all staff member of the company through internal communication.

2.3.6 Site Visit Information and Opportunities to Communicate with Auditor (G3.3)

The local stakeholders will be informed in advance of the VVB visit, regarding the validation and verification process. As long as the audit plan has been settled, the project owner will arrange a stakeholder meeting with auditor during the site visit. Invitation will be done using appropriate means of communication, all the stakeholders will be informed via phone, mail or whatsapp regarding the project process and the auditor's visit. Stakeholders shown in **Table 10** will be contacted in Cerro Largo department.

Table 10. List of stakeholders to be contacted in Cerro Largo.

Institution	Department	Name	City/Town	Scope
Escuela Nº 35 Arbolito	Cerro Largo	Miriam Lago	Arbolito	Teaching center
Parador Arbolito	Cerro Largo	Lidia Da Costa	Arbolito	Commerce
Seccional 10º Arbolito	Cerro Largo	Nestor Tejera,	Arbolito	Police
Alcaldías	Cerro Largo	Luis Segui	Arbolito	Public
Municipio de Arbolito	Cerro Largo	Luis Segui	Arbolito	Public
Policlínica Municipal	Cerro Largo	Angélica Silvera	Arbolito	Clinic
Alcaldías	Cerro Largo	José Eduardo Lucas	Arévalo	Public
Escuela Arroyo Malo	Cerro Largo	Daiana Ferreira	Arroyo Malo	Teaching center
Vecino	Cerro Largo	Artigas Luz	Arroyo malo	Neighbour
Alcaldías	Cerro Largo	Graciela Echenique	Fraile Muerto	Public
Escuela Nº 72 La Micaela	Cerro Largo	Michele Rivero	La Micaela	Teaching center
Policlínica La Micaela	Cerro Largo	Gladys Araujo	La Micaela	Clinic
Hotel Crown	Cerro Largo	Sr. Enrique López	Melo	Commerce
Oficina Municipal de Tránsito	Cerro Largo	Sandra Rivero	Melo	Public
Escuela Técnica Superior (ex UTU)	Cerro Largo	Carlos Vaz, Victoria	Melo	Public
Mano Amiga	Cerro Largo	Katerin Maubrigades	Melo	NGO
Intendencia Municipal de Cerro Largo	Cerro Largo	Ec. Luis Sergio	Melo	Public
Junta Departamental de Cerro Largo	Cerro Largo	Ary Ney Sorondo	Melo	Public
Escuela Nº Placido Rosas	Cerro Largo	Graciela Rodriguez	Placido Rosas	Teaching center
Policlínica Municipal	Cerro Largo	Paola Rocha	Placido Rosas	Clinic
Seccional 13 Placido Rosas	Cerro Largo	Fabricio Díaz	Placido Rosas	Police
Alcaldías	Cerro Largo	Diego Fernandez	Placido Rosas	Public
Alcaldías	Cerro Largo	Jorge Pereira, Blanca	Placido Rosas	Public
Policlínica Rincón	Cerro Largo	Elizabeth Aristimuño	Rincón	Clinic
Seccional Nº 3 Pueblo Rincón	Cerro Largo	Cristian Duarte,	Rincón	Police
Junta Local Rincón	Cerro Largo	Pablo Manini	Rincón	Public
Escuela Nº 67	Cerro Largo	Patricia Carrero	Rincón	Teaching center
Liceo Tupambaé	Cerro Largo	Maximiliano Álvarez	Tupambaé	Teaching center
Escuela Nº 9 Tiempo Completo Tupambaé	Cerro Largo	Yelsi Olivera	Tupambaé	Teaching center
Policlínica ASSE	Cerro Largo	José Luis Cunha,	Tupambaé	Clinic
Almacén Don Juan	Cerro Largo	Carlos Saravia	Tupambaé	Commerce
Parador Rosil	Cerro Largo	Mario Marengo	Tupambaé	Commerce
Estacion de Servicio ANCAP	Cerro Largo	Jorge Peretti	Tupambaé	Commerce
Farmacia Santa Higinia	Cerro Largo	Danée Viera Coteló	Tupambaé	Commerce
Tupambaé Plan	Cerro Largo	Ana Maria Tisnes -	Tupambaé	NGO
Seccional 8º Tupambae	Cerro Largo	Pedro Alvarez,	Tupambaé	Police
Alcaldías	Cerro Largo	Douglas Lucas	Tupambaé	Public
As Civil Uruguay Trabaja - Tpbaé Plan	Cerro Largo	Hilda Madruga	Tupambaé	Public with
Juzgado de Paz Tupambaé	Cerro Largo	Hugo Prieto Morales	Tupambaé	Public

Stakeholders shown in **Table 11** will be contacted in Treinta y Tres department

Table 11. List of stakeholders to be contacted in Treinta y Tres department.

Institution	Department	Name	City/Town	Scope
Comisaría 4ta Sección	Treinta y Tres	Alcides Morales,	Cerros de Amaro	Police
Policlínica Municipal	Treinta y Tres	Lilian Bueno	Cerros de Amaro	Clinic
Escuela N°67	Treinta y Tres	Marisol Daer	Cerros de Amaro	Teaching center
Almacén	Treinta y Tres	Daniel Oyambure	Isla PATrulla	Commerce
Seccional Policial 4ta	Treinta y Tres	José Luis Charquero	Isla PATrulla	Police
Policlínica Municipal	Treinta y Tres	Graciela Martirena	Isla PATrulla	Clinic
Escuela N°3	Treinta y Tres	Fanny García	Isla PATrulla	Teaching center
Policlínica Municipal	Treinta y Tres	Leticia Rosas	La Calavera	Clinic
Escuela N°12	Treinta y Tres	PATricia Sasía	La Calavera	Teaching center
Sala Auxiliar ASSE	Treinta y Tres	Dra. Elisa Morales	Sta. Clara de	Clinic
Municipio	Treinta y Tres	Oscar Viera, Judith	Sta. Clara de	Public
Escuela Agraria	Treinta y Tres	Ing. Agr. Virginia	Sta. Clara de	Teaching center
Seccional Policial 8va	Treinta y Tres	Crio. Victor	Sta. Clara de	Police
Autoservice Minimar	Treinta y Tres	Angélica Ferreira	Sta. Clara de	Commerce
Liceo	Treinta y Tres	Gioconda Pérez,	Sta. Clara de	Teaching center
Escuela N°47	Treinta y Tres	José Arismendi, Ana	Sta. Clara de	Teaching center
Escuela N°19	Treinta y Tres	Sandra Gómez	Sta. Clara de	Teaching center
GEO Treinta Y Tres Grupo Eto-ecologista	Treinta y Tres	Esc. Ricardo Ramírez	Treinta y Tres	NGO
Cooperativa Agraria Quebrada de los Cuervos	Treinta y Tres	Eduardo Gonzalez	Treinta y Tres	NGO
M.V.O.T.M.A.	Treinta y Tres	Daniela Lemes	Treinta y Tres	Public
<i>Intendencia Municipal de Treinta y tres</i>	Treinta y Tres	Dr. Dardo Sánchez	Treinta y Tres	Public
Junta Departamental de Treinta y Tres	Treinta y Tres	Guzman Contreras	Treinta y Tres	Public
Cuartelillo de Bomberos Vergara	Treinta y Tres	Suf Of May Yubert	Vergara	Firefighters
Liceo Vergara	Treinta y Tres	Isabel Carrasco	Vergara	Teaching center
Liceo Vergara	Treinta y Tres	Yanet Salaberry	Vergara	Teaching center
Escuela Agraria Vergara	Treinta y Tres	Guillermo Sensian,	Vergara	Teaching center
ONG Grupo Envira	Treinta y Tres	Esc. José Luis Cuello	Vergara	NGO
Entidad Naturista Vergarenses de Investigación	Treinta y Tres	Dr. Jorge Pirez Bello	Vergara	NGO
Pizzeria Km0	Treinta y Tres	Marisol Mieres	Vergara	Commerce
Oficina Turismo	Treinta y Tres	Victoria Silvera	Vergara	Public
<i>Municipio de Vergara</i>	Treinta y Tres	Alc Fidencio	Vergara	Public
Seccional 9ª Vergara	Treinta y Tres	Crio Daniel Fleitas	Vergara	Police
Escuela N° 24	Treinta y Tres	Juán Casuriaga	Villa María Albina	Teaching center
Policlínica Mpal Ma Albina	Treinta y Tres	Victoria Delgado	Villa María Albina	Clinic
Ex Almacén el Milagroso	Treinta y Tres	Carlos Barbat	Villa María Albina	Commerce
Subcomisariade Seccional nro 7	Treinta y Tres	Julio Cesar Segovia	Villa María Albina	Police
Vecina	Treinta y Tres	Jaqueline Techera	Villa María Albina	Neighbour
Vecino	Treinta y Tres	Andrés Soto	Villa María Albina	Neighbour
Vecino	Treinta y Tres	Cesar Machado	Villa María Albina	Neighbour
Est La Tapera	Treinta y Tres	Ramón Cabrera	Villa María Albina	Neighbour

2.3.7 Stakeholder Consultations (G3.4)

As it is explained above, stakeholder's participation in the project is done through formal and informal channels. There are some types of stakeholders -such as forest contractors' enterprises, beef cattle breeders or rural communities- that can be affected (positively or negatively) by the project. Forest contractors' enterprises hire personal from the surrounding areas, beef cattle breeders are sometimes previous land owners living in the area.

It has to be noted that all the forestry plantations were done based on the National Forestry (Law No. 15.939 of December, 1987). Guanaré/FAS forest plantations are done entirely on private land. An Environmental Impact Assessment is requested by public authorities before establishing the forest. These EIA's were presented in the DINAMA web page for public consultations. Any person, company or entity from the project area or not, had the opportunity to comment and influence the project design.

In addition, all the planted areas must attend local regulations on maximum size of plantations, distance to water streams, neighbors fences, power lines, etc. established by national regulation (public sector's stakeholder).

The stakeholder group that influence project design are the beef cattle breeder and rural communities. This stakeholder is normally the previous land owner that after forest implementation continues breeding cattle in the non-forested areas. The interaction between cattle and forest is so mutually beneficial that Guanaré/FAS and cattle breeders communicate about the design of projects in order to synergistically grow.

Rural communities can also influence in the project design. For example, there is a case of a rural community in Velazquez (out of the project's area of influence but where Guanaré/FAS has operations) that complained about the trucks' movements in the town, resulting from the harvesting activity in a nearby farm. The local government arranged a secondary route for that trucks but after some time other residents complained again. This time the problem was that the secondary route diminished the business activity in the Velazquez, the drivers were not stopping for meals or shopping.

Another example is a populated center in Rocha (out of the project's area of influence but where Guanaré/FAS has operations) where residents complaint about the harvesting and loading activity affecting the students in a rural school in the area. Considering such complaint, Guanaré/FAS modified its activity, concentrating activities after school time and intensifying them in holidays.

2.3.8 Continued Consultation and Adaptive Management (G3.4)

As already shown in previous chapter, there are permanently open channels to communicate with the project developer. As it is described in section 2.3.3, stakeholders can raise their comments or suggestions in the "Neighbors visit form" (**Figure 15**) and the "complaints and claims form" (**Figure 16**). The project owner will check the forms regularly and collect all the comments received.

In the "General Manual for Forest Management", which is available to all Guanaré/FAS employees, specifies the following items related to the relationship with the communities and communication:

- At all times you should try to be good neighbors, maintain fluid channels of communication and respect patterns of coexistence.
- Promote the harmonious integration of the company in the short and long term in local communities.
- Improve the level of information of local communities regarding forestry activity in general and the management of Guanaré/FAS in particular.
- Prevent or mitigate undesirable impacts of forestry activity in the social environment.

- Keep updated the lists of interested parties and contact forms. Ensure that interested parties know ways of communicating with the company.
- All communications received (complaints / claims, requests, invitations, thanks or other interested parties) must be reported to the respective management.
- It is important to take care of the deadlines between when a complaint or complaint is received, and the corresponding follow-up is given. For the first contact and / or first response should not have been more than two weeks, or less, if the case requires speed. In the following instances of the handling of the matter, one must act in a responsible manner, trying to minimize the time until the resolution of the conflict.
- The management of the company, or whoever it designates, will be responsible for the resolution of all the communications that have to be answered.
- To resolve conflicts, proceed in accordance with INS 03 -PROCEDIMIENTO DE RESOLUCIÓN DE CONFLICTOS, and completing the corresponding internal form.

2.3.9 Stakeholder Consultation Channels (G3.5)

Part of the communication with communities consist in verbal communication from the company' workers towards them. Guanáré/FAS workers are permanently present in the project area and they communicate with communities and stakeholders.

Guanaré/FAS has also implemented a mechanism to prevent complaints. It consists in analysing the impact of future actions that will be taken by Guanáré/FAS. For example harvesting of a certain area will increase the truck passage in a public road, generating modifications to the regular activity of the zone. Guanáré/FAS staff anticipates to this situation visiting the neighbours that could be affected, explaining the activities that will be implemented and leaving a contact telephone to contact them in case of need.

2.3.10 Stakeholder Participation in Decision-Making and Implementation (G3.6)

Guanaré/FAS has open channels to enable the effective participation of all communities. The "complain form" and "visit to neighbor form" (see chapter 2.3.3) is a way for communication to communities. These channels are open to any culture and gender.

2.3.11 Anti-Discrimination Assurance (G3.7)

The project owner should obey Labor Law of the Republica Oriental del Uruguay with anti-discrimination assurance.

Guanaré/FAS has a Forest Management General Manual where it is clearly explained that discrimination attitudes are totally forbidden: *"any type of discrimination must be avoided in any instance by reason of gender, race, religion, political or other orientation"*

2.3.12 Feedback and Grievance Redress Procedure (G3.8)

The project owner has appointed a staff member to record and collect conflicts and dissatisfaction between Guarané/FAS and local communities/neighbours.

If there is a conflict of interest between the parties, the stakeholders can phone call the relevant contact. Every main entrance of the different farms has a signboard with relevant contact information.

