Forestal Apepu SA

Environmental and Social Impact Assessment
Information package

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Acronyms

DD	Due Diligence
EIA	Environmental Impact Assessment
ES	Environmental and Social
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EU	European Union
FAPI	Federation of Autodetermination of Indigenous Peoples (Federación por la Auto-determinación de los Pueblos Indígenas)
HCV	High Conservation Value
IARC	International Agency for Research on Cancer
INDI	Paraguayan Institute for Indigenous Affairs (Instituto Paraguayo Del Indígena)
INFONA	National Forest Institute (Instituto Forestal Nacional)
IPS	Social Security Institute (Instituto de Previsión Social)
WHO	World Health Organization
MADES	Ministry of Environment and Sustainable Development (Ministerio del Ambiente y de Desarrollo Sostenible)

1 INTRODUCTION

Forestal Apepu SA is a Paraguayan company created by the Arbaro Fund in 2019 for the establishment and management of timber plantations. The company owns land properties in the Department of San Pedro with a total area of 2,658 ha where it plans to establish 1,855 ha of plantations. To date 1,150 ha have already been planted.

As part of the investment process, the Arbaro Fund conducted detailed Due Diligence (DD) on the investment opportunity, which included a deep understanding of the potential impacts that the execution of a plantation forestry project could have on the environment and the local population. Assessments involved site visits, documentation review, as well interviews with relevant stakeholders, including previous property owners, neighbours and local government officials. The environmental and social (ES) assessment determined that the project corresponds to the risk category B.

Forestal Apepu has completed the process of Environmental Impact Assessment (EIA) that is required per national law to obtain the necessary permits to operate (environmental licenses). Beyond these national requirements, the company has conducted a number of additional assessments and implemented measures to assess and address ES impacts and risks in line with the international standards to which the Arbaro Fund and the company adhere.

The current information package is a compilation of the main studies, assessments and procedures that are part of the ES Impact Assessment (ESIA) and ES Management Plan (ESMP) of the project.

The main report provides an overview of the foreseen project operations, the baseline conditions of the project area and its area of influence, the assessment of the ES impacts that foreseen project operations may have, and the proposed mitigation measures and provisions for the ESMP.

The main report builds on the most recent reports produced by independent consultants as part of the national process to obtain the environmental licenses, which are available in ANNEX 1 and ANNEX 2. It provides further information on those areas that are not covered by the EIA in line with international standards, particularly social aspects of the ESIA and ESMP provisions, based on additional studies conducted and procedures in place, some of which were subsequent to the national EIA process.

2 LEGAL FRAMEWORK

2.1 Regulatory agencies

The main institutions regulating the forest sector in Paraguay are:

- The **Ministry of Environment and Sustainable Development** (MADES) created by Law 6123/2018. Its purpose is the coordination, implementation and control of national environmental policy and is responsible for all the legal provisions governing environmental matters.
- The **National Forest Institute** (INFONA) created by Law 3464/2008. INFONA is the institution responsible for the forest sector.

In addition, the following institutions are also relevant for project operations:

- Ministry of Public Health and Social Welfare. Created by Decree Law 2000, it is the institution responsible for the establishment and management of the national health service, for enforcing the provisions of the health code and its regulations.
- Ministry of Justice and Labour. Institution of the State responsible for ensuring compliance with the General Technical Regulations on Safety, Medicine and Hygiene at Work (Decree Law 14390/1992) and the Labour Code (Law 213/1993).
- Governorate of the Department of San Pedro. It is the regional governing body with powers to intervene in the various environmental projects in the departments.
- Municipality of San Estanislao. The municipality is the local governing body with political, administrative and regulatory autonomy on matters such as urbanism, environment, education, culture, sports, tourism, health and social care.

2.2 Main laws and regulations

The Paraguayan legal framework (laws, decrees and resolutions) relevant for the project includes legislation on environmental protection, indigenous peoples, gender, agrarian reform and the establishment of institutions and agencies. It should be noted that Paraguay has ratified international conventions pertaining to the environment, indigenous peoples and human rights.

The most important environmental regulations that apply to Forestal Apepu are presented as follows:

- Private property owners are required to conduct an EIA as part of the process to obtain an environmental license to conduct operations on their land (Law 294/1993 and Decrees 453/2013 and 954/2013).
- All rural estates with an area larger than 20 ha are obliged to maintain 25% of the forest cover existing in 1986 (Law 422/1973 and Decree 18831/1986).
- Buffer zones of streams and rivers shall be protected. The exact width depends upon the size of the water body (Law 4241/2010 and Decree 9824/2012).
- Conversion of natural forests to other land uses is not allowed in Eastern Paraguay since 2004 (Law 2524/2004 and subsequent extensions).
- Crimes against the environmental law are penalized (Law 716/1996).

Labour relations shall be governed by Law 17071/1943, 1860/1950 and 375/1956. The most important provisions can be summarized as follow:

- The Labour Code (Law 213/1993) establishes the latest provisions on minimum wage, vacations and other benefits that shall be observed when engaging labour in Paraguay.

- Workers shall be registered in the national social security system (IPS) which provides health insurance and retirement pension fund. Costs are split between the employer and the employee.
- Paraguay has ratified all fundamental ILO conventions.

The rights of indigenous peoples are protected as follows:

- In article 64 of the Constitution, Paraguay recognizes the right of indigenous communities to communal ownership of their lands.
- The Indigenous Peoples' Statutes (Law 904/1981) protect indigenous traditional status, regulate indigenous reserves and create the executive authority for indigenous peoples (INDI).
- A Free Prior and Informed Consent process is required for any project affecting traditional indigenous lands (Decree 1039/2018).
- Paraguay is a signatory to the core international human rights treaties, including the ILO Indigenous and Tribal Peoples Convention 1989 (169).

The full list of applicable regulations is provided in ANNEX 3.

Relevance and overall compliance

Company management should be aware of the local legislation and ensure full compliance. Since the project is a greenfield development, it is crucial to evaluate the compliance of prior owners with environmental laws since this could trigger liabilities for the company as future owner.

In one of the properties that constitute the project area, national institutions detected two breaches as part of the EIA process initiated by previous owners:

- The property does not meet the 25% forest cover requirement. An area of approximately 20 ha will have to be reforested with participation of native species in order to meet the requirement and be in compliance with the Forest Law.
- In recent years an area of approximately 14 ha of natural forests was cleared. As per the previous landowner the forest had been heavily damaged by fire. This is a breach of the forest moratorium and the same area will have to be reforested with native species.

While these actions were no done by Forestal Apepu, the project company is responsible to implement or complete the implementation of the mitigation measures, defined as part of the new EIA process.

2.3 The EIA process

Private property owners are required to conduct an EIA as part of the process to obtain an environmental license to conduct operations on their land. The EIA is conducted by an accredited consultant and comprises:

- General description: project justification, objectives, area of influence
- Baseline description: climate, soils and vegetation, current land uses
- Project description: land uses and project activities, economic evaluation, organisational chart
- Legal considerations
- Environmental impact assessment
- Environmental management plan
- Monitoring plan

The EIA is submitted to the MADES for approval. The MADES will control that the proposed activities are in full compliance with environmental, forest and land use laws, decrees and regulations, and will eventually conduct site visits. As part of this process a public summary of the EIA is disclosed.

Once approved, the environmental license requires that an audit report is submitted at least every second year, in order to renew the license. This report includes an evaluation of the implementation of measures and can introduce adjustments to the foreseen activities, in which case the potential impacts of new activities are assessed, and mitigation measures are adjusted accordingly.

Relevance and overall compliance

The project area comprises several land properties, previously owned by different individuals and managed through two different environmental licenses. All properties had a valid environmental license from the previous owners at the time of the acquisition.

However, the licenses needed to be updated to reflect the foreseen forestry project. Forestal Apepu has followed the administrative procedure to renew the licenses, for which it submitted audit reports conducted by an accredited consultant to MADES in a timely manner (available in ANNEX 1 and ANNEX 2). The company is still to receive the final resolution from MADES for one of the properties, as the process is facing important delays.

2.4 Protected areas

Protected Areas are regulated by Law 352/1994 and Resolution 200/2001. The limits of the project area were superposed with legally protected areas in Paraguay, including other sites declared of environmental interest by international organizations, specifically RAMSAR sites and Important Bird Areas. The limits do not coincide or border with any of these areas.

Nevertheless, towards the south the property borders with the stream Tapiracuai. The Tapiracuai stream and its associated springs and wetlands have been declared as Private Protected Area of the category Nature Reserve by Law 4647 in 2012. The protected area status extends from the spring of the Tapiracuai towards the estuary with the same name along both sides of the stream up to 100 m (estimated to comprise 51 ha within the project area).

A Nature Reserve is a protected area category that allows sustainable activities within its borders, regulated by a management plan. In particular, the law establishing the Tapiracuai reserve allows leisure activities that do not alter the natural features of the stream.

Relevance and overall compliance

All property owners affected by this law are called to develop a management plan for the protected area within the scope of their property within 180 days of the promulgation of the Law. Nevertheless, based on informal consultation with officials from the Ministry of Environment and the Director of the Network of Private Protected Areas, this has not been executed by the Ministry of Environment.

Forestal Apepu should ensure that the buffer area along the stream Tapiracuai is properly designated as a protected area.

3 PROJECT DESCRIPTION

3.1 Objectives and justification

Objectives

The main objective of the project is the establishment of timber plantations for the production of wood for local sawmills and veneer industries.

Specific objectives:

- Establish 1,855 ha of plantations in areas previously used for cattle and commercial agriculture
- Produce wood in a sustainable manner for the local industries
- Sequester carbon dioxide in the plantations and contribute to climate change mitigation
- Protect natural forests and other sensitive areas within the project area and promote environmental awareness
- Create employment opportunities for the local population and contribute to livelihood enhancement and diversification
- Foster socioeconomic development and create positive impacts in the local communities
- Build a business model that can be replicated in the region

To ensure the implementation of best practices from a productive, environmental and social perspective, the company follows the ESG requirements of the Arbaro Fund and seeks to acquire FSC certification at an early stage. Among other, operations are conducted in line with the following standards and principles:

- FSC principles and criteria
- IFC Performance Standards
- National legislation
- Principles of good governance, transparency and disclosure
- Engagement with local and international stakeholders

Justification

Paraguay has seen severe landscape changes over the past decades. Between 1945 and 2000 the country underwent a period of extreme deforestation, mainly due to agricultural expansion. Deforestation was concentrated in the eastern region where growing conditions are favorable.

In 2004 Paraguay passed the Zero Deforestation Law, which prohibits the conversion of forested areas to other land uses in the eastern region. While this effectively stalled deforestation in the east, forest loss continues at high rates in the west. Subject to several extensions, the law is now valid until 2020.

This development has left the eastern region with a small and fragmented forest landscape. Today about 80% of the region is covered with agriculture and pastureland, with only about 2 million ha of natural forests. The remaining forest cover is distributed in national parks and private farms. The latter consist of farms on which the so-called legal reserve has been maintained, which corresponds to the obligations imposed by the Forest Law with respect to the conservation of 25% of the original forest cover of a property.

Due to the lack of incentives for the conservation of these fragments of forest, traditionally their maintenance has been perceived as a liability by producers. Consequently, these forests have been

subject to a process of gradual degradation caused by the unsustainable exploitation of wood, their use for livestock, and sometimes even their intentional burning for conversion to other uses.

Heavily degraded forests are characterized by very few trees of commercial value and low regeneration, meaning that they cannot be rationally managed. At the same time, Paraguay faces a supply deficit of sustainably produced wood estimated at 11 to 12 million m^3 annually.

This scenario highlights the need for alternatives that produce wood, while promoting forest conservation and recovery. Sustainable timber plantations are necessary to respond to this need.

3.2 Location and area of influence

The project is located in the San Estanislao District in the south of the San Pedro Department, at a distance of around 160 km from Asuncion. The closest large city is San Estanislao (see Figure 1).

Figure 1 Project location

Source: Arbaro Advisors based on google maps

The project area consists of four adjacent land properties:

- Three land properties known as Apepu with a total area of 2,158 ha
- One adjacent land property known as Rancho Bonito with a total area of 500 ha

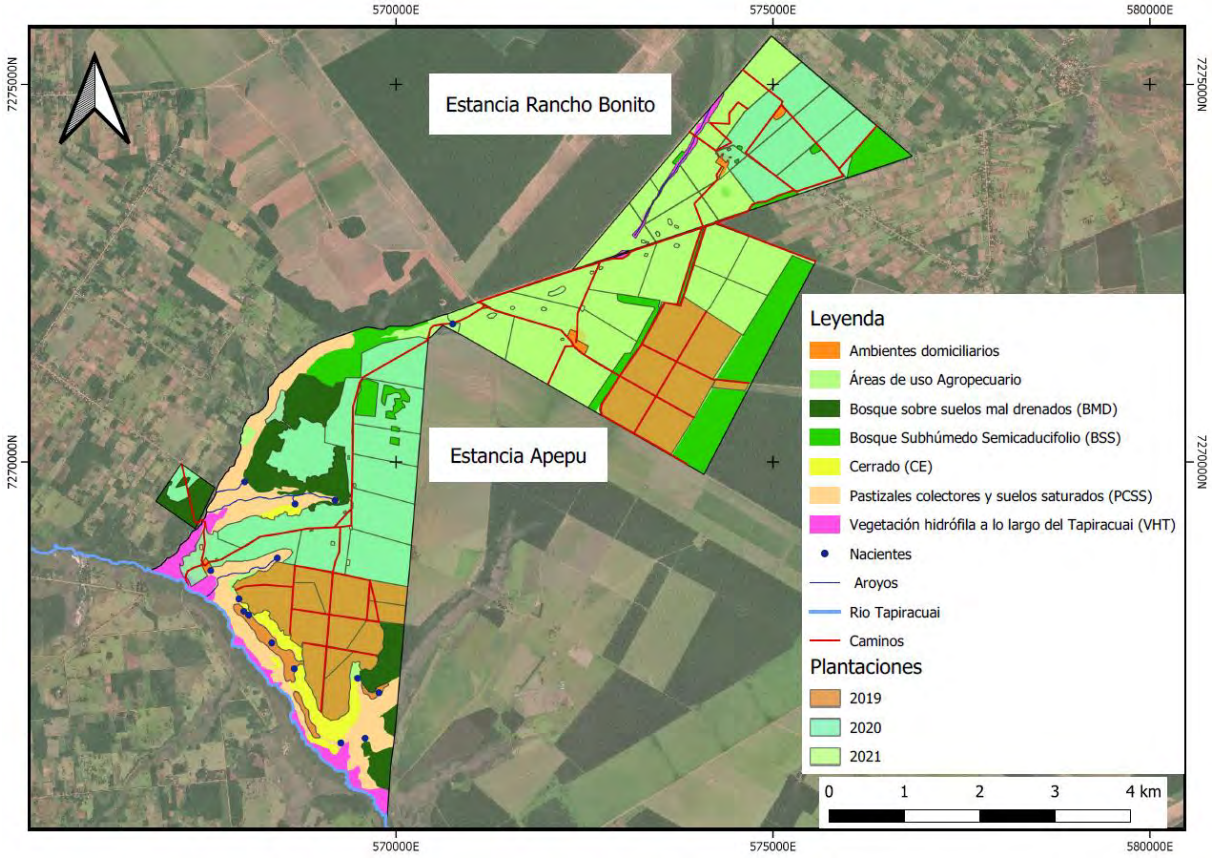
The area of influence is considered the area surrounding the project properties in a radius of 1 km and includes all communities adjacent to the project area.

3.3 Land use planning

Based on geographic data analysis, site observations of current land use and soil studies, the area was classified according to land categories and assigned to future uses (see Figure 2). As part of this process protection areas were identified, including natural forest areas as well as buffer zones around springs and along streams.

Figure 2 Land use planning

Source: UNIQUE forestry and land use



3.4 Forest operations

Silvicultural regime

All forest operations are planned and conducted according to the following principles:

- Site species market approach
- Best quality silviculture and planting materials
- Towards achievement of FSC certification
- In line with Arbaro requirements and restrictions

The company will establish 1,855 ha of Eucalyptus plantations over three years for the production of high-quality veneer and saw logs, with biomass as by-product. A small share of this area will be planted with a mix of Eucalyptus and native species in order to comply with the minimum forest reserve required per law.

Table 1 summarizes the main features of the applied silvicultural regime.

Table 1 Key data on silvicultural regime

Source: UNIQUE forestry and land use

Feature	Description
Planting density	1,000 trees/ha and 800 trees/ha
Spacing	5 x 2 m and 5 x 2.5 m
Species	Eucalyptus: mainly hybrids of E. grandis x E. urophylla and E. grandis x E. camaldulensis

Feature	Description
	Native species: Petereby, Yvyra kuru, Guatambu, Cedro
Rotation	10 to 13 years
Pruning schedule	Up to 10 m in 3 to 4 pruning interventions in years 1 to 3
Thinning schedule	3 thinning interventions in years 2, 5 and 8
Commercial MAI	37 to 39 m^3/ha/year

Site and soil preparation

Since plantations are established on pastureland and areas previously used for mechanized agriculture, the sites are clean, and no major site preparation is needed. Some woody shrubs are removed.

Soil preparation is conducted on the whole plantation area, since most sites suffer from soil compaction due to previous intensive use. Furthermore, sites previously used for cattle are degraded and require improvement. Soil preparation includes ploughing and tillage, using a tractor, as well as ripping and lime application in strips whenever needed. The following inputs are necessary at this stage:

- Lime application on most soils due to their acidic nature
- Weeding through manual labour and herbicides
- Fipronil for ant control

Species selection

The principle that determines the success of plantations is the choice of a species adapted to each site. For this reason, results of soil studies, complemented by climatic data and past experiences with reforestation in the region have to be considered when selecting species to be planted.

Eucalyptus have been planted in Paraguay for more than 50 years. In the eastern region, they achieve high yields, are non-invasive and have no ecological limitations in terms of soil or water. Furthermore, the species is suitable for producing high value timber used for furniture, veneer and laminated wood.

There are three professionally managed nurseries in Paraguay that offer eucalyptus clonal materials of good quality. Different genetic materials should be used to reduce risk of pests and diseases, targeting a maximum of 20% of the area planted with the same clone.

In the case of the native species, due to the lack of planting materials in the market, these will be produced by the company in cooperation with one nursery.

Planting

Planting is conducted manually in the lines demarcated during soil preparation. This is done in combination with fertilizer application. Once the seedling is planted, soil compression is avoided to protect the roots.

Based on former experiences, the best period for planting in the region is from March to October, since planting in very warm or dry periods results in high mortality. Within the first six months blanking is conducted twice, to ensure that the target survival rate of 85 to 90% is achieved.

Maintenance

For the maintenance of the plantations, several measures are foreseen:

- Until the third plantation year, regular control of weeds, mechanically with hoe and/or machete and applying herbicide in rows

- Application of fipronil for control of leaf-cutting ants
- General maintenance: cleaning of debris, installation of fire breaks for fire control

Pruning

Pruning is the removal of branches up to a certain height to create a clean stem. The objective is to only have a long and straight stem, as well as to avoid the appearance of knots that diminish the value of the stem wood. Moreover, pruned trees are better protected against surface fires, due to the absence of fuel close to the ground.

Pruning is conducted manually over several interventions during the first three years, up to a total height of 10 meters.

Thinning and final cut

Thinning refers to the removal of trees to manage competition between the trees. Trees with best performance are selected and given more space to favour their development, while trees with poor development and competitors are removed. Three thinning interventions are foreseen in years 2, 5 and 8, and the final cut is foreseen in year 12.

Harvesting operations are conducted manually by chainsaw operators, while hauling of harvested logs is done with machinery.

4 BASELINE DESCRIPTION

4.1 Physical environment

Climate

The eastern region of Paraguay has a climate with two seasons, with a very short transition between seasons. In the winter from May to August the average temperature is between 16 and 18°C. Temperatures below 0°C may occur during this period, as well as freezing for short periods of several days. High temperatures start in September and usually continue until the end of March, reaching up to 42°C. The average temperature is between 22 and 26°C.

The average annual rainfall reaches 1,500 mm, with well-distributed rainfall during the year, although there are drier periods between July and September and wet periods between October to May. A station located in Santa Rosa del Aguaray in the property Rancho 068, that could serve as reference for the project area, has recorded rainfall since 1977 with an average of 1,685 mm per year.

Figure 3 Average temperature in San Pedro
Source: UNIQUE forestry and land use

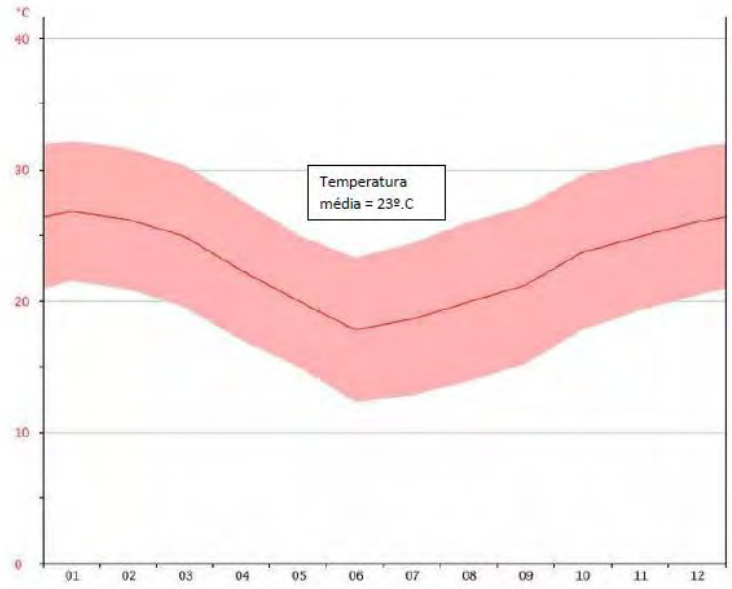


Figure 4 Annual distribution of rainfall in San Pedro
Source: UNIQUE forestry and land use

Soils

The properties' soils originate from the base rock formation Misiones, which covers the total area. To the east, the formation covers the sandstone of the Independencia formation, and to the west it is below the basalt spill of the High Parana formation. This old-age sandstone (Triassic) is of wind sedimentary origin and locally dragged by water. It is generally estimated that the age of the source material is 180 to 200 million years.

The sandstone of this formation is a non-consolidated rock. It presents uniform dark red color, has medium to thick grains, mainly of quartz, rounded or elliptical. The granules are little cemented by a clay-hematitic matrix, partly with a small increase of clay in horizon B. They are massive but little stratified, without discontinuity of origin indicating that the material was worked by a large flow or movement of water and in some places by the wind.

The soil can be classified or included in the order of the Ultisols (Paleosoils) with sandy horizons. Soil tests conducted indicate that the soils in the project area present limitations in terms of compaction, acidic pH and nutrient deficiency in varying degrees, that need to be addressed as part of project operations.

Land uses

As part of the DD the land uses prior to the start of project, the land use change history and the suitability for forestry production were assessed in the project area, with a combination of site visits, multitemporal imagery analysis, and soil sample tests.

