

NON-PERMANENCE RISK REPORT 'GUANARÉ' FOREST PLANTATIONS ON DEGRADED GRASSLANDS UNDER EXTENSIVE GRAZING



Document Prepared By Carbosur

Contact Information

Project Title	'Guanaré' Forest Plantations on degraded grasslands under extensive grazing
Version	Version 03.1
Date of Issue	29 March 2014
Project ID	959
Monitoring Period	24 April 2006 to 12-January-2013
Prepared By	Carbosur
Contact	Misiones 1372/304, Uruguay, telephone: +59829153514, Agustin.inthamoussu@carbosur.com.uy ; www.carbosur.com.uy

1 INTERNAL RISK

Project Management																				
Risk Factor	Risk Factor and/or Mitigation Description			Risk Rating																
a)	Species planted are proven to be adapted to the same agro-ecological zone. The proposed project activity is using mostly <i>Eucalyptus grandis</i> and, to a lesser extent, <i>E. dunnii</i> (in low areas where <i>E. grandis</i> can be affected by frost damage), <i>E. globulus</i> and <i>E. maidenii</i>. A very small fraction of the total area was planted with Loblolly Pine (<i>Pinus taeda</i>). None of these species are native to the area. The choice of species is due primarily to the fact that they ensure an adequate productivity level and a market access for the products to be obtained, which would not be possible if other species were used. The two main species used in the project (<i>E. grandis</i> Hill ex Maiden and <i>Eucalyptus globulus</i>) are members of the <i>Myrtaceae</i> family, and are not native to Uruguay. However, they originate in regions of Australia with ecological conditions highly similar to those in Uruguay (table below). This similarity explains why this species adapted so well to Uruguayan conditions, where it has been successfully grown and bred for many years. <i>E. grandis</i> was firstly introduced in 1963, brought from South Africa, while <i>E. globulus</i> has been successfully grown and bred for more than 150 years. The introduction of the latter species to Uruguay dates back to 1853 and its cultivation was spread massively afterwards (Brussa, C. 1994). Currently these two species are among the most widely planted in Uruguay, representing approximately 65% (25% <i>E. grandis</i> and 40% <i>E. globulus</i>) of commercial plantations according to the National Forest Inventory (2010). The National Institute of Agricultural Research of Uruguay has released a few locally developed varieties, which will be used by ‘Guanaré’ project. In addition, there are numerous native relatives of <i>Eucalyptus</i> in Uruguay, including more than 20 native tree species belonging to the <i>Myrtaceae</i> family Comparison of climatic conditions between site of origin of <i>E. globulus</i> and <i>E. grandis</i> project site: <table><tr><th></th><th>Conditions in site of origin (<i>E. globulus</i>)</th><th>Conditions in site of origin (<i>E. grandis</i>)</th><th>Conditions in Uruguay</th></tr><tr><td></td><td>New South Wales Victoria and Tasmania, Australia</td><td>Queensland and New South Wales, Australia</td><td>Treinta y Tres (Uruguay)</td></tr><tr><td>Latitude</td><td>30°-44° S</td><td>26°-33° S</td><td>33°S</td></tr><tr><td>Annual precipitation</td><td>600-1,780 mm</td><td>1,020-1,780 mm</td><td>1,100-1,300 mm</td></tr></table>				Conditions in site of origin (<i>E. globulus</i>)	Conditions in site of origin (<i>E. grandis</i>)	Conditions in Uruguay		New South Wales Victoria and Tasmania, Australia	Queensland and New South Wales, Australia	Treinta y Tres (Uruguay)	Latitude	30°-44° S	26°-33° S	33°S	Annual precipitation	600-1,780 mm	1,020-1,780 mm	1,100-1,300 mm	0
	Conditions in site of origin (<i>E. globulus</i>)	Conditions in site of origin (<i>E. grandis</i>)	Conditions in Uruguay																	
	New South Wales Victoria and Tasmania, Australia	Queensland and New South Wales, Australia	Treinta y Tres (Uruguay)																	
Latitude	30°-44° S	26°-33° S	33°S																	
Annual precipitation	600-1,780 mm	1,020-1,780 mm	1,100-1,300 mm																	