As part of the “Comprehensive Management Plan”, there is a specific document from Guarané/FAS called “Conflicts Resolution”. This document clearly explains how Guarané/FAS proceed once they receive or detect a conflict with any third party:

- The contact data of the company will be made public by different means (printed material, direct contact of supervisors with communities and neighbors, visits of social advisors, web page, etc.) in order to enable any person to access it to present possible complaints or denunciations.
- If complaints or disputes are received, either directly or through third parties or communication means, Guarané/FAS will act according to the conflict resolution procedures described in the manual.
- Complaints or complaints transmitted in the field will be received by supervisors or area managers, who will attend them according to their powers. If the dispute cannot be resolved, the immediate superior will be approached, going to the General Manager as necessary.
- Complaints received at the office in Montevideo will be referred to the area managers or the General Manager.
- It is important to take care of the deadlines between when a complaint or dispute is received and the corresponding follow-up is given. For the first contact and / or first response should not have been passed more than two weeks, or less, if the case requires speed. In the following instances of the treatment of the matter, one must act in a responsible manner, trying to minimize the time until the resolution of the conflict.
- The Complaint Form must be completed for all stages and filed in Administration.

The General Manager will designate a person responsible for collecting and processing the information regarding all the complaints received by the company, who will keep record of them and their resolution status.

Also, Since 2015, Guarané/FAS implemented an integrated management system that includes a digital management system to manage Corrective Actions Requests, raised by Guarané/FAS employees by request of any affected stakeholder (see detailed SAC System description in section 2.3.16).

2.3.13 Accessibility of the Feedback and Grievance Redress Procedure (G3.8)

As it is mentioned in section 2.3.12, for the first contact and / or first response should not have been passed more than two weeks, or less, if the case requires speed. The manager of the company, or whoever he designates, will be responsible for the resolution of all the communications that have to be answered.

2.3.14 Worker Training (G3.9)

The project owner and group of experts provide technical advice and technical training to project staff and personal from forest contractors companies. These companies usually contracts people from the surrounding areas, belonging to the neighbor communities to the project area.

All the workers will be train in order to perform the activities with adherence to the Principles & Criteria of the Forest Stewardship Council ® (FSC ®) for forest management and chain of custody.

More than 360 employees (direct employees and contractors) are working in Guanaré/FAS project. All these employees are included in the company's "Annual Capacitation Plan", that includes the following training courses:

- Induction for new contractors: Orientation and training activities to inform and establish the Guanaré/FAS management guidelines to those responsible for the contractor companies and their health and safety services
- General induction 1: Guanaré/FAS Management Policy; Continuous improvement; FSC Principles & Criteria; Occupational Health and Safety; Care of the environment; Social Responsibility, Labor Rights and Duties.
- Safety and continuous improvement
- Legal and management requirements
- FAS Integrated Management System
- Specific training in Operative 1: Train all phytosanitary workers on how to obtain the "phytosanitary Card" (all operators of contractors and Guanaré/FAS direct employees that carry out the activity of applying chemical products).
- Specific training in Operative 2: Chainsaw documentation
- Specific training in Operative 3: Chainsaw security
- Specific training in Operative 4: Defensive Driving for vehicles 4x4
- Health and First Aid
- Investigation of incidents to Guanaré/FAS supervisors
- Ergonomics
- Fire control
- ArcGIS
- Language

- Induction to Chain of Custody

The Annual Training Plan is available for the validator in case of need.

2.3.15 Community Employment Opportunities (G3.10)

The project will have impact in a big area located in the Center east region of Uruguay. All the people in the communities (including women, minorities and poor people) will be involved directly or indirectly with the project.

All people from the region will be given an equal opportunity to fill all work positions if the job requirements are met.

According to the records corresponding to the years 2017 - 2018 (available on Guanaré/FAS web platform), during the implementation of the project, Guanaré/FAS contracted for forestry activities (plantation, harvest, sawmills and road works), an average of 14 companies per year, which translates into a labor of around 362 workers per year. For the period 2006-2016 total number was higher and it is estimated in 400 employees per year.

From the total number of contractors working for Guanaré/FAS , it is estimated than around 60% of these contractors are living in the project area of influence.

There are some forest activities where more subtle or dainty movements are needed or where more meticulous work is demanded, which is the case of the work at nurseries or the harvesting with ultra-sophisticated harvesters. In such cases, women could be better qualified for the task. It is expected that women from the community can participate in such type of activities, or others.

Since 2014, the company has a system to digitize and centralize the information of subcontracted companies, where all the data provided is available, based on the number of operators per company, which allows the documentation of the activity, as well as the training history carried out by the Operators, both by the contracting companies and by Guanaré/FAS .

2.3.16 Relevant Laws and Regulations Related to Worker's Rights (G3.11)

Forestry in the country has its own regulation for labor conditions (Decree 372/99), on top of a large number of norms which affect any activity. This decree was developed with the active participation of the forest producers, and basically defines several rules for safety, health and living conditions of forest workers.

Another important regulation relates with the minimum wage regime. In Uruguay, the law promotes the appointment of sectoral three-party committees¹⁶ (government, workers and companies) to discuss worker categories and minimum wages applicable to each category. The agreements reached by these committees are mandatory for all the companies in the corresponding sector. Historically, rural activities were not included in these committees, and minimum wages were fixed by decrees. In 2005, the forest companies, the forest workers and the government reached the first ever agreement for a minimum wage regime in a rural activity.

¹⁶ These committees are called "Consejos de Salarios" in Spanish.

Forest industry workers are organized in a specific union. SOIMA (Uruguay's Wood Industries Workers Union).

As of 2014, the Union is presented as one of the strongest in the country and has negotiated significant improvements in wage conditions.

These agreements set minimum wages by category, with semiannual adjustments based on inflation and dollar variations. Employees work 48 hours a week, with a maximum of eight-hour per day, (excepting if the hours worked on Saturdays are distributed from Mondays to Fridays). In this case the hours worked per day can be extended to nine and a half hours.

There is a national legislation aimed at the enforcement of safety and health standards, which is controlled by the Ministry of Labour.

Since 2015, Guanaré/FAS implemented an integrated management system that includes a digital management system to manage Corrective Actions Requests.

The Corrective Action System (SAC) allows companies working with, and Guanaré/FAS in its internal functioning, to have a centralized control and monitoring system to improve management in all stages and activities (operational, safety, environmental, social).

The system works with each member of the team having a tablet with the SAC system installed. Each time a Non-Conformity is detected, the person must record it in the system through a form with the following information:

- -Activity Data
- -Company in charge
- -Work crew
- -Geolocation that allows user to attach a photo file or record for a certain period of time.
- -Description of Non-Conformity

Once the form is completed, the system automatically notifies the owner of the contractor company and the foreman by email and text message. They, in turn, must provide a solution to the issue detected (for example, spillage of hydraulic fluid in a harvesting activity) within specific periods of time, depending on the type and severity.

Once the contractor has notified the issue has been solved, a Guanaré/FAS supervisor must go to the location where the SAC was recorded, verify compliance and close the request.

If the deadline is not met by the contractor and the request is not closed, different measures will be taken, according to Guanaré/FAS management procedures.

The system has the following benefits:

- -Constant control and monitoring.
- -Minimization of accidents.
- -Improvement in communication between the parties.
- -Generation of a real-time database that allows statistical analysis.

2.3.17 Occupational Safety Assessment (G3.12)

Guanaré/FAS consider the Safety and Health of the people, and of everyone directly or indirectly related to the activities, to be of the utmost importance. The company has implemented a system, coordinated by prevention technicians, oriented to the care of occupational safety, well-being and health risks of the personnel who works in the field. The system encompasses everyone, each and every one of the employees and contractors are committed to take care of their own safety as well as their co-workers'. Safety management is treated as a continuous self-improvement process which materializes in a systematic process of risks identification, assessment and control which requires the participation of everyone, reason why it is mandatory.

According to national legislation, the employer has the obligation to register in the Social Security Bank ("Banco de Previsión Social" - BPS) and Ministry of Labor and Social Security. By this, the employee assures health assistance for every member of the family.

Safety training and dissemination

Guanaré/FAS make strong emphasis on the training and awareness rising of the personnel and the people living in the area where we develop our activities. A continuous follow-up of the work conditions and facilities is performed in all the sites where the company operates. Continuous training and teaching is done and the exchange of experience among contractors is promoted. All observations and incident records are processed systematically in order to obtain statistics which allow the detection of issues which require special attention. If there are accidents, a relevant investigation is carried out to reduce future risks. In order to improve this control, Guanáré/ Guanáré/FAS started to implement a new software for its Management System. This innovative tool allows, through the use of tablets, a better control and monitoring of the Corrective Action Requests. The company have a Continuous Training Program structured according to the detected needs. The objective is clear: self-protection; the company wants every individual involved to embrace safety measures as a VALUE. Therefore, families and communities are included in the orientations, because we believe that safety starts "at home".

The project owner implemented health and safety practices to protect workers from occupational safety and health hazards. These practices shall, proportionate to scale, intensity and risk* of management activities, meet or exceed the recommendations of the ILO Code of Practice on Safety and Health in Forestry Work

Since 2015, Guanáré/FAS implemented the Mobile Attendance System. The main objective of this application is to register the attendance of employees and/or contractors at their working places.

From a mobile device (smartphone or tablet), employees may mark their entry/exit using the QR code that appears in their personal working card or entering their identity card numbers. At the time of marking, the

device takes a picture of the employee (double authentication factor) and records the date, time and geographical location.

In addition, the system automatically checks employee's documentary status –for instance, the validity of the health card, delivery of safety equipment, among others– and reports such information to the corresponding person in case the employee status is not in good standing so as to carry out their duties.

This system allows a strict control of work, rest and commuting times. It can be used as an input for payroll settlement.

Features like the Notification Manager and Your History issue proactive notices relative to the expiration of employees and vehicles documentation, as well as admission notices to the premises, late arrivals, absenteeism, etc.

The marks constitute supportive data for presenteeism.

2.4 Management Capacity

2.4.1 Project Governance Structures (G4.1)

Guanaré has a contractual agreement with FORESTAL ATLANTICO SUR (FAS) for the management of its investment. Guanaré/FAS is internally well structured, with experienced staff in the area of forest investments, forest management and trade of timber. Internal organization chart and other information are made available for the validating team.

FORESTAL ATLANTICO SUR was established in the year 2006, as a result of the association between Peter Lyford-Pike (Uruguay) y José Rafael Campino (Forestal Del Sur - Chile).

These two entrepreneurs, renowned in the international markets for their long experience in the marketing and supply of plantation timber for the industry, provide the support and expertise (gained over more than twenty years) necessary for the company to have a professional and reliable commercial potential. Guanaré/FAS is a leading provider of forestry services, which specializes in the production and marketing of raw materials. It's based on three pillars: commercial activity, logistics and forestry production. At present, as a result of this professional reliability and fulfillment of commitments which has been built by the partners over many years, Guanaré/FAS is considered to be a trustworthy provider, one with which it is safe to enter into long and medium-term commercial agreements.

Carbosur has a contractual agreement with Guanaré/FAS for the development and management of the carbon component of the project. It is not a project proponent.

2.4.2 Required Technical Skills (G4.2)

For the development of the Project, are required skills and experience related to:

- Experience in management of natural resources conservation projects
- Ability to interact with different actors and stakeholders,

- Development of Projects with rural populations,
- Experience in the development of carbon projects and environmental services
- Experience in the evaluation and monitoring of biodiversity

The project owner and the experts group provide technical advice and technical training, and carry out Project implementation of quality control and quality assurance at the same time.

All the workers will be train in order to perform the activities with adherence to the Principles & Criteria of the Forest Stewardship Council ® (FSC ®) for forest management and chain of custody. More than 360 employees (direct employees and contractors) are working in Guanaré/FAS project. All these employees are included in the company's "Annual Capacitation Plan".

2.4.3 Management Team Experience (G4.2)

The project owner has many years in management of projects of conservation of natural resources, with which it has developed capacities to interact with different types of actors, as a result of which it has established cooperation agreements with local governments, companies, producer organizations and native communities. It has also developed a system applicable to environmental projects, which has effective tools and methodologies to have effective control over the interventions carried out.

FAS manages its forest plantations integrated with other land uses, optimizing the management of natural resources responsibly according to the following policy principles:

- An economically, environmentally and socially integrated management for the achievement of the company's productive aims in a sustainable manner and with long term horizons.
- Adherence to the Principles & Criteria of the Forest Stewardship Council ® (FSC ®) for forest management and chain of custody, avoiding at any circumstance the management of wood from controversial origins.
- Good management of forestry resources, supported by the continuous study of the scientific breakthroughs, the experience in the country and the application of the best practices.
- Observation of national and international regulations in force, as well as the provisions established by the certification standards adopted by the company periodically verifying such compliance through inspections and audits.
- Supporting our employees in what regards to their professional and personal growth as we believe them to be essential for the development of the company encouraging teamwork, personal and professional development of each member, in an environment of respect, non-discrimination, trust, commitment, transparency and ethics.

- Promote health, safety and welfare of all employees through a proactive, systematic and effective management based on an adequate identification, assessment and control of risks.
- Implement trainings workshops focused on informing, raising awareness, promoting involvement and engagement of all employees in the basics of this policy.
- Preservation of natural resources and values, seeking the recuperation of degraded systems, the conservation of ecosystems' functions and the protection of areas and species of special interest. Preservation of cultural values and the respect for local communities' interests.
- Promote positive stakeholder relations, good neighbourliness, open communication, transparency, dialogue, respect for the diverse interests of communities. Encourage cooperation through projects related to the local development of the communities where we interact through educational and recreational activities and prioritizing the hiring of local staff.
- All our employees, representatives, advisors and consultants, regardless where they are located, are prohibited by law and policy of Forestal Atlántico Sur to offer or receive, pledge, payable or receivable, directly or indirectly, money or anything else value to any person, or entity (eg representatives of political parties, public and / or private companies -contractors-services institutions, other) to obtain or retain undue, own or benefits company.

People who represent Guarané/FAS have a responsibility to visibly show our commitment to this policy and any documents the develop or complement for its effective implementation.

2.4.4 Project Management Partnerships/Team Development (G4.2)

N/A

2.4.5 Financial Health of Implementing Organization(s) (G4.3)

The project developer (Guanaré SA) is legally registered company in Uruguay, and according to the public information listed in National Enterprise Credit Information Publicity System, none of them were involved in nor complicit in any form of corruption such as bribery, embezzlement, fraud, favoritism, cronyism, nepotism, extortion, and collusion.

Project has secured more than 80% of funding needed to cover the total cash out before the project reaches breakeven. This has been demonstrated in the validation and verification process under VCS in attached Excel file and Memorandum prepared by Pedro Aramendía, CFO of Guarané: total cost of purchased land and plantation costs in 2013, represented 87% over the highest level of accumulated cash out in 'Guanaré' afforestation cash flows. The most reliable and substantial demonstration are Guarané's financial statements, in which it can be seen that the company has an enormous capital in assets (land and standing trees), demonstrating that funding for Guarané project has already been secured, in other words the funding needed to implement Guarané project has already been available and has already been executed. Guanare is in good financial health.