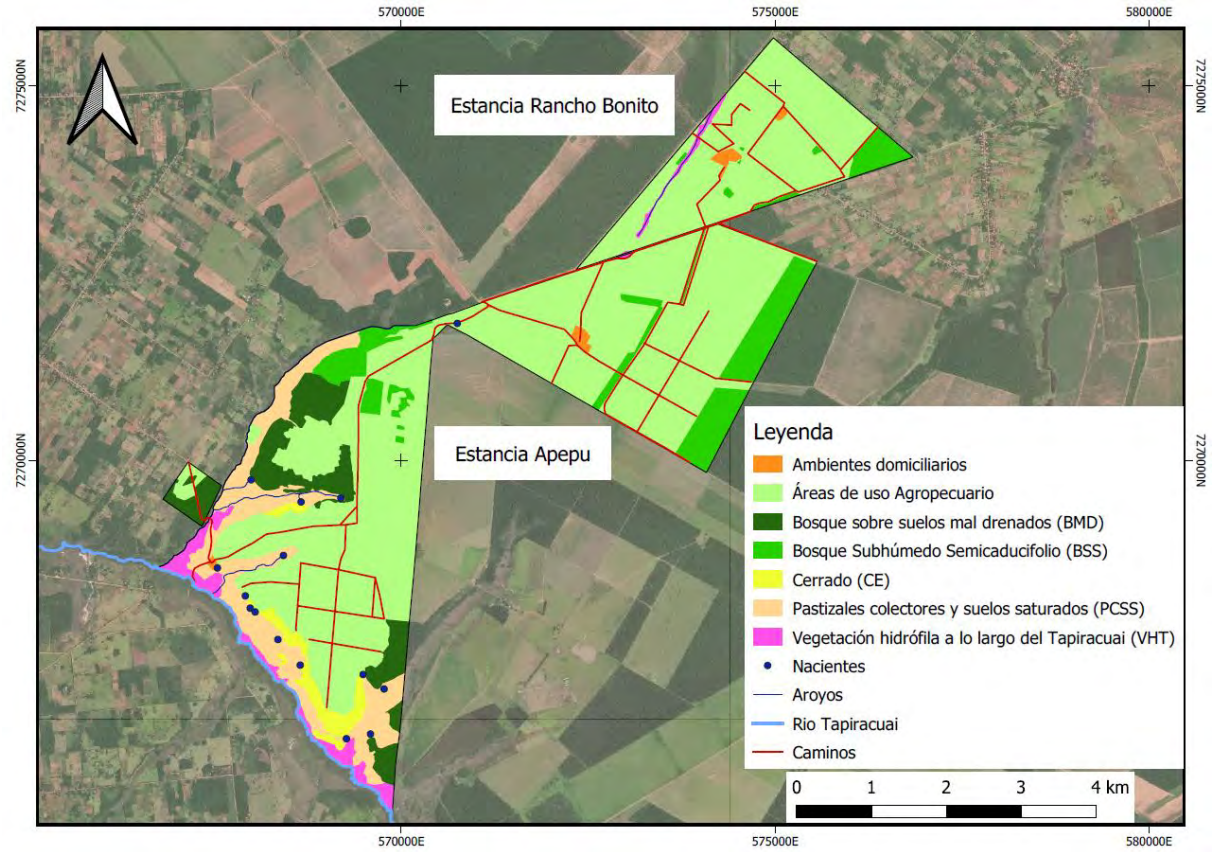
The project area has been traditionally used for agricultural activities. Originally covered with natural forests for the most part, the area was deforested decades ago and converted to agricultural uses.

Figure 5 presents the land uses and main environments identified on the land, which can be described as follows:

- Intensive agriculture: Areas subject to mechanized agriculture under intensive regimes, mainly for production of soybeans and maize. These are flat areas suitable for productive activities. Some areas present limitations in terms of superficial sandy texture, acidity and fertility. The soil presents low content of aluminium, magnesium and sulphur.
- Pastureland: Areas with implanted pastures used to breed, raise, winter and fatten cattle. These areas were subject to poor maintenance and are covered by weeds and bushes in some parts. These areas will need more intensive soil preparation. Soils present limitations as above, but more accentuated in some cases.
- Degraded natural forests: Patches of high and low forests, as well as riparian forests, heavily degraded with little chances of recovery unless actively managed. The sandy clay loam soils ensure good moisture retention in times of low rainfall. In low forests the clay content is lower, and forests are partly surrounded by soils subject to water saturation.
- Low fields: Areas of estuaries and wetlands located on the banks of the Apepu stream that borders in the northwest part of the property and the Tapiracuai stream to the south of the property. These areas present important environmental features and are not suitable for commercial exploitation. Soils exhibit strong limitations in terms of texture, acidity and slopes.
- Administration, infrastructure and roads: Roads and old facilities requiring complete renovation, including housing facilities, offices, warehouse sheds, stables and others.

Figure 5 Current land uses in the project area

Source: UNIQUE forestry and land use



4.2 Biological environment

The company properties are located in a region that transitions between two ecosystems, the Humid Chaco (mosaic of woods and savannas on sedimentary soils originating from river flows) and the Atlantic Forest (subtropical deciduous forests).

The Atlantic Forest is considered a biodiversity hotspot critically endangered due to the expansion of the agricultural frontier. As in most private properties in eastern Paraguay, a large part of the natural forest in the property has been deforested years ago. In general, the project area is already highly modified, with few sites remaining in their natural states.

The lowland forests close to the streams have remained closest to their natural state when compared to the other environments. This is because they present little suitability for intensive productive activities. These areas present important environmental features, such as the springs and natural drainages featured on the slopes towards the Tapiracuai stream.

Status of natural forests

As part of the DD a team conducted a quick forest inventory in sample points in the natural forests, to assess the status of forests and identify timber species of significance, observing the following:

- All forests are highly degraded. Particularly the so-called high forests in the north-eastern part of the property, which would naturally feature a higher share of valuable timber species, has been intensively intervened. Nowadays, the area exhibits very few valuable timber species.
- The forest area in the west, closer to the Apepu and Tapiracuai streams, presents a higher species diversity of non-commercial species.

- The forests feature a few species with an international and/or national conservation status (see next section). This is a common situation in most degraded forest fragments in eastern Paraguay. The endangered or rare species encompass valuable timber species overexploited in the past, and usually, some regeneration of these species is found in remaining forest fragments.

Biodiversity baseline

Forestal Apepu hired a team of biologists to conduct a field study to characterize the biodiversity and natural environments in the project area. The study identified a number of species with conservation status from the IUCN and the national list of endangered species from the MADES (see Table 2).

The southwest fraction of the project area is dominated by cerrado and natural grasslands that conform a biological corridor along the Tapiracuai and Apepu streams. This area has interesting attributes of biological value, with more than eight species of plants and two species of birds with a threat status. The area of cerrado with 55 ha is of good quality, maintaining typical species of this environment, including two endemic species. In addition, these environments are important for the water balance of the streams.

Table 2 Rare, endangered and endemic species identified in the project area
Source: UNIQUE forestry and land use

Species	Local name	Environment	Conservation status
Flora			
Alsophila cuspidata	Amambay	Natural grassland	Endangered (MADES Resolution 470/19)
Annona calophylla	Aratiku silvestre	Cerrado	Endemic in the country (Peña & De Egea 2018)
Ipomoea morongii Britton		Cerrado	Endemic in the country (Peña & De Egea 2018)
Butia paraguayensi	Jata'i	Cerrado	Threatened (MADES Resolution 470/19)
Handroanthus pulcherrimus	Tajy sa'yju, lapacho amarillo	Cerrado	Threatened (MADES Resolution 470/19)
Discocactus hartmanii	Cactus	Cerrado	Endangered (MADES Resolution 470/19)
Handroanthus heptaphyllus	Tajy hu, lapacho negro	Subhumid deciduous forest	Least Concern (IUCN 2019) Endangered (MADES Resolution 470/19)
Cordia trichotoma	Peterevy	Subhumid deciduous forest	Least Concern (IUCN 2019) Endangered (MADES Resolution 470/19)
Cedrela fissilis	Cedro	Subhumid deciduous forest	Vulnerable (IUCN 2019) Endangered (MADES Resolution 470/19)
Balfourodendron riedelianum	Guatambu	Subhumid deciduous forest	Endangered (IUCN 2019) Endangered (MADES Resolution 470/19)
Fauna			
Rhea americana	Ñandu	Cerrado	Least Concern (IUCN 2019) Threatened (MADES Resolution 470/19)
Gallinago undulata	Jakavere guasu	Natural grassland	Vulnerable (IUCN 2019) Threatened (MADES Resolution 470/19)
Caiman yacare	Yacaré negro	Low areas associated to streams	Appendice II CITES, commercial value for the leather industry
Salvator merianae	Teju guasu		Appendice II CITES, commercial value for the leather industry
Vanellus chilensis	Tetéu or Tero tero		Appendice II CITES
Cathartes burrovianus	Yryvu akã sa'yju Cuervo cabeza amarilla	Natural grassland and cerrado	Appendice II CITES

Species	Local name	Environment	Conservation status
Falco femoralis	Kiri kiri guasu or Halcón plomizo	Natural grassland and cerrado	Appendice II CITES
Molothrus bonariensis	Guyraũ or Tordo renegrido and Mulata	Natural grassland and cerrado	Appendice II CITES
Alouatta caraya	Mono aullador or karaja	Forest	Appendice II CITES
Cerdocyon thous	Zorrito or aguara'i	Cerrado and forest	Appendice II CITES

4.3 Social environment

Neighbouring communities

The project area is surrounded by large private landholdings and communities (see Figure 6). The company has identified two neighbouring communities that are particularly vulnerable as the affected communities:

- Colonia Republicano towards the north-western border, with approximately 3,000 inhabitants.
- Colonia Kururu'o towards the north-eastern border, with around 2,000 inhabitants.

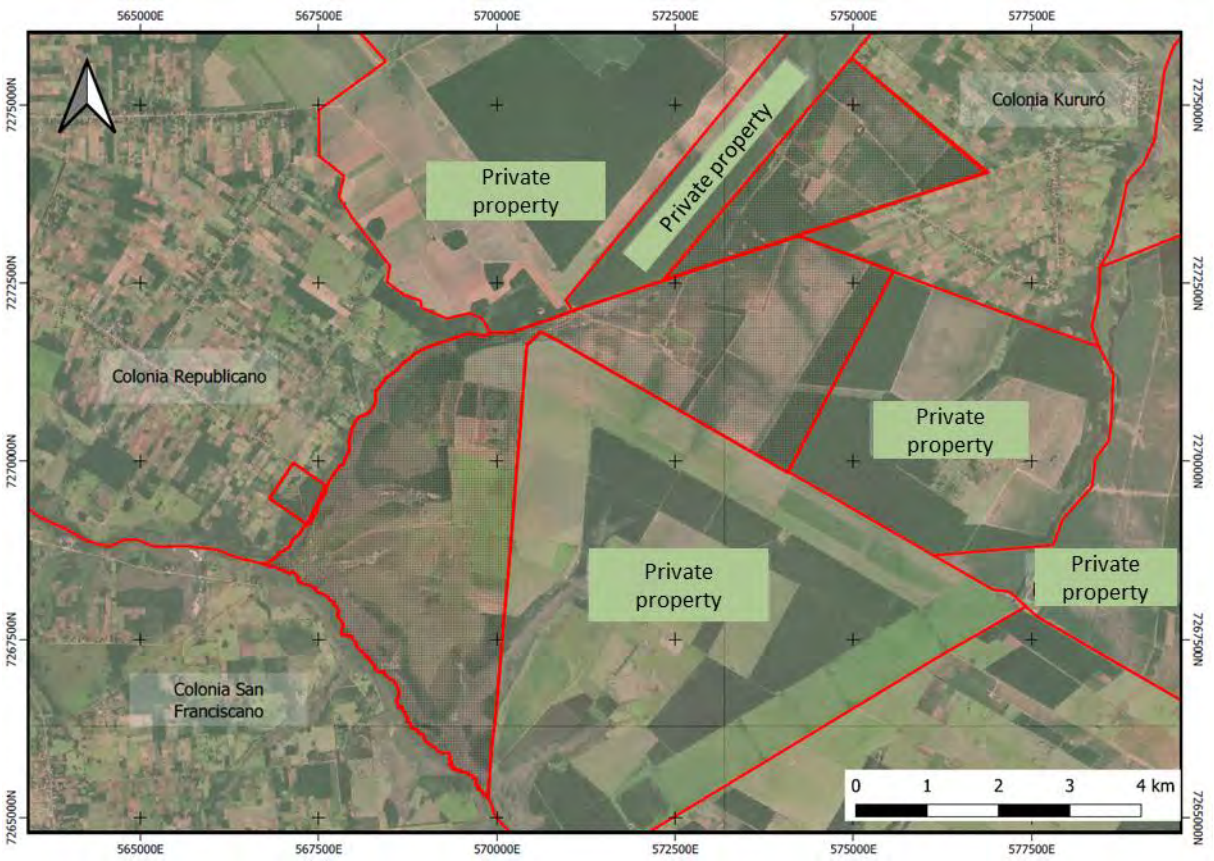
These are settlements dating around 15 years, managed by INDERT. According to INDERT, they are stable now and most inhabitants have been acquiring property titles or occupation certificates ever since. However, this process is still ongoing.

Towards the southwestern border of the project area, there is another community called Colonia San Francisco, with approximately 100-200 inhabitants. This is an old colony in which people have regularized property titles and better employment opportunities.

Forestal Apepu has collected baseline information on the affected communities and local socioeconomic context (see the report provided as ANNEX 4).

Figure 6 Communities and landholdings surrounding the project area

Source: UNIQUE forestry and land use



Land tenure

Private property and individual rights over land are highly protected in Paraguay. However, Paraguay has not implemented much needed rural reforms to address the lack of public services and market access in many rural communities throughout the country. This has brought about a growing gap between modern agribusiness and traditional agriculture undertaken by smallholders.

Land claims between indigenous or rural communities and agribusiness are often rooted in irregularities of land occupation in the past, particularly the so-called irregular distribution of land during the dictatorship of Stroessner. Hence the encroachment of land by landless farmers, sometimes triggered by righteous claims and sometimes by political opportunists, is not uncommon. In 2003 a governmental agency called INDERT was established to undertake the redistribution of irregularly occupied land and solve land-related conflicts.

As observed in site visits, and as confirmed by the stakeholders during the interviews, no major issues related to encroachment, occupation or displacement have been identified in the project area and its surroundings.

Legal due diligence was conducted prior to the acquisition of the land and no irregularities were identified in the land titles. Cases of informal land uses were identified and are being formalized by the company.

Labour conditions

Labour issues in Paraguay are governed by the Labour Code, Law 213/93, modified and partially updated by Law 496/95, and the Labour Procedural Code, Law 742/61. Furthermore, Paraguay has ratified all fundamental ILO conventions[1].

While the Paraguayan law introduces appropriate safeguards and benefits for workers, informal labour is high, particularly in the rural setting. This is further accentuated in case seasonal work is required, commonly employed for activities such as planting. Also, outsourcing labour in rural settings is very common. Due to the lack of professionalized service providers in rural Paraguay, these work informally and are largely unaware of their obligations, such as benefits for employees and social security. According to the domestic census conducted in 2017, informality affects 65% of the working population[2]. Most affected are men living in rural areas, of which 80% are considered to be engaged in an informal labour situation[3].

Child labour continues to be an issue in rural areas, particularly often engaged to assist family businesses in smallholder fields or household work. As for forced labour, the risk is greatest when working with indigenous peoples. A census in 2008 revealed that when indigenous peoples do get a salary, it amounts to about half of the minimum wage[4].

Paraguay has made significant advances in integrating women into the labour market. In 2011, 50% of women were economically active, including in rural areas. Education of girls and women has also improved. Nevertheless, women in rural settings and women working as domestic workers are usually in a precarious situation. According to ILO (2013) only 10% of domestic workers are covered by the social security system[5].

Indigenous peoples

According to the results of the Third National Census of Indigenous Peoples[6], in 2012 there were 115,944 indigenous persons in Paraguay (some 2% of the population) living in 13 departments throughout the country. At that time, the Department of San Pedro had an indigenous population of about 3,600.

While Paraguay has adopted a progressive legal framework[7] recognizing the rights of indigenous peoples, in practice, implementation of these laws has been falling short. The Special Rapporteur on the

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[1] https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO:11200:P11200_COUNTRY_ID:102796

[2] https://www.ultimahora.com/informalidad-laboural-no-hay-avances-y-afecta-al-65-los-ocupados-n2775685.html

[3] http://www.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/documents/publication/wcms_245620.pdf

[4] http://www.un.org/esa/socdev/unpfii/documents/UNPFII_Mission_Report_Paraguay_ES.pdf and http://www.abc.com.py/edicion-impresa/interior/paraguay-salio-de-la-lista-negra-de-trabajo-forzoso-2333.html

[5] https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_policy/---cepol/documents/publication/wcms_426615.pdf

[6] http://www.dgeec.gov.py/Publicaciones/Biblioteca/indigena2012/Pueblos%20indigenas%20en%20el%20Paraguay%20Resultados%20Finales%20de%20Poblacion%20y%20Viviendas%202012.pdf

[7] Paraguay is a signatory to the core international human rights and environmental treaties, the American Convention on Human Rights, the jurisdiction of the Inter-American Court of Human Rights. In 1993, the ILO Indigenous and Tribal Peoples Convention, 1989 (No. 169). At the 2007 United Nations General Assembly, it voted in favour of the adoption of the United Nations Declaration on the Rights of Indigenous Peoples ("the Declaration"). In addition, Article 64 of the Paraguayan Constitution recognizes the right of indigenous communities to communal ownership of their lands, which are indivisible and non-transferable, not subject to seizure or income tax and may not be leased or used as security for contractual obligations.

rights of indigenous peoples, Victoria Tauli-Corpuz[8], found indigenous peoples in Paraguay to be particularly vulnerable. Main concerns included: The lack of security of their rights to their lands, territories and resources; lack of access to justice and redress; lack of effective mechanisms for consultation and consent; racism and discrimination; widespread poverty and extreme poverty; and barriers to their enjoyment of their economic, social, cultural and environmental rights.

Considering this context, it is important to proactively identify any indigenous rights that may be associated to Apepu and/or its surroundings. Therefore, following analysis has been conducted:

- The identification of any indigenous communities and/or claims through interviews with local stakeholders
- The spatial overlapping and mapping of Apepu with the communities identified in the 2012 census and the communities identified through the interviews conducted

The resulting map (see Figure 7) clearly shows that the closest communities are located at about 15 km. Following general comments must be made on these results:

- All stakeholders interviewed, including local authorities in San Estanislao have confirmed the absence of indigenous communities close to Apepu or its boundaries.
- The indigenous communities that could be confirmed through interview partners are commented in the map. All other communities are drawn from the census.
- The community most mentioned by all stakeholders was Santa Isabel, located at the District of Vy'a Renda. The community leader of Santa Isabel further mentioned an indigenous family living in San Estanislao, on a property of 70 ha, which is not recognized to date as an indigenous community, and another community located at the limits of the District of Caapibary and San Estanislao. Both communities are located at around 20 km from the borders of Apepu.
- A local expert on indigenous peoples and coordinator of the Federation of Autodetermination of Indigenous Peoples (FAPI) confirmed that the area is not occupied or claimed by any indigenous groups.

[8] UN OHCHR (2015). Report of the Special Rapporteur on the rights of indigenous peoples, Victoria Tauli-Corpuz, regarding the situation of indigenous peoples in Paraguay. A/HRC/30/41/Add.1.

Figure 7 Indigenous communities in the project area

Source: UNIQUE forestry and land use based on the 2012 indigenous census

5 ENVIRONMENTAL AND SOCIAL IMPACTS

5.1 Introduction

Potential impacts are assessed in terms of their significance, assigning one of the following four categories: low, moderate, high or extreme.

Significance is initially determined as a combination of likelihood and severity (see Table 3). Additional aspects such as duration, permanency and scale are considered to determine the final significance of the impact.

Table 3 Significance of impacts
Source: Arbaro and UNIQUE forestry and land use

Likelihood / Severity	Negligible	Marginal	Critical	Catastrophic
Certain	High	High	Extreme	Extreme
Likely	Moderate	High	High	Extreme
Possible	Low	Moderate	High	Extreme
Unlikely	Low	Low	Moderate	Extreme
Rare	Low	Low	Moderate	High

In the following relevant impacts are described and assessed; a detailed matrix is presented at the end of the chapter. Furthermore, mitigation measures are proposed to reduce the significance to acceptable levels. The assessment is based on the potential impacts that were identified as part of the EIA process to obtain the environmental license, which has been enhanced with findings of additional studies and assessments conducted by the Arbaro Fund and the company.

5.2 Positive impacts

Creation of employment and socioeconomic development

Description

The project area was previously used for cattle and agricultural production, activities that required little labour. The previous owners only employed two qualified workers and three seasonal workers.

With the establishment of forest plantations, Forestal Apepu will substantially contribute to the generation of employment. It is estimated that the project will support 70 FTE direct jobs, plus an additional 100 FTE indirect jobs along the value chain, assuming an intermediate level of mechanisation (as per Arbaro's methodology).

Local population and service providers will benefit from fair labour conditions, creation of qualified jobs and development of skills. This will in turn contribute to revenue diversification and enhanced resilience of households. Forestal Apepu will also engage proactively with the local population, potentially reaching 5,000 people that live in the surrounding communities.

Significance: High

Carbon sequestration and nature protection

Description

Forestal Apepu will establish 1,855 ha of timber plantations on areas dominated by herbaceous vegetation and partly degraded. This will substantially contribute to the sequestration of carbon from the atmosphere. Once fully established and sustainably managed, it is estimated that the project will create and maintain a permanent carbon stock of 300,000 tCO_2 (as per Arbaro's methodology).

In addition, project operations will contribute to the recovery of soils and protection of natural forest patches and natural habitats within the project area, which will result in additional carbon sequestration and protection of the environmental services these provide. Carbon will also be stored in harvested products, aimed to be used for long-life products.

Forestal Apepu will have additional positive impacts on the environment by establishing plantations in a region dominated by agriculture and subject to strong deforestation in the past. Impacts include landscape diversification, protection of water courses and natural forests, and reduced pollution through responsible use of chemical products.

Significance: High

5.3 Adverse environmental impacts

Pollution due to the use of chemicals

Description

In Paraguay plantation forestry requires the use of inputs, including herbicides and pesticides. The most hazardous product employed is fipronil, product used for ant control, and to a lesser extent, the herbicide glyphosate. These are discussed in terms of their hazards as follows:

- Leaf cutting ants are the most important pest identified for eucalypts in Paraguay. To date, the product employed to fight them is based on the active ingredient fipronil, a phenylpyrazole. Although fipronil is classified as moderately hazardous (class II) by the WHO, it has been banned in the European Union (EU) for certain crops due to its high toxicity to bees. Currently there are no effective alternatives on the Paraguayan market that could be used to replace this product.
- Glyphosate, one of the most popular weed killers, is generally considered as having low hazard potential for mammals. Nevertheless, there has been controversy in recent years about its dangers, particularly after the IARC concluded in 2015 that glyphosate is probably carcinogenic to humans. This conclusion was however not confirmed by the EU assessment or a recent joint WHO/FAO evaluation.

In plantation forestry the use of such products is concentrated in the initial years, decreasing as the trees grow, and is used as substantially lower rates than in agriculture.

Significance: High

Mitigation measures

- Employ a responsible and knowledgeable person in charge of chemicals.
- Formulate a plan and procedures for the safe use of chemicals, including application, storage and disposition.
- Use pesticides, herbicides and other inputs specifically and according to the instructions of the producer.

- Install the appropriate infrastructure for storing and handling chemicals and provide protective equipment to employees.
- Train workers conducting the application of pesticides and herbicides and require and monitor the use of protective equipment.
- Conduct research on alternative products.

Habitat destruction and health hazards due to fires

Description

In eastern Paraguay fires are common in the dry period, from July to October, with peaks in August or September. In these months there are two factors that favour the appearance of fires as well as their propagation: the first is related to climatic conditions, and the second to social factors, since fire is traditionally used as a tool to promote land use change, soil preparation or the regeneration of vegetation during this time of the year. While fire is commonly used to renew pastures for cattle, the intentional use of fire can quickly get out of human control.

Since the risk of fires is mainly associated to human factors, the risk is considered to be highest in the areas of the project bordering neighbouring communities.

Significance: High

Mitigation measures

- Prepare a comprehensive fire prevention and firefighting plan, that covers prevention measures, preparedness procedures in case of fire events, and firefighting provisions.
- Establish a network of firebreaks in the plantations sites and ensure the timely conduction of silvicultural treatments, particularly pruning and weed control.
- Acquire and maintain appropriate tools, equipment and infrastructure for firefighting and provide regular trainings to employees.
- Engage with local communities to build positive relationships, promote awareness and seek cooperation with neighbours.

Soil and water resources

Description

The selection of sites that are suited for plantation forestry and the use of species whose requirements are met by site conditions of utmost importance to avoid adverse impacts on the physical environment, particularly on soil fertility and water availability. In general, it is best practice to avoid planting eucalypts on dry or semiarid areas.

Given that site conditions in eastern Paraguay and specifically in the project area, particularly rainfall, are well suited to eucalypt plantations and that there are successful experiences under similar site conditions, risks related to poor site-species match are assessed as low.