	<table><tr><td>Mean maximum temperature in January</td><td>20-23 °C</td><td>29 °C</td><td>30 °C</td></tr><tr><td>Mean minimum temperature in July</td><td>0-8 °C</td><td>2-9 °C</td><td>3-6 °C</td></tr><tr><td>Occurrence of frosts</td><td>Occasional, mild</td><td>Occasional, mild</td><td>Occasional, mild</td></tr></table> The Köppen Climate Classification System, which uses a numerical basis of classification (temperature and precipitation averages), with many zone boundaries determined by the climatic conditions associated with vegetation patterns, defines five major climate groups: both the project region and <i>E. globulus/E.grandis</i> native regions are included in the mild mid-latitude climate (Mcknight, T., Hess, D. 2008). The Köppen Climate Classification System also defines that both the project region and <i>P. taeda</i> native regions are included in the mild mid-latitude climate (Mcknight, T., Hess, D. 2008). This similarity explains why this species adapted so well to Uruguayan conditions, where it has been successfully grown and bred for many years. <i>P. taeda</i> started to be spread in 1960s (Morey and Porcile). Currently <i>Pinus taeda</i> species is one of the most widely planted in Uruguay, representing approximately 20% (185,009 ha) of commercial plantations according to `Dirección General Forestal¹. In addition, this species has been successfully planted and is satisfactorily growing in Guanare project site since 2007, there were no soil, weather or ecological adaptation problems which could be seen during this 6 years.	Mean maximum temperature in January	20-23 °C	29 °C	30 °C	Mean minimum temperature in July	0-8 °C	2-9 °C	3-6 °C	Occurrence of frosts	Occasional, mild	Occasional, mild	Occasional, mild	
Mean maximum temperature in January	20-23 °C	29 °C	30 °C											
Mean minimum temperature in July	0-8 °C	2-9 °C	3-6 °C											
Occurrence of frosts	Occasional, mild	Occasional, mild	Occasional, mild											
b)	Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued. Not applicable.	0												
c)	Management team includes individuals with significant experience in all skills necessary to successfully undertake all project activities All activities related to forest investments of ‘<i>Guanaré</i>’ are implemented by Forestal Atlántico Sur (FAS). This company was founded in 2005, in parallel to ‘<i>Guanaré</i>’, by Chilean and Uruguayan partners with long, successful experience in forestry. Project management team is very well trained and experienced to successfully develop any activity related to timber production. The management team is led by Peter Lyford-Pike, Pedro Aramendía and Nelson Ledesma. Peter Lyford-Pike, managing Director, has worked at high-level management positions in various Uruguayan companies of the industrial and commercial sector, including more than 20 years of experience in the forestry sector. In 1988 he started, and then managed for 14 year, Tile S.A., a company that implemented the first pulpwood exports from Uruguay and from Concepción del Uruguay, Argentina.	0												

¹ [http://www.mgap.gub.uy/portal/agxppdwn.aspx?7,20,441,O,S,0,3293%3bS%3b1%3b185,](http://www.mgap.gub.uy/portal/agxppdwn.aspx?7,20,441,O,S,0,3293%3bS%3b1%3b185)