2.4.6 Avoidance of Corruption and Other Unethical Behavior (G4.3)

As legally registered companies, the project owner and other involved entities have the obligation to comply with relevant regulations, including anti-corruption law. The annual audit by the government makes sure that it operates with full compliance with Uruguay law and regulations.

Guanaré/FAS has a Forest Management General Manual where it is clearly explained that corruption and other unethical behaviors are totally forbidden.

2.4.7 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

None of the project documents will be considered as commercially sensitive information, and all of the documentations are available to any stakeholders.

2.5 Legal Status and Property Rights

2.5.1 Statutory and Customary Property Rights (G5.1)

All the land is privately owned by Guarané

2.5.2 Recognition of Property Rights (G5.1)

Since these lands are all legal forestry land, the ownership is clear, and there is no dispute over land ownership in the project site

2.5.3 Free, Prior and Informed Consent (G5.2)

Prior to the project initiation, all of the project land was owned by Guarané. To make sure the successful development of the project, the project owner which had the ownership of forest land had presented all the requested documentation to government authorities. So, the project will not encroach uninvited on private property, community property or government property

2.5.4 Property Rights Protection (G5.3)

Prior to the project implementation, the project area was degraded grasslands where farmers (private owners) used these lands for extensive beef production. Private owners voluntary sold the lands to project owner, therefore the project activities will not lead to involuntary removal or relocation of property rights holders from their lands or territories, and does no force rights holder to relocate activities important to their culture or livelihood.

Due to its history, there are no native peoples in Uruguay. Only a new stream of people who have recognized themselves as descendants of indigenous communities, but who currently reside in cities.

Roque Roldán's estimate for a paper for the Inter-American Development Bank, presented in Fortaleza in March 2002 based on ILO data, estimated its total number at only 524 (0.02% of the Uruguayan population) even though it is a subject of debate among different historians, the historical reports of the different auditing

houses that certify in Uruguay indicate that there is no indigenous population according to the definitions of FSC.

2.5.5 Illegal Activity Identification (G5.4)

The forests are nursed by project staff regularly as a result of the implementation of the project, so there will not be illegal activities or deforestation of native forests inside Guanaré/FAS farms or surrounding the project boundaries. The project benefits are gained from legal activities. Therefore, the project's climate, community and biodiversity impacts will not be affected by illegal activities.

2.5.6 Ongoing Disputes (G5.5)

Because the project owner signed legal purchase agreements on all the land, the forest land was developed reasonably and legally., so there is neither ongoing or unresolved conflicts or disputes over rights to lands, territories and resources nor any disputes that were resolved and recorded during the last twenty years.

2.5.7 National and Local Laws (G5.6)

The project activity complies with the National law and binding regulations, since forest investment has been approved by the General Forestry Directorate (entity of the Ministry of Agriculture, Livestock and Fishery) and the National Environment Directorate (entity of the Ministry of Housing, Territorial Planning and the Environment). The former ensures that the project activity complies with National Law N° 15.939 and all binding decrees and decisions¹⁷, while the second granted the environmental authorization

2.5.8 Approvals (G5.7)

The total planted area had been approved by the General Forestry Directorate (entity of the Ministry of Agriculture, Livestock and Fishery) and the National Environment Directorate (entity of the Ministry of Housing, Territorial Planning and the Environment).

2.5.9 Right to Claim Benefits (G5.8)

Please refer to existing documentation regarding Guanare's land ownerships provided during validation under VCS

2.5.10 Other Programs (G5.9)

The project was also validated and verified under the VCS, project ID Number 959.

2.5.11 Double Counting (G5.9)

This project will not seek to generate or has received any other form of environmental or social credit

¹⁷ <http://www.mgap.gub.uy/portal/hgxpp001.aspx?7,20,417,O,S,0,,>

3 CLIMATE

3.1 Without-Project Climate Scenario

3.1.1 Without-Project Estimated Greenhouse Gas Emissions (CL1.1)

Since continuation of an activity that has been applied without changes for more than 20 years has been selected as the baseline scenario, it is assumed, in agreement with IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry (2003) that the net GHG removals by sinks in the baseline equals zero.

3.2 Net Positive Climate Impacts

3.2.1 With-Project Estimated Greenhouse Gas Emissions (CL2.1)

The net anthropogenic GHG removals by sinks is estimated as the actual net GHG removals by sinks minus the baseline net GHG removals, minus leakage. The following general formula described in the methodology is used to calculate the net anthropogenic GHG removals by sinks of an A/R project activity, in t CO₂-e:

$$C_{AR-CDM} = \Delta C_{ACTUAL} - \Delta C_{BSL} - LK$$

Where:

C_{AR-CDM}	Net anthropogenic GHG removals by sinks; t CO ₂ -e
ΔC_{ACTUAL}	Actual net GHG removals by sinks; t CO ₂ -e
ΔC_{BSL}	Baseline net GHG removals by sinks; t CO ₂ -e
LK	Total GHG emissions due to leakage; t CO ₂ -e

The actual net greenhouse gas removals by sinks were estimated using the following equation described in the methodology:

$$\Delta C_{ACTUAL} = \Delta C_P - GHG_E$$

Where:

ΔC_{ACTUAL}	Actual net greenhouse gas removals by sinks; t CO ₂ -e
ΔC_P	Sum of the changes in above-ground and below-ground tree biomass, dead wood, litter and soil organic carbon stocks in the project scenario; t CO ₂ -e
GHG _E	Increase in GHG emissions as a result of the implementation of the proposed A/R CDM project activity within the project boundary; t CO ₂ -e

The following formula described in the methodology is used in order to estimate GHG emission:

$$GHG_E = \sum_{t=1}^{t^*} GHG_{E,t}$$

Where:

GHG_E Increase in GHG emissions as a result of the implementation of the proposed A/R CDM project activity within the project boundary; t CO₂-e

$GHG_{E,t}$ Increase in Non-CO₂ emissions due to biomass burning of existing vegetation as part of site preparation in year t; t CO₂-e

T 1,2,3,.....,t* years elapsed since the start of the A/R CDM project activity

The tool for “Estimation of non-CO₂ GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” has been considered. The use of fire for site preparation and/or to clear the land of harvest residue prior to replanting is specifically excluded from the project management and therefore project emissions are estimated as zero.

Carbon stock changes

ΔC_P is the sum of the changes in above-ground and below-ground tree biomass, dead wood, litter and soil organic carbon stocks in the project scenario. For ex-ante estimation, dead wood and litter pools were conservatively neglected. Calculations for tree biomass (above and below) and soil organic carbon are described below.

Biomass carbon pools

Above and below ground biomass have been estimated according to the tool “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activity”. A summary of the main factors used and each source of data are presented in the table below. Estimations are archived as part of the project documentation and will be available for the validation team. Data used for estimating tree biomass are shown in **Table 12**

Table 12. Assumed parameters used for estimation of tree biomass carbon stocks

Parameter	Symbol	E. grandis	Source
Mean Annual Increment (m ³ .ha ⁻¹ .yr ⁻¹)	MAI _j	From 13.5 to 28	Local growth model (SAG grandis)
Wood basic density (Mg.m ⁻³)	D _j	0.52 and 0.46	Country-specific values
Biomass expansion factor (dimensionless)	BEF _{1j}	From 1.15 to 3.4	IPCC Good Practice Guidance for LULUCF (2003), Table 3A.1.10
Carbon fraction (dimensionless)	CF	0.5	Tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs"

Root-to-shoot (dimensionless)	ratio	R_j	From 0.2 to 0.4	Tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs"
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Soil organic carbon

Estimations of soil organic carbon (SOC) stocks were done in accordance to the "Tool for the estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activity". As suggested by the tool, it is assumed that the implementation of the project activity increases the SOC content of the lands from the pre-project level to the level that is equal to the steady-state SOC content under native vegetation. The increase in SOC content in the project scenario takes place at a constant rate over a period of 20 years from the year of planting. The project meets the applicability conditions of this tool since:

- the areas of land to which the tool is applied do not fall into wetland category, do not contain organic soils and are not subject to any of the land management practices and application of inputs listed in Tables 1 and 2 of the tool;
- Since the land use prior to project start is grassland, only Table 2 applies. For the temperate warm moist climate region corresponding to the project activity, none of the three combinations included in Table 2 are applicable;
- litter remains on site and is not removed and soil disturbance is in accordance with appropriate conservation practices, limited to site preparation and not repeated within 20 years.

Table 13. Parameters used for estimation of SOC

Parameter	Symbol	Value	Source (SOC estimation tool, V01.1.0)
Reference SOC (tC/ha)	$SOC_{REF,i}$	88	Table 3 HAC soils, warm temperate
Land use factor	$f_{LU,i}$	1	Table 6 All permanent grassland
Management factor	$f_{MG,i}$	0.95	Table 6 Moderately degraded grassland Overgrazed or moderately degraded grassland, with somewhat reduced productivity (relative to the native or nominally managed grassland) and receiving no management inputs
Input factor	$f_{IN,i}$	1	Table 6 Grassland without input of fertilizer

SOC at the beginning of the project ($SOC_{INITIAL,i}$) is estimated by multiplying the factors in **Table 13** by the reference SOC. As per the tool, a loss in SOC ($SOC_{LOSS,i}$) is applied in the case that soil disturbance occurs on more than 10 per cent of the land area, which is the case of Guanaré/FAS project. The following methodological formula is used for calculating the annual change in SOC stock:

$$dSOC_{i,j} = \frac{SOC_{REF,j} - (SOC_{INITIAL,i} - SOC_{LOSS,i})}{20}$$

Where:

- $dSOC_{t,i}$ The rate of change in SOC stock in stratum i of the area of land, in year t ; t C/ha/yr
- $SOC_{REF,i}$ Reference SOC stock corresponding to the reference condition in native lands by climate region and soil types applicable to stratum i of the area of land; tC/ha
- $SOC_{INITIAL,i}$ SOC stock at the beginning of the A/R CDM project activity in stratum i of the areas of land
- $SOC_{LOSS,i}$ Loss of SOC caused by soil disturbance attributable the A/R CDM project activity, in stratum i of the areas of land ; tC/ha

Application of the equation results in an estimated increase of 0.64 t C/ha/year in soil organic carbon.

3.2.2 Net Impact (CL2.2)

Baseline net GHG removals and total GHG emissions due to leakage are zero, thus ex-ante estimation of C_{AR-CDM} equals ΔC_{ACTUAL} .

According to VCS version 3 AFOLU requirements, the amount of carbon credits must not exceed the long term GHG benefit of the project. The period over which the long term average GHG benefit is calculated is 71 years (to include the harvest in the last rotation cycle started before the end of the crediting period). The total GHG benefit, calculated as the sum of stock changes along the 71 year period, is 7,644,973 t CO₂ (**Table 14**).

Table 14. Estimated net GHG removals

Years	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)	Years	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
2006	0	3,128	0	3,128	2041	0	134,441	0	134,441
2007	0	20,498	0	20,498	2042	0	133,228	0	133,228
2008	0	80,697	0	80,697	2043	0	447,794	0	447,794
2009	0	414,306	0	414,306	2044	0	1,031,617	0	1,031,617
2010	0	573,861	0	573,861	2045	0	749,514	0	749,514
2011	0	691,379	0	691,379	2046	0	-249,940	0	-249,940
2012	0	783,242	0	783,242	2047	0	-132,639	0	-132,639
2013	0	937,138	0	937,138	2048	0	156,655	0	156,655
2014	0	493,100	0	493,100	2049	0	902,981	0	902,981
2015	0	506,262	0	506,262	2050	0	700,815	0	700,815

2016	0	541,448	0	541,448	2051	0	218,898	0	218,898
2017	0	853,148	0	853,148	2052	0	-3,944,142	0	-3,944,142
2018	0	718,617	0	718,617	2053	0	-3,266,852	0	-3,266,852
2019	0	156,611	0	156,611	2054	0	-2,160,043	0	-2,160,043
2020	0	156,788	0	156,788	2055	0	879,377	0	879,377
2021	0	407,551	0	407,551	2056	0	431,358	0	431,358
2022	0	877,639	0	877,639	2057	0	1,377,266	0	1,377,266
2023	0	651,238	0	651,238	2058	0	688,657	0	688,657
2024	0	-152,042	0	-152,042	2059	0	707,176	0	707,176
2025	0	-56,544	0	-56,544	2060	0	764,097	0	764,097
2026	0	170,339	0	170,339	2061	0	1,246,131	0	1,246,131
2027	0	754,367	0	754,367	2062	0	1,037,381	0	1,037,381
2028	0	577,165	0	577,165	2063	0	167,749	0	167,749
2029	0	179,156	0	179,156	2064	0	164,804	0	164,804
2030	0	-3,165,964	0	-3,165,964	2065	0	558,911	0	558,911
2031	0	-2,620,334	0	-2,620,334	2066	0	1,284,529	0	1,284,529
2032	0	-1,740,208	0	-1,740,208	2067	0	932,988	0	932,988
2033	0	705,873	0	705,873	2068	0	-311,043	0	-311,043
2034	0	346,848	0	346,848	2069	0	-166,562	0	-166,562
2035	0	1,105,860	0	1,105,860	2070	0	196,643	0	196,643
2036	0	553,019	0	553,019	2071	0	1,124,484	0	1,124,484
2037	0	568,561	0	568,561	2072	0	872,488	0	872,488
2038	0	613,422	0	613,422	2073	0	271,915	0	271,915
2039	0	1,000,940	0	1,000,940	2074	0	-4,918,053	0	-4,918,053
2040	0	833,370	0	833,370	2075	0	-4,203,111	0	-4,203,111
Total						0	7,644,973	0	7,644,973

3.3 Offsite Climate Impacts (Leakage)

3.3.1 Types of Expected Leakage (CL3.1)

Leakage is assumed to be zero. See chapter below

3.3.2 Quantity of Expected Leakage (CL3.1, 3.3)

The methodology requires the assessment of sources of leakage due to activity displacement (conversion from grazing land to forestry). Application of the tool “Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity” led to the conclusion that this source can be neglected. The application of the “Guidelines on conditions under which increase in GHG emissions related to displacement of pre-project grazing activities in A/R CDM project activity is insignificant”, which is one of the applicability conditions of the tool, resulted in the conclusion that the project will not cause any displacement of the activity occurring before project implementation.