Forest operations, particularly when machinery is used for soil preparation, harvest and road works, create soil disturbance and biomass loss, and can lead to soil erosion, soil compaction, fertility loss and lower water retention. Since the project area has no steep slopes, the risk of erosion is limited. Adequate techniques that minimize soil disturbance should be selected in each case and special attention should be given when conducting operations in proximity to water sources.

Significance: High

Mitigation measures

- Conduct site demarcation and site-species match consistently in all plantation sites, based on soil analysis, and do adequate use of fertilization.
- Use techniques that minimize soil disturbance and biomass removal and limit the use of heavy machinery as much as possible.
- Ensure that roads are property maintained and do erosion control.
- Ensure that machinery is well maintained.
- Identify buffer zones of water sources during land demarcation and ensure their protection.

Adverse impacts on natural ecosystems and biodiversity

Description

The company establishes plantations on areas previously used for agriculture and as pastureland, which are highly modified ecosystems. Furthermore, all patches of natural forests and buffer areas have been identified and will be protected. Considering these factors, it is unlikely that project operations will have important adverse impacts on natural values. Nevertheless, the company will need to ensure that protection provisions are effectively implemented and respected by company employees and local people that may have access to the land.

Eucalypt plantations have been object of controversy around the world due to its invasive potential. Forestal Apepu will be planting mostly cloned material, which seems to have very limited seeding and spreading capability. Based on other experiences in the country, to date eucalypts have not been associated to invasive behaviour. Nevertheless, it is important to ensure best practices are followed when planting eucalypts, ensuring the respect of protection and buffer areas. Furthermore, timber plantations can be subject to pests and diseases.

Significance: High

Mitigation measures

- Protected areas should include all areas protected by law, natural forests and the springs identified. Plantations should be established only on areas previously used for cattle and agriculture, observing minimum buffer areas and springs.
- Ensure the maintenance of protection and buffer areas and monitor the development of environments adjacent to eucalypt plantations.
- Ensure sufficient level of genetic diversification and apply integrated pest and disease management techniques.

5.4 Adverse social impacts

Labour conditions

Description

As presented in the baseline conditions, labour issues are likely to be a challenge in rural areas in Paraguay where informal labour is very common, and employees as well as contractors are in many cases unaware of their legal rights and obligations.

Nevertheless, labour laws and obligations are clearly defined, and implementation can be ensured through a professional management structure, awareness and constant control.

Significance: Moderate

Mitigation measures

- Introduce the company's standards in service provision contracts and assist service providers with their implementation through clear procedures, training and easily accessible information.
- Provide decent accommodation and living standards for field staff.
- Implement a monitoring program for subcontracted workers that covers child labour and labour conditions: wage levels, age of employees, social security obligations and living conditions.
- Conduct awareness raising on the standards followed by the company and the labour law among the field staff, the contractors and subcontracted personnel.
- Install a grievance mechanism for employees.

Health and safety risks

Description

Occupational health and safety is an important issue in forest operations. In Paraguay plantation forestry would typically be semi mechanized, with machinery being used for site and soil preparation, but maintenance and harvesting activities being conducted manually by operators. Workers are exposed to health and safety risks from the use of equipment and machinery for operations, particularly during harvesting operations, as well to risks inherent to land operations, such as animal and insect bites.

In addition to harvest operations, risks are to be considered carefully for the application of inputs and in the event of a fire, as discussed in previous sections. On the other hand, the project area does not feature any particularly difficult conditions that may pose additional challenges in this regard, such as difficult topography or isolation.

The Paraguayan laws establish minimum conditions for health and safety. However, these are hardly controlled by public agencies. Nevertheless, international standards for health and safety in forestry operations are known, and other companies in Paraguay implement them. Therefore, the risk is considered manageable. FSC certification may provide an additional safeguard to ensure health and safety standards are consistently implemented.

Significance: High

Mitigation measures:

- Introduce the company's standards in service provision contracts and assist service providers with their implementation through clear procedures, training and easily accessible information.
- Develop BOP procedures for operations and conduct training to employees with focus on health and safety aspects.
- Require and monitor the use of protective equipment for each job profile, appropriate and commensurate to the risk imposed by the nature of the activities. This should also cover subcontracted workers.
- Do appropriate signalisation of dangers, particularly in risky areas, such as storing room of chemicals.
- Provide first aid trainings and first aid kits in appropriate places, including mobile first aid kits for working groups.

Risks related to increased traffic

Description

Typical possible impacts on community members bordering a forestry company are increased noise, dust and risk of accidents due to transport of wood and inputs. This is particularly true for Colonia Republicano, located along the main access roads to the project area, which also leads to all main markets.

Significance: High

Mitigation measures

- Implement rules for safe driving and use the roads on appropriate times.
- Whenever possible assist the communities with road maintenance.
- Implement mitigation measures for potential heavy traffic on the roads passing through Colonia Republicano, such as installing hedgerows at the front of the houses bordering the roads.
- Install a grievance mechanism for local communities.

Access to natural resources

Description

Towards the southwest of the project area, the project property occupies both sides of the stream Apepu including a small portion of land on the western side of the stream. This part of the stream features small waterfalls and rapids used for recreation by community members. While this use is not allowed on private property according to Paraguay law, this is not the perception of community members, who are convinced that it is their right by law to access the stream. In fact, the previous owners limiting the access caused unrest among community members in the past.

It is strongly recommended that the company allows community members access to the stream, while seeking to jointly define some rules for its rational use. As explained by the previous owners, the public use of the area also entails risks linked to residues, increased traffic, disturbance to animals and risk of fires.

Significance: High

Mitigation measures

- Grant access to community members to the stream Apepu and engage with community members or representatives for its safe use.
- Define an agreement in which rights and obligations of community members are clear. For example, the neighbourhood commission could be in charge of managing the site for leisure, while ensuring certain rules are followed, in particular prohibit and control the use of fire.
- Install a grievance mechanism.

Adverse impacts on indigenous peoples

Description

As explained in the baseline conditions, the assessments conducted did not reveal any indigenous communities located within the area of influence of the project, the closest communities being located at about 15 km.

Significance: Moderate

Mitigation measures

- In case indigenous peoples immigrate to the surrounding area, the company should engage with them according to international standards.

Adverse impacts on cultural heritage

Description

No evidence has been found indicating any cultural heritage values associated to the site, and there is no indication of this to be likely.

Significance: Moderate

Mitigation measures

- The team conducting the High Conservation Value (HCV) assessment should look out for signs of any possible pre-columbine objects.

5.5 Summary

The following presents an overview of the assessment of adverse impacts:

Impact	Project phase	Likelihood	Severity	Scale	Duration	Permanency	Significance
Pollution due to the use of chemicals	Construction and operation	Possible	Critical	Local	Medium-term	Irreversible	High
Habitat destruction and health hazards due to fires	Operation	Possible	Critical	Local	Long-term	Irreversible	High
Soil and water resources	Construction and operation	Possible	Critical	Local	Medium-term	Irreversible	High
Adverse impacts on natural ecosystems and biodiversity	Construction and operation	Possible	Critical	Local	Long-term	Irreversible	High
Labour conditions	Construction and operation	Possible	Marginal	Project area	Project lifetime	Reversible	Moderate
Health and safety risks	Construction and operation	Possible	Critical	Project area	Project lifetime	Irreversible	High
Risks related to increased traffic	Construction and operation	Possible	Critical	Local	Project lifetime	Irreversible	High
Access to natural resources	Construction and operation	Possible	Critical	Site-specific	Project lifetime	Reversible	High
Adverse impacts on indigenous peoples	Construction	Rare	Critical	Site-specific	Long-term	Irreversible	Moderate
Adverse impacts on cultural heritage	Construction	Rare	Critical	Site-specific	Long-term	Irreversible	Moderate

6 MANAGEMENT PLAN

6.1 Introduction

The ESMP constitutes a key element to ensure that company operations are conducted in line with ES requirements. The company has developed its ESMP during the first months of operations. The ESMP should be continuously reviewed and improved as needed to meet best standards, based on new assessments and monitoring results.

This chapter provides a description of the major elements of the ESMP and formulates additional recommendations to be considered by the company.

6.2 Policies and procedures

Forest Apepu has developed an Environmental and Social Management System (ESMS) in line with the standards followed by the company. The ESMS defines the overall framework and tools to manage ES matters in company operations. For this several policies, procedures and plans have been developed.

The following list presents the most relevant documents developed by the company that are important to address potential adverse ES impacts:

- Environmental and social policy
- Forest management plan, including training program
- Integrated pest management plan
- Health and safety procedures, including provisions for emergency preparedness and response, measures for fire prevention and firefighting and procedures for use of chemical products
- Stakeholder engagement plan and grievance mechanisms
- Monitoring procedures

It is further recommended that the company develops manuals of best operating practices for key operations, which would complete the existing health and safety procedures.

6.3 Roles and responsibilities

Forestal Apepu has designated a team responsible for ES matters, made up of three people dedicated part time to the project. The following roles are covered by the team:

- ES manager, responsible for overall coordination of the project staff to implement ES measures, FSC certification and communication with investors and stakeholders
- Environmental officer, responsible for the EIA and environmental license process, coordination of environmental studies and monitoring
- Liaison and health and safety officer, responsible for communication with communities, health and safety standards, grievance mechanisms and development projects

The capacities and skills of the designated team are considered appropriate to address the potential ES impacts identified as part of the ESIA.

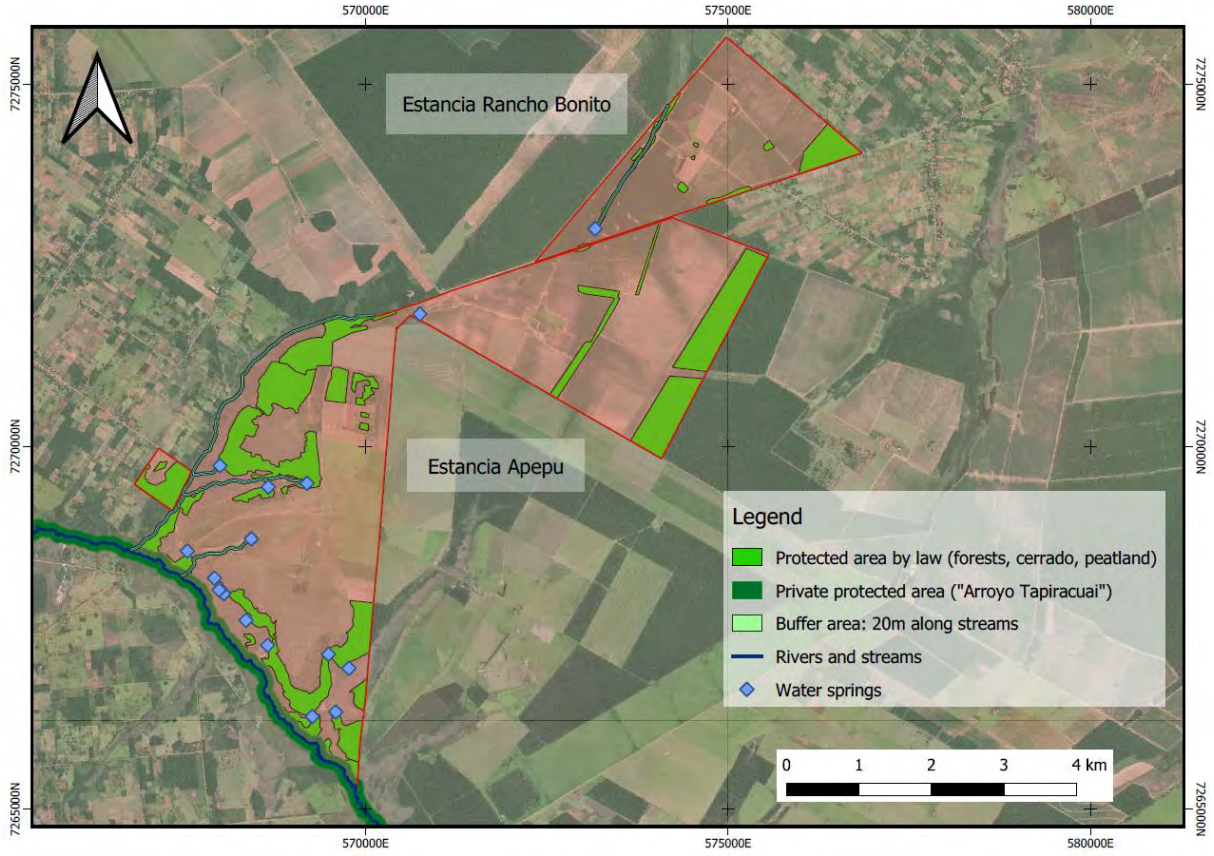
6.4 Environmental protection

Areas designated for conservation

The company has demarcated the areas that will be set aside for conservation (see Figure 8). These include all the patches of natural forests, the area corresponding to the Tapiracuai Nature Reserve, buffer areas along streams and around springs, and cerrado areas. This demarcation respects legal requirements and considers key natural ecosystems and values in line with the findings of the biodiversity baseline study.

Figure 8 Protected areas in the project area

Source: UNIQUE forestry and land use



Conservation provisions

Based on the results of the biodiversity study Forestal Apepu has conducted a wider assessment of HCV in the project areas. While no HCV were identified, the company recognizes the environmental value and need for protection of the remnants of natural forests and other natural habitats in the project area. Conservation provisions include:

- Wildlife hunting and tree harvesting are prohibited in the areas of natural forests
- The use of fire is prohibited in natural habitats
- Drainage or other high impact operations are not conducted in natural habitats
- Installation of signage with company policies and training to employees, with disciplinaries in case of breach

The company has also decided that no additional plantations will be established on natural grasslands; the 24 ha already established will be managed through low impact techniques and carefully monitored.

6.5 Social engagement

Social engagement plan

Forestal Apepu is committed to establish transparent communication and engagement with stakeholders, and to provide positive impacts to local population, through employment and social development projects adapted to the local needs.

The company has developed a social engagement plan, which includes the following elements:

- Mapping and analysis of stakeholders, with identification of level of influence and interest over the project and particular vulnerabilities
- Definition of level of engagement and communication channels in each case
- List of stakeholder contacts

As part of the DD several stakeholders were consulted, including members of local communities and institutions. The full list of the interviewees is available in ANNEX 5. To follow on this initial approach, in the first months of operations Forestal Apepu coordinated meetings with the local communities to formally introduce the company and foreseen operations, discuss expectations and address concerns of community members, and explain the engagement approach envisaged by the company. A report summarizing the outcomes of the meetings is available in ANNEX 6.

Forestal Apepu has conducted an additional study based on Participatory Rural Appraisal to collect additional information on the local communities, with the objective to better understand their current situation and needs and identify potential social development projects. Based on the findings an agricultural project has been initiated with the communities.

Grievance mechanisms

The company has introduced a grievance mechanism so that stakeholders can express their concerns without fear and anonymously. The mechanism is mainly targeted at the most vulnerable stakeholders: field workers and neighbouring communities.

The grievance mechanism has been communicated to community members and the workforce and is accessible at no cost. There are two channels to communicate grievances:

- Letter boxes installed at the gate of the project area (mainly for communities) and inside the property (mainly for workers) that allow the communication of grievances anonymously
- Directly to the liaison officer in person or per phone

While people have the opportunity to use formal channels, the most important communication channel of the company is based on the continuous presence of the liaison officer. A response to any complaints must be provided within two weeks upon reception and the company aims at closing complaints within three months.

The mechanism is considered to be culturally appropriate and understandable.

6.6 Monitoring

Forestal Apepu will monitor and evaluate on a regular basis that project operations are conducted as planned. In addition to aspects related to productive activities (operations, costs, forest growth and forest health) the company has developed specific procedures to monitor ES matters. Table 4 presents fundamental elements that will be monitored.

Table 4 Environmental and social monitoring

Source: UNIQUE forestry and land use

Component	Indicators	Procedures
Employment	- Number of employees and breakdown - Level of compliance with local laws: most importantly minimum age, registration to IPS and minimum wage - Satisfaction level of employees	- Employee records - Annual employee satisfaction survey
Health and safety	- Level of compliance of health and safety procedures: most importantly the use of chemical products and use of protection equipment - Hours of trainings and number of participants	- Health and safety check forms - Training records
Accidents	- Number of accidents - Causes of accidents and follow-up measures	- Accident records
Communication and grievances	- Number of grievances - Causes of grievances and follow-up measures - Number of meetings	- Grievance records - Meeting records
Illegal activities	- Number of illegal activities, description of the event, measures taken	- Illegal activity records
Biodiversity	- Impacts on biodiversity and development since the baseline - Species diversity and richness - Level of compliance with land use planning and restrictions	- Regular reporting on progress against the plan - Biodiversity assessments
Water	- Values of drinking water analysis	- Annual tests on drinking water tests

7 CONCLUSION AND RECOMMENDATION

The assessment has identified potential ES impacts that may result from project operations. The assessment did not identify any impacts of major significance, and it is concluded that the identified adverse impacts are manageable. Many of these impacts are already fully or partly addressed in planned operations, but the company must ensure that implementation is done as planned. Additional mitigation measures are recommended and should be followed by the company in order to further reduce risks.

On the other hand, the project has the potential to provide substantial positive impacts, most importantly in the form of employment and carbon sequestration.

ANNEX 1 EIA Property Apepu

Project

AGRICULTURAL ACTIVITY

ADJUSTMENT (ENLARGEMENT)

Of the Environmental Management Plan (PGA)

TO

REFORESTATION

Owner

AGROGANADERA APEPU SA

DECLARATION No. 3401/2015 and RESOLUTION
DGCCARN A.A. No. 004/2018

Location: Capiibary

District: San Estanislao

Department: SAN PEDRO

FINCAS No. 271-8326-11257

PADRON No:579-9176-11945

CONSULTANT: For. Eng. Dalmacio Barboza

CTCA I 574

YEAR 2019

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14.1 SOME ACTIONS TO BE CONSIDERED ARE: 26

1 HISTORY

The property a few years ago started agricultural activities. In recent times the livestock production was gradually decreasing for that reason the firm that is made up of several partners, they decided to change sectors with very encouraging ventures for the environmental forestry sector as it is planned to perform pure reforestation with exotic species Eucalyptus for wood production and biomass, converting pasture areas and areas of agricultural use into forest plantations. The property currently has Environmental Impact Statement (DIA) No. 3401/2015 Resolution DGCCARN A.A. No. 004/2018, dated 05 January.

This Adjustment is for the expansion of activities, change of use of pasture and agricultural areas to reforestation that is much more beneficial to the environment.

2 JUSTIFICATION FOR THE PROPOSED SYSTEM

Paraguay has undergone severe landscape changes over the past few decades, with high rates of deforestation. Paraguay's forest cover has fallen from 8.3 million ha in 1943 to around 1.5 million ha in 2011, mainly due to the expansion of agricultural holdings. During this time, annual deforestation has reached rates of 200,000 to 300,000 ha per year.

This development has left the Eastern region with a small and fragmented forest landscape. The remaining forest cover is distributed in national parks and private farms. The latter consist of farms and stays on which the so-called “legal reserve” has been maintained, which corresponds to the obligations imposed by the Forest Law (Law 422/73) with respect to the conservation of 25% of the original forest cover of a property.

Due to the lack of incentives for the conservation of these forest fragments, traditionally their maintenance has been perceived as a liability by producers. Consequently, these forests have been subject to a process of gradual degradation caused by the unsustainable exploitation of wood, their use as roosts for livestock, and sometimes even their intentional burning for conversion to other uses.

This process has left many forest fragments in a state of severe degradation. Heavily degraded forests are characterized by very few trees of commercial value and low regeneration, so they cannot be subjected to a regime of management of native forests rationally. This scenario highlights the need for achievable alternatives that promote forest conservation and recovery. In this context, the Firm ARGOGANADERA APEPU SA, proposes the reforestation as a viable alternative that aims to conserve the native forests of the farm. Intensive reforestation points to the planting of high-value and fast-growing exotic species. Exotic species are managed only by one cycle with the aim of producing quality wood and providing the necessary funds to maintain or recover the remaining forest.

3 GENERAL AND SPECIFIC OBJECTIVES

- Adjust (Expand) the Environmental Management Plan to reforestation activity

- Determine which natural resources will be affected by the activity to be expanded in the project, compensate for or mitigate negative environmental impacts
- Identify the relevant, positive and negative environmental impacts that would eventually cause the activity to be incorporated into the project and formulate appropriate mitigation measures
- Perform a re-survey of the property area by adjusting the surface that confers the title

Specific goals

- Establishment of fast-growing forest plantations on an initial area of 461 hectares of pure plantations, second stage 477 hectares and third stage 474 hectares.
- Implement high productivity system in terms of volume of wood in order to meet the future demand of local industries and obtain greater economic benefits with the diversification of wood production and livestock production.
- Produce wood for energy use
- Environmental services: We look with high interest at the market being developed for environmental services offered by forests (e.g. carbon capture). Where possible, forest production should meet current compliance requirements and voluntary carbon market standards, as well as possible future standards for other payments for changing environmental services.
- Help combat climate change with increased carbon capture
- By integrating silviculture into operations, maximize land yields, rather than expanding them so you can increase your income.
- Be a model of activity that has a multiplier effect on the local and regional environment.
- Generate labour for the local population.

4 GENERAL DESCRIPTION OF THE STUDY AREA

The property object of the adjustment is located in the place called Capiibary, District of San Estanislao, department of San Pedro. The owner of the farm is the Firm Agroganadera APEPU SA and is made up of three farms that gives a total area of 2,226.2 ha. It is currently engaged in agricultural activity with the current incorporation of reforestation with Eucalyptus spp.

It is accessed by San Estanislao leaving route No. 8, 1 km where it is diverted by neighbourhood path 7 km one can reach the property by the south side; also has access by Bertoni crossing or street six thousand by route No. 3 with south direction, about 6 km where deflected by the street called 10,000 Defensores, entering about 9 km one can reach the northern head of the property. It is around 160 km from Asunción.

Central coordinate of the property UTM J21- N 7. 271.000 E. 569.000.

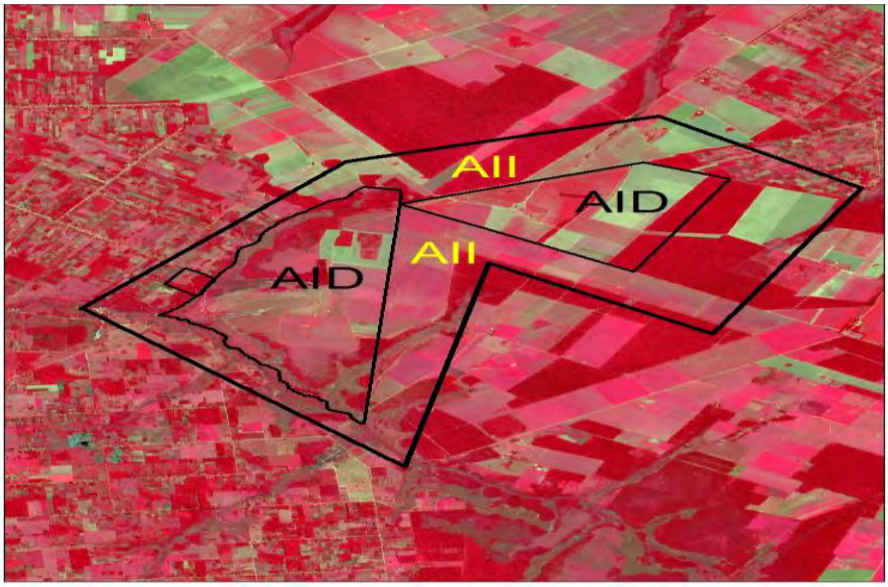
5 AREA OF DIRECT INFLUENCE

For a study of the impact that this adjustment might cause in the project settlement area, two areas or regions defined as Direct Influence Area (AID), and Indirect Influence Area (AII) have been considered in the study area.

It has been defined as area of study, the one where the direct and indirect influences of the project have significance.

The Direct Influence Area (AID) includes the surface area of the land affected by the project facilities, and defined by the boundaries of the property, which receives the impacts generated by the activities to be developed on the site directly.

The Indirect Influence Area (AII) is considered the area surrounding the property within a radius of 1,000 meters with centre in the intervention area of the farm, which can be the subject of impacts, product of the actions of the project.