	During that time he co-founded and co-managed COFUSA, a company that developed and manages today nearly 25,000 ha of forest plantations in Northern Uruguay 's large scale forest plantations (30,000 ha), and started Urufor S.A., today the largest sawmill in the country. In 2002 he launched Pike & Co., the leading forest consultancy in Uruguay. Nelson Ledesma, CEO, is a senior forest engineer, with long experience in the management of forests and in the logistics of wood products. He managed large scale forest plantations of Paso Alto (a company that reached 35,000 ha of eucalypt plantations in N Uruguay). Then he worked during several years for Tile S.A., as manager of wood procurement, and later as general manger. He is also a director of the Uruguayan Society of Forest Producers. Pedro Aramendía, CFO, is a senior economist with long experience in management of agriculture businesses. He was the director of the Committee for the Reform of the State, reporting to the office of the President of Uruguay during the period 2000-2004.	
d)	The management team is based in Uruguay and is located within 5 hours of travel to all areas of the project site All the management team is based in Uruguay. The headquarters are in Montevideo, and several staff members are located in the project sites. All project areas can be reached by good condition roads with a travel time of not more than 5 hours.	0
e)	The management team includes Carbosur, a climate change consultancy with more than 10-year experience in carbon projects in the forestry and other sectors Carbosur has been hired by 'Guanaré' as the contractor in charge of managing all aspects related to VCS registration and project monitoring. Carbosur has vast experience with the CDM and VCS, having successfully led the registration of one A/R CDM project (#3845), and having contributed significantly to the development of the first consolidated methodology for A/R CDM projects (ARACM0001), which is the one used for 'Guanaré' project. Carbosur also proposed to the A/R Working Group of the CDM a tool for accounting soil organic carbon in A/R CDM projects, which was later approved, with modifications, by the CDM Executive Board, and is also used in 'Guanaré' project. Carbosur has also led the registration of four CDM projects, and has another project requesting registration. In addition, it currently has another fourteen CDM and six VCS projects in several stages of development. Carbosur has also contributed to the development of VCS Guidelines for AFOLU projects released in 2008, and has also experience with the issuance of VCUs (Fray Bentos Biomass Power Project, issued in 2008). Carbosur also contributed with several comments to the non-permanence risk tool (used for this report), which were taken into consideration by the VCS. Finally, Carbosur has developed a REDD methodology for VCS for rainforest Alliance, which has not been submitted to the VCS.	-2

	Daniel Martino, former Executive Director of Carbosur was leader of 'Guanaré' VCS project during validation. After registration, Agustin Inthamoussu, General Manager has taken the leadership of Guanaré carbon projects and is the main responsible for this verification. Inthamoussu is a Reviewer of National GHG Inventories for UNFCCC, a member of the South America VCS Advisory Panel and JNR REDD Expert within the VCS. Inthamoussu has 6 years in developing afforestation carbon projects, being developed six VCS and one CDM A/R project.	
f)	Adaptive management plan is in place Adaptive management plans are those that identify, assess and create a mitigation plan for potential risks to the project and any other obstacle to project implementation. 'Guanaré' forest may be affected by mainly two potential risks that are common to other plantations in the rest of the country: fire and pest and disease outbreaks. Thus, 'Guanaré' plantations are constantly monitored. Guanaré S.A. (project participant), Guanaré A.A.R.L. (project participant) and Forestal Atlántico Sur (project manager), have a "Management and Monitoring Plan" (document attached as supporting documentation) which is a document with the general Management Plan and Monitoring in relation to the management of forest lands, according to the production objectives of the properties with environmental and sustainability criteria and social responsibility. Monitoring by means of reports of trained field staff is what makes possible early detection of potential pests and diseases as well as nutrient deficiencies. Biomass loss events (both biotic and abiotic) can be immediately detected through the continuous presence of experts in the forests and through the various systematic procedures in place. A continuous forest inventory has been implemented, including a visit to each plot every 6 months during the first two years after plantation, and every year thereafter, for measurement of a number of biometric variables: diameter at breast height, total height, and commercial height in order to evaluate and estimate the standing timber volume and with the purpose of developing the best silvicultural management plan adapted to the site conditions and species utilized. The mitigation plan vary on the biomass loss event reason: forest fires, while considered as of low risk, are the main risk factor. An integral plan for fire prevention has been implemented in 2007. It includes the definition of contingency plans for each region, the provision of fire-fighting equipment to all sites, the training of staff, and the coordination with other forest companies for fire watch and eventual responses in case of a fire start.. 'Guanare.' initiated contacts with other forestry companies present in the area of interest for the purpose of bringing them together and organized a forest fire protection plan. The main objective of this partnership is to increase the prevention capabilities, improve detection and firefighting and to integrate existing resources into a single technical plan protection. A second objective is to reduce the cost of protecting all participating companies. The first year of the PAIF Group (Temp. 2009-2010), 9 companies incorporated; with a total of 100,305 has plantation. The second season (2010-2011), there were 12 associates with a total of 153,154 ha plantations. For the past season (2011-2012) the total companies' partner is 13, totaling 229,000 hectares of plantations under protection. The Group is organized into 11 sub-areas or blocks of protection, in each of which is	-2