Beef cattle breeding (cow-calf) was the dominant activity in the pre-project land (Eastern hilly areas of Uruguay). Cattle were based on a breeding herd where heifers are mostly placed with bulls at the age of 3 years. Sales include culling cows to be fattened, surplus heifers, and calves (at weaning). Average production is 33 kg per ha per year¹⁸. Existing cattle in the pre-project situation may either stay within project boundaries or in an area controlled by project participant, or be sold to the market (calves and surplus heifers are normally sold in the market for fattening on other grazing areas, while cows, heifers and a reduced number of bulls are sold to slaughterhouses). It is Guarané’s policy that land owners can continue with their activities for a period of six months to one year after the purchase of the land, so that they have time to reduce the population of their cattle. In some cases, they may even stay in the land with long-term rental contracts.

Furthermore, according to data gathered from governmental Livestock Controller Division (DICOSE)¹⁹ there has been a smooth increase in the beef cattle and sheep stock in the departments of Cerro Largo and Treinta y Tres (where the project activity occurs) in the last decade (from 1.75 million livestock units, LSU, in 2003 to 1.92 million LSU in 2009). On the other hand, according to data taken from National Forest Directorate (DGF)²⁰ forest plantations have also been increasing for the same period of time (from 37 thousand hectares in 2003 to 72 thousand hectares in 2009) in the same departments. In addition, native forest has been also increasing in terms of area in the last 43 years at the National level. According to National Forest Inventory (2010)²¹ and to the forest maps based on aerial photographs of 1967²² native forests have increased 21% in terms of area. The fact that total forest area and amount of livestock have been increasing, analyzing Cerro Largo and Treinta y Tres official data, is an evidence that project activity does not result in displacement of the previous productive system. Therefore, leakage is assumed to be zero.

3.3.3 Leakage Mitigation (CL3.2)

Therefore, leakage is assumed to be zero.

¹⁸ INIA., 2001. Tecnologías forrajeras para sistemas ganaderos de Uruguay. Boletín de Divulgación 76.

¹⁹ <http://www.mgap.gub.uy/DGSG/DICOSE/dicose.htm>

²⁰ <http://www.mgap.gub.uy/portal/hgxpp001.aspx?7,20,442,O,S,0,,>

²¹ <http://www.mgap.gub.uy/portal/hgxpp001.aspx?7,20,440,O,S,0,,>

²² URUGUAY MAP. Forest Directorate.- First Forest Chart. Montevideo: MAP, 1979
([http://www.mgap.gub.uy/portal/hgxpp001.aspx?7,20,410,O,S,0,MNU;E;2;15;125;1;MNU;,\(](http://www.mgap.gub.uy/portal/hgxpp001.aspx?7,20,410,O,S,0,MNU;E;2;15;125;1;MNU;,())

3.4 Climate Impact Monitoring

3.4.1 Climate Monitoring Plan (CL4.1)

Data and Parameters Available at Validation

Table 15. Parameters available at validation

Data Unit / Parameter:	A_i
Data unit:	ha
Description:	Area of stratum i
Source of data:	Monitoring of strata and stand boundaries is done using a Geographical Information System (GIS) which allows for integrating data from different sources (including GPS coordinates and Remote Sensing data)
Value applied:	Variable according to stratum
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	N/A

Data Unit / Parameter:	$BEF_{2,j}$
Data unit:	Dimensionless
Description:	Biomass expansion factor for conversion of stem biomass to above-ground biomass for tree species or group of species j
Source of data:	IPCC default values (e.g. Table 3A.1.10 of IPCC GPG-LULUCF 2003)
Value applied:	From 1.15 to 3.4, depending on the tree age
Justification of choice of data or description of measurement methods and procedures applied:	N/A

Any comment:	BEFs in IPCC reports and national forest inventories are usually applicable to closed canopy forests. If applied to individual trees growing in open field.
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Data Unit / Parameter:	CF _j
Data unit:	t C t ⁻¹ d.m.
Description:	Carbon fraction of tree biomass for species or group of species j
Source of data:	The IPCC default value of 0.5 t C t ⁻¹ d.m.
Value applied:	0.5
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	N/A

Data Unit / Parameter:	D _j
Data unit:	t d.m. m ⁻³
Description:	Basic wood density for species or group of species j
Source of data:	Densidad, Dureza y Color de Eucalyptus grandis de Uruguay Ing. Quím. Silvia Böthig Informe de Investigación N° 5, Julio 2001"
Value applied:	0.46 and 0.52
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	N/A

Data Unit / Parameter:	R_j
Data unit:	Dimensionless
Description:	Root-shoot ratio for species or group of species j
Source of data:	Calculated as B/A where $B = \exp[-1.085 + 0.9256 \cdot \ln(A)]$, where A is aboveground biomass ($t \text{ d.m. ha}^{-1}$) and B is below-ground biomass ($t \text{ d.m. ha}^{-1}$) [Source: Table 4.A.4 of IPCC GPG-LULUCF 2003]
Value applied:	0.23 to 0.29 depending on the tree age
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	N/A

Data Unit / Parameter:	$V_{\text{TREE } j \text{ p } i}$
Data unit:	m^3
Description:	Stem volume of trees of species or group of species j in plot p in stratum i
Source of data:	Existing local species-specific tree growth models. (SAG grandis)
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	In case of ex ante calculation, growth was estimated based on average growth according to specific site conditions presented in the project site.

Data Unit / Parameter:	Bark volume
Data unit:	m ³ /ha
Description:	Bark volume of trees of species
Source of data:	Methodological tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs"
Value applied:	15% of total stem volume
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	Stem volume estimations of local growth models are under bark, thus this factor is applied

Data Unit / Parameter:	$f_{IN,i}$
Data unit:	Dimensionless
Description:	Relative stock change factor for baseline input regime (e.g. crop residue returns, manure) in stratum i of the areas of land
Source of data:	Tables 6 of "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM Project" activities.
Value applied:	0.7
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	N/A

Data Unit / Parameter:	SOC _{REF}
Data unit:	t C ha ⁻¹
Description:	Reference SOC stock corresponding to the reference condition in native lands (i.e. non-degraded, unimproved lands under native vegetation . normally forest) by climate region and soil type applicable to stratum i of the areas of land
Source of data:	Table 3 of “Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM Project” activities.
Value applied:	88
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	NA

Data Unit / Parameter:	f _{MG,i}
Data unit:	Dimensionless
Description:	Relative stock change factor for baseline management regime in stratum i of the areas of land; dimensionless
Source of data:	Table 6 of “Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM Project” activities.
Value applied:	0.95
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	N/A

Data Unit / Parameter:	$f_{LU,i}$
Data unit:	Dimensionless
Description:	Relative stock change factor for baseline land-use in stratum i of the areas of land; dimensionless
Source of data:	Tables 6 of "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM Project" activities.
Value applied:	1
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Any comment:	N/A

Data and Parameters Monitored

Table 16. Parameters monitored

Data Unit / Parameter:	D _n
Data unit:	cm
Description:	Diameter of the n th piece of lying dead wood intersecting a transect line
Source of data:	Field measurements along transect lines in sample plots
Description of measurement methods and procedures to be applied:	Standard operating procedures (SOPs) prescribed under national forest inventory are applied. In absence of these, SOPs from published handbooks, or from the IPCC GPG LULUCF 2003, may be applied
Frequency of monitoring/recording:	Before every verification event
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Quality control/quality assurance (QA/QC) procedures prescribed under National forest inventory are applied. In absence of these, QA/QC procedures from published handbooks or from IPCC GPG LULUCF 2003, may be applied.
Calculation method:	N/A
Any comment:	N/A

Data Unit / Parameter:	DBH
Data unit:	cm
Description:	Diameter at breast height of tree
Source of data:	Field measurements in sample plots

Description of measurement methods and procedures to be applied:	Usually the diameter at breast height of the tree, but it could be any other diameter or dimensional measurement (e.g. basal diameter, root-collar diameter, basal area, etc.) applicable for the model or data source used. Standard operating procedures (SOPs) prescribed under national forest inventory are applied. In the absence of these, SOPs from published handbooks, or from the IPCC GPG LULUCF 2003, are applied
Frequency of monitoring/recording:	Before every verification event
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, are applied
Calculation method:	N/A
Any comment:	N/A

Data Unit / Parameter:	H
Data unit:	m
Description:	Height of trees
Source of data:	Field measurements in sample plots
Description of measurement methods and procedures to be applied:	Standard operating procedures (SOPs) prescribed under national forest inventory are applied. In the absence of these, SOPs from published handbooks, or from the IPCC GPG LULUCF 2003, are applied
Frequency of monitoring/recording:	Before every verification event
Value applied:	N/A
Monitoring equipment:	N/A

QA/QC procedures to be applied:	Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, are applied
Calculation method:	N/A
Any comment:	N/A

Data Unit / Parameter:	DWR _{LI, p, i}
Data unit:	Dimensionless
Description:	Dry-to-wet weight ratio of the litter sub-sample collected from plots
Source of data:	Laboratory measurement of field samples
Description of measurement methods and procedures to be applied:	Litter samples shall be collected and well mixed into one composite sample at the same time of the year in order to account for natural and anthropogenic influences on the litter accumulation and to eliminate seasonal effects. A subsample from the composite sample of litter is taken, oven dried and weighed to determine the dry weight.
Frequency of monitoring/recording:	Before every verification event
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	N/A
Any comment:	It is acceptable to determine this ratio for three randomly selected sample plots in a stratum and then apply the average ratio to all plots in that stratum

Data Unit / Parameter:	N
Data unit:	Dimensionless
Description:	Total number of wood pieces intersecting the transect
Source of data:	Field measurements
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	N/A
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	N/A
Any comment:	N/A

Data Unit / Parameter:	T
Data unit:	Year
Description:	Time period elapsed between two successive estimations of carbon stock in trees and shrubs
Source of data:	Recorded time
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	N/A
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A

Calculation method:	N/A
Any comment:	If the two successive estimations of carbon stock in trees are carried out at different points of time in year t_2 and t_1 , (e.g. in the month of April in year t_1 and in the month of September in year t_2), then a fractional value is assigned to T

Data Unit / Parameter:	$a_{p,i}$
Data unit:	m^2
Description:	Area of sampling frame
Source of data:	Area of litter sampling frame used in plot p in stratum i
Description of measurement methods and procedures to be applied:	Standard operating procedures (SOPs) prescribed under national forest inventory are applied. In absence of these, SOPs from published handbooks, or from the IPCC GPG LULUCF 2003, may be applied
Frequency of monitoring/recording:	N/A
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, may be applied
Calculation method:	N/A
Any comment:	Often a litter sampling frame of $0.50 m^2$ is used

Data Unit / Parameter:	$A_{p,i}$
Data unit:	ha

Description:	Area of sample plot
Source of data:	Field measurement
Description of measurement methods and procedures to be applied:	Standard operating procedures (SOPs) prescribed under national forest inventory are applied. In the absence of these, SOPs from published handbooks, or from the IPCC GPG LULUCF 2003, are applied
Frequency of monitoring/recording:	Every five years since the year of the initial verification
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, are applied
Calculation method:	N/A
Any comment:	Sample plot location is registered with a GPS and marked on the project map

Data Unit / Parameter:	BLI_WET,p,i
Data unit:	kg
Description:	Wet weight of the composite litter sample collected from plot p of stratum i; kg
Source of data:	Field measurements in sample plots
Description of measurement methods and procedures to be applied:	Standard operating procedures (SOPs) prescribed under national forest inventory are applied. In the absence of these, SOPs from published handbooks, or from the IPCC GPG LULUCF 2003, may be applied
Frequency of monitoring/recording:	Every verification
Value applied:	N/A
Monitoring equipment:	N/A

QA/QC procedures to be applied:	Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, may be applied
Calculation method:	N/A
Any comment:	N/A

Description of the Monitoring Plan

Monitoring will be done according to the consolidated methodology AR-ACM0001 "Afforestation and reforestation of degraded land" (version 05.1.0, EB 60). Analysis of its applicability conditions have been developed in section 2 of this PD.

Monitoring comprises gathering information, performing calculations and making estimations of GHG emissions and removals. It ensures that commonly established principles of forest inventory and management are put into practice. All data gathered as part of the monitoring plan is archived electronically and kept at least for two years after the end of the last crediting period.

Physical limits will be calculated and checked periodically. The project boundary and the boundaries of pre-defined strata will be adjusted after plantations are established. This is to be done by using GPS technology, and the information will be organized in GIS format. Areas of each stratum will be recalculated and adjusted accordingly.

All activities performed in each stratum will be recorded and relevant parameters quantified. This includes the following:

- Site preparation: application of herbicides, tillage operations (date of operation, tools used, number of passes, width of operation in strip tillage, depth of operation, chemical weed control).
- Planting date, number of trees planted per unit area, tree species.
- Tree survival rate
- Fertilization date, application form, type and amount of fertilizer used.
- Harvesting date, volumes of wood removed by type of product.
- Disturbances: date, location, affected area (using GPS), type of disturbance, biomass lost.

Sampling design and stratification

Project boundaries will be defined at the beginning of project activity and updated along the crediting period. Boundaries may vary or new strata may be created after disturbances effects (pests, droughts, fire) and

boundaries will be redefined. Geographic coordinates are established, recorded and archived. A Geographic Information System will be implemented with the following basic layers:

- project boundaries
- aerial photographs
- soils map
- projected land-use map
- roads, fences, firebreaks, wood stocking areas, buildings, etc.
- permanent sampling plots

Other layers will be added in the future. The layers will be linked to several databases.

With the purpose of developing the monitoring plan, the total area will be divided in 22 strata. Stratification was done considering region (as described in section 2.3); age class (plantation date); and species planted²³. Current stratification could suffer subdivisions or merges in the case unexpected disturbances occur or insignificant intra-stratum variability is detected in the annual variation in carbon pools (e.g. forest management activities like thinning or harvesting). The size of the sample plot is a trade-off between accuracy, precision, and time (cost) of measurement. The size of the plot is also related to the number of trees, their diameter, and the carbon stock variance among plots. The plot should be large enough to contain an adequate number of trees per plot to be measured. IPCC Good Practice Guidance for LULUCF, chapter 4.3, recommends using a single plot varying between 100 m² to 600m², increasing the size from densely planted stands of 1000 trees per hectare to sparsely planted stands of multi-purpose trees. Because of application of thinning, forest stands in this project, have a low number of trees per hectare, tending to have a few large trees per hectare as the stands get older, and uniformly distributed. Taking into consideration the guidance by IPCC and the project-specific conditions, circular plots of 500 m² have been selected for monitoring. Permanent sampling plots are selected, since these are considered to be more efficient for estimating changes in carbon stocks by filtering out any variance due to plot effect.