5.1 PROPERTY BORDERS

North: Stream Apepu/Suc. Edmundo Rolón, Guillermo Sánchez, Manuel Rodríguez

South: Stream Tapiracuai.

East: Successors of J.J. Barrail and Others.

West: Stream Tapiracuai # Rights of Cohene and J. Brizuela

5.2 CLIMATE

The climatic data of the reading station in Santa Rosa del Aguaray that serves as a reference for this study, which records rainfall data from 1977 to the present day and is installed within the Estancia, the averaged data can be observed in the table:

Table No. 1: Average Climate Parameters of Assumption

Climate data	Annual daily average	Monthly average (mm)	
		December	June
Temperature (°C)	s/d	s/d	s/d
Precipitation (mm)	1,685	175	102

Source: own elaboration based on data from Estancia Rancho 068 S.A. (1977 to 2013)

The Eastern Region of Paraguay has a climate with two seasons. In the winter (May to August) the average temperature is between 16 and 18 °C, but temperatures below 0 °C can also occur, freezing occurs for short periods of days. At this time deciduous species throw their foliage. The high temperature starts to be felt from September onwards and usually until the end of March, reaching temperatures of up to 42 °C. The average temperatures are between 22 and 26 °C. The transition between the seasons is very short. The average annual rainfall reaches 1,500 mm, with well-distributed rainfall during the year, although it does have drier periods between July and September and wet between the months of October to May.

6 SOILS AND VEGETATION

From the base rock formation Misiones, originate the soils of the agro-cattle establishment Apepú S.A., the formation completely covers the surface. To the east, the Misiones formation covers the sandstone of the Independencia formation and to the west it is below the basalt spill of the High Paraná formation. The sandstone of the formation Misiones is of uniform dark red colour, has medium to thick grain, mainly of quartz, is rounded or elliptical, is little cemented by a clay-hematitic matrix, partly with a small increase of clay in the horizon B. These rocks largely originate the soils of the area and can be classified or included in the order of the Ultisols (Paleosoils) with sandy horizons, qualifying as a Kandico horizon especially when the capacity of cation exchange is less than 12 m.e./100 grams of soil.

In the area where the establishment develops, the soils originate on this old-age sandstone (Trisica) called Misiones of wind origin and locally dragged by water. It is generally

estimated that the age of the source material is 180 to 200 million years. It constitutes a non-consolidated rock, of uniform dark red colour, with medium and thick grains, rounded or elliptical, dominantly quartz. The granules are not very cemented, massive and not very stratified without discontinuity of origin, indicating that the material was worked by large flow or movement of water in massive form and in some places by wind.

Within the establishment there is no outcrop of the original vegetation of the local area, typical of the formations called heterogeneous forests with species such as: In the positions of highest topography, with high-altitude latifoliate trees such as lapacho, ybyrá pytá, ybyraró, cedar, guayaibí, curupay, ybyrá-yú, laurel, timbó, among others, with dense undergrowth with also a variety of species. However, in areas with intermediate height topography, vegetation is observed with short, stocky species such as Myrtacea, guabirámí, giant chirca, yataí, yahapé, among others.

7 CURRENT LAND USE

7.1 INTENSIVE AGRICULTURAL USE

The area that is subject to mechanized agricultural crops under intensive regime comprises 828.27 ha, the most important crops are soybeans and maize. The soils of the area are derived from sandstone and are classified by their use capacity as II-Sf preferably, especially in the flatter areas (less than 5 % slope) and some sectors greater than 5%.

7.2 LIVESTOCK USE (PASTURE AREAS)

It comprises 532.18 ha. These are areas of pastures implanted for breeding, rebreeding, wintering and fattening cattle, but currently with weed due by the low use and lack of maintenance, of it some sectors are closed by shrubs even with some trees that have grown and can currently provide shadow and protection to the cattle. The soils are derived from sandstone of the series Misiones and are classified in the use capacity class III-Sft for its limitations of fertility and acidity, in addition to the topography as the contour must be followed to work with forestry and agricultural crops.

7.3 DEGRADED HIGH FOREST AREA

It comprises 518.88 has. High forests, intermediate to low forest and forests in galleries in the vicinity of water courses, are characteristic of the Eastern region, currently preserved under the figure of “legal reserve”, but completely degraded with little chance of recovery if no measures such as forest maintenance and enrichment are adopted. The soils are sandy-clay-loam of the use capacity class III- Sft, with interesting presence of clay. These specifications ensure good moisture retention in times of drought or low rainfall.

Low forests are distributed partially in soils classified as IV-St, with less clay participation than soils occupied by high forests. These forests are partly occupying and partly surrounded by soils subject to water saturation of the VI-VII(pr) classes.

7.4 LOW FIELD

It comprises 311.41 ha. These are areas of esteros and wetlands that are located on the banks of the Apepu creek that borders in the North-West part of the property and in the south of the property the wetland area of the Tapiracuai creek. These areas are not suitable for commercial use. The soils are classified as VI-VII(pr).

7.5 ADMINISTRATIVE AREA AND INFRASTRUCTURE

These are old facilities requiring complete restructuring comprising employer housing, offices, personnel housing, warehouse sheds, stables and others.

7.6 ROADS

It currently comprises 22.64 ha, is distributed in all areas of use of the property, some will be part of the reforestation project and others will be enabled as the project advances. In total, there will be 11.65 ha of roads, and firebreaks will be built in all areas to be reforested.

Table No2 of current land use

Current land use	Area ha	Area %
Agricultural use	828.27	37.2
Native forests	518.88	23.3
Low field	311.41	14.0
Pastures	532.18	13.9
Management and retirement area	12.84	0.6
Roads	22.64	1.0
Total	**2,226.2**	**100**

Table No. 3 of alternative use

Alternative use	Area ha	Area %
Forests area (reserve)	457.31	20.5 (45.8)
Area for reforestation I stage	461.0	20.7
Area for reforestation II stage	477.0	21.4
Area for reforestation III stage	474	21.3
Low field	264.93	11.9
Protective forests	61.54	2.8
Management and retirement area	12.84	0.6
Roads	11.65	0.5
Remaining agricultural use	5.94	0.3
Total	**2,226.2**	**100**

8 REFORESTATION PROJECT

8.1 PROJECT DESCRIPTION

8.1.1 Total area of the estate

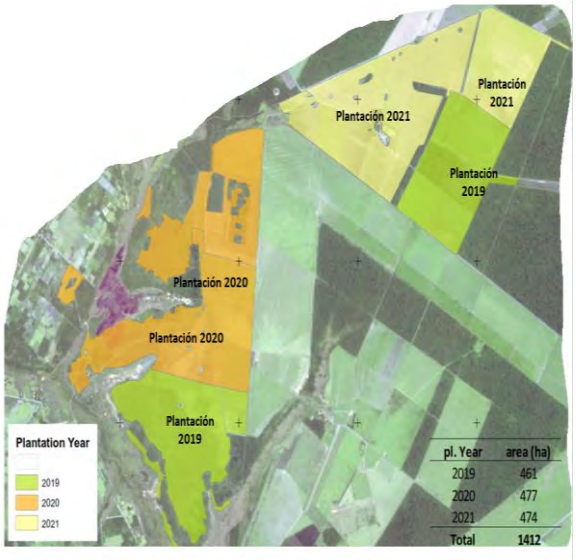
Agroganadera Apepu S.A. has 2,226.2 ha, the detail is presented in current and alternative land uses.

8.1.2 Total area of the area to be reforested

Reforestation in this estate is planned in three stages (years 2019, 2020 and 2021) distributed as follows:

Table No. 4 Stages of reforestation

Years	Area (ha)
2019	461.31
2010	477.0
2021	474.0
TOTAL, ha	**1,412.31**



Source: Areas to be reforested in the first three years. Source: Unique

All planted areas will seek forest certification by the Forest Stewardship Council (FSC) to ensure sustainable forest management practices and has ecological restoration and social development plans in place.

8.1.3 Selection of species and lists of materials to use

The following criteria for the choice of plantings were respected:

- Clones/species must have a good reception in Paraguay or in similar places;
- Species/clones taken into account should come from known sources.

Clone G0 by GENEFOR S.A.

Hybrid of E. grandis x E. urophylla, presents a good growth with a favourable initial start and responds well to the increase of space through thinnings. No manifest diseases so far.

Taking into account the frost tolerance range of E. grandis, E. urophylla and its hybrids, the results have shown that this material has a medium tolerance. The shape of the pole is evaluated using a scale of 1 to 6, where 1 is winding and 6 is straight.

Average crack (5 years): 9.5%

Db. Prom 5 years (g/cm3): 0.386

Age: 5 years

Shape: 3

DBH (cm): 25.5

Height (m): 27.8

Clone G1 by GENEFOR S.A.

Hybrid E. grandis x E. urophylla, the growth is medium, but is partly compensated with the high density of the wood that will possibly be suitable for use as floors and structural wood.

Considering the frost tolerance range of E. grandis, E. urophylla and its hybrids, the results have shown us in this material that it has a low tolerance.

The shape of the pole is evaluated using a scale of 1 to 6, where the 1 is winding and the 6 is straight.

Average crack (5 years): 13.6%

Db. Prom 5 years (g/cm3): 0.44

Age: 5 years

Shape: 5

DBH (cm): 25.3

Height (m): 30.3

Source: GENEFOR S.A. website.

The species to be planted are listed in Table No5:

Table No5: Species for reforestation

Species	Approximate share (in %)
E. grandis x E. urophylla and its clones (G 0)	25%
E. grandis x E. urophylla (G 1)	34%
E. grandis x E. urophylla (G 2)	28%
E. grandis x E. camaldulensis (G 7)	7%
E. grandis x E. urophylla (G 12)	6%

The species selected for reforestations are already used with good preliminary results in other estates and properties managed by Unique.

8.1.4 Planting density and spacing

The planned density is 1,000 plants per ha and with a distribution of 5 m between rows and 2 m between plants.

8.1.5 Estimate of expected yields on the plantation

The average annual increase is expected to be according to Table 3, according to the experiences of other similar projects. Soils are very strong indicators for MAI estimates on a plantation to be established.

Table No6: Yield in m³/ha/a

Species	Average yield (MAI in m³/ha/a)	
	Good places	Regular sites
G0, G1, G2, G7 and G12	40 m³/ha/a	38 m³/ha/a

8.1.6 Ground preparation

Before planting, the sites will be mechanically cleaned. The activities that correspond to a good preparation will be:

- Heavy harrow
- Subsoiling
- Lime application
- Light harrow

8.1.7 Plantation

The first activity to start the plantation is the marking of the land to be reforested; then the holes are done with forest shovels and, finally, the plantation. During the planting operation, all necessary care will be taken to promote the good growth and survival of plantings. The planting place should be as well prepared as possible to facilitate the rooting of the plant. It will never be planted at the bottom of the subsoiling groove. A platform should be made, completely covering the groove to the original ground level with the soil removed. Leaving large or sharp stones in the hole or in contact with the plant will be avoided, as they may impede the normal development of the roots or damage the plant. After planting, soil compaction should be avoided to protect the roots.

Based on experiences so far, it has been determined that the planting season is from March to October, since planting in very hot or dry seasons results in high mortality. However, planting tests are being carried out in dry seasons using gel and irrigation with promising results.

Blanking takes place within the first three months after planting if tree mortality is above 15 to 20%.

The survival rate is defined as the relationship between living trees and trees planted after one year of planting. In the survival rate, no difference is done between the original

planting and blanking. To avoid negative effects on plantation yield, survival rates of 85 to 90% are required.

8.1.8 Cleaning, pruning and thinning

For the maintenance of the plantations, regular weed control is planned until the third year, depending on each case, mechanically with hoe and/or machete, and in most cases applying systemic herbicide in rows. In addition, ants are controlled and general maintenance activities (cleaning, fire control) are carried out.

Thinning refers to the cut to be made on the plantation when there is competition between the trees; those trees of better quality are selected, eliminating those of bad development. Thinning is carried out in order to leave more space between the trees and thus provide better conditions for their development.

The following thinning regime shall apply:

- First thinning after 3 years; reduction to 550 trees/ha
- Second thinning after 7 years; reduction to 350 trees/ha
- Third thinning (optional) after 9 years; reduction to 220 trees/ha

Pruning is the cut that is made to the branches of the trees; consists of completely removing the branches from their level of exteriorization out of the bark. The cut aims to develop a long and unique pole, straight and commercial, as well as to avoid the appearance of knots that decrease the value of the poles.

8.1.9 Fire prevention and control

Fire is a tool used by the rural population in Paraguay to reduce forest fuels, fertilize soils and regenerate vegetation, and as such is a particularly widespread phenomenon in the context of grazing.

Climatic conditions also favour the occurrence of fires because moderate seasons generate a climate (summer precipitation region) where vegetation produces high loads of biomass during a hot and rainy summer (October to May). During the dry winter months (July to September), these fuels may be available to spread the fire fiercely if conditions are right.

In an environment with fire occurrence, fire cannot be completely excluded from a landscape point of view. However, the effects of fire can be mitigated, and the spread of fires can be controlled in order to achieve the highest possible protection in high-value areas. Preventive measures are primarily aimed at limiting the occurrence of fires to certain areas where losses and damage are acceptable. Some effective methods for controlling the spread of fires are reducing fuel load and creating firebreaks. Unique Wood has a track record of several years in fire prevention and management with strategic partners and regular training with a Paraguay Forest Fire Corps team for all projects managed for investors.

8.1.10 Prevention and control of pests and diseases.

Phytosanitary protection is a set of management strategies, standards, techniques, procedures and activities that aim to protect, prevent and/or decrease to ecological, economic and social sustainable levels the losses caused by pests and diseases in the forest. It can be said that every crop is susceptible to pests or diseases, especially monoculture, some more than others and certainly depending on the region, involving native or exotic species. However, as in other species there are ways to reduce such risks. Unique focuses on the following aspects to reduce the risk of phytosanitary problems:

- Genetic selection of resistant varieties;
- Forestry measures such as pruning and thinning that ensure healthy and strong trees;
- Avoid continuity of canopy and monoculture on very large areas; and
- Planting two or more species to avoid the monoculture.

In addition, staff will be trained to recognize potential pests that could cause damage to plantations, and frequent observations will be made on plantations. Table 7 lists the quarantine pests registered by SENAVE affecting Eucalyptus species in Paraguay.

Table 7: List of quarantine pests affecting Eucalyptus species in Paraguay

Type of pest	Species	Relevant species affected in Paraguay
Insect: Coleoptera	*Gonipterusgibberus*	*E. camaldulensis*
	Gonipterusscutellatus	*E. camaldulensis*
Insect: Hemiptera	*Ctenarytainaeucalypti*	
	Ctenarytainaspatulata	*E. camaldulensis and E. grandis*
Insect: Lepidoptera	*Euselasiaapisaon*	
	Thyrinteinaarnobia	*E. grandis*
Fungi	*Ceratocystisfimbriata*	
	Corticiumsalmonicolor	
	Coniellafragariae	
	Cryphonectria parasitica	
	Cryphonectria cubensis	
	Cryphonectria eucalypti	
	Mycosphaerella suberosa	
	Sporothrixeucalypti	

Source: SENAVE, 2013

In addition to the pests listed in Table 7 other pests were recently detected in Paraguay and should be considered. Among these is the phytophageal insect *Thaumastocorisperegrinus,* known by the name Chinche del Eucalyptus, and *Leptocybe invasa,* a tiny black wasp native to Australia, considered the eucalyptus plague with the highest diffusion speed in the world. In giant Paraiso, the attack of mycoplasma that reduces tree growth is common.

8.1.11 Rotation

It is foreseen a rotation of 12 to 13 years.

8.1.12 Harvesting program

Low-impact motor-manual harvesting will be applied according to FSC standards.

8.2 ECONOMIC ASSESSMENT OF THE PROJECT

[Note: This section has been removed for disclosure due to confidentiality reasons and given its limited added value for an environmental and social impact assessment.]

8.3 INVESTMENT REQUIRED

[Note: This section has been removed for disclosure due to confidentiality reasons and given its limited added value for an environmental and social impact assessment.]

8.4 ECONOMIC ANALYSIS AND INVESTMENT

[Note: This section has been removed for disclosure due to confidentiality reasons and given its limited added value for an environmental and social impact assessment.]

8.5 NET CURRENT VALUE

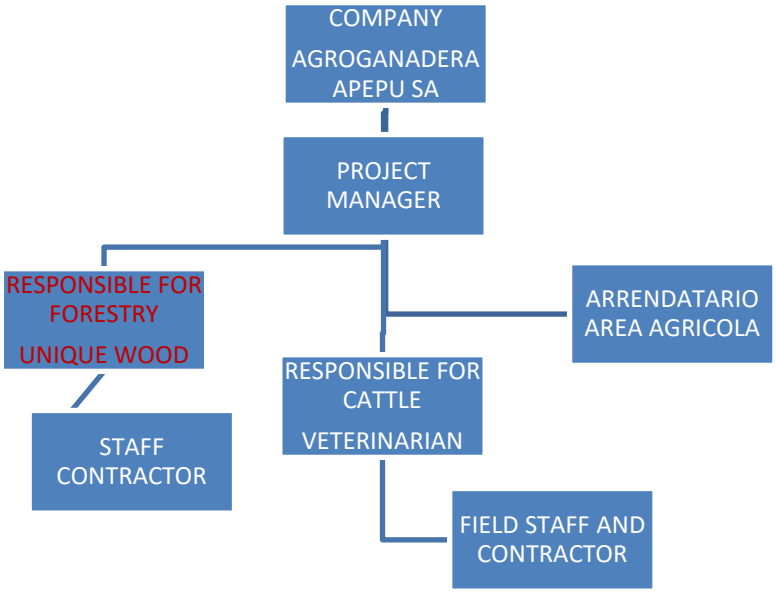
[Note: This section has been removed for disclosure due to confidentiality reasons and given its limited added value for an environmental and social impact assessment.]

8.6 PROJECT MANAGEMENT

UNIQUE assumes the technical management of forest production, providing its services in the areas of forest planning, coordination and supervision of operational work and marketing of wood.

The internal management plan will be updated periodically, and all information is measured and verified through a monitoring system implemented for all plantations under UNIQUE management.

9 PROJECT ORGANIZATION CHART



10 LEGISLATIVE AND REGULATORY CONSIDERATIONS

10.1 INSTITUTIONAL

Institutions involved

Private Institutions

Executing company: responsible for reforestation

Consulting company: responsible for the realization of the Adjustment

Public Institutions

Ministry of Environment and Sustainable Development. Created by Law No. 6123/2018 that elevates the secretary of the environment to the Ministry, and will be governed by Law No. 1561/00, whose purpose is the coordination, implementation and control of national environmental policy and is constituted as the implementing authority of all the legal provisions governing environmental matters.

National Forest Institute (INFONA). Created by 3464/08, an autonomous and decentralized institution. Its jurisdiction encompasses the entire national territory and its specific functions include formulating forestry policy in line with the country's rural and economic development policy, it is also an executing body of Law 422/73 and 536/95.

National Animal Health Service (SENACSA). Institution created to monitor compliance with the health checks carried out on herds of animals intended for human consumption, whether milk or meat.

Ministry of Public Health and Social Welfare (MSPB and BS). Created by Decree Law No. 2000, its main functions include the establishment and management of the health service of the republic; it is the institution responsible for enforcing the provisions of the health code and its regulations.

Ministry of Justice and Labour (MJT). Institution of the State responsible for ensuring compliance with the General Technical Regulations on Safety, Medicine and Hygiene at Work, created by Decree Law No. 14.390/92 and 21393, Labour Code.

Governorate of the Department of Alto Paraguay. That through the country's decentralization policy the Governorates have been created in order to intervene in the various environmental projects in the departments.

Municipality of Puerto Casado. The Municipality is the local governing body with political, administrative and regulatory autonomy. It has autonomy in terms of urbanism, environment, education, culture, sport, tourism, health and social care.

10.2 LEGAL FRAMEWORK

Table No. 10: Summary of Laws with environmental references

Legal Instrument	Relevant Articles	Responsible Institution	Comments
National Constitution	6,7,8,38,109, 163,168		It establishes principles of environmental protection and quality of life.
Law 1183/85	1898-2011-2012-2000	All those you authorized by the law	Civil Code
Law 294/93 and decree 14.281	The whole text of the Law	MADES Directorate-General for Environmental and Natural Resources Control	It establishes the obligation of environmental impact assessment and its regulation
Law 1561/2000	The whole text of the Law	MADES CONAM	Creates the National Environment System, the National Environment Council and the Secretary of the Environment
Law 422/73	The whole text of the Law	SFN	Creates the National Forest Service Creates the National Forestry Institute and sets standards for forest resource management
Law 3464/08	The whole text of the Law	INFONA	Creates the National Forestry Institute
Law 96/92	The whole text of the Law	MADES/DGPCB/DAP	Creates the Wildlife Protection and Conservation system.

Law 4241	1-4	INFONA/MADES	Restoration of water-bed forests within the national territory
Law 4014/10	3-4-5-7	Municipality - Paraguayan Network for fire monitoring and control prevention	Fire prevention
Law 123/91	The whole text of the Law	MAG	It adopts new phyto-sanitary standards.
Law 836/80	66-67-68-69-80-81-82-83-128-129-130	MSP and BS SENASA MADES	Health Code
Law 213/93		All those indicated by the Law	Labour Code
Law 716/96	The whole text of the Law		Ecological Crime
Law 1100/97	The whole text of the Law	MSP and BS	Sound pollution

11 METHODOLOGY OF ENVIRONMENTAL ASSESSMENT

A modified Leopold matrix was adopted, placing in the row the actions with impact potential in the planning, operation and exploitation phase, in the columns the environmental factors and the effects of the actions. Quantitative values were assigned to the effects caused by the actions on environmental factors on a scale of 1 to 3; it can be positive when actions are beneficial to environmental factors, and negative when adverse.

The algebraic sum of the values assigned to the effects caused by the actions, gives a quantitative result the degree of impact generated by the proposed project, being low (1), medium (2) and high (3).

Impact quantification is addressed in a matrix with a breakdown of the planning, construction and operational phase.

The matrix analysis can be concluded as follows:

- Of the three phases that the project comprises, the most impactful is the implementation phase, being the actions that cause the most negative impacts: the intervention of the soil for flora and fauna.
- Generally, the most impacted resources in these types of projects are soil, flora and fauna, and the most benefited is the economic partner, with job creation and consequently greater circulation of money creating in turn indirect benefit to other sectors especially commercial.
- It should be borne in mind that, although the algebraic sum of the matrix has given 53 positive, mitigation measures to be implemented such as soil erosion, nutrient loss, soil compaction and the appearance of pests and diseases, among others, should

be applied unrestrictedly, to greatly alleviate the pressure exerted on the most impacted resources

- The mitigation plan describes the recommended corrective measures to reduce the negative impacts this activity has on.

Table No. 11 Modified Leopold Matrix

		Reforestacion											
	FACTORES IMPACTADOS	ACCION IMPACTANTE / EFECTO	Preparacion de suelo		Combate de hormigas		Plantacion		Limpieza y mantenimientos		Aprovechamiento	
			M	1	M	1	M	1	M	1	M	1
MEDIO FISICO	Suelo y agua	Erosión	-3	2	-1	1	1	2			-1	2
		Calidad del agua	-3	2	-1	1	1	2	1	2	-1	2
		Sedimentación	-2	2			1	2			-1	2
	Aire	Calidad del aire	-3	2	-2	2	2	2	1	2	-2	2
		Ruido	-2	1			-1	1	-2	2	-2	2
MEDIO BIOLOGICO	Flora	Especies herbáceas	-3	1	-1	1	-2	1	-1	1	-1	1
		Especiés arbóreas	-2	1	-1	1	-2	1	2	2	-4	2
		Variabilidad genética	-1	1	-1	1	-1	1				
	Fauna	Hábitats	-3	2	-2	2	-2	2	-1	1	-2	2
		Vertebrados	-1	2	-1	2	-1	2				
		Invertebrados	-3	2	-1	2	-3	2	-1	1	-1	1
MEDIO SOCIO ECONOMICO	Infraestructura	Medios de comunicación	3	2	2	2	2	2	2	2	3	3
		Plusvalía de la propiedad	4	3	3	3	4	4	3	3	-3	2
	Población	Generación de empleos	3	3	3	3	3	3	3	3	3	3
		Calidad de vida	2	2	2	3	3	3	3	3	3	3
			-13		11		30		32		-7	

Impactos negativos	Impactos positivos	Suma algebraica
-20	73	53

12 DETERMINATION OF THE IMPACTS OF THE REFORESTATION PROJECT

12.1 POSITIVE ENVIRONMENTAL IMPACT

Plantations, reforestation of deteriorated lands and forests, and social tree planting projects, produce positive results, for the goods produced, and for the environmental services they provide.