	defined detection resources, surveillance and combat, according to the plantation area, and territorial concentration. PAIF funding is done among the companies, see the following video: http://www.youtube.com/watch?v=lw-hv8MV6F4. Forests are also continuously monitored for the eventual appearance of pest or disease problems, as well as for eventual nutrient deficiencies. The continuous monitoring enables the rapid detection of potential risks and any other possible obstacles to project implementation. Every time a pest or disease attack event takes place, 'Guanaré' conducts a survey study to determine the source of the incident and applies the necessary mitigation measures to keep the forest health. In addition, the event is registered in a brief document with the purpose of collecting information to prevent the replication of the conditions that caused the pest attacks or plant diseases. Health monitoring reports includes the surveillance of <i>Thaumastocoris peregrinus</i>, <i>Gonipterus spp.</i>, <i>Coniothyrium zulluense</i>, among several pathogens. A copy of one these reports are included –confidential –as part of supporting evidence. In addition 'Guanaré', forest plantations also belong to a group of monitored fields supervised by INIA (public-private entity of Uruguayan National Investigation Institute on Agriculture), "Facultad de Agronomía" (Forest Department research area of the public University) and "Sociedad de Productores Forestales" (Research area of Uruguayan Forest Producers Union). The program consists in the monitoring of plagues in all national territory. Monitoring reports are not yet available; the INIA has not yet published any. Lessons learnt from different areas (forest prevention, pests attacks, irrigation, fertilization, silviculture, etc.) are being collected and documented in different documents in the company. These are also being incorporated in the project decision-making in future monitoring periods.	
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.		-4

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment	0
b)	Project cash flow breakeven point is between 7 and up to 10 years from the current risk assessment. Not applicable	0
c)	Project cash flow breakeven point between 4 and up to 7 years from the current risk assessment, as demonstrated in the actual project cashflow.	1
d)	Project cash flow breakeven point is less than 4 years from the current risk assessment. Not applicable	0
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven. Not applicable	0

f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	0
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven. Not applicable	0
h)	Project has secured more than 80% of funding needed to cover the total cash out before the project reaches breakeven. This is demonstrated in the attached Excel file and Memorandum prepared by Pedro Aramendía, CFO of Guanaré: total cost of purchased land and plantation costs represented 87% over the highest level of accumulated cash out in 'Guanaré' afforestation cash flows. There is no bank documentation (bank records) to demonstrate that funding has been secured because Guanaré did not apply for bank loans. Neither there is commodity purchase agreement, ERPAs or other signed contractual agreements. The most reliable and substantial demonstration are Guanaré's financial statements, in which it can be seen that the company has an enormous capital in assets (land and standing trees), demonstrating that funding for Guanaré project has already been secured, in other words the funding needed to implement Guanaré project has already been available and has already been executed.	0
i)	At the moment of this verification 'Guanaré' project has available as callable financial resources less than 50% of total cash out before project reaches breakeven point.	0
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)] Total may not be less than zero.		1

Opportunity Cost		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated. Not applicable.	0
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to 100% more than from project activities. Not applicable.	0
c)	NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than from project activities. Not applicable.	0
d)	NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated. Not applicable.	0
e)	NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity. Not applicable.	0
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity. It was demonstrated in the PD that the baseline scenario (extensive beef cattle	-4

	production) is the only possible alternative land use activity within 'Guanaré' project boundaries. The IRR of this activity is less than half that expected for the project activity (please, see attached worksheet).	
g)	Mitigation: project proponent is not a non-profit organization. Not applicable.	0
h)	Mitigation: Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over the length of the project crediting period. Not applicable.	0
i)	Mitigation: Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over at least 100 years. Not applicable.	0
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)] Total may not be less than 0.		0

Project Longevity		
a)	'Guanaré' (Guanaré S.A. and Guanaré A.A.R.L.) is the project proponent and the owner with full property rights of the project land, as demonstrated by the notarial certificates during validation. All lands are legally registered in the National Directorate of Land Registry. A notarial deed of incorporation of the companies <i>Guanaré S.A.</i> and <i>Guanaré A.A.R.L.</i> was also available during validation. The proof of title will be maintained for the entire project longevity. As part of corporate responsibility and commitment to the environment, society and the economic viability of its business <i>Guanaré</i> has been granted FSC (Forest Stewardship Council) certification for the sustainable management of its forest plantations sustainably managed². The sale of land or the conversion of forest to other land uses are not considered as possible sources of income, and it is assumed that the project will continue to operate indefinitely over time. The only limit to the operational life of the project is given by the legal term of validity of <i>Guanaré S.A.</i>, set in activity especially for investments in the project and related investments (e.g., other forests not included in the carbon project). This legal term is 100 years, which can be renewed as many times as needed. Thus, it is defined that the project's operational lifetime is 100 years from the date of commencement of operations of <i>Guanaré S.A.</i> (24 April 2006). A memorandum declaring that the project longevity is at least 100 year was available to the validation team. Is important to clarify that including selling the land at the end of the	$24 - (100/5) = 4$