Estimation of the number of sample plots was done in accordance with the methodological tool “Calculation of the number of sample plots for measurements within A/R CDM project activities”. Calculations are archived as part of project documentation. The monitoring plan will aim at an estimation of the mean carbon stocks with a precision level of 10% with 90% confidence. These are the values suggested by the selected methodology, and have also been chosen because they reach a compromise between precision in estimation of the population parameters and costs of the measurement and processing (section 4.3.3.4.1 IPCC GPG). The outcome of the estimation from the tool was a total of 109 plots for the whole project area. The distribution of permanent sampling plots per stratum is presented in **Table 17**.

The location of the plots will follow the guidance given by the corresponding methodological tool, as well as IPCC Good Practice Guidance for LULUCF (2002), chapter 4.3. An Arc-Map software (NAPA) developed by Pike & Co. will be used to randomly locate the permanent sampling plots (location is systematic, with

²³ Taking into account different species already includes both forest managements applied (22 and 16 years rotation length).

random start). This software has a feature to enable the location of all plots on forest areas (i.e., it avoids plots from being located in firebreaks and other non-planted areas). The map with the location of the sampling plots is loaded on the GPS receptors used by forest inventory crews, so that they can reach the plots accurately. An example of the software output for two contiguous strata is shown in **Figure 17**.

Data collection: The following steps are followed for identifying the sampling points:

1. Identify the plot to be measured in the paper map and in the GPS.
2. Steer to the plot with the help of a GPS navigator.
3. When the operator is approaching the point, make sure the GPS has the best possible signal. Stop at the first point that the GPS reads zero. If the GPS is kept at zero, that is the point indicated, otherwise move the GPS to the zero mark a second time. That becomes the ultimate focal point, even whether the zero moves again.

Table 17. Number of plots per stratum

Location	Stratum	Area (hectare)	Absolute numbers
Cerro Chato/Valentines	CCH/V 2006 globulus		
	CCH/V 2006 dunnii		
	CCH/V 2009 maidenii		
	CCH/V 2009 globulus		
	CCH/V 2010 maidenii		
Las Cañas	Las cañas 2010 grandis		0
	Las cañas 2011 grandis	200	1
	Las cañas 2009 grandis	364	2
	Las cañas 2008 grandis	5.202	30
	Las cañas 2007 grandis	4.233	24
Regis/Garao	R/G 2007 taeda	54	1
	R/G 2009 taeda	93	1
	R/G 2009 tereticornis	25	1
	R/G 2006 grandis	366	2
	R/G 2007 grandis	742	4
	R/G 2011 grandis	355	2
	R/G 2008 grandis	873	5
	R/G 2009 grandis	3.010	17
Tupambaé	Tup 2009 grandis	776	4
	Tup 2011 grandis	161	1
	Tup 2008 grandis	325	2
	Tup 2007 grandis	1.799	10
Sum		18.576	109

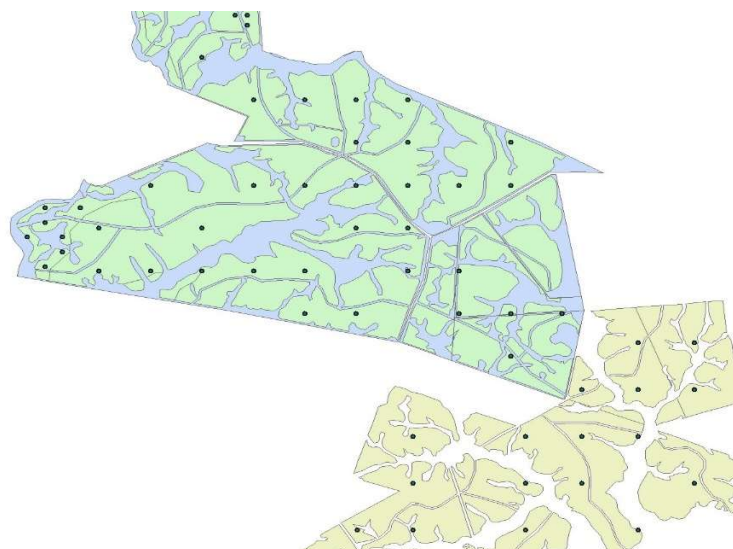


Figure 17. Example of location of permanent sampling plots.

4. Mark a new GPS point in the defined location.
5. Set the plot at that point, leaving a visible stake buried in the center of the plot (the stake is not intended to be permanent, but a mark for the control to be held a few weeks afterwards).

Each pool will be measured following the methodology procedures and IPCC Good Practice Guidance for LULUCF (2003). Carbon stocks in above and below ground biomass of trees are estimated by applying the BEF method. Stem volume, will be calculated applying a manual of procedures developed for local conditions, based on DBH and height measurement in each plot. Stem volume of trees is converted to above-ground and below-ground tree biomass using basic wood density (D), biomass expansion factor (BEF) and root-to-shoot ratio (R). Default carbon fraction (CF) value will be used in order to estimate the carbon stock.

Deadwood will be calculated according to the tool “Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities”. Two types of dead wood will be measured in the field: standing dead wood and lying dead wood. The former will be measured in the same sample plots used for estimating biomass stocks, and will be sub-divided into three categories. The carbon stock for the first two categories (dead standing trees and dead standing trees with fewer leaves and twigs) will be estimated in the same way as for living trees applying a reduction factor to account for lost biomass. The third category, which are standing trees with no leaves and branches, will be also divided into three types according to the rottenness level of the wood (a specific method will be applied in order to define rottenness). Each category will have a specific reduction factor. Laying dead wood will be estimated with the transect method. Two transect lines, intersecting and bisecting orthogonally each other in the center of the plot will be set. The length of the line should be of 100 meters in total. The diameter of wood pieces with diameter larger than 10 cm that are touched by the transect line are measured. The rottenness category is estimated as for standing dead wood. Then the methodological formula is applied.

Samples for measuring litter carbon stock shall be collected from the same plots used for living biomass estimations, using a sample frame to be laid on the ground on random locations. All litter on the area within

the frame will be collected. A sub-sample shall be extracted and weighed. It shall be further oven-dried and weighed again. Dry to wet weight ratio shall be estimated, and the resulting value shall be applied to all samples in the plot. Then the methodological formula is applied.

In order to ensure that application of default data results conservative, the “Guideline on conservative choice and application of default data in estimation of net anthropogenic GHG removals by sinks” is applied.

Prior to the start of the inventory, all equipment used during the field work shall be checked and calibrated. This includes:

1. Measuring tapes: a. Verify correct display of the numbers b. Check if it is stretched. This is done by a comparison with all other tapes and the tape pattern (without use tape that is taken for backup). c. Verify that the tip of the tape is zero
2. Caliper: a. Verify correct display of the numbers b. Check for bent or mechanical problems c. In the case of digital caliper, verify the proper functioning of the electronic device, making successive comparisons with the scale of the same caliper or comparing with another caliper. d. Check the height for DBH measures obtained by each operator.
3. Height measurements disposals (Criterion): a. Verify correct display of the viewfinder (setting interior light intensity depending on environmental conditions) b. Check battery charge and the replacement ones c. Control measurements/calibration of them (measure height of 5 different trees with all the equipment to be used)
4. GPS: a. Verify correct display of the screen b. Check battery charge and the replacement ones c. Check the correct registration of the plots to measure d. Check the location of the plots with all GPS, ensuring that all team scores the same location.
5. Others: a. Equipment: In case there are other measuring pieces of equipment (such as Suunto, blumeneis and other), they should also be verified and calibrated. b. Safety Equipment: Helmet, Vest, Leggings

The project will manage the sampling uncertainties evaluating and trying to reduce the type of errors. For that, the project developer shall:

- produce a Measurement Protocol (MP) and run courses for all field personnel;
- double check 10 per cent of sampling measurements by an independent party team. If the difference between measurements is higher than 5%, a third definitive measurement will be run. If the difference is higher than 10% the sample plot will be eliminated;
- minimize measurement errors: special attention will be paid to systematic errors that could scale up to the total estimations and multiply the uncertainty. A number of quality assurance and quality control measures will be implemented, as explained elsewhere;
- minimize model errors or static factors: These errors were minimized in the design of the monitoring methodology, which makes minimal use of default values, and uses widely accepted equations or models;

- minimize sampling errors: The allocation of samples in the field will be random, so the differences between population and sample mean and variance will tend to be neutralized, if the sample fraction is wide enough;
- minimize data recording and calculation errors: Usually hard to detect, they can be checked by controlling the range and variance of data of different measurement teams. Use of data loggers, software, automatic data recording field equipment, etc., will minimize errors in data handling.

Managing data quality

A Quality Control System will be implemented for routinely checking for data consistency, correctness and completeness; for identifying and correcting errors and omissions; and for properly documenting and archiving data and documentation related with the monitoring activities. Quality Assurance measures will be implemented, in order to verify that data quality objectives are met, and in general, to support the effectiveness of the QC system.

QA/QC plan includes a number of activities aiming at achieving accuracy and precision of data, and transparency of procedures, such as:

- development of Standard Operating Procedures for field measurements, clearly defining all staff responsibilities and raising awareness about the importance of each task for producing reliable results;
- proper training of field measuring teams;
- periodical check and maintenance of measuring instruments; all mechanical, optical and electronic instruments will be periodically checked by qualified personnel. In addition, consistency on field data will be permanently monitored, in order to detect any malfunctioning.
- perform area measurements using different methods (e.g., aerial photograph, cadastral data, satellite images, ground measurements), and check for accuracy and consistency.
- development of electronic worksheets for data processing; special software may be designed for the monitoring process, with graphical capabilities and data consistency checking functions.
- fully document and archive field and processed data, as well as all procedures used; to ensure data preservation, all relevant data, data analyses, static factors, photos, images, GIS output and other data shall be stored in electronic and paper format.
- establish procedures for eliminating inconsistent or erroneous field data; perform random checks of field measurements in order to detect measurement errors or systematic biases; some of such measures are: 1) use field computers and automatic data loggers (e.g., electronic recording caliper), and hire independent workers for transferring field data to digital media. (IPCC GPG 5.3.6.1); 2) during field work, double check 10% of sampling measurements with an independent party team or with a team different from the one that performed the measurement or sampling; if the difference between measurements is higher than 5%, a third definitive measurement will be run. If the difference is higher than 10%, the data or the plot will be eliminated;

- establish procedures to ensure representativeness of PSPs (i.e., to avoid biased estimates due to differential management of PSPs); The allocation of samples in the field will be systematic with random start, so, the differences between population and sample mean and variance will tend to be neutralized, as the sample fraction is wide enough; identification of plots in the field should be coded and apparent only to the monitoring team; periodical checks will be performed on simple measurements (e.g., DBH) outside PSPs, in order to correlate these values with plot measurements;
- development of allometric equations and emission/C-stock-change factors; project-specific equations and stock change factors would minimize errors, as compared to the use of default factors.
- check project data with benchmarks; this will help detecting possible inconsistencies in data collection or processing.

Operational and management structure

The monitoring will be coordinated by the property manager (Forestal Atlántico Sur) and implemented by a qualified contractor. One staff member of Forestal Atlántico Sur will be identified as the focal point.

- Entity applying monitoring plan
- Forestal Atlántico Sur S.A.
- Gabriel Otero 6559
- Montevideo 11.500, Uruguay

3.4.2 Dissemination of Monitoring Plan and Results (CL4.2)

The full project documentation will be published on VCS and CCB website for public comments, as well as the project summary in Spanish version, and the local communities and other stakeholders can easily download from the website.

Also, the full project documentation will be published on Guarané/FAS website for public comments.

3.5 Optional Criterion: Climate Change Adaptation Benefits

3.5.1 Regional Climate Change Scenarios (GL1.1)

N/A

3.5.2 Climate Change Impacts (GL1.2)

N/A

3.5.3 Measures Needed and Designed for Adaptation (GL1.3)

N/A

4 COMMUNITY

4.1 Without-Project Community Scenario

4.1.1 Descriptions of Communities at Project Start (CM1.1)

The four departments of the North of the country (Artigas, Rivera, Tacuarembó and Cerro Largo) present the lowest degrees of development (Veiga, 2016). In Cerro Largo the distribution by geographical area is mostly urban (87.8%), lower than the total number of the country and also of the interior; with a rural population that was approximately 10,481 people (remaining 12.1%) according to the results of the 2004 Census. One education indicator is the literacy rate that, according to the General Census of 1996, reached 93.4% of the population of 15 or more years in Cerro Largo, being below the average of the interior (95.6%) and the total country (96.8%) (Barrenechea et al., 2008).

Life expectancy at birth is not the demographic indicators that measure achievements in health matters. According to INE, Cerro Largo has one of the lowest values of this indicator, with an index of life expectancy at birth of 75.4 years for 2006, which places the department in the national context in 15th place in this area (out of 19), with a value lower than the national average (75.7 years). It should be noted that Cerro Largo has held this position at the national level since the nineties.

The UNDP carries out a worldwide Human Development Index (HDI), which consists of "a synthetic measure of the achievements of a society in terms of human development", and "seeks to quantify and combine in an aggregate index the achievements average that registers a country in three fundamental dimensions: to achieve a long and healthy life (health dimension), to acquire useful knowledge (education dimension) and to have the necessary resources to enjoy a decent standard of living (standard of living or access to resources)".

According to the Human Development Report in Uruguay 2005, considering the order of the departments according to its HDI, Cerro Largo was located (with data for the year 2002) in the 15th place. This is if we consider an approximation to the level of living dimension through GDP per capita; since if this approach is considered through the income of households, descends to the 16th position. Therefore, it is among the departments of least relative human development in the country (in previous HDI calculations, for 1991 and 1999 it held the 17th and 14th positions, respectively).

In terms of economy, the generation of value in Cerro Largo denotes a high primary specialization, higher than the average of the interior, centred on livestock (cattle and sheep), rice, forestry and dairy cattle to a lesser extent, which do not contribute to the boost of local development.

The main activities in the department of Cerro Largo are beef cattle ranching (62% of establishments declare cattle ranching as the main source of income, occupying 85% of the area of the department according to the 2000 Agricultural Census), and the sheep (15% of establishments, occupying just over 4% of the departmental area). In addition, they are responsible for 64% of rural employment.