12.1.1 Reducing the use of natural forests as a fuel source

Plantations offer the best alternative to the exploitation of natural forests, to meet the demand for wood and other fire products. Plantations for timber production generally use the fastest growing species, and access and exploitation are easier than in the case of natural forests, as they give more uniform and marketable products. In addition, community plantations for the production of firewood and fodder, near the villages, facilitate users' access to these goods, while helping to relieve pressure on local vegetation, which may be the cause of cutting and overgrazing. Grazing is generally established on marginal or agriculturally unsuitable land (e.g. existing forest land or deteriorated areas); and plantations create a beneficial and productive use of land, which does not compete with the most productive.

12.1.2 Increased environmental services

Reforestation provides a number of environmental benefits and services. Restoring or increasing tree cover increases soil fertility, and improves soil retention, structure, and food content (reducing leaching, providing green manure, and adding nitrogen, if the species used are of this type). If the lack of firewood forces manure to be used as fuel, rather than fertilizer for agricultural fields, the production of firewood will indirectly help to maintain soil fertility. Tree planting stabilizes soils, reducing hydraulic and wind erosion of hillsides, nearby agricultural fields, and non-consolidated soils, such as sand dunes.

By establishing tree cover in bare or deteriorated terrain, it helps to reduce the rapid flow of rainwater, thus regulating the flow of rivers, and improving water quality, and reducing the inflow of sediment into surface waters. Beneath trees, cooler temperatures and moderate wet and dry cycles are a favourable microclimate for microorganisms and fauna, and can help prevent soil lateralization. Plantations have a moderating effect on winds and help settle dust and other air particles. By incorporating trees into agricultural systems, crops can be improved, thanks to their positive effects on land and climate. Finally, plant coverage established through the development of large-scale plantations and tree planting is a means for carbon absorption, a short-term response to global warming caused by the accumulation of carbon dioxide in the atmosphere.

Tree planting, as part of a social forestry program, can take different forms, including community groves, plantations on the government grounds, or on authorized passageways, around agricultural land, next to rivers, and next to houses. This type of planting causes few negative environmental impacts. Trees give useful products, and environmental and aesthetic benefits. The common problems arising from these activities are social in nature.

Trees planted for protection, such as protective sashes, or wind guards, or to stabilize slopes, control erosion, facilitate watershed management, protect riverbanks, or fix sand dunes, are beneficial by nature, and provide environmental protection and services. If problems arise, they will most likely be social (land and resource tenure issues).

12.1.3 Environmental awareness

It promotes citizen action in defence of the environment, participating in forestry actions, sensitizing the population, encouraging social participation and promoting environmental education. Participatory reforestations are plantations organized by environmental volunteer associations, schools, town halls, etc. with the aim of improving, restoring and conserving degraded natural spaces.

12.2 NEGATIVE ENVIRONMENTAL IMPACT

Effect that produces a certain human action on the environment in its various aspects. The concept can be extended, with little use, to the effects of a catastrophic natural phenomenon. Technically, it is the alteration of the baseline, due to anthropic action or natural events. Human actions, motivated by the achievement of various purposes, cause side effects on the natural or social environment. While the effects pursued are often positive, at least for those who promote action, side effects can be positive and, more often, negative. Environmental Impact Assessment (EIA) is an analysis of the predictable consequences of action; and the Environmental Impact Statement (DIA) is the prior

communication, which environmental laws require under certain assumptions, of the environmental consequences predicted by the evaluation.

12.2.1 Temporary impacts

The negative impacts of site preparation include not only the loss of existing vegetation and the environmental, economic and social values it may have, but also environmental problems related to land clearing: increased erosion, disruption of the hydrological cycle, soil compaction, food loss, and the consequent decrease in soil fertility. Although harmful, many of these effects can be short-lived; the site begins to recover.

12.2.2 Inherent impacts on agriculture

Plantations are artificial forests: trees are managed, essentially, as long-cycle agricultural crops. As such, many of the negative agricultural impacts inherent in agriculture also occur in forest planting. The magnitude of the impact depends, in large part, on the conditions existing at the site before planting it, preparation techniques, sown species, treatments during rotation, duration of the site, and animals specialized in meat.

12.2.3 Impacts on watershed hydrological cycle

Reforestation and afforestation activities in the most arid regions, especially, can deplete soil moisture, lower the level of groundwater, and affect the basic flow to rivers.

12.2.4 Impacts on soil structure

Like any other agricultural crop, fast-growing, short-cycle tree plantations can deplete soil food and reduce site fertility by repeatedly removing biomass and disrupting soil. This is the case, also for long cycle rotations, but the effects are less noticeable. Soil compaction and damage that occurs during site clearing (removal of vegetation by physical or burned means), mechanical preparation and harvesting. Erosion may occur on plantations if coverage is incomplete or lacks low vegetation. The accumulation of leaf litter under plantations increases the risk of fire and reduces the infiltration of rainwater, and if one or two species predominate in leaf litter, the chemical and biochemical characteristics of the soil can be changed. Dead leaves from conifer plantations (pines) can acidify soil.

12.2.5 Conflict of interest with other water users for irrigation

Some species are allopathic and produce toxins that inhibit germination of the seeds of other species. Irrigation plantations can cause conflict with other water users and cause other environmental and social impacts that are common in irrigation projects.

12.2.6 Indirect impacts

Indirect impacts of large commercial plantations include the results of the construction of roads to transport timber and the industries that process it.

13 ENVIRONMENTAL MANAGEMENT PLAN (REFORESTATION)

Table No. 12 Project impacts

ACTION: REFORESTATION		**Responsible**	**Deadlines**
Negative impacts	**Effects**		
Temporary: Short-lived	• Loss of vegetation and environmental, economic and social values. • Increased erosion by soil preparation • Interruption to the hydrological cycle • Soil compaction • Soil fertility loss		
Proposed measure:	• ***Maintain area of representative forests (reserve)*** • ***Keep the forest protective of watercourses*** • ***Not expose the ground for long*** • ***Reforest with fast-growing species*** • ***Avoid soil compaction*** • ***Implement fertilization if necessary***	***Proponent***	***Continuous***
Inherent impact on agriculture	• Loss of nutrients from change of use • Compaction and degradation by the passage of machines. • Excessive ground disruption • Poor crop rotation • Continuous duration of crop • Appearance of pests.		
***Proposed measure*:**	• ***Fertilizer replenishment according to analysis*** • ***Maintain permanent plant coverage*** • ***Rational use of insecticides***	***Proponent***	***Periodically***

	• ***Perform stand rotation cycles*** • ***Have reforested area of no more than 100 ha by plots*** • ***Integrated pest control***		***Annual and continuous***
Impact on the watershed hydrological cycle	• Decreased surface water quality by sediment drag by irrational soil use (excessive soil work) • Decreased aquifer recharge by soil compaction by the passage of machinery (tractors)		
Proposed measure:	• ***Maintain permanent plant cover*** • ***Avoid as much as possible the burning of branches of pruning products*** • ***Perform subsoiling in highly compacted areas, to allow aeration and facilitate the root development of plantings*** • ***Avoiding use of insecticide***	***Proponent***	***Continuous*** ***Annual and Periodically***
Impact on soil structure	• Soil fertility loss • Very long rotation cycle • Removal of vegetation by physical means or burnt • Erosion from incomplete soil cover • Accumulation of leaf litter prone to fires • Soil acidification by excessive dead leaf (conifer)		
Proposed measures	• ***Soil fertilization on a regular basis*** • ***Avoid very long rotation cycle*** • ***Avoid removal of vegetation by physical or burned means*** • ***Prevent soil cover from being incomplete or missing undergrowth***	***Proponent***	***Periodically***

	• ***Avoid excessive accumulations of leaf litter for risk of fire propagation and reduced infiltration of rainwater.*** • ***Avoid soil acidification*** • ***Have a mobile water tank with pump and high-pressure hose***		
Indirect impacts Road construction impacts to transport timber	• Soil erosion • Dust emission • Machine traffic noise • Chemical soil contamination		
Proposed Measures	• ***Build roads with proper drainage system*** • ***Avoid cutting off the natural flow of water*** • ***Having speed reducers*** • ***Decrease vehicle traffic in the area*** • ***Avoid the use of agrochemicals and spillage of it in the area***		
Impact by introduction of exotic species	• Decline in native species • Appearance of pests and diseases • Unsuitable site for exotic species to be planted		
Proposed measures	• ***Conserving area of native species of the place*** • ***Avoid the introduction of pest and diseases*** • ***Introduce exotic species in the right place (rain and temperature)***	***Proponent***	***Temporarily***
Positive impact			

Reducing the use of natural forests as a fuel source	• **Greater use alternative than natives** • **Growth faster than native** • **More uniform production** • **Greater ease of operation** • **Relieves pressure on local vegetation** • **Originate a beneficial and productive use of land, which does not compete with the most productive uses**		
Increased environmental services	• **Increases tree coverage** • **Increased soil fertility** • **Improves moisture retention** • **Improves food structure and content** • **Provides fertilizer and nitrogen** • **Has a moderating effect on the winds** • **Constitutes a means for carbon absorption** • **Short-term response to global warming caused by the accumulation of carbon dioxide in the atmosphere.**		
Environmental awareness	• **Boosts citizen action in defence of the environment** • **Incentivizes social participation and promotes environmental education**		

14 MONITORING CHRONOGRAM

For the monitoring of the work, some recommendations are presented, and additional adjustments on the possible impacts that may cause the activities carried out that have not been mentioned in the approved impact study, it is being met with very good judgment by the company from the beginning of this activity and to measures that advance the execution of the project.

14.1 SOME ACTIONS TO BE CONSIDERED ARE:

- Permanent attention in the investment and development phase of the project.
- Verification of compliance with the measures envisaged to avoid negative environmental impacts.
- Detection of unforeseen impacts
- Attention to changes in measurements. Implementation of the programme involves ongoing attention in the investment and development phase of the project, verifying compliance with the measures envisaged to minimize negative environmental impacts and the detection of unanticipated impacts.

Annexes

ANNEX 2 EIA Property Rancho Bonito

CHANGE OF OWNERSHIP OF DENOMINATION AND ADJUSTMENT OF THE PGA

AGRO-LIVESTOCK ACTIVITY AND REFORESTION

OWNER: FORESTAL APEPU SA

Place Rancho Bonito

San Estanislao District - Dpt. San Pedro

Finca No. 2845 - Padrón No. 3647

Year 2020

Responsible: Ing. For. Dalmatia Barboza - CTCA I 574

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1 BACKGROUND

Forestal Apepu SA is a firm dedicated to forestry production activity and has acquired the property of 499.999 ha., to carry out reforestation for wood production purposes.

The firm also owns the piece of land adjacent to this property, which carries out a reforestation program with Eucalyptus for timber production.

The farm belonged to the Agricultural Cooperative Friesland Ltda., where intensive agricultural activity was previously produced, the property has Environmental Impact Study approved by Declaration DGCCARN 040/2014, audit report approved by Resolution DGCCARN AA No. 437/2016, and currently in force the audit report approved by Resolution DGCCARN AA No. 4208/2019.

This Report is presented in order to change ownership and denomination, adjusting the project to the activities to be conducted.

2 GENERAL AND SPECIFIC OBJECTIVES

- Adjust (Expand) the Environmental Management Plan to reforestation activity
- Determine which natural resources will be affected by the activity to be expanded in the project, compensate or mitigate the negative environmental impacts
- Identify the relevant environmental impacts, positive and negative, that would eventually cause the activity to be incorporated into the project and formulate the appropriate mitigation measures
- Perform a new survey of the property area by adjusting the surface that confers the title

2.1 Specific objectives

- Establishment of fast-growing forest plantations on an area of 414.09 hectares of pure plantations, 28.59 hectares of mixed plantations in lower areas and 9.2 hectares of confinement for natural regeneration and/or mixed plantations.
- Implement high productivity system in wood volume in order to meet the future demand of local industries and obtain greater economic benefits with diversification of wood production and livestock production.
- Producing wood for energy use
- Environmental services: We note with high interest the market being developed for environmental services offered by forests (e.g. carbon capture). Where possible, forestry production should meet current compliance requirements and voluntary carbon market standards, as well as possible future standards for other payments for changing environmental services.
- Help combat climate change with increased carbon capture

- By integrating forestry into operations, maximize land performance, rather than expanding them to increase income.
- To form a model of activity that exerts a multiplier effect on the benefit of the local and regional environment.
- Generate labour for the local population.

3 DESCRIPTION OF THE PROJECT AREA

3.1 Location.

It is accessed in several ways but the most used accesses are by San Estanislao departing to route No. 3, one kilometre where it is diverted by neighbourhood road and seven kilometres and you reach the property on the south side; it also has access by crossing Bertoni or street six thousand by route No. 3, facing south about six kilometres, is diverted by the street called 10,000 Defensores, entering about nine kilometres you reach the southern head of the property. It is about 160 km from Asunción.

Currently in the establishment, activities corresponding to the agricultural sector have been developed, assuming that at some point it was for livestock use, according to some indicators on site and by demonstrations of locals.

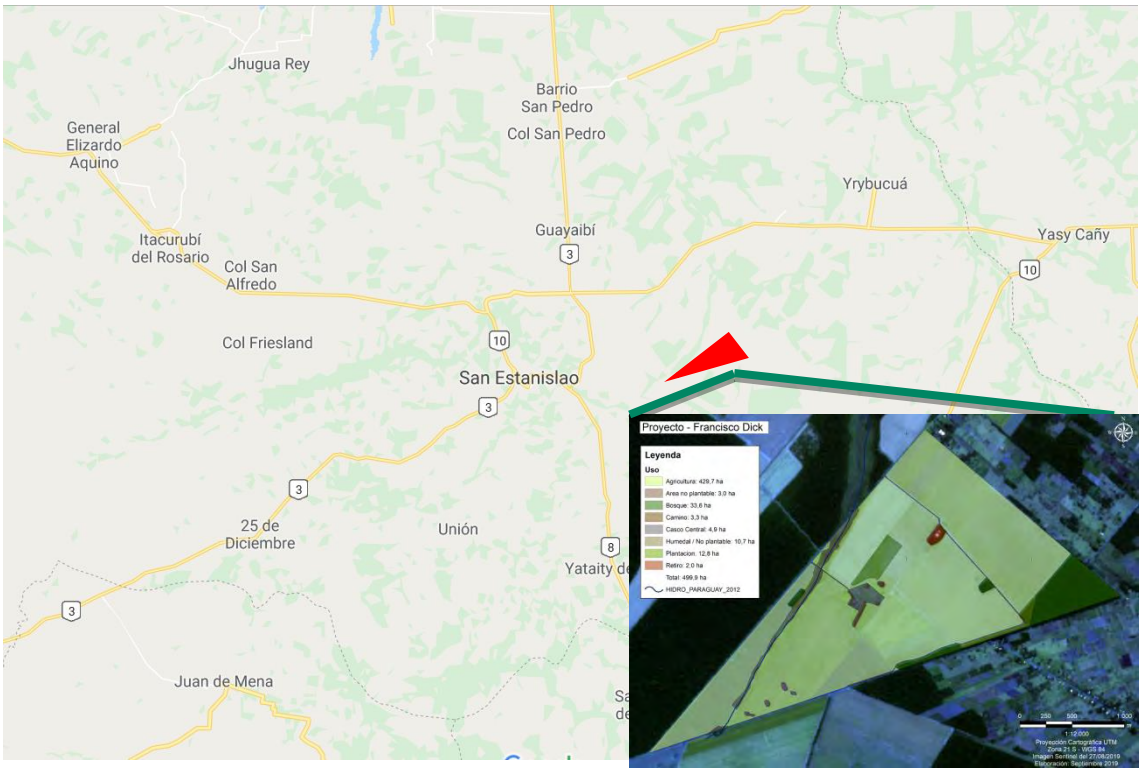

Figure 1. Location of the property. Google maps and satellite image.

3.2 AREA OF DIRECT INFLUENCE

For a complete study of the impact that this adjustment could cause in the project settlement area, two areas or regions defined as Direct Influence Area (AID), and Indirect Influence Area (AII), have been considered in the study area.

It has been defined as an area of study, one where the direct and indirect influences of the project have significance.

The Direct Influence Area (AID) includes the area of land affected by the project facilities, and defined by the limits of the property, which receives the impacts generated by the activities to be developed on the site directly.

The Indirect Influence Area (AII) is considered the area around the property within a radius of 1,000 meters with centre in the area of intervention of the farm, which can be subject to impacts, product of the actions of the project.

Figure 2 Project Influence Area

3.3 Climate

Climate data from the reading station in Santa Rosa del Aguaray that serves as a reference for this study, which records rainfall data from 1977 to date and is installed within the Estancia, the averaged data can be seen in the following table.

Table 1: Climate parameters

Climate data	Annual daily average	Monthly average (mm)	
		December	June
Temperature (°C)	s/d	s/d	s/d
Precipitation (mm)	1.685	175	102

Source: own elaboration based on data from Estancia Rancho 068 S.A. (1977 to 2013)

The Eastern Region of Paraguay has a climate with two seasons. In the winter (May to August) the average temperature is between 16 and 18 °C, but temperatures below 0°C may also occur, occurring frosts for short periods of days. At this time the deciduous tree species throw their foliage. The high temperature begins to feel from September onwards and usually continues until the end of March, reaching temperatures of up to 42°C. The average temperatures are between 22 and 26°C. The transition between the seasons is very short. The average annual precipitation reaches 1,500 mm, with rains well distributed during the year, although it does have drier periods between July to September and wet between the months of October to May.

3.4 Vegetation

The original vegetation of the local area is typical of the formations called “heterogeneous forests” of species such as: In the highest topography positions, with latifoliate trees of high-height of species such as lapacho, ybyrá pytá, ybyraró, cedar, guayaibí, curupay, ybyrá-yú, laurel, timbó, among others, with dense undergrowth and also varied species. However, in areas with topography of intermediate height you can see vegetation with low-rated, stocky species such as Mirtaceae, guabirá-mí, giant chirca, yataí, yahapé among others.

3.5 Soil

3.5.1 CLASSIFICATION OF SOILS, ACCORDING TO TAXONOMY AND USE CAPACITY

The sub-groups of soils and sub-classes of use capacity, identified in the area are as follows:

5.1. Soils represented by profiles 1 level 274 meters above sea level and 5 level 254 meters above sea level.

These profiles represent soils derived mainly from the Independence formation, manifested under the Missions formation, and that according to the morphological, physical, chemical and biological characteristics are slightly clay soils from 20 cm of the surface, also the colour is darker red from the surface (2.5 YR 4/6, wet, to more, Munsell table).

The B21 horizon develops from 30 cm deep so they are classified as **Rhodic Paleudult Francosa medium to fine.**

These soils by use capacity are **classified as sub-class II.fet,** and have slight limitations due to low fertility, slight water erosion and long slope. Represented by trial pits 1 and 5. The pH in the two soils is slightly acidic, and neutral in depth, therefore less dolomite lime should be applied. The organic matter of the upper horizon is adequate, as well as the clay content.

5.2. Soils represented by profiles 2 level 288 meters above sea level and 3 level 276 meters above sea level.

These profiles represent soils derived from the Missions formation influenced by the Independence (permian) formation and which according to morphological, physical, chemical and biological characteristics are sandy soils on the surface up to 60 cm deep, highly meteorized. The clay franc B-horizon is greater than 60 cm thick and is not classified as Hapludult. The low interchange capacity and base contents are maintained; however, their colour is reddish brown to dark red from horizon B1, therefore, they are classified **as Arenic Rhodic Paleudult, thick franc.**

These soils by their use capacity, are **classified as sub-class III.fet,** because they have strong limitations due to low fertility and strong water erosion, by the sandy texture in the upper horizons and the long slope they possess.

PH is adequate, neutral, less dolomite lime should be applied, however, it is recommended to apply to improve adsorption of nutrient elements by plants. Phosphorus, Calcium, Magnesium, Potassium, sum of bases and cation exchange capacity is slightly low. The percentage of organic matter is low.

5.3. Soils represented by profile 4 level 296 meters above sea level. View soil map

This profile represents soils derived mainly from the sandstone of Misiones, Triassic, are deep, sandy especially in the first 100 cm to more, highly meteorized by soil forming factors. They are dark red, from 5 YR4/3 to 10 R 3/4 (the Munsell Table), sandy texture on the surface to sandy clay in depth, structure weak subangular blocks break to granular. They present all horizons A, B, C, being the pH acidic and the content of organic matter and nutrients low. The diagnostic control or litter section is more than 80 cm deep due to the texture (sandy franc) on the upper litter of the floor. The most stable aggregate manifests itself at more than 100 centimetres deep, the weak structure must therefore be taken care of for handling and use. The horizon thickness of the textural B is greater than 60 centimetres, so they are not included in the Hapludult group. For their low exchange capacity and base content, (with pH 7 ammonium acetate), they are included **in thick Franc Kandiudult Arenic.**

Some of these soils occupy a small area and can be classified as a subgroup of Psamment Arenic Kandiudult.

These soils by their use capacity **are classified as sub-class IV.fet,** due to their high limitation for use by their fertility (f), strong risk of water erosion by topography and sandy surface horizons (et). Represented by trial pit 4.

3.5.2 RECOMMENDATIONS FOR SOIL USE AND MANAGEMENT PRACTICES.

Taxonomic sub-groups and Subclasses of use capacity define the agricultural and forestry use and possible management that they must receive according to the limitations presented by each soil.

6.1. Soils classified as Rhodic Paleudult Francosa fine and Sub-class II.fet of use. Trial pits 1 and 5 on the map.

The soils of the taxonomic unit, Rhodic Paleudult, Subclass II.set of use capacity have to a lesser degree limitations compared to the soils above. For soils of this sub-group and subclass, as the density of surface horizons is high, acidic pH, nutrient content and organic matter, the following management practices are recommended:

a. Densification of surface horizons. The soils of the taxonomic unit Rhodic Paleudult, subclass II.fet have a lower degree of limitations, especially the surface texture that is sandy franc and clay franc on horizon B than at 25 cm already appears (the head of horizon B which is clay franc).

   It is suggested to correct the limitation of the ploughing or densification floor with subsoiling or vertical tillage as indicated above.

b. Nutrient deficiency limitation. The results of analysis of samples of the soils of this taxonomic unit indicate that limitation by nutrient deficiency in the soil is medium to low, therefore nutrients need to be applied. It is suggested to apply first 200 kg/ha of 10 – 30 – 10. Repeat that dosage per year by plants and then the maturation dose 10 – 10 – 30 at the rate of 200 kg/ha.

In all soils water erosion control should be carried out, with crops in contours and direct planting, and incorporation of green fertilizers, between lines, especially in reforestation.

6.2. Soils classified as Arenic Rhodic Paleudult thick franc and Sub-class III.fet of use capacity. Trial pits 2 and 3

The soils of the taxonomic unit, Arenic Rhodic Kandiudult, Sub-class III.set of use capacity present limitations such as the density of surface horizons, acidic pH, low nutrient content and organic matter for forest plants and cultivated pastures. Here are some corrections to the limitations to be made:

a. Densification or plough floor of the upper horizons, up to 30 to 50 cm., should be broken with subsoiling or deep vertical tillage. It is a densified litter (apparent density greater than 1.30 gr/dm3), to facilitate the growth of the roots of plants installed in the soil

b. The reaction or pH of the soil is neutral however it is recommended to apply dolomite agricultural lime (contains calcium and magnesium) to improve the absorption of nutrients (macro and micronutrients). Apply 300 to 500 kg/ha of dolomite lime, granules.
c. Deficiencies of macronutrients and micronutrients, it is recommended the application of essential nutrients for Eucalyptus, Nitrogen, Phosphorus, Potassium, Calcium and Magnesium and some micronutrients such as boron, zinc and copper, necessary for the levelling and maintenance of basic nutrients.