² See certificates in the following links:

<http://info.fsc.org/details.php?id=a0240000005sUZWAA2&type=certificate>

	crediting period (60 years) in the economic analysis is done in order to follow basic economy rules. It does not mean that the land will be actually sold at the year 60 of the project. It is necessary to assume a fixed income for land selling with the aim of obtaining a reasonable Internal Rate of Return (IRR), comparable with the benchmark.	
b)	With legal agreement or requirement to continue the management practice. Not applicable.	0
Total Project Longevity (PL) May not be less than zero		4

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	2

2 EXTERNAL RISKS

Document and substantiate the risk and/or mitigation for each risk factor applicable to the project. Include any relevant documentary evidence. Where a risk or mitigation is not relevant to the project, please write "Not applicable".

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Ownership and resource access/use right are held by the same entity. 'Guanaré' holds full property rights on the land and there are absolutely no disputes over the tenure or use of the land. There are no indigenous groups in Uruguay in general, or in the areas where the project lands are located, in particular. There are no sites of interest to local communities within the premises of the company.	0
b)	Ownership and resource access/use rights are held by different entity(s) (e.g., land is government owned and the project proponent holds a lease or concession). Not applicable.	0
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership. Not applicable	0
d)	There exist disputes over access/use rights (or overlapping rights). Not applicable.	0
e)	WRC projects unable to demonstrate that potential upstream and sea impacts that could undermine issued credits in the next 10 years are irrelevant or expected to be insignificant, or that there is a plan in place for effectively mitigating such impacts. Not applicable	0
f)	Mitigation: Project area is protected by legally binding commitment (e.g., a conservation easement or protected area) to continue management practices	0

	that protect carbon stocks over the length of the project crediting period. Not applicable.	
g)	Mitigation: Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have implemented activities to resolve the disputes or clarify overlapping claims. Not applicable.	0
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)] Total may not be less than zero.		0

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Local population are not reliant on the project area, the risk is not relevant to the project.	0
b)	Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted. Not applicable.	0
c)	Mitigation: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area. Not applicable.	0
Total Community Engagement (CE) [where applicable, (a + b + c)] Total may be less than zero.		0

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Governance score of less than -0.79. Not applicable	0
b)	Governance score of -0.79 to less than -0.32. Not applicable	0
c)	Governance score of -0.32 to less than 0.19. Not applicable	0
d)	Governance score estimation, according to the World Bank Institute Worldwide Governance Indicators is 0.781. The worksheet used to estimate the value will be available for the verification team.	1
e)	Governance score of 0.82 or higher. Not applicable	0
f)	Mitigation: Uruguay has an established Designated National Authority under the CDM (http://cdm.unfccc.int/DNA/index.html?click=dna_forum) and has one registered CDM Afforestation/Reforestation project (http://cdm.unfccc.int/Projects/DB/BVQI1278956093.58/view)	-2
Total Political (PC) [as applicable ((a, b, c, d or e) + f)] Total may not be less than zero.		0

External Risk	
Total External Risk (LT + CE + PC) Total may not be less than zero.	0

3 NATURAL RISKS

Explain the significance and likelihood of the natural risk and any mitigation activities implemented, (copy table for each natural risk).

Natural Risk (Fire)	
Significance	Insignificant (less than 5% loss of carbon stocks)
Likelihood	Every 25 to less than 50
Score (LS)	1 Conservative approach has been applied considering statistics of 5 years (2005-2012) provided by National Firefighting Directorate (Presidency of the Republic) (documents archived as part of project documentation)
Mitigation	0.5 Mitigation of risks factor are applied, prevention and mitigation measures are considered in Grupo PAIF