Employment in agriculture is concentrated in beef cattle, which represents 64% of employment (5,800 jobs). However, cattle ranching is one of the activities that have the lowest rates of people employed per thousand hectares (employs five people per thousand hectares).

When referring to Treinta y Tres, the distribution by geographical area is mostly urban (89.7%), lower than the total of the country but higher than the interior; with a rural population that includes a total of 5,079 inhabitants (remaining 10.3%) (Barrenechea et al., 2008). Literacy indicator, according to the General

Census of 1996, reached In Treinta y Tres to 94.7% of the population aged 15 or more, being below the average of the interior (95.6%) and that of the total country (96.8%).

According to the IDH, Treinta y Tres is located in 13th place (out of 19), remaining at a low average level with respect to previous years (also 13th in 1999). Life expectancy at birth is one of the demographic indicators that measure achievements in health. According to the INE, Treinta y Tres has one of the lowest values of this indicator, with an index of life expectancy at birth of 75.4 years for 2006, which places the department in the national context in 15th place in terms of life expectancy at birth, with a value somewhat below the national average (75.7 years).

In the department of Treinta y Tres, the main activities are livestock (cattle and sheep) and rice. The dairy must also take into account the involvement of a number of producers that are not negligible and that make it a way of life without visualizing alternative alternatives to that activity (some 60 families).

In summary, communities in the area are not diverse, they share the same language, religious belief, livelihood system, history or culture. Their relationship with natural resource is through the main responsible of the economy, beef cattle breeding.

4.1.2 Interactions between Communities and Community Groups (CM1.1)

Communities (described in 2.1.5) do not normally generate community groups related to forestry. However, there are some community groups created around the beef cattle breeding activity, like “Sociedad Fomento Treinta y Tres” or “Sociedad Fomento Cerro Largo”. These social organizations are characterized by being groups constituted voluntarily by the community for self-management of their economic development

4.1.3 High Conservation Values (CM1.2)

High Conservation Value	Quebrada de los Cuervos
Qualifying Attribute	<i>Biodiversity reserve, ecosystem services</i>
Focal Area	

High Conservation Value	Santa Sofía farm
Qualifying Attribute	Biodiversity reserve, ecosystem services
Focal Area	

One of the project sites is Santa Sofía farm. The project has been categorized as AVC (Area de Valor de Conservación) according to FSC Standard.

High Conservation Value	Museo Gral. Aparicio Saravia (Estancia El Cordobés)
Qualifying Attribute	National Historical Monument
Focal Area	

High Conservation Value	Parroquia de Santa Clara de Olimar
Qualifying Attribute	Historical site
Focal Area	
High Conservation Value	Azotea de Fructuoso Mazziotto
Qualifying Attribute	Historical site
Focal Area	
High Conservation Value	Casa de las Crónicas de Justino Zavala Muñiz.
Qualifying Attribute	Historical site
Focal Area	
High Conservation Value	Quinta de los Naranjos de López Sar.
Qualifying Attribute	Historical site
Focal Area	
High Conservation Value	Casa de estancia de Justino Muñiz y entorno
Qualifying Attribute	Historical site
Focal Area	
High Conservation Value	Casa de estancia "Las Marías" de Doroteo Navarrete, parque, manguera de piedra y entorno
Qualifying Attribute	<i>Historical site</i>
Focal Area	
High Conservation Value	"Azotea de Pay Alonso", manguera de piedra, monte indígena y entorno
Qualifying Attribute	<i>Historical site</i>
Focal Area	

High Conservation Value	Lugar en que se desarrollo el "Combate de Arbolito", estela eregida donde cayó Antonio Florencio (Chiquito Saravia) y entorno en un área de 10 hectáreas circundantes a la estela.
Qualifying Attribute	<i>Historical site</i>
Focal Area	

High Conservation Value	Antigua Azotea de Altezor - Quinta de Tropa
Qualifying Attribute	<i>Historical site</i>
Focal Area	

4.1.4 Without-Project Scenario: Community (CM1.3)

Expected changes in the well-being conditions and other characteristics of communities under the without project land use scenario are difficult to assess. According to the description of the communities at project start (4.1.1) and considering the evolution of the communities during the last 13 years, the most probable scenario without project land use scenario is that communities would not have improved in their well-being.

Conclusion is achieved based on the historical characteristics of communities and how they are linked to beef cattle breeding. This is the main economic activity that has generated employment and is the main source of income for the region, over the last 300 years. Soil productivity is relatively low, and production of grass is reduced compared to other soils in Uruguay. Therefore cow–calf operation is the main activity: method of raising beef cattle in which a permanent herd of cows is kept by a farmer or rancher to produce calves for later sale. This is the perfect scenario for maintaining “gaucho” traditions. Gaucho is part of the national folklore, but the actual gauchos are only descendants of the original archetype.

4.2 Net Positive Community Impacts

4.2.1 Expected Community Impacts (CM2.1)

Creation of employment is one of the main social benefits of the project. Typically, an extensive livestock production system employs 1.4 persons every 1,000 ha. Guarané/FAS project is expected to multiply that figure by more than 10.

Beyond an increased number of 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, 'Guanaré/FAS' project activity will generate several job opportunities, creating nearly 700 job positions when the sustainable production be reached. The vast majority of employees will be hired by contractors. The majority of the outsourced contractor companies currently working with Guanáré/FAS, are registered in Uruguay as "PYMES" (small and medium sized enterprises - SME), mostly family companies.

- Internationally tradable products

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

- Eradication of rural poverty

The main contribution of Guanáré/FAS project activity to the eradication of rural poverty will be through 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)²⁴, 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.

- 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. Guanáré/FAS 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.

- Increased nationally added value to forestry products

Guanaré/FAS 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, the presence of Guanáré/FAS and of other similar initiatives in the area are also seeking carbon finance (GFP, Weyerhaeuser 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 Guanáré/FAS could be exported through Montevideo harbor at prices which will be higher than those that could be obtained by selling pulpwood, which is the traditional wood product exported from Uruguay.

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

- Development of new productive chains

²⁴ Carámbula, M. y Piñeiro, D. La Forestación En Uruguay: Cambio Demográfico y Empleo en Tres Localidades

Guanaré/FAS has no plans to not invest in the industry sector. Nevertheless, as mentioned above, Guanaré/FAS forest plantation may contribute to promote the establishment of industrial investments in the area.

- Geographic decentralization of development

As it was mentioned above, Guanaré/FAS 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.

Guanaré/FAS has implemented a program to support and assist local communities, public schools, public entities (firefighters, police) or any stakeholders with problematics solvable by Guanaré/FAS, with donations of various types. From materials goods (firewood, tools, school supplies) to staff time (educational presentations in schools) and sometimes cash, Guanaré/FAS is committed to promote and enhance the well-being of the community. A complete and detailed list of donations is available for VVB during validation.

4.2.2 Negative Community Impact Mitigation (CM2.2)

There is no negative impact identified related to communities. In the Project Area there are high conservation area values related to the community, but with no interference with Guanaré/FAS project.

4.2.3 Net Positive Community Well-Being (CM2.3, GL1.4)

The main source of income for communities associated with the agriculture in the project area is beef cattle breeding (cow-calves). The production methods have been applied for the last 300 years (extensive production) and is affected by natural disasters such as droughts, floods. Overall , agricultural production is low. The project will benefit communities economically and socially.

- 1) Income improvement: during the project period, the net income generated by the project includes generation of employment and increasing labor income
- 2) Job creation: The project will provide permanent, temporary, direct and indirect employment opportunities. Most of the work will belong to local farmers involved in the project.
- 3) Enhance social cohesion: project developer will form a closer interaction channel, which will strengthen communication between communities, local/national governments and forestry contractors' companies.
- 4) Technical training: people from communities hired to develop forest activities will be technically trained .
- 5) After the project is implemented, it will contribute with the beauty landscape.

4.2.4 High Conservation Values Protected (CM2.4)

None of the HCV related to community well-being will be negatively affected by the project because almost all HCV are not located in the rural areas, but in towns, negligible being affected by the project activity. There is a HCV, "Quebrada de los Cuervos" that is part of the National System for Conservation Areas (SNAP) with strict conservationist rules for the protected area and buffer zone. Guanaré/FAS project is not affected or affecting the Quebrada de los Cuervos.

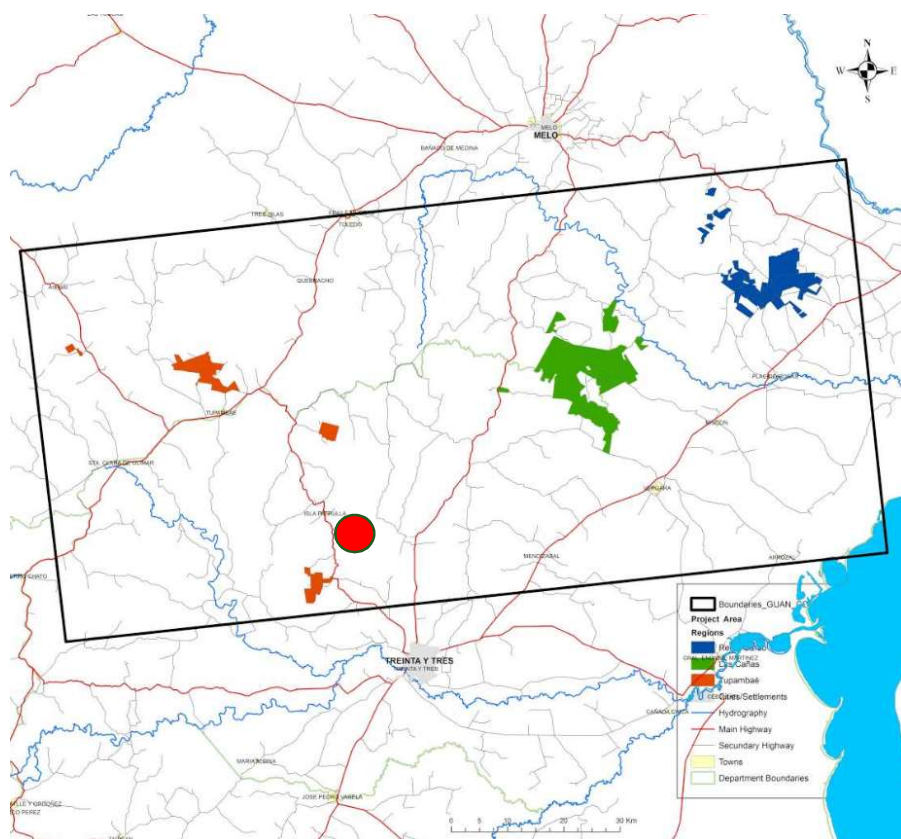


Figure 18. Location of Quebrada de los Cuervos (red dot)

Santa Sofía farm is part of the project area, and is also a private HCV defined by Guarané/FAS and approved by local communities (with public consultation in 2011). FSC standard has a standardized procedure that needs to be followed in order to categorize an area as HCV. The procedure includes doing a public consultation, inviting all potential affected communities. The area was successfully categorized as HCV in 2013 and permanent biodiversity monitoring is conducted in the site. See biodiversity section of this report. The report "Characterization of habitats and wildlife monitoring" for the AAVC Santa Sofía farm conclude over the last years, that there are no changes in the HCV, which is in a good state of preservation, as well as their buffer zones. The state of conservation, the presence of natural regeneration and the absence of traces of cattle were verified. Studies of the same characteristics were carried out in Isla Patrulla, Horizonte, Agrocampo, and no negative changes were observed with respect to previous monitoring. The study included a list of flora and fauna species (amphibians, mammals, birds). according to international conservation lists (IUCN, CITES) and according to the database of biological invasions in Uruguay (InBUy). The categories were aligned in accordance with the categorization of IUCN and CITES. The SNAP species (priority species for the conservation of the SNAP-Sistema Nacional de Areas Protegidas) were taken into account. Specialists are hired to survey and monitor flora and fauna in the project sites. Those environments/species of interest for conservation and representative areas are selected, as is the case of native forest. Social advisors in their interviews with local social actors are consulted about potential sites of value for conservation. The answers are evaluated by the technicians of the company for their consideration. It was verified in the revised documentation "Sites of high conservation value" according to interviewees - Zone influence Arbolito, Placido Rosas, La Micaela, Depto. Cerro Largo November 2016 - August 2018.

4.3 Other Stakeholder Impacts

4.3.1 Impacts on Other Stakeholders (CM3.1)

The project activities may contribute to other stakeholders, improving socio-economic conditions, by bringing decentralized development and generating job opportunities.

4.3.2 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)

No negative impacts have been identified on other stakeholders.

4.3.3 Net Impacts on Other Stakeholders (CM3.3)

As there has not been identified negative impacts, there is no need to anticipate to their results.

4.4 Community Impact Monitoring

4.4.1 Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

Guanaré/FAS 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 neighbours and local development.

The responsibility for the application of this Plan lies with the General Management of FAS, with delegated functions in company personnel and external advisors, as the case may be. Full “Social Monitoring and Management Plan” document will be available for VVB during validation and verification.

The project monitoring plan is based on the “theory of change approach”, which supposes the improvement of a list of assumptions about the possible impacts of the project activity. Measurable indicator is established for the evaluation of the community impact of the project.

The indicators presented in the monitoring plan will be evaluated periodically. The monitoring purpose is to identify the areas for improvement, where the level of compliance is not being achieved and for the development of new strategies to accomplish the objective.

Assumption	Indicator	Source of data	Monitoring frequency	Goal
Improve of livelihood of communities and stakeholders	Number of direct employees living in the area of influence	Human Resources	Annual	At least 10% of the employees should be residing in the area of influence
	Number of indirect employees living in the area of influence	Mobile Employees Attendance System	Annual	At least 50% of the employees should be residing in the area of influence

Improvement of technical capacities of communities and stakeholders	Number of trained people in forestry-related areas	Internal registry of trainings	Annual	100% of forestry contracted companies should be trained every year
Improvement of communities' well-being	Number of complaints resolved	Internal record of complaints and resolutions	Annual	100% of complaints should be answered in maximum two weeks and resolved as soon as possible
	Contribution of project developer to communities in material assistance (donations)	Internal registry of donations (supported by accountability books)	Annual	Contribute with communities with what is possible

Apart from these objective indicators, a set of subjective indicators will be collected from stakeholders present in the project area of influence.

Semi-directed interviews with local stakeholders will be conducted during periodic social monitoring visits to the areas of influence. Positive and negative impacts of forestry activity will be questioned.