It is recommended for the growth stage, a higher proportion of phosphorus as macronutrients, followed by application of Nitrogen such as Urea or Nitrate. It is suggested at the rate of 200 kg/ha level 10- 30-10, for correct rooting of plants.

In the stage of maturity and hardening of plants, strengthen the aggregate of fertilizers complete with potassium increase, approximately 200 kg/h., of the level 10-10-30 as far as possible. All fertilizers are important that they have micronutrients in their composition such as boron, zinc and copper in the form of sulfate, borate and inglate.

In addition to chemical management it is recommended to apply organic matter per Eucalyptus plant at a rate of 50 kg/plant.

6.3. Soils classified as Thick Franc Arenic Kandiudult, sub-class IV.fet of use capacity. Trial pit 4 on the map.

It is suggested to correct the limitations (IV.fet) that occur in these soils and are:

a. Plough floor or densification of the upper horizons, up to 30 to 50 cm., must be broken with subsoiling or deep vertical tillage. It is a densified litter (apparent density greater than 1.50 gr/dm3), to facilitate the growth of the roots of plants installed in the soil.
b. The reaction or pH of the soil is acidic to slightly acidic. It should be neutralized with dolomite agricultural lime (contains calcium and magnesium), possible to bring the pH to 6.6. Apply 800 kg/ha of dolomite lime, granulated (with magnesium). Granulated dolomite limestone is currently available and can be applied to the ground with motorized traction applicator (with several advantages).
c. Low nutrient content, mainly macro and micronutrients, according to analysis results. It is due to the continuous use of the soil, by washing, effects of seasonal rains and sandy free texture on surface horizons. The limitation can be corrected with fractional and adequate fertilizer aggregates, which contain deficit nutrients (macro and micronutrients), as indicated in analysis results. It is recommended to add 300 kg/ha of grade 10 -30 -10 fertilizers, initially as a base, to complete with urea at a rate of 100 kg/ha once the plants are 40 to 50 cm tall. At 1 or 1.5 years add fertilizers containing potassium as potassium chloride (60 kg/100 kg) at a rate of 100 to 150 kg/ha, in half a moon to plants. Micronutrients should be added according to soil sample analysis, especially these soils have deficits in copper, boron and zinc that you must add in the form of chloride or inglate according to percentage.

In addition to chemical management it is recommended to apply organic matter per Eucalyptus plant at a rate of 50 kg/plant.

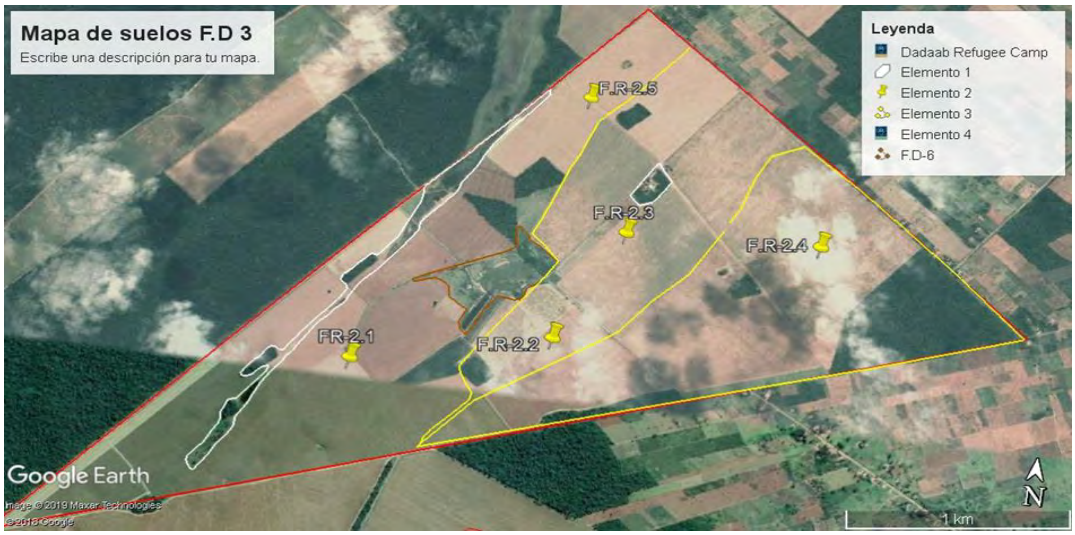

Figure 3 map and floor image of the project area

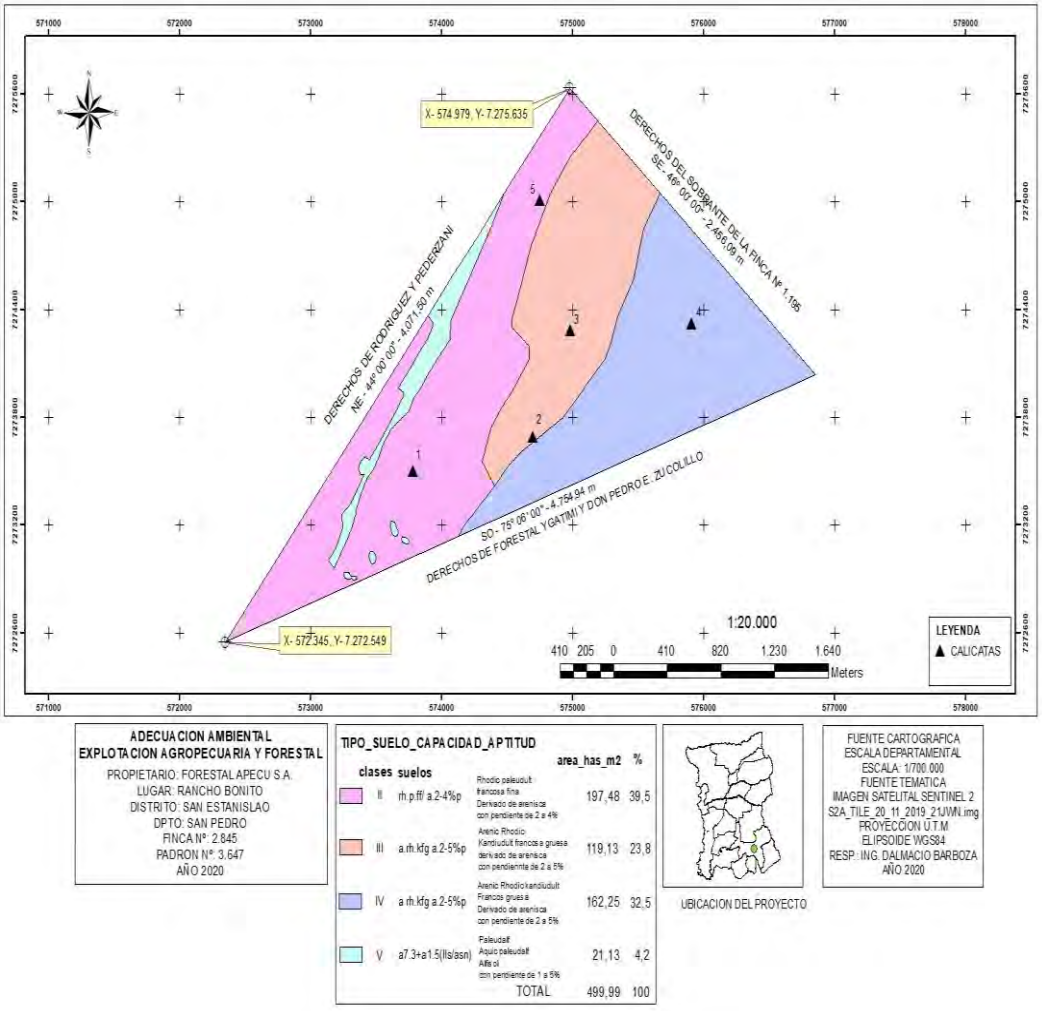

Figure 4 Soil aptitude map and taxonomy

4 Current usage.

The property has 499.999 ha, the current uses of which are detailed in Table 2. Intensive agriculture and livestock areas are the observed commercial uses.

Table 2: Current land use

Description	Ha	%
Agricultural use	457.37	91.47
Forest area	32.79	6.65
Reforestation	4.14	0.83
Retreat	1.95	0.39
Administration	1.18	0.24
Low area	1.56	0.31
Internal road	1.00	0.20
Total	**499.99**	**100.0**

5 Alternative/Future Use.

The alternative use of the project for the property, as seen in Table 2, is the conversion of agricultural areas to reforestation areas. This respecting the reserve forests and completing the area at 25%. Also, an area to be confined (regenerate) is foreseen to restore area, enabled with natural regeneration and / or mixed plantations (eucalyptus and native species).

Table 3: Alternative land use

Description	Ha	%
Area to be reforested	414.50	82.90
Native forest (legal reserve)	32.79	5.72
Mixed plantation area (reserve)	28.59	5.72
Area for natural regeneration	9.23	1.85
Firebreaks	6.07	1.21
Reforested area	4.12	0.82
Retreat	1.95	0.39
Administration (central centre)	1.18	0.24
Natural low area (non-plantable)	1.56	0.31
Total	**499.99**	**100.0**

OBS: A new digitization was made adjusting some uses according to the objective of the project: It proposed area for natural regeneration 9.23 ha, and the rest of the liability is completed with mixed plantations (see alternative map), this area will be confined in principle for natural recovery, which will technically be very difficult, being already area of agricultural use. The mixed plantations comprise 28.59 ha, eucalyptus initially planted and then plant the natives between plants with the aim of harvesting the euca-

lypts and leaving the natives as reserve, which will complete more than 25%. In this report the firm proposes if it is not possible to recover (regenerate) perform mixed plantations (native and eucalyptus trees) to harvest eucalyptus trees and let the native ones grow and thus recover the proposed area.

6 DETERMINATION OF THE NECESSARY LEGAL RESERVE, 25% OF THE FOREST AREA OF 1986

For the determination of the Necessary Legal Reserve, the calculation of 25% of the forest area of 1986 (Original Wooded Area – ABO) was made and compared with the current forest area, the results are detailed in the following table:

Table 4: Summary of the Legal Reserve

Adequacy Surface (ha)	ABO (ha) Year 1986	Necessary Legal Reserve (ha): 25% ABO	Current forest (ha)	Reforested + Mixed Ref. + Natural regeneration (ha)	Proposed Reserve (ha)
499.99	274.88	68.72	32.79	4.12+28.59+9.23	74.73 = (27.18%)

7 REFORESTATION PROJECT

7.1 PROJECT DESCRIPTION

7.1.1 Total area of the farm

Forestal Apepu S.A. has 499.99 ha, the detail is presented above in the Current and Alternative Use.

7.1.2 Total area of the area to be reforested

Reforestation is planned on this farm in two stages (years 2020, 2021) distributed in this way:

Table No. 5 Stages of Reforestation/includes Mixed Plantation

Years	PURE PLANTATION	MIXED PLANTATION	AREA (HA)
2020	212.60	6.22	218.8
2021	201.89	22.36	224.2
TOTAL, HA	**414.5**	**28.5**	**443.0**

Areas to be reforested in the first two years. Source: Unique

All planted areas will seek forest certification by the Forest Stewardship Council (FSC) seal to ensure sustainable forest management practices and has ecological restoration and social promotion plans.

7.1.3 Selection of species and lists of materials to use

The following criteria for the choice of plantings were respected:

- Clones/species should have a good reception in Paraguay or similar places;
- Species/clones should be taken into account that come from known sources.

Clone G0 of GENEFOR S.A.

Hybrid E. grandis x E. urophylla, presents a good growth with a favourable initial start and responds well to the release of space through thinnings. No manifested diseases so far.

Taking into account the frost tolerance range of E. grandis, E. urophylla and its hybrids, the results have shown that this material has an average tolerance. The shape of the pole is evaluated using a scale of 1 to 6, where 1 is winding and 6 is straight.

Average slash (5 years): 9.5%

Average DB 5 years (g/cm3): 0.386

Age: 5 years

Shape: 3

DBH (cm): 25.5

Height (m): 27.8

Clone G1 DE GENEFOR S.A.

Hybrid E. grandis x E. urophylla, growth is medium, but is partly compensated with the high density of wood that will possibly be suitable for use as floors and structural wood.

Taking into account the frost tolerance range of E. grandis, E. urophylla and its hybrids, the results have shown us in this material that has a low tolerance.

The shape of the pole is evaluated using a scale of 1 to 6, where 1 is winding and 6 is straight.

Average crack (5 years): 13.6%

Average DB 5 years (g/cm3): 0.44

Age: 5 years

Shape: 5

DBH (cm): 25.3

Height (m): 30.3

Source: GENEFOR S.A. website.

The species listed in Table No.

Table 6: Species for reforestation

Species	Approximate share (in %)
E. grandis x E. urophylla and its clones (G 0)	25%
E. grandis x E. urophylla (G 1)	34%
E. grandis x E. urophylla (G 2)	28%
E. grandis x E. camaldulensis (G 7)	7%
E. grandis x E. urophylla (G 12)	6%

Species selected for reforestation are already used with good preliminary results in other rooms and properties managed by Unique.

7.1.4 Planting density and spacing

The planned density is 1,000 plants per ha and with a distribution of 5 m between rows and 2 m between plants.

7.1.5 Estimating expected yields on the plantation

The average annual increase is expected to be according to Table 3, according to experiences in other similar projects. Soils are very strong indicators for MAI estimates on a plantation to be established.

Table 7: Performance in m3/ha/a

Species	Average performance (MAI in m3/ha/a)	
	Good places	Regular sites
G0, G1, G2, G7 and G12	40 m3/ha/a	38 m3/ha/a

7.1.6 Field preparation

Before the plantations, the sites will be mechanically cleaned. The activities that correspond for good preparation will be:

- Heavy harrow
- Subsoiling
- Lime application
- Light harrow

7.1.7 Plantation

The first activity to start planting is the marking of the land to be reforested; the holes are then done with forest shovels and, finally, the planting. During the planting operation, all necessary care will be taken to promote the good growth and survival of the planted plants. The planting site should be as well prepared as possible to facilitate the rooting of the plant. It will never be planted at the bottom of the subsoiling groove. A platform must be made, completely covering the groove to the original ground level with the soil removed. It will be avoided leaving large or sharp stones in the hole or in contact with the plant, as they can impede the normal development of the roots or damage the plant. After planting, soil compaction should be avoided to protect the roots.

Based on experience so far, it has been determined that the planting season is from March to October, as planting in very hot or dry seasons results in high mortality. However, planting tests are being conducted in dry seasons using gel and irrigation with promising results.

Blanking takes place in the first three months after planting if tree mortality is above 15 to 20%.

The survival rate is defined as the relationship between living trees and trees planted after one year of planting. In the survival rate, there is no difference between original planting or blanking. To avoid negative effects on plantation yield, survival rates of 85 to 90% are required.

7.1.8 Cleaning, pruning and thinning

For the maintenance of the plantations, until the third year the regular weed control is provided for, on a case-by-case basis, mechanically with hoe and/or machete, and in most cases by applying systemic herbicide in rows. In addition, ant control and general maintenance activities (cleaning, fire control) are carried out.

The thinning refers to the cut to be made on the plantation when there is competition between the trees; this is how best-developed trees are selected, eliminating poorly developed ones. The thinning is done in order to leave more space between the trees and thus provide better conditions for their development.

The following thinning regime shall apply:

- First thinning after 3 years; reduction to 550 trees/ha
- Second thinning after 7 years; reduction to 350 trees/ha
- Third thinning (optional) after 9 years; reduction to 220 trees/ha

Pruning is the cut that is made to the branches of the trees; consists of completely removing the branches from their level of externalization outside the bark. The cutting is intended to develop a long and unique, straight and woody pole, as well as to avoid the appearance of knots that decrease the value of the rolls.

7.1.9 Fire prevention and control

Fire is a tool used by the rural population in Paraguay to reduce forest fuels, fertilize soils and regenerate vegetation, and as such is a phenomenon especially widespread in the context of grazing.

Weather conditions also favour the occurrence of fires because moderate seasons generate a climate (summer precipitation region) where vegetation produces high loads of biomass during a hot and rainy summer (October to May). During the dry winter months (July to September), these fuels may be available to spread fire ferociously if conditions are adequate.

In a fire-based environment, fire cannot be completely excluded from a landscape point of view. However, the effects of fire can be mitigated, and the spread of fires can be controlled in order to achieve the highest possible protection in high-value areas. Preventive measures are primarily intended to limit the occurrence of fires to certain areas where losses and damage are acceptable. Effective methods for controlling the spread of fires are reducing fuel load and creating firebreaks. Unique Wood has a multi-year track record in fire prevention and management with strategic partners and regular training with a team of Paraguay's Forest Fire Corps for all projects managed for investors.

7.1.10 Prevention and control of pests and diseases.

Phytosanitary protection is a set of management strategies, standards, techniques, procedures and activities that aim to protect, prevent and/or reduce to sustainable levels in ecological, economic and social levels losses caused by pests and diseases in the forest. It can be said that every crop is susceptible to pests or diseases, especially monoculture, some more than others and certainly depending on the region, be native or exotic species. However, as in other species there are ways to reduce such risks. Unique focuses on the following aspects to reduce the risk of phytosanitary problems:

- Genetic selection of resistant varieties;
- Forestry measures such as pruning and thinning that ensure healthy and strong trees;
- Avoid continuity of canopy and monoculture on very large surfaces; and
- Planting two or more species to avoid the monoculture.

In addition, staff will be trained to recognize potential pests that could cause damage to plantations, and frequent observations will be made on plantations. Table presents Table quarantine pests registered by SENAVE affecting Eucalyptus species in Paraguay.

Table 8: List of quarantine pests affecting Eucalyptus species in Paraguay

Type of pest	Species	Relevant species affecting Paraguay
Insect: Coleoptera	*Gonipterus gibberus*	*E. camaldulensis*
	Gonipterus scutellatus	*E. camaldulensis*
Insect: Hemiptera	*Ctenarytaina eucalypti*	

	Ctenarytaina spatulata	*E. camaldulensis and E. grandis*
Insect: Lepidoptera	*Euselasia apisaon*	
	Thyrintein arnobia	*E. grandis*
Fungi	*Ceratocystis fimbriata*	
	Corticium salmonicolor	
	Coniella fragariae	
	Cryphonectria parasitica	
	Cryphonectria cubensis	
	Cryphonectria eucalypti	
	Mycosphaerella suberosa	
	Sporothrix eucalypti	

Source: SENAVE, 2013

In addition to the pests listed Table in Paraguay. These include the phytophageal insect *Thaumastocoris peregrinus,* known by the name Chinche del Eucalyptus, and *Leptocybe invasa,* a tiny black wasp native to Australia, considered the most widely spread eucalyptus plague in the world. In Giant Paradise, mycoplasma attack that reduces tree growth is common.

7.1.11 Rotation

It is calculated with a rotation of 12 to 13 years.

7.1.12 Harvesting program

Low-impact motor-manual harvesting will be applied according to FSC standards.

Table No. 9 Annual Activity Calendar.

Activity	E	F	M	To	M	J	J	To	S	Or	N	D
Land planning												
Lime application												
Framing and marking												
Plantation and first blanking												
Ant control at blanking												
Irrigation and care of plantings												
Internal transport of plants												
Fertilizer application												
Application of herbicides												

7.2 Project Management

UNIQUE assumes the technical management of forestry production, providing its services in the areas of forest planning, coordination and supervision of operational work and timber marketing.

The internal management plan will be updated periodically, and all information is measured and verified through a monitoring system implemented for all plantations under UNIQUE management.

7.3 Economic evaluation of the project

[Note: This section has been removed for disclosure due to confidentiality reasons and given its limited added value for an environmental and social impact assessment.]

7.4 Investment required

[Note: This section has been removed for disclosure due to confidentiality reasons and given its limited added value for an environmental and social impact assessment.]

8 Conclusions and Recommendations

We are convinced of the technical and economic feasibility of the project. In addition to economic benefits the project will have positive impacts on the environment (carbon capture, environmental restoration by planting native species) and on the socio-economy of the region (qualified employment generation)

9 LEGISLATIVE AND REGULATORY CONSIDERATIONS

9.1 Institutional

Institutions involved

Private Institutions

Executing company: responsible for reforestation

Consulting company: responsible for the completion of the Adjustment

Public Institutions

Ministry of Environment and Sustainable Development. Created by Law No. 6123/2018 that elevates the Secretary of the Environment to Ministry, and will be governed by Law No. 1561/00, whose object is the coordination, implementation and control of the national environmental policy and is constituted as the implementing authority of all the legal provisions governing environmental matters.

National Forestry Institute (INFONA). Created by 3464/08, autonomous and decentralized institution. Its jurisdiction covers the entire National territory and among its

specific functions are to formulate forest policy in accordance with the country's rural and economic development policy, it is also executing body of 422/73 and 536/95.

National Animal Health Service (SENACSA). Institution established to monitor compliance with health checks on herds of animals intended for human consumption, whether milk or meat.

Ministry of Public Health and Social Welfare (MSPB and BS). Created by Decree Law No. 2000, among its main functions is to organize and administer the health service of the republic; it is the institution responsible for enforcing the provisions of the health code and its regulations.

Ministry of Justice and Labour (MJT). Institution of the State responsible for ensuring compliance with the General Technical Regulations on Safety, Medicine and Hygiene at Work, established by Decree Law No. 14.390/92 and 21393, Labour Code.

Governorate of the Department of San Pedro. That through the country's decentralization policy, the Governorates have been created to intervene in the various environmental projects in the departments.

Municipality of San Estanislao. The Municipality is the local governing body with political, administrative and regulatory autonomy. It has autonomy in terms of urban planning, environment, education, culture, sport, tourism, health and social care.

9.2 Legal framework

Table 11:Summary of Laws with environmental references

Legal Instrument	Relevant Articles	Responsible Institution	Guest reviews
National Constitution	6,7,8,38,109, 163,168		It establishes principles of environmental protection and quality of life.
Law 1183/85	1898-2011-2012-2000	All those authorized by law	Civil Code
Le and 294/93 and Decree 14.281	The entire text of the Law	MADES Directorate-General for Environmental and Natural Resources Control	It establishes the obligation of environmental impact assessment and its regulation
Law 1561/2000	The entire text of the Law	MADES CONAM	Creating the National Environment System, the National Environment Council and the Secretary of the Environment
Law 422/73	The entire text of the Law	INFONA	Creating the National Forest Service Creating the National Forestry Institute and setting forest resource management standards
Law 536	The entire text of the Law	INFONA	Promoting reforestation

Law 3464/08	The entire text of the Law	INFONA	That creates the National Forestry Institute
Law 96/92	The entire text of the Law	MADES/DGPCB/DAP	Creates the Wildlife Protection and Conservation System.
Law 4241	1-4	INFONA/MADES	Restoration of waterway-protective forests within the national territory
Law 4014/10	3-4-5-7	Paraguayan municipality-network for fire monitoring and control prevention	Fire prevention
Law 123/91	The entire text of the Law	MAG	It adopts new phytosanitary standards.
Law 836/80	66-67-68-69-80-81-82-83-128-129-130	MSP and BS SENASA MADES	Health Code
Law 213/93		All those indicated by law	Labour Code
Law 716/96	The entire text of the Law		Ecological Crime
Law 1100/97	The entire text of the Law	MSP and BS	Sound pollution

10 ENVIRONMENTAL ASSESSMENT METHODOLOGY

A modified matrix of Leopold was adopted, locating in rows the impacting actions in the planning, operation and use phase, in the columns the environmental factors and effects of the impactful actions. Quantitative values were assigned to the effects caused by impactful actions on environmental factors on a scale of 1 to 3; can be positive when actions are beneficial to environmental factors, and negative when adverse to them.

The algebraic sum of the values assigned to the effects caused by the actions, results in a quantitative degree of impact generated by the proposed project, which may be low (1), medium (2) and high (3).

Impact quantification is addressed in a matrix where the planning, construction and operational phase is discriminated against.