This will allow the company to understand how the activity contributes or interferes with satisfying the priority needs of the community for its development, according to the opinion of qualified informants who live or work in the area for a long time.

The opinions of the interviewees in areas of influence in reference to the positive and negative impacts of forestry activity will be recorded in a table. This information allows will allow Guanaré to select and define the socio-environmental indicators that can be followed up in the coming periods in order to verify the contribution to the development of the communities, as well as the impact on natural ecosystems.

4.4.2 Monitoring Plan Dissemination (CM4.3)

The monitoring plan and results of every verification will be published on Guanaré/FAS website which can be consulted by stakeholders. Also, a contact person with phone numbers will be published.

4.5 Optional Criterion: Exceptional Community Benefits

The project does not seek to obtain the Gold Level for exceptional community benefits.

4.5.1 Exceptional Community Criteria (GL2.1)

N/A

4.5.2 Short-term and Long-term Community Benefits (GL2.2)

N/A

4.5.3 Community Participation Risks (GL2.3)

N/A

4.5.4 Marginalized and/or Vulnerable Community Groups (GL2.4)

N/A

4.5.5 Net Impacts on Women (GL2.5)

N/A

4.5.6 Benefit Sharing Mechanisms (GL2.6)

N/A

4.5.7 Benefits, Costs, and Risks Communication (GL2.7)

N/A

4.5.8 Governance and Implementation Structures (GL2.8)

N/A

4.5.9 Smallholders/Community Members Capacity Development (GL2.9)

N/A

5 BIODIVERSITY

5.1 Without-Project Biodiversity Scenario

5.1.1 Existing Conditions (B1.1)

The natural grasslands are the most representative habitat of Uruguay. This environment, mainly due to agricultural exploitation, has been degraded and modified over time, leaving only a few pristine areas. The natural prairie is the habitat of many species of fauna, many of them categorized as RAE species worldwide.

Although afforestation takes place in certain types of prairie environments, which leads to a reduction in the area of the natural grasslands, the correct designs and management make the biodiversity of the area little affected and, in certain cases, improved. This is the case of most Guanaré/FAS farms where the company establish and conserve buffer areas of grazing environments.

The project area consists basically of grassland altered by many years of grazing. This activity would have caused a significant alteration of dominant species, as well as some soil loss due to laminar erosion due to frequent over grazing. This grazing-degraded grassland covers most of the project area. Associated with this, there are lowland, humid zones, with richer biodiversity and higher conservation value. The forests of the proposed project activity will be planted on grazing-degraded zones, and the project was designed with the objective of preserving the most valuable areas.

These conservation areas include natural forests by the rivers and streams, composed by hydrophytic species close to the streams, and xerophytic species surrounding them in an ecotone with a shrub, straw, high-grass transition to the grasslands. These ecosystems have suffered alterations in the past, due to human intervention. Valuable tree species include *Salix humboldtiana*, *Sebastiania schottiana*, *Sapium* sp., *Pouteria salicifolia* and *Erythrina cristagalli*. Also, in the most humid areas *Lueha divaricata*, *Quillaja brasiliensis*, *Cupania vernalis*, *Ocotea acutifolia*, *Allophylus edulis*, *Sebastiania klotzchiana* and *Citarexylum montevidense* appear frequently. In intermediate zones, it is common to find *Schinus longifolius* and *Acanthosyris spinecens*, whereas the most common species in the drier zones are *Gochinatha malmei*, *Aloysia gratissima* and *Lithraea melloides*.

In Uruguay plantations are established on old farming land, mainly established on degraded grasslands that is the most important type of vegetation in Uruguay. Plantations are located neither in the tropics nor rainforests

The native pastures of Uruguay, since the introduction of the cattle by the Spaniards at the end of the 15th century, have undergone a substantial modification from those times to the present. This condition has intensified due to overgrazing, the introduction of exotic forage species and the tendency to add new grazing lands by burning areas of humid grasslands, *chilcales* (shrubby areas) and other natural ecosystems that used to be habitats of RAE and IUCN species.

5.1.2 High Conservation Values (B1.2)

High Conservation Value	Quebrada de los Cuervos
Qualifying Attribute	<i>Biodiversity reserve, ecosystem services</i>

Focal Area	N/A
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There is a HCV, “Quebrada de los Cuervos” that is part of the National System for Conservation Areas (SNAP) with strict conservationist rules for the protected area and buffer zone. Guanáre/FAS project is not affected or affecting the Quebrada de los Cuervos

No other HCVs were identified related to biodiversity in the project zone before the implementation of the project. Native forests were degraded because of intensive beef production and no hunters control.

Before the implementation of the Guanáre/FAS project, native fauna or flora studies in the area were never conducted. Extensive beef production companies did not have the habit nor the obligation to carry out this kind of studies, since traditionally the extensive cattle is not certified by international standards (for example, FSC or similar), nor is it controlled by the Ministry of the Environment (DINAMA).

5.1.3 Without-project Scenario: Biodiversity (B1.3)

Uruguay is located in a biogeographic transition zone in the southern part of the South American continent. The confluence of biogeographic regions gives rise to natural fields interspersed with wetlands, different types of native forests, landscapes and important bodies of water, including coastal lagoons. Noteworthy biodiversity exists at the ecoregional, ecosystem, species and genetic levels. Furthermore, habitat diversity reveals a variety of interesting species, many of which are globally significant in ecological, economic and social terms.

Natural temperate grasslands (Pampas) cover about 60% of the national territory and are significantly affected by intensified land use practices.

Native Forest areas in Uruguay have grown steadily over the past 25 years (from 3.5% coverage to 6%). The forestry sector (forest plantations based on introduced species) has recently experienced dynamic growth, with significant investment occurring as a result of opportunities offered for developing new projects, such as sawmills, power plants and pulp mills

Uruguay is home to several bird species considered globally threatened, such as the yellow cardinal, the black-and-white monjita (*Heteroxolmis dominicanus*) and the marsh seedeater. Several tree species located in Uruguay are at their southern and eastern natural range limits, implying genetic variability of populations important for breeding programmes. Other native species are known for their medicinal or aromatic characteristics, for timber or as ornamentals. Many landraces have evolved from introduced species, such as wheat, during the colonial era.

Source: <https://www.cbd.int/countries/profile/default.shtml?country=uy>

In Uruguay plantations are established on old farming land, mainly established on degraded grasslands that is the most important type of vegetation in Uruguay.

5.2 Net Positive Biodiversity Impacts

5.2.1 Expected Biodiversity Changes (B2.1)

After the afforestation project is fully launched, there will be an increase in plant species, and the project will implement afforestation activities through scientific and rational allocation methods, without burning and cutting or harvesting native forests.

Ecotones and buffer areas are very important areas from the point of view of biodiversity and its conservation. In them, 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 are habitat and biological corridors for many RAE fauna species.

In all the wildlife studies conducted by Guanaré, 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.

5.2.2 Mitigation Measures (B2.3)

In the fields where FORESTAL ATLÁNTICO SUR operates, environmental assessments and impact surveys are carried out by a team of experts. Based on the results obtained in these studies, management and monitoring plans have been developed for the restoration of natural systems which may have been affected by previous practices (agricultural, farming, forestry or other activities), the conservation of natural resources and values in the influence areas (flora, fauna, soils and hydric resources) and the prevention or mitigation of environmental impact caused by forestry operations.

Monitoring tasks include, in particular, regular assessments of the effects of forestry operations on the soil, pollution and ecosystems. On the other hand, studies of the fauna are being carried out with the purpose of determining the effect of these operations in the species composition and distribution in the country and the possibility of controlling harmful species such as the wild boar. (Source: Guanaré/FAS web site)

General measures for the protection of the facilities include: prohibition of hunting, fishing, catching specimens and damaging the native forest; measures to prevent and control fires; environmental safeguards that include guidelines for the responsible management of the various natural ecosystems present, soil conservation, protection of water resources, and proper waste management.

5.2.3 Net Positive Biodiversity Impacts (B2.2, GL1.4)

First, due to long-term farming, ecological structure of most project sites was relatively homogenous, with low biodiversity. Guanaré/FAS 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.

Second, because ecotones and buffer areas are very important areas from the point of view of biodiversity and its conservation, Guanaré/FAS focused special studies in those areas. In them, 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 are habitat and biological corridors for many RAE fauna species.

In all the wildlife studies conducted by Guanaré, strict pasture species have been detected in forest lands.

Third, scientific and rational afforestation projects can adjust the hydrological cycle, reduce drought and flood risk; promote soil nutrient cycle, improve local micro-climate and others ecological environments.

5.2.4 High Conservation Values Protected (B2.4)

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. Guanaré/FAS 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.

In "Santa Sofía", Garao, north of Plácido Rosas, province of Cerro Largo, there are complex ecosystems composed of primary swamp forests or "capones" associated to rain forests considered rare in the country and located in patches that add 186,9 ha. Since the end of 2013, this area has been considered of High Conservation Value since it is an area with exceptional characteristics, with relictual patches of flora from Brazil and mainly due to the diversity of flora species present.

5.2.5 Species Used (B2.5)

The project is planted mostly with *Eucalyptus grandis* and, to a lesser extent, *E. dunnii* (in lower areas where *E. grandis* can be affected by frost damage), which are not native to the area. The choice of species is due primarily to the fact that they ensure an adequate productivity level and a market access for the products to be obtained, which would not be possible if other species were used. It is worth mentioning that there are no tree species native to the ecosystem where forests will be established, since the original vegetation is grassland. Native forests, located on low areas at the margins of an extensive network of rivers and minor water streams, cover less than 5% of Uruguay's territory. Native tree species have usually short, contorted stems, and very slow growth rates. Because of these features, there are currently no native tree species suitable for large-scale commercial plantations. A few species with potential commercial uses have been identified, but there is very limited knowledge on their management. Also, their feasibility would largely depend on finding a market value for their wood products. Specific sampling was performed on native forests in order to evaluate growth, sanitary status and number of species.

E. grandis Hill ex Maiden (rose gum), a member of the Myrtaceae family is not native to Uruguay. However, it originates in a region of Australia with ecological conditions highly similar to those of Uruguay. This similarity explains why this species adapted so well to Uruguayan conditions, where it has been successfully grown and bred for many years (the National Institute of Agricultural Research of Uruguay has released a few locally developed varieties, which will be used by 'Treinta y Tres' project). In addition, there are numerous native relatives of *Eucalyptus* in Uruguay, including more than 20 native tree species belonging to the Myrtaceae family.

5.2.6 Invasive Species (B2.5)

N/A

5.2.7 Impacts of Non-native Species (B2.6)

Species	Eucalyptus grandis
Justification of Use	They ensure an adequate productivity level and a market access for the products to be obtained, which would not be possible if other species were used. The project will produce high quality wood suitable for plywood and saw wood production. To produce these type of logs, intensive silvicultural management is implemented (pruning up to 9 meters and thinning), which means intensive and specialized workforce
Potential Adverse Effect	As a general measure, the project will voluntarily adopt the application of the National Code of Good Forest Practices. Likewise, an environmental management system will be implemented with a focus on continuous improvement, following the FSC (Forest Stewardship Council) standard. Based on the environmental impact studies carried out, a significant negative environmental impact is not expected as a consequence of the implementation of the project activities and the use of E. grandis. The project is classified in Category A in DINAMA (lower impact). Natural regeneration (mainly in buffer zones and lowlands) will be controlled. After pruning and thinning, drainage zones will be controlled, and no pruning/thinning residues will be allowed in these areas

Species	Eucalyptus dunnii
Justification of Use	This specie will be planted in lower areas where E. grandis can be affected by frost damage. Similarly to E. grandis, E. dunnii ensure an adequate productivity level and a market access for the products to be obtained, which would not be possible if other species were used. The project will produce high quality wood suitable for plywood and saw wood production. To produce these type of logs, intensive silvicultural management is implemented (pruning up to 9 meters and thinning), which means intensive and specialized workforce

Potential Adverse Effect	As a general measure, the project will voluntarily adopt the application of the National Code of Good Forest Practices. Likewise, an environmental management system will be implemented with a focus on continuous improvement, following the FSC (Forest Stewardship Council) standard. Based on the environmental impact studies carried out, a significant negative environmental impact is not expected as a consequence of the implementation of the project activities and the use of E. dunnii . The project is classified in Category A in DINAMA (lower impact) Natural regeneration (mainly in buffer zones and lowlands) Will be controlled After pruning and thinning, drainage zones will be controlled and no pruning/thinning residues will be allowed in these areas
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Regarding Pine plantations, a very small area of this genus was planted. Natural regeneration is permanently controlled.

5.2.8 GMO Exclusion (B2.7)

Guanaré/FAS Project is FSC certified so it has a commitment with FSC values. One of them is the prohibition of introduction of genetically modified organisms in forestry operations

5.2.9 Inputs Justification (B2.8)

Based on FSC Principle 6, Environmental Impact, management systems should promote the development and adoption of non-chemical methods for pest management, in order not to harm the environment. The use of chemical pesticides should be avoided.

Pesticides used for weed control in forest operations are allowed by the FSC. Except in ant control containing Fipronil, a substance banned by the FSC, the company has approved its use and the company has an approval valid until 2020 to allow the use of this product. As part of the 7 commitments of this derogation (see derogation), the company works together with others companies to test alternatives to the use of Fipronil, presenting the Omitox product analysis. The study is called "Fractional evaluation frameworks and systematic control of fipronil / Omitox for the control of cutting ants (Progress Report 2018).

The implementation of training courses for applicators and monitoring of plots with alternative methods is verified. There are still no viable alternatives on an operational scale, just some general recommendations to concentrate the applications in the spring in order to reduce the use of the product.

The procedures are guided by the National Code of Good Forest Practices. The management plan and the corresponding procedures indicate the measures for the management of forest plantations. What is related

to the use of agrochemicals is included in the Forest Procedure. There is also a form (summary by product) with the list of agrochemicals and the frequency of use updated to 2018.

The company has a spreadsheet (Field Expenses) of the pesticides used (name, product, applied amount, active ingredient, dosage, property where it was used and costs). In addition, it delivers this information annually in FSC auditors.

The pesticides used are on the list of the General Plant Health Division of the MGAP.

The forestry procedure declares its commitment to reduce the use of chemical products ", this objective is carried out through research. For herbicides, the aim is to introduce grazing livestock to reduce their use and, if necessary, use those with less toxicity: in the case of the hormiguicides, it has information about trials (several companies, University, SPF) with the same objective (research examples: entomopathogenic fungi, detailed description of the life cycles for the rationalization of the use of the bait). The annual records of the use of chemical products are reviewed and it is observed that with the integral management of pests carried out by the company, there are no increases in the use of pesticides.