The matrix analysis can be concluded as follows:

- Of the three phases included in the project, the most impactful is the implementation phase, the actions that cause the most negative impacts: soil intervention for flora and fauna.
- Generally, the resources most impacted on these types of projects are soil, flora and fauna, and the most benefited is the economic partner, with the creation of jobs and consequently greater circulation of money creating in turn indirect benefit to other sectors especially commercial.
- It should be noted that, although the algebraic sum of the matrix has given 53 positive, mitigation measures to be implemented such as soil erosion, nutrient loss, soil compaction and the appearance of pests and diseases, among others, should be ap-

plied unrestrictedly, to greatly alleviate the pressure exerted on the most impacted resources

- The mitigation plan describes the recommended corrective measures to reduce the negative impacts of this activity.

Table No. 12 Modified Leopold Matrix

		Reforestacion									
	FACTORES IMPACTADOS	ACCION IMPACTANTE / EFECTO	Preparacion de suelo		Combate de hormigas		Plantacion		Limpieza y mantenimientos		Aprovechamiento	
			M	I	M	I	M	I	M	I	M	I
MEDIO FISICO	Suelo y agua	Erosión	-3	2	-1	1	1	2			-1	2
		Calidad del agua	-3	2	-1	1	1	2	1	2	-1	2
		Sedimentación	-2	2			1	2			-1	2
	Aire	Calidad del aire	-3	2	-2	2	2	2	1	2	-2	2
		Ruido	-2	1			-1	1	-2	2	-2	2
MEDIO BIOLOGICO	Flora	Especies herbáceas	-3	1	-1	1	-2	1	-1	1	-1	1
		Especiés arbóreas	-2	1	-1	1	-2	1	2	2	-4	2
		Variabilidad genética	-1	1	-1	1	-1	1				
	Fauna	Hábitats	-3	2	-2	2	-2	2	-1	1	-2	2
		Vertebrados	-1	2	-1	2	-1	2				
		Invertebrados	-3	2	-1	2	-3	2	-1	1	-1	1
MEDIO SOCIO ECONOMICO	Infraestructura	Medios de comunicación	3	2	2	2	2	2	2	2	3	3
		Plusvalía de la propiedad	4	3	3	3	4	4	3	3	-3	2
	Población	Generación de empleos	3	3	3	3	3	3	3	3	3	3
		Calidad de vida	2	2	2	3	3	3	3	3	3	3
			-13		11		30		32		-7	

Impactos negativos	Impactos positivos	Suma algebraica
-20	73	53

11 DETERMINATION OF THE IMPACTS OF THE REFORESTATION PROJECT

11.1 POSITIVE ENVIRONMENTAL IMPACT

Plantations, reforestation of deteriorated lands and forests, and social tree planting projects produce positive results, for the goods produced, and for the environmental services they provide.

11.1.1 Reducing the use of natural forests as a fuel source

Plantations offer the best alternative to the exploitation of natural forests, to meet the demand for wood and other fire products. Plantations for timber production generally

employ the fastest growing species, and access and exploitation are easier than in the case of natural forests, as they give more uniform and marketable products. In addition, community plantations for the production of firewood and fodder, near the villages, facilitate users' access to these goods, while helping to relieve pressure on local vegetation, which may be the cause of excessive cutting and grazing. Grazing is generally established on marginal or unsuitable land for agriculture (e.g. existing forest land or damaged areas); and plantations cause a beneficial and productive use of land, which does not compete with the most productive uses.

11.1.2 Increased environmental services

Reforestation brings a number of environmental benefits and services. By restoring or increasing tree cover, soil fertility is increased, and its moisture retention, structure, and food content is improved (reducing leaching, providing green fertilizer, and adding nitrogen, if the species used are of this type). If the lack of firewood forces manure to be used as fuel, instead of fertilizer for agricultural fields, the production of firewood will indirectly help to maintain soil fertility. Tree planting stabilizes soils, reducing hydraulic and wind erosion of nearby slopes, agricultural fields, and non-consolidated soils, such as sand dunes.

By establishing tree cover on bare or deteriorated land, it helps to reduce the rapid flow of rainwater, thus regulating river flow, and improving water quality, and reducing sediment entry into surface water. Under trees, cooler temperatures and moderate wet and dry cycles are a favourable microclimate for microorganisms and wildlife and can help prevent soil lateralization. Plantations have a moderating effect on winds and help settle dust and other air particles. By incorporating trees into agricultural systems, crops can be improved, thanks to their positive effects on land and climate. Finally, plant cover established through the development of large-scale plantations and tree planting is a means of carbon absorption, a short-term response to global warming caused by the accumulation of carbon dioxide in the atmosphere.

Tree planting, as part of a social forest program, can take different forms, including community groves, plantations on government land, or on authorized passageways, around agricultural land, by rivers, and next to houses. This type of planting causes few negative environmental impacts. Trees give useful products, and environmental and aesthetic benefits. The common problems arising from these activities are social in nature.

Trees planted for protection, such as protective sashes, or wind guards, or to stabilize slopes, control erosion, facilitate watershed management, protect riverbanks, or fix sand dunes, are beneficial in nature, and provide environmental protection and services. If problems arise, they will most likely be social (land and resource tenure issues).

11.1.3 Environmental awareness

It promotes citizen action in defence of the environment, participating in forest actions, sensitizing the population, incentivizing social participation and promoting environmental education. Participatory reforestations are plantations organized by environmental volunteering associations, educational centres, town halls, etc. with the aim of improving, restoring and preserving degraded natural spaces.

11.2 NEGATIVE ENVIRONMENTAL IMPACT

Effect that produces a certain human action on the environment in its various aspects. The concept can be extended, with little use, to the effects of a catastrophic natural phenomenon. Technically, it is the alteration of the baseline, due to the anthropic action or natural events. Human actions, motivated by the achievement of various purposes, cause side effects on the natural or social environment. While the effects pursued are usually positive, at least for those who promote performance, side effects can be positive and, more often, negative. Environmental Impact Assessment (EIA) is the analysis of the predictable consequences of action; and the Environmental Impact Statement (DIA) is the prior communication, which environmental laws require under certain assumptions, of the environmental consequences predicted by the evaluation.

11.2.1 Temporary impacts

The negative impacts of site preparation include not only the loss of existing vegetation and the environmental, economic and social values it may have, but also environmental problems related to soil clearing: increased erosion, interruption of the hydrological cycle, soil compaction, food loss, and consequent decrease in soil fertility. Although harmful, many of these effects can be short-lived; the site begins to recover.

11.2.2 Impacts inherent in agriculture

Plantations are artificial forests: trees are essentially managed as long-cycle agricultural crops. As such, many of the negative agricultural impacts that are inherent in agriculture also occur in forest plantation. The magnitude of the impact depends, in large part, on the conditions existing at the site before planting it, preparation techniques, sown species, treatments during rotation, duration of rotation, and animals specializing in canine animal feed

11.2.3 Impacts on the watershed hydrological cycle

Reforestation and afforestation activities in the most arid regions, especially, can deplete soil moisture, lower groundwater levels, and affect basic flow to rivers.

11.2.4 Impacts on soil structure

Like any other agricultural crop, fast-growing, short-cycle tree plantations can deplete soil food and reduce site fertility by repeatedly removing biomass and disrupting soil. This is also the case for long cycle rotations, but the effects are less noticeable. Compaction of the soil and damage that occur during the clearing of the site (removal of vegetation by physical means or burning), mechanical preparation and harvesting. Erosion may occur in plantations if coverage is incomplete, or low vegetation is lacking. The accumulation of leaf litter under the plantations increases the risk of fire and reduces the infiltration of rainwater, and if one or two species predominate in leaf litter, the chemical and biochemical characteristics of the soil can be changed. Dead leaves on coniferous plantations (pines) can acidify the soil.

11.2.5 Conflict of interest with other water users for irrigation

Some species are allopathic and produce toxins that inhibit the germination of the seeds of the other species. Irrigation plantations can cause conflict with other water users and cause other environmental and social impacts that are common in irrigation projects.

11.2.6 Indirect impacts

The indirect impacts of large commercial plantations include the results of building roads to transport timber and the industries that process it.

12 ENVIRONMENTAL MANAGEMENT PLAN (REFORESTATION)

Table No. 13 Project Impacts

ACTION: REFORESTATION		**Responsible**	**Deadlines**
Negative impacts	**Effects**		
Temporary: Short-lived	• Loss of vegetation and environmental, economic and social values. • Increased erosion by clearing the land • Hydrological cycle interruption • Soil compaction • Loss of soil fertility		
Proposed measure:	• ***Maintain representative forest area (reserve)*** • ***Keep the forest protective of watercourses***		

	• ***Not expose the soil for long*** • ***Reforest with fast-growing species*** • ***Avoid soil compaction*** • ***Implement fertilization if needed***	***Proponent***	***Continuous***
Impact inherent in agriculture	• Nutrient loss from change of use • Compaction and degradation by the passage of machines. • Excessive soil work. • Poor crop rotation • Continuous crop duration • Appearance of pests.		
Proposed measure:	• ***Fertilizer replenishment according to analysis*** • ***Maintain permanent plant cover*** • ***Rational use of insecticides*** • ***Perform rolling rotation cycle.*** • ***Have reforested plots of no more than 100 hectares*** • ***Integrated pest control***	***Proponent***	***Periodically Annual and continuous***
Impact on the watershed hydrological cycle	• Decreased surface water quality by sediment drag due to irrational land use (excessive soil work). • Decrease in aquifer recharge by soil compaction by the passage of machinery (tractors)		
Proposed measure:	• ***Maintain permanent plant cover.*** • ***Avoid as much as possible the burning of pruned branches*** • ***Perform subsoiling in highly compacted areas, to allow aeration and facilitate root development of plants*** • ***Avoid using insecticide***	**Proponent**	**Continuous Annual and Periodically**

Impact on soil structure	• Loss of soil fertility • Very long rotation cycle • Removal of vegetation by physical means or burned • Erosion due to incomplete soil cover • Accumulation of leaf litter. Fire • Soil acidification by excessive dead leaves (conifer)		
Proposed measures	• ***Soil fertilization on a regular basis*** • ***Avoid very long period rotation cycle*** • ***Avoid removal of vegetation by physical or burned means*** • ***Prevent soil cover from being incomplete or missing vegetation*** • ***Avoid excessive accumulations of leaves by risk of fire spread and less infiltration of rainwater.*** • ***Avoid soil acidification*** • ***Have a mobile water tank with pump and high-pressure hose***	**Proponent**	**Periodically**
Indirect impacts Road construction impacts to transport timber	• Soil erosion • Dust emission • Noise from machinery traffic • Chemical soil contamination		
Proposed measures	• ***Build roads with proper drainage system*** • ***Avoid cutting off the natural flow of water*** • ***Having speed reducers*** • ***Decrease vehicle traffic in the area*** • ***Avoid the use of agrochemicals and spillage in the area***		
Impact by introduction of exotic species	• Native species decline • Appearance of pests and dis-		

	eases • Unsuitable site for exotic species to be planted		
Proposed measures	• ***Preserve area of native species of the place*** • ***Avoid the introduction of pest in diseases*** • ***Introduce exotic species in proper place (rain and temperature)***	**Proponent**	**Temporarily**
Positive impact	•		
Reducing the use of natural forests as a fuel source	• **Greater alternative of use than natives** • **Faster growth than natives** • **More uniform production** • **Easier to operate** • **Relieves pressure on local vegetation** • **Originates a beneficial and productive use of land, which does not compete with the most productive uses**		
Increased environmental services	• **Increases tree cover** • **Increased soil fertility** • **Improves moisture retention** • **Improves food structure and content** • **Provides fertilizer and nitrogen** • **It has a moderating effect on the winds** • **Is a mean of carbon absorption** • **It responds in the short term to global warming caused by the accumulation of carbon dioxide in the atmosphere.**		
Environmental awareness	• **Boosts citizen action in defence of the environment**		

	• **Incentivizes social participation and promotes environmental education**		

13 MONITORING CHRONOGRANA

For the monitoring of the work, some additional recommendations and adjustments are presented on the possible impacts that may be caused by the activities carried out that have not been mentioned in the Approved Impact Study, these are being met with very good judgment by the company from the beginning of these activities and as the implementation of the project advances.

13.1 Some main actions to consider are:

- Permanent attention in the investment and development phase of the project.
- Verification of compliance with the measures envisaged to avoid negative environmental impacts.
- Detection of unforeseen impacts
- Attention to changes in measures. The implementation of the programme implies ongoing attention in the investment and development phase of the project, verifying compliance with the measures envisaged to minimize negative environmental impacts and the detection of unforeseen impacts.

Annexes

14 Photos/Images

Aerial view of the property

Aerial view of the property

Trial pit on the west side of the property

Trial pit on the central area of the property

Trial pit northeast area of the property.

Trial pit east of the property

Six-year plantation

Six-year plantation

One-year plantation

One-year planting, another perspective

ANNEX 3 Laws and regulations

Legislation	Issuing/regulating authority	Approval entitlement (content)	Issuing date	Expiring date	Comments
Environmental Impact Assessment Law 294/1993 Decrees 453/2013 and 954/2013 introduce relevant changes to this law	MADES	The Law regulates activities requiring an environmental license and establishes the proceedings to obtain an environmental license. Specifically applicable to the project: All rural estates that conduct agricultural or livestock activities on 500 ha or more, or forestry covering 1,000 ha or more, require an environmental licence from the environmental agency.	1993	-	The project area has two valid environmental licenses from previous owners, one of them with liabilities. Forestal Apepu is responsible for the adjustment and regular renewal of the licenses.
Moratorium on land use change of natural forests in Eastern Paraguay Law 2524/2004, followed by Laws 3139/2006, 3663/2008, 5045/2013, and 5266/2018	INFONA MADES	The Law introduces a moratorium on natural forest conversion in Eastern Paraguay.	2004	Latest extension valid until December of 2020	There is a liability in one of the properties due to clearing of natural forest by previous owner. Forestal Apepu will be responsible to implement compensation measures.
Forest Law Law 422/1973 and Decree 18.831/1986	INFONA	The Law regulates forest use. Particularly relevant is the obligation of property owners of estates larger than 20 ha to conserve a forest area of at least 25% of the original forest cover, against the baseline of 1986.	1973	-	There is a liability in one of the properties, where the minimum forest area is not met. Forestal Apepu will be responsible to implement compensation measures.
Environmental Services Law 3001/2006	MADES	Provides the opportunity of compensating the lack of the minimum natural forest area conservation on private properties (see above Forest Law) through a compensation scheme.	2006	-	Does not currently apply to the project. However, it is a valid environmental compensation instrument in case of any loss or destruction of the minimum legal natural forest area, or a possibility for certification of any area of natural forest exceeding the minimum area by law.

Legislation	Issuing/regulating authority	Approval entitlement (content)	Issuing date	Expiring date	Comments
Water resources and buffer areas Laws 3239/2007 and 4241/2010 and Decree 9824/2012	MADES INFONA	Establishes the criteria for the conservation of protective forests at the margin of water courses.	2010	-	Applies to all streams and springs in the project area.
Declaration of the Tapiracuai and its associated springs and wetlands as Private Protected Area Law 4647/2012	MADES Local Government of San Pedro	Declares the stream Tapiracuai and its associated springs and wetlands as private protected area under the management category of Nature Reserve. The protected area status extends from the spring of the Tapiracuai (UTM 588023X; 7241928Y) towards the estuary with the same name (UTM 515214X; 7270155Y) along both sides of the stream up to 100 m. All private properties affected are called to develop a management plan for the Protected Area within the scope of their property within 180 days of the promulgation of this Law. Following activities are prohibited: - Pour effluents into the stream - Alter the course of the stream - Commercial exploitation that would lead to a modification of riverbanks (for example, to establish beaches) Leisure activities that do not alter the natural features of the stream are allowed.	2012	-	The project area is limited by the Tapiracuai stream towards its south-eastern border. The approved environmental licence considers an intangible area bordering the stream. Nevertheless, the previous owners did not develop a management plan.
Protected Areas Nº 352/1994 and Resolution Nº 200/2001	MADES	Regulates Protected Areas and its different categories.	1994	-	The only Protected Area that affects the project area is the Private Protected Area declared by Law 4647/2012
Environmental crimes, punishment and administrative fees Law 716/1996 and Decree 2598/2014 of Law 5146/2014		Establishments of penal punishments and administrative sanctions in cases of breaches of the environmental law.	1996 and 2014	-	Applies in cases of breaches.

Legislation	Issuing/regulating authority	Approval entitlement (content)	Issuing date	Expiring date	Comments
Wildlife Law 96/1992	MADES	Regulates wildlife management and protection. Hunting of wildlife is subject to specific authorization.	1992	-	Hunting and wildlife management would be subject to this law.
Indigenous communities Decree 1039/2018	INDI	Requires and Free Prior and Informed Consent process for every project that may impact indigenous territories.	2018	-	Not applicable to the project area.
Registry of forest plantation for production Decree 11681/1975 and Resolution 429/2010	INFONA	All plantations shall be registered before INFONA prior to the commercialization of wood products.		-	Applies at the time of harvesting operations.

ANNEX 4 Social baseline information

Forestal Apepu
Neighboring Communities Baseline

Date: June 2020

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1 INTRODUCTION

1.1 Background

Forestal Apepu S.A. is a forestry company established in 2019. The company has acquired two stays in the Department of San Pedro, eastern Paraguay, 15 km east of the city of San Estanislao, covering approximately 2,700 ha.

The company is inserted in a relatively vulnerable social context. Within the framework of the company's environmental and social policy, it seeks to generate positive socio-economic impacts, through the generation of local employment and the design and implementation of projects with a strong socio-economic component.

The objective of this report is the socio-economic characterization of the neighboring communities of Forestal Apepú S.A. It was prepared between February and May 2020 and features bibliographic data, data from local public institutions and information generated through interviews with community members.

1.2 Context

The Apepu estate is located about 15 km east of the city of San Estanislao, between the Districts of San Estanislao and Caapibary in the south of the Department of San Pedro.

The Department of San Pedro has a population of almost 430 thousand inhabitants, 6% of the national population. It has a young population, with more than 30% of the population being less than 15 years of age. However, there is a trend of decline of the infant-juvenile population[1].

According to data from the 2018 Permanent Household Survey (EPH)[2], San Pedro has the third highest incidence of poverty in the national territory[3], with 39,930 people in extreme poverty[4]. The percentage of the poor (non-extreme) population was reduced from 48% on average in 2016 to 36% on average in 2018[5]. By comparison, nationally, poverty affected 28% of the population in 2016.

81% of San Pedro's population is rural. Historically, poverty disproportionately affects the rural population in Paraguay, with 20% and 37% of the urban and rural population being poor in 2016, respectively. At the national level, half of the population occupied in family agriculture experi-

[1] https://www.dgeec.gov.py/Publicaciones/Proyeciones%20por%20Departamento%202019/02_San%20Pedro_2019.pdf

[2] https://www.5dias.com.py/2020/04/caaguazu-itapua-y-san-pedro-las-zonas-con-mayor-pobreza-extrema/

[3] http://www.revistaplus.com.py/2016/11/15/pobreza-y-desigualdad-la-necesidad-de-un-analisis-territorial-por-departamentos/

[4] It is defined population in extreme poverty to all people living in households whose per capita incomes are lower than the cost of a Basic Food Basket.

[5] https://observatorio.org.py/situacion_departamental/11

ences poverty, with a higher incidence among women or households led by women. This proportion places family farming as one of the activities that influences poverty the most, with an important gender component[6].

2 CHARACTERIZATION OF COMMUNITIES

2.1 Identification of the communities

The Apepu and Rancho Bonito estates border the Republicano and Cururu'o communities. They are relatively new settlements. According to the social due diligence study conducted in February 2019, its settlement began approximately 15 years ago. Land management was assumed by INDERT on behalf of these communities and is relatively advanced after a long process.

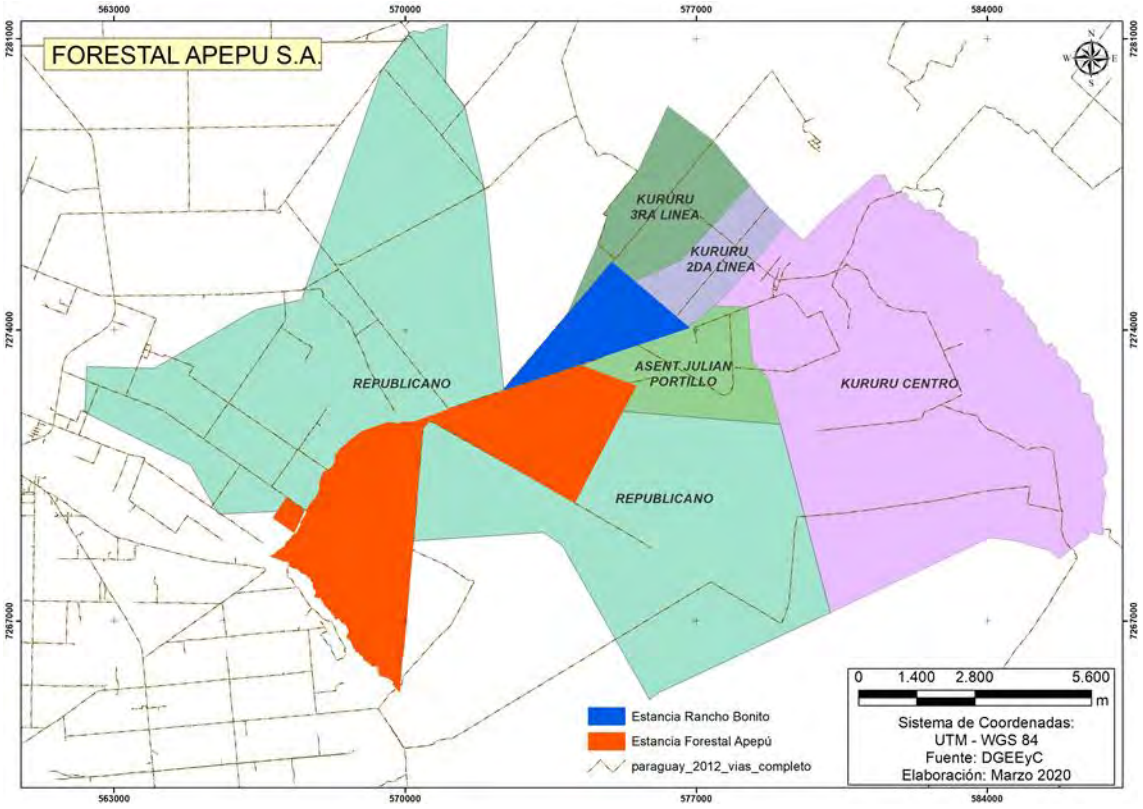


Figure 1 Map of neighboring estates and communities

[6] https://repositorio.iep.org.pe/bitstream/IEP/1147/1/Veronica-Serafini_Pobreza-rural-Paraguay.pdf

Table 1Demographics of neighboring communities

Parameters	Unit	Cururu'o	Republicano
Population 2019	*Inhabitants*	1,146	850
Birth rate 2019	*%*	1.6%	20% (17 births)
Mortality rate 2019	*%*	1.1%	3.52% (3 deaths)

Source: *Data from the Departmental and District Poverty Index, % of district employees were collected from the 2018 DGEEC.*

The Cururu'o community has 1,146 inhabitants, which are distributed in the neighborhoods of Julián Portillo (518), Cururu'o center (291), 2da línea (136) and 3ra línea (88), and the Hachita settlement (113). The Hachita settlement is the most recent and conglomerates the most vulnerable population in the community.

2.2 Land tenure situation

According to demonstrations by INDERT representatives[7] and the villagers interviewed, most of the inhabitants of the Cururu'o and Republicano communities have the record of occupation of INDERT.

In the community of Cururu'o, families were initially assigned lots of between 10 and 12 ha, which however, were progressively reduced to smaller farms due to the growing population.

2.2 Women's situation

In Paraguay, the rural female population accounts for 47.2% of the rural population. In rural areas there are 31.1% of young women who do not study or work. Their exclusion from the education and employment system makes them vulnerable to unwanted pregnancies and forced migration. In addition, rural women suffer the highest rate of illiteracy. Occupational inactivity mainly affects women in rural areas (39.8%) and particularly those in poverty (51.9%). The reasons for inactivity usually have to do with household activities and family reasons.

According to public institutions in the region, the poverty level of women in the Cururu'o and Republicano communities is classified as medium and low. Women from communities are engaged in the breeding of hens and minor pets and dairy. The average number of children per woman is 2 to 3 in Cururu'o and 5 in Republicano. In addition, in 2019, one infantile pregnancy is recorded in Cururu'o and none in Republicano.

In the Republicano community, women are characterized by being organized to obtain resources from local entities such as the Municipality and intermediate institutions such as PRODERS and others.

[7] The demonstrations of INDERT representatives correspond to the first DD held in February 2019.

2.3 Education

The three communities have the basic infrastructures for education services, both in primary and secondary school, with the items for teachers and professors. According to the Municipal and Departmental budget, there is compliance with the nutritional supplement for students such as the delivery of school kits as required by MEC.

Table2 Schools in the communities

Locality	Educational Institution	Director	Enrolled
Cururu'o	Basic School 4050 "3 de Mayo"	Patrocinio Galeano Larroza (morning) Nelci Rosaliz Amarilla Chaparro (aternoon)	173
	National School Oñondivepa	Jorge González Zárate	18
Julian Portillo	Basic School 5950 "3 de Agosto"	Alcides González Franco	139
	EMA - Basic School 5950 "3 de Agosto"	Nelson Zarza Lopez	28
Republicano	Basic School 2822 "Virgen del Huerto"	Joaquin Benitez Espinola	194
	National School Barrio Republicano	Leongino Amarilla Vazquez	115

2.4 Health

The Cururu'o community has a primary health care system with 90% coverage. In 2019-2020, the construction of a new health service center was in place.

Republicano inhabitants do not have a service in their community. To receive assistance they must resort to Cruce Tacuara or San Estanislao. However, there is a project to build a USF (Family Health Unit).

The lack of health care in the community is noted in some prevention indicators. For example, the number of children under the age of 5 vaccinated in 2019 is 218 children in Cururu'o, and only 45 in Republicano.

2.5 Work and migration

Most families are engaged in family agricultural or livestock production, with occasional sales. On average families have 1-2 ha of chakra. The main items are cassava, corn, bean, sesame, melon, watermelon, and pineapple. In addition, families with a higher capacity have dairy cattle, while others have pigs and chickens.

Some community members work as day laborers in neighboring estates. This work is not constant, and generally of low quality, that is, it is informal.

Opportunities for economic development are scarce due to the difficulty of marketing agricultural products, and the lack of jobs at the local level. The lack of opportunities has led to a major migration to Chaco, where there is a greater supply of employment. While no data are available on the number of people employed and the amount that have emigrated, it is very common to

hear from families about members who have emigrated to Chaco. Therefore, it is estimated to be significant. For decades now, the San Pedro Department has been classified as an expulsion department. The main historical destinations of the emigration of the population are the Departments Central, Canindeyú and Alto Paraná, an in recent years also Chaco is one of the most common destinations.

2.6 Public services

- **SAFETY:** Only the community of Cururu'o has a police post that is responsible for the coverage of the three communities supported by the Tacuara police post.
- **DRINKING WATER**: In all communities there is a drinking water distribution service with gradual needs for expansion. One of the difficulties in all communities is the prompt response in case of equipment failures since technicians must come from distant points.
- **ROADS[8]:** The maintenance of the roads in the three communities is carried out with machinery of the Governorate or the Municipal Government, with the counterpart of the road commissions consisting of the purchase of fuel and expenses (usually meals) for operators.
  The company Apepu S.A. has ceded a portion of its land so that Republicano settlers can use it if they need to move to Cururu'o and not use the alternative path that Republicano uses to enter directly into the Apepu estate. This road has the characteristics of a public road, but is located on private property. At this time, Apepu S.A. is looking for a legal/legal solution to the problem to avoid any responsibility for the public use of the road, without depriving the community of the use of the road.
  The construction of three bridges in the San Estanislao-Capiibary section is currently planned, which will improve the connection of community settlers with regional urban centers.
- **CHAPELS AND RELIGIOUS CENTERS.** Each community has its chapels, catechetical centers and other religious denominations. These religious centers are a place where the unity of communities with spiritual supports is sought**.**

2.7 Social support/projects

PRODERS[9]

The Sustainable Rural Development Project (PRODERS) of the Ministry of Agriculture (MAG) implements rural extension and organizational capacity building programmes among small producers and indigenous communities.

In the Apepu region, members of the Cururu'o and Republicano communities are beneficiaries of the project SEMBRANDO OPORTUNIDADES[10], implemented by PRODERS. As part of this project, PRODERS seeks to support the poorest families (unlike their other projects seeking to work

[8] Source: Ing. Rodolfo Segovia, departmental head of MOPC Proyectos San Pedro.

[9] Data Reference ING. Miguel Rivarola head of the south area San Pedro project of PRODERS Peasant Strategies

[10] The PROJECT SEMBRANDO OPORTUNIDADES, was born in 2013 with the Decree No. 291/13 and its implementation began in 2015 through TECHNICAL PLANNING SECRETARIAT.

with committees and community organizations) with technical assistance and technology packages. This project aims to reduce poverty from 18.8% to 9%.

Beneficiaries in the Apepu area so far are:

- REPUBLICANO Community: 20 Families.
- JULIAN PORTILLO Community: 16 Families.
- CURURUO Community: 10 Families.

These families received technological packages and technical assistance for the installation of greenhouses adapted to the climate of our country, planters, onion harvester, potato harvester and the fertigation system. In addition, families interested in animal production received poultry, input packs, seeds, and pigs.

Project development has been slow. This was related to the insecurity of planning and provision of PRODERS items. The first technology packages were delivered in December 2019, and since then the PRODERS unit in Guayaibi has been monitoring implementation through technical support.

PRODERS assistance does not envisage marketing for producers. This management is carried out by another MAG directorate.

TEKOPORA[11]

This is the social programme implemented by the Ministry of Social Development with the aim of protecting and promoting families in poverty and vulnerability.

The main objective of the programme is to improve the quality of life of the participating population, facilitating the exercise of the rights to: food, health and education, by increasing the use of basic services and strengthening social networks, in order to cut off intergenerational transmission of poverty.

It is also intended to provide family and community support, through systematic accompaniment to facilitate meeting co-responsibilities, build family and community work capacities, and build conditions to ensure citizen participation and increase the financial resources of participating households.

The potential benefits of this project require enrollees to have the following realities:

- Boys and girls from 0 to 14 years old and/or - adolescents from 15 to 18 years old
- Pregnant women
- People with disabilities
- Indigenous communities

Several families have qualified in all three communities for this project:

- Cururu'o: 61 beneficiaries
- Julian Portillo: 11 beneficiaries

[11] Ministry of Social Development. Program Tekopora. Date dreview 19/12/1/2019 13:02 hoRas. Jorge Ivan Armoa (head of the ministry's control and monitoring department)

- Republicano: 25 beneficiaries

SENAVITAT

In the community of Julián Portillo 48 families have SENAVITAT housing, and another 118 have applied but do not yet have answers. The Republicano community has also benefited from Senavitat housing, although the exact amount is not known.

In Cururu'o there are no social housing construction projects. This community is the oldest in the area. This implies a traditional culture of own housing, which is not the case with new settlements.

2.8 Contact details of the main representatives

Table 3 Contact details of major communal organizations

ORGANIZATION-PROJECTS	Community	OBJECTIVES AND MAIN ACTIVITIES	REPRESENTATIVES AND CONTACT DATA	COMMENTS
Housing Commission **Water Commission** **Tekopora Commission**	JULIAN PORTILLO JULIAN PORTILLO JULIAN PORTILLO	Construction of social housing. Collection and maintenance of water service Tekopora program update management	*(data not provided)*	Active Active Active
Neighborhood Commission **Asphalt Commission**	CURURUO CURURUO	Communal well-being Continuous management of the project	*(data not provided)*	Inactive Active
Neighborhood Commission **Water Commission** **Women's Committee**	Republicano Republicano Republicano	Communal Welfare Collection and maintenance of water. Preparation of raw materials for consumption and sale	*(data not provided)*	Inactive Active Active

ANNEX 5 Stakeholder consultation

List of people interviewed as part of the ESDD:

Stakeholder group	Function	Date
Local Authority	Two councilmen of Townhall of Santaní	12-13.02.2019
Local Authority	Director of Agrarian Extension, Regional Ministry of Agriculture, Santaní	12.02.2019
Local Authority	Director of Regional INDERT office (national institution for rural development and land issues), Santaní	12.02.2019
Local Authority	Chief of regional office of INFONA, Santaní Chief of regional offices of INFONA, Asunción	13.02.2019
Local population	Four residents of Colonia Republicano, among which a peasant leader and the wife of a member of the local neighbourhood commission	12-13.02.2019
Local population	Two residents of Kururu'o and its fraction Julián Portillo Two officers of Police of Kururu'o	12.02.2019
Property owners	Three previous property owners	11-15.02.2019
Environmental experts	Environmental consultant in charge of the latest environmental license of Apepu	21.02.2019
National authority	Three employees of the Ministry of Environment	28.02.2019
Independent environmental expert	President of the national network of conservation on private lands (telephone contact)	28.02.2019
Independent expert on indigenous peoples	Lead indigenous expert and coordinator of the Federation of the Autodetermination of Indigenous Peoples (FAPI) (telephone contact)	13.03.2019

ANNEX 6 Project introduction to local communities

Presentation of the forestry Project to the communities of influence

Forestal Apepú

Authors

Gladys Núñez, Andrea Eisenhut, Andrea Braun

UNIQUE

Date: 16.12.2019

1 SUMMARY

Forestal Apepú, within the framework of its social policy, as well as its activities with a view to FSC certification in 2020, carried out the first meetings of presentation of the forest project to the communities considered to be of influence: Kururuo, Republican and Julián Portillo. These meetings took place on 3, 5 and 10 December 2019.

The main objective of this activity was to explain the project, introduce the technical team, the work system that the company is implementing in the area, as well as the communication system to be established between both parties: company and community. Below is a brief summary of the comments that arose during the meetings in each community.

1.1 Community Kururuo

The meeting was held on 3/12 in the home of Mr. Gustavo Díaz, member of the Kururuo community, chairman of the neighbourhood commission and currently staff of the company Forestal Apepú S.A., a total of 12 people participated among members of the community and technical team of the company (participated in the activity Jorge Galeano, Gualberto Arce, Gladys Nuñez and Andrea Eisenhut).

From the team's perspective, the project received a good reception from the participants, said they find it a positive venture and appreciate it being under a sustainability approach taking care of natural resources, in addition to the safety of the staff.

An observation raised by one of the participants, which was then supported by the rest of those present, is that because the company has a social responsibility policy, and while they consider the provision of local employment positive, they consider this as an "individual" benefit, not a collective one; so he indicated that Kururuo is a humble community that has many needs, and called for the company to be open to providing support whenever possible, in the face of activities or needs that arise in the community.

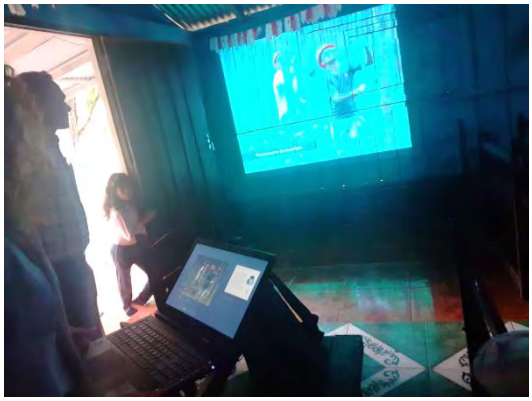
They were then told that the company has a projection to carry out socio-economic projects with them in the near future, for which a community participation workshop will be developed, which will allow to know in more detail the reality of the community. This had a positive response, as one of the participants stated that years ago he carried out as his own initiative forest plantations on his property on a small scale, and indicated that he would like

to re-carry out such a project, because of the age he considers it will be difficult to get a job, to which he consulted whether the company could provide seeds for this purpose.

In response, the technical team stated that with the activity to be carried out of the participatory workshop, it would be sought to see possible project options, among which the outgrower options were not ruled out. It is important to note that they also stated that they would like to know a little about the economic impact of such projects

1.2 Community Julián Portillo

The meeting took place on 5/12 in the Valentine's Chapel with members of the community Julián Portillo, with representatives of different social commissions such as the Drinking Water Commission, Teko Pora Commission, Chapel Commission, Community Development and Development Commission, and the technical team of the company (participated in the activity Jorge Galeano, Gualberto Arce, Gladys Núñez and Andrea Eisenhut).



The presentation of the project had a good reception by the participants, who welcomed the presence and presentation of the project, since until now projects developed in the Apepú farm by previous administrations of the establishment were not socialized with the community. One of those present stated that this type of Project is very important to the community as there was the possibility of the use of local labour.

Another important point expressed by the participants is the environmental vision they manifest to have of the project, since it will allow to counteract the extensive crops of grains, the use of agrochemicals, allowing greater care of natural resources.

A social reference noted the importance of the project providing technical assistance for small horticultural producers for consumption and income. This point of action is very important to the community and affects people who are no longer of productive working age and depend on this type of production.

In response to the concerns expressed by the inhabitants of Julián Portillo, the Technical team stated that it will articulate the conduct of participatory workshops where community diagnostics will be made without ruling out the inclusion of these proposals that have an economic and social impact.

1.3 Community Republicano

The meeting took place on 10/12 in the home of Mr. Agustín Correa, member of the Republicano community and currently staff of the company Forestal Apepú S.A., participated 34 people representatives of the following organizations: Senavitat Commission, Sanitation Board Commission, women's committee, community members and technical team of the company (Jorge Galeano, Gualberto Arce, Gladys Núñez, Andrea Eisenhut and Paul Borsy).

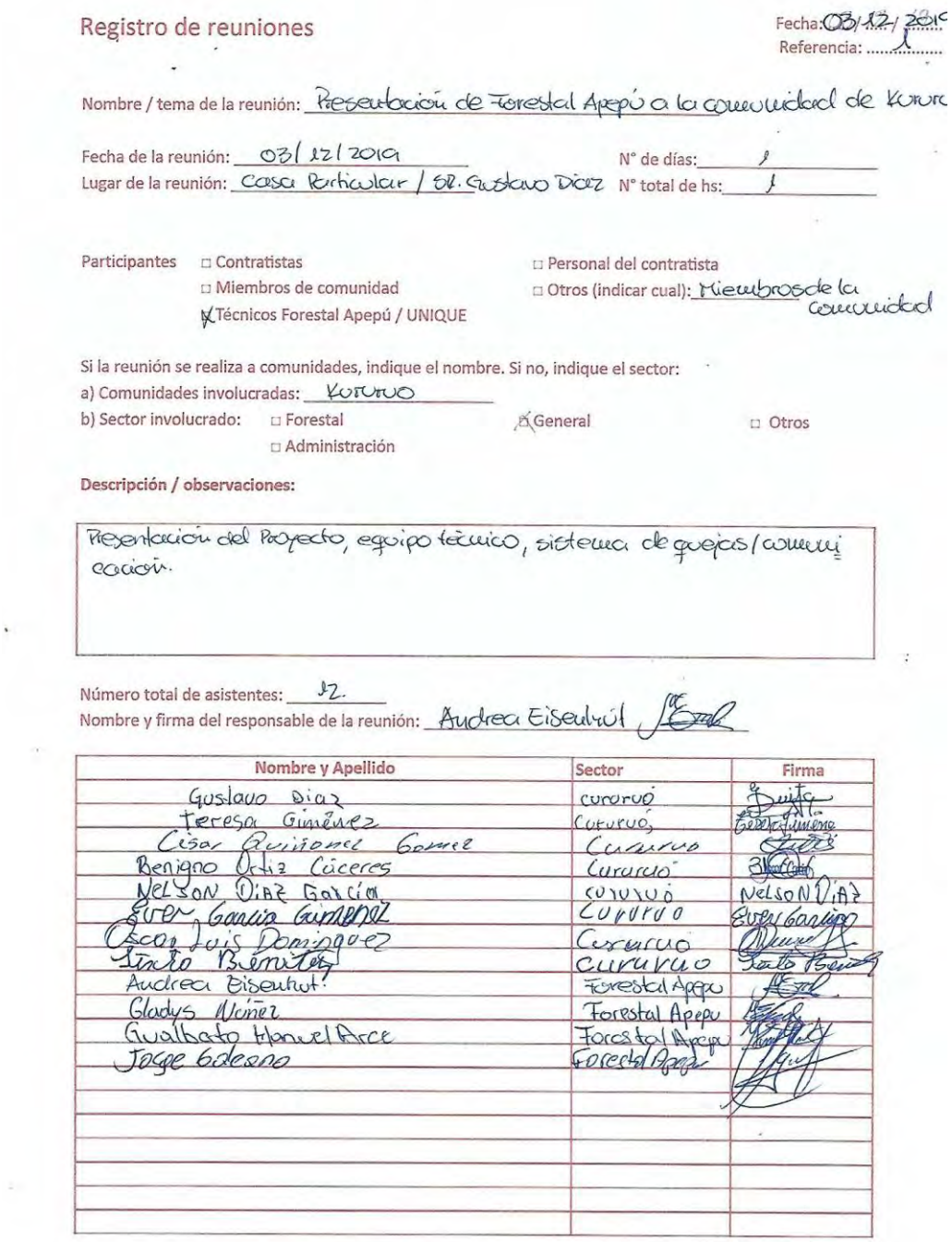
From the team's perspective, the project received a good reception from the participants. They stated that they find it a very positive undertaking and appreciate that it is under a participatory, sustainable and developmental approach for the community.

One of the priority needs in the vision of one of the referents is the urgent need for the installation of a health post in the area, whose manifestation was clarified that the project is totally unconnected to projects that fall under the responsibility of the public sector.

Following the presentation, within the framework of the first participatory workshop and approach to the communities of influence to project future initiatives, several problems and possible projects to be implemented with the community were discussed, the details of which are visualized in the report on this.

2 ANEXES

Attendance forms



Registro de reuniones

Fecha: 03/12/2019
Referencia: 1

Nombre / tema de la reunión: Presentación de Forestal Apepú a la comunidad de Kurur

Fecha de la reunión: 03/12/2019 — N° de días: 1
Lugar de la reunión: Casa Particular / Sr. Gustavo Diaz — N° total de hs: 1

Participantes
- ☐ Contratistas
- ☐ Miembros de comunidad
- ☒ Técnicos Forestal Apepú / UNIQUE
- ☐ Personal del contratista
- ☐ Otros (indicar cual): Miembros de la comunidad

Si la reunión se realiza a comunidades, indique el nombre. Si no, indique el sector:
a) Comunidades involucradas: Kururuo
b) Sector involucrado: ☐ Forestal ☒ General ☐ Otros ☐ Administración

Descripción / observaciones:

Presentación del Proyecto, equipo técnico, sistema de quejas/comunicación.

Número total de asistentes: 12.
Nombre y firma del responsable de la reunión: Andrea Eisenhut

Nombre y Apellido	Sector	Firma
Gustavo Diaz	Kururuo	
Teresa Giménez	Kururuo	
Cesar Quintanel Gomez	Kururuo	
Benigno Ortiz Cáceres	Kururuo	
Nelson Diaz García	Kururuo	Nelson Diaz
Ever Garcia Gimenez	Kururuo	Ever Garcia
Oscar Luis Dominguez	Kururuo	
Ignacio Bremster	Kururuo	
Andrea Eisenhut	Forestal Apepu	
Gladys Nuñez	Forestal Apepu	
Gualberto Manuel Arce	Forestal Apepu	
Jorge Cdeano	Forestal Apepu	

Registro de reuniones

Fecha: 05 / 12 / 19
Referencia: 2

Nombre / tema de la reunión: Presentación de Forestal Apepú a la comunidad de Julian Portil

Fecha de la reunión: 05 - 12 - 19
Lugar de la reunión: Capilla de la Comunidad

N° de días: 2
N° total de hs: 1

Participantes
- □ Contratistas
- □ Miembros de comunidad
- X Técnicos Forestal Apepú / UNIQUE
- □ Personal del contratista
- □ Otros (indicar cual): Miembros de la comunidad.

Si la reunión se realiza a comunidades, indique el nombre. Si no, indique el sector:
a) Comunidades involucradas: Julian Portillo
b) Sector involucrado: □ Forestal X General □ Otros
□ Administración

Descripción / observaciones:

Presentación de proyecto, equipo técnico, sistema de quejas, comunicación

Número total de asistentes: 15
Nombre y firma del responsable de la reunión: Andrea Eisenhut.

Nombre y Apellido	Sector	Firma
Rosa Estigarribia Gimenez	Julian Portillo	Rosa Estigarribia
Blanca Baez Rodriguez	Julian Portillo	Blanca Baez Rodri
Jorge Aquino Gonzalez.	Julian Portillo.	
Fabiana Maydana Lurachi	Julian Portillo	
Teresa Rodrigues	Julian portillo	Teresa Rodrigu
Guillermo Gavilan Villalba	"	
Noelia Amarilla Figueredo	Julián Portillo	
Eclipa Ramirez G.	Julian Portillo	Eclipa Ramirez G.
Julián Recalde	Julián Portillo	
Victoriano Aquino	Julián Portillo	
Gladys Mingo	Forestal Apepu	
Juan Pablo Gonzalez Riquelme	Julian Portillo	
Gualberto Manuel Arce	Forestal Apepú	
Andrea Eisenhut.	Forestal Apepú	
Jorge Galeano	Forestal Apepú	

Registro de reuniones

Fecha: 10/12/19
Referencia: 4

Nombre / tema de la reunión: Presentación de Forestal Apepú y Taller con Pol Borsy en Repub.

Fecha de la reunión: 10 de diciembre 2019 — N° de días: 1.
Lugar de la reunión: Casa particular del Sr. Agustín Correa — N° total de hs: 5 horas.

Participantes
- □ Contratistas
- □ Miembros de comunidad
- ☒ Técnicos Forestal Apepú / UNIQUE
- □ Personal del contratista
- □ Otros (indicar cual): Miembros de la comunidad

Si la reunión se realiza a comunidades, indique el nombre. Si no, indique el sector:

a) Comunidades involucradas: Republicano

b) Sector involucrado: □ Forestal □ Administración ☒ General □ Otros

Descripción / observaciones:

Presentación de proyecto, equipos Técnicos, Sistema de queja, comunicación. Taller con Pol Borsy, Posibles proyectos, Prioridad de necesidades, Visita a fincas con productores de mandioca, sandía, poroto, maíz, ganadería, pasturas, resaltaron [mencionaron] muchos proyectos posibles de las que quedaron en reunirse los vecinos ponerse de acuerdo en elegir 2 proyectos en las que podamos nosotros apoyar y acercarnos los proyecto para poder convocar otra reunión para planificar.

Número total de asistentes: 34

Nombre y firma del responsable de la reunión: Paul Borsy [firma]

Nombre y Apellido	Sector	Firma
Adelaida Orué de Aponte	Republicano	Adelaida Orué
Estelvina Benítez	Republicano	Estelvina Benítez
Isabel Acosta Ramos	Republicano	Isabel Acosta Ramos
Maria Gomez	Republicano	[firma]
Juana D. Domínguez	Republicano	
Manuela Alonzo	Republicano	
Mercedes Gómez D.	Republicano	Mercedes Gómez D.
Zulma Zabalos	Republicano	Zulma Zabalos
Norma Gavilan	Republicano	Norma Gavilan
Cirila Gómez	Republicano	Cirila Gómez
Nelva Zarza	Republicano	Nelva Zarza
Antonio Vera	Republicano	Antonio Vera J.
[firma]	Republicano	
Amelia Melgarejo	Republicano	
Felipe Gómez	Republicano	
Almirón D.	Republicano	
Cándido Correa	Republicano	
Ronald Duré	Republicano	[firma]
José Andrés Tofe	Republicano	José A. Tofe

Agustín Herme Correa — Republicano — Melchora Gonzáles
[firma] — Republicano
[firma] — Republicano
María E. Servín — Republicano
Rosa Mascareño Yanay — Republicano
[firma]

Andrea Eisenhut.	Forestal Apepu	
Gladys Núñez	Forestal Apepu.	
Gualberto Manuel Arce	Forestal Apepu	
Jorge Gokano	Forestal Apepú	