The staff of the contractor companies for pesticide application work uses safety equipment in accordance with current legislation. However, during the audit, farms were not visited with the application of agrochemicals in which the products were not applied at that time. Therefore, the company has all the procedures that indicate the use of personal protective equipment suitable for this type of activity (General Forest Management Manual, Chapter 8). The personnel is supervised by the Guarané/FAS supervisors, there is a strict control of these cases, as it is verified in the internal system of Sacs.

The deposits visited during FSC audits comply with current legal regulations and the provisions of the ILO, regarding storage and emergency procedures in case of accidental spillage of pesticides (General Manual of Forest Management, chapter 8)

5.2.10 Waste Products (B2.9)

In the Guarané/FAS General Forest Management Manual, there is a special chapter for waste products identification, classification and management. Chapter 6 of this manual gives detailed information regarding waste management and chapter 7 gives detailed information regarding fuels and lubricants handling.

5.3 Offsite Biodiversity Impacts

5.3.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Measures (B3.2)

Negative Offsite Impact	Mitigation Measure(s)
<i>Livestock enters protected natural areas or CAVL cabling or the exclusion of livestock in those areas.</i>	<i>Build fences or exclusion of livestock in those areas.</i>
<i>High density of cattle - degradation of grasslands and native forest, by shift of livestock from plantation to said natural areas</i>	<i>Proper management. Livestock density control (units per ha). Livestock management plan. Evaluation of pastures within afforestation.</i>

<i>The advance of the native forest towards the plantation, eliminates the buffer areas</i>	<i>Buffer zones are established or re-established between forest plantation and native forests. This grasslands buffers zones must be equal or bigger than 20 meters</i>
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5.3.2 Net Offsite Biodiversity Benefits (B3.3)

The project comprises a total area of 18,576 ha with a long history of grazing by beef cattle, activity that have caused soil erosion and land degradation. In Guanaré/FAS project, forest plantations for obtaining pulp and saw wood and removing carbon dioxide from the atmosphere are being established since 2006, decreasing significantly soil erosion and soil degradation.

Before the implementation of the Guanaré/FAS project, native fauna or flora studies in the area were never conducted. Extensive beef production companies did not have the habit nor the obligation to carry out this kind of studies, since traditionally the extensive cattle is not certified by international standards (for example, FSC or similar), nor is it controlled by the Ministry of the Environment (DINAMA). After the Guanaré/FAS project was implemented, new HCVs areas were defined and native forests were strictly controlled.

5.4 Biodiversity Impact Monitoring

5.4.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

Criteria for the categorization of representative FAS properties for the conservation of biodiversity

The following criteria will be used for the categorization of forest properties in Guanare/Fas, 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 HCVF 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.

Activities taken to perform the flora and fauna monitoring studies:

1) Prior to the fieldwork, surveys over satellite images (Google Earth) and over available historical information are made. Based on this information, areas of interest, access to them and other logistical aspects are defined.

2) In situ, ground survey (surface data) according to vegetation physiognomy was carried out, with the main landscape zones initially registered by distance photography with a drone.

Subsequently, walking and vehicle trips were made by transects in the natural environments present in the property. The vegetation was characterized by recording the dominant species of each zone, through observation, collection and registration.

In relation to the fauna, walking tours were carried out in the main landscape units, recording the richness and abundance of the tetrapod fauna species. Photographs were taken with digital cameras and Cannon sx50is, Nikon Coolpix L110, of the most representative species.

For the bird survey, binocular 12X25 was also used for walking tours. For the group of birds, we recorded the number of species (richness) and the number of individuals of each (abundance) based on direct sightings and the identification of vocalizations.

For the amphibian survey, surveys were carried out with estimation of abundance by sound record of vocalizations and by active search of individuals. For reptiles, an active search was made under stones, trunks and other cryptozoic shelters.

For mammals, trap cameras were placed, traces, traces and caves were surveyed, and

For the survey of aquatic fauna, the sampling units were distributed based on the results of habitat characterization (landscape ecology) in the study area and the subsequent definition of areas of interest and watershed representativeness. Samples were carried out with emphasis on the geographical sectors of interest that have been previously identified. Each station was located by GPS.

The processing of the data included the elaboration of a list of species and categorization of them according to international conservation lists (IUCN, CITES) and according to the database of biological invasions for Uruguay (InBUy).

Categories were applied in accordance with the categorization of the International Union for the Conservation of Nature (IUCN) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Based on the field information surveyed, the studies corresponding to environmental indicators (indexes and indicator species) were carried out.

Fauna Monitoring Plan

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

According to Canter L.W. 1998, environmental indices are useful for:

- 1) summarize existing environmental data
- 2) report on the quality of the affected environment
- 3) assess the vulnerability or susceptibility to contamination of a certain environmental category
- 4) selectively focus on key environmental factors
- 5) serve as a basis to predict the impact.

The specific biological diversity of a site depends on the number of species present (Wealth of species) and the number of individuals that make up each of the species (relative abundance).

Margalef's biodiversity index is an estimate of the biodiversity of a community and considers the number of species present (richness) and the number of individuals (abundance). It takes as a base the numerical distribution of the individuals of the different species using the number of existing individuals in the sample analyzed.

The index of Shannon, Shannon-Weaver or Shannon-Wiener is used to measure specific biodiversity. Express uniformity of importance values across all species in the sample. The index reflects the heterogeneity of a community based on two factors: the number of species present and their relative abundance. Conceptually, it is a measure of the degree of uncertainty associated with the random selection of an individual in the community. It measure the average degree of uncertainty by predicting which species an individual chosen at random from a collection will belong to. Their values vary between 0.5 and 5,

although their normal value is between 2 and 3. Values below 2 are considered low in diversity and higher than 3 are high in species diversity. It has no upper limit or, in any case, it is given by the logarithm base that is used.

Bearing in mind that the most surprising transformation caused by man is the simplification of natural environments and the reduction of biodiversity, biological diversity indexes (Margalef and Shannon) are used to determine the degree of environmental impact.

As an arbitrary measure of the research team, the values of the Margalef index, higher or equal to 15.0, correspond to a high biological diversity.

The values, below the average in these indices, may be due to:

- Disturbances due to harvesting activities (noise, traffic of vehicles and people, exposure to atmospheric agents, etc.)
- Lack of buffer zones between planted forests and natural environments.
- Lack of connection or biological corridors in natural areas.
- Lack of natural environments that act as feeding or reproduction areas.
- Barrier effect for the movement of species, mainly because of height of planted trees (final stage of forestry before harvest).

Species richness indexes (Chao) are also used to evaluate the real number of species present in each farm studied. Chao 1 is a nonparametric estimator of the number of species in a community based on the number of rare species present in the sample.

The richness of the species distributed in a non-homogeneous way, between the different environments inside the area, would indicate a certain human affectation in the area that would be increasing the number of some particularly sensitive species.

In turn, the distribution of the species is estimated taking into account the levels of specific richness and relative abundance detected in the main landscape units.

So far, in the monitored farms, the structure of the different species present in the area tends to be fairly homogeneous (it is not clearly dominated by any species). That is, all the species observed have a similar high abundance, which indicates a low degree of imbalance. The population differences are not enough for these species to affect the rest of the community. In some properties, high or very high values have been recorded in the biodiversity indexes.

Criteria for the selection of species to determine the biological diversity of a given site:

At the global level, both invertebrate and vertebrate species are used for studies of biological diversity.

In the case of the research team, the Bird Class was chosen, subfilum Vertebrata (Vertebrates) due to:

- Easy direct and / or indirect registration
- Important number of species in our country
- Specific conservation status defined in most species, whether at the national, regional and global levels (DINAMA, IUCN, CITES).
- Can apply as RAE species for international forest standards

Selection of species as indicators ("Indicator species")

An indicator organism is a species selected for its sensitivity or tolerance to the various types of contamination and their effects. In addition, the use of indicator species are useful for diagnosing environmental quality because they have some important characteristics:

- Provide valuable information quickly to take conservation measures in a minimum time available.
- Animals, plants and their quantitative and qualitative relationships are modified to different types of environmental degradation even when they are produced sporadically or discontinuously over time.
- Many species, due to their mobility, absorb and indicate environmental actions of broad or specific foci in a natural area.
- The biological indicators are compatible and can complement with analysis and physical-chemical indicators

Selection criteria

To select indicator species, the role they play in the ecosystem will be taken into account, especially considering those species known to be sensitive to specific actions of the use of resources related to the project in question, species that play a basic role in a given community and species that represent a certain group of species (associations). Taking into account the variety of environments involved in the different farms to be studied, the species to be selected will also depend on the specific ecosystems affected and the degree and type of affectation.

- The analysis of the relative abundances of some species will be useful for the purpose of evaluating changes in the habitat that determine high or low levels in the populations and are manifestations of impacts on a larger scale

For example, some bird species that are not very specialized, find food resources in modified environments, where some specific plant species that provided food to other species of birds specialized in them have disappeared. These last ones (specialists), will see reduced their populations in these areas, while those (generalists) will see them increased sensibly due to lack of competence in the availability of other resources (shelters, water, etc.).

Species populations with reduced margins (stenoic) and broad (eurioic) tolerance for limiting environmental factors (food, shelter, pH and water transparency, etc.) are especially taken into consideration here.

The degree of singularity or isolation is also taken into account, specifically considering those species with low dispersion capacity and low mobility. It is also important the real or potential value from the aesthetic, scientific or economic point of view, its survival expectation and its rarity at the local and global level.

In this sense, the presence of species with the following international status (IUCN) is especially taken into account:

- "Extinct"
- "Extinct in the wild",
- "In critical danger"
- "In danger"
- "Vulnerable"
- "Threatened"

In addition, species with the following status for Uruguay are also considered (Olmos, A. 2009), categorized by:

- "Rare"
- "Scarce"
- "Not Common"

Special consideration is given to those species that DINAMA (National Directorate of the Environment) recommended its inclusion in the list of priority species for conservation.

Other species, that are water quality bioindicators are also taken into account. In this sense, the Fish Class is a group that turns out to be a good tool to determine water quality because:

- 1) their communities generally comprise a wide variety of species which represent different trophic levels,
- 2) are well-known organisms of aquatic habitats and
- 3) are present in small water bodies.

Finally, for the selected species, a habitat assessment can be carried out according to the "Habitat Assessment Procedure" (HEP) proposed by the US Fish and Natural Resources Service, which evaluates the quality and quantity of habitat available for said species.

The fauna monitoring reports are done once a year in FAS/Guanaré representative farms, where biologists delivers detailed reports like the one shown in Figure 19.



Figure 19. 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.

The national herbarium collections of vascular plants were enriched thanks to numerous new collections, fruit of the surveys, samples that were deposited in the Herbarium of the Museum and Botanical Garden, identified internationally with the acronym MVJB, with the scientific transcendence that it has, including publications in refereed journals.

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 follows:

a) Farms with AREAS OF HIGH VALUE OF CONSERVATION (AVC): "Santa Sofía "(Cerro Largo) by the presence of capons (swamp forests), sites that are characteristic and representative of those in the area - (AAVC1 due to the diversity of flora species).

b) Farms with areas of SPECIAL INTEREST FOR CONSERVATION: Native forest of "Las Cañas" and "El Yugo" (Cerro Largo), small capons and stony fields of "La Micaela", "Mederos", "Derley González", "Dellepiane", "Tacuarí", "Azotea de Ramírez" and " L.Barros ".

5.4.2 Biodiversity Monitoring Plan Dissemination (B4.3)

Along with the project implementation, the project documentation will be published on VCS and CCB website for all stakeholders, so that they can obtain the detailed project information and development progress. Also, the summary of project description in local language will also be disseminated to local communities through local government, as long as the summary of monitoring reports during each verification.

Also, the full project documentation will be published on Guarané/FAS website for public comments, together with specific brochures describing the project characteristics and benefits.

5.5 Optional Criterion: Exceptional Biodiversity Benefits

N/A

5.5.1 High Biodiversity Conservation Priority Status (GL3.1)

N/A

5.5.2 Trigger Species Population Trends (GL3.2, GL3.3)

N/A

APPENDICES

The following appendices may be used if appropriate. Delete the instruction and heading if not used.

Appendix 1: Stakeholder Identification Table

Guanaré/FAS team responsible of the social monitoring has elaborated a descriptive sheet of the main stakeholders identified, denominated “Social and Cultural characterization” sheet. The following figure is showing an example of these sheets.

Empresa: FORESTAL ATLANTICO SUR Establecimientos: Eco Forestal Avance Forestal Fecha: Abril 2017-18
CARACTERIZACIÓN SOCIAL Y CULTURAL actualización
NOMBRE DE LOS ESTABLECIMIENTOS: Eco Forestal y Avance Forestal
UBICACIÓN Departamento: Cerro Largo Paraje o Localidad cercanas: <u>Tupambaé</u>
ZONAS DE INFLUENCIA DEL ESTABLECIMIENTO Directa: (zonas afectadas en forma continua por actividades forestales) <u>Tupambaé</u> Empresas Forestales en la zona: RMK TIMBERLAND GROUP CAMBIUM S.A. EUFORES WEYERHAEUSER

Stakeholder	Rights, Interest and Overall Relevance to the Project
<i>Identify communities and any community groups within them, any cross-cutting community groups, and list other stakeholders</i>	

Appendix 2: Project Activities and Theory of Change Table

Use this appendix, if applicable, to identify project activities and fulfill the requirements of Section 2.1.8 above. This is an example of just one method of representing the theory of change. Results chains/flow diagrams are another effective way to represent the theory of change. Modify the table, if necessary, to suit the project activities, or delete if not used.

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
Forest plantation (afforestation)	Timber sustainably produced and carbon removals	Carbon credits	Mitigation of climate change	wood production, land restoration and carbon sequestration. Generation of income and job opportunities for local communities/ rural areas
Preserve HCV	Increase the biodiversity value	Improved community's wellbeing	Generation of a more sustainable scenario for forestry development	enhancing biodiversity conservation and increasing the connectivity of forests
Training to Guanaré/FAS staff and forest contractors companies	Trained staff member and forestry contractor companies people in several topics	Better social and labor working conditions,	Better quality of life	wood production in a sustainable way
Promote community social and economic development (with multiple activities such as orchard in schools and donations)	Implement orchards in schools in the project area of influence	School kids with knowledge about food production, environmental awareness, respect for the work	Community members with a better well-being	Generation of income for local communities/rural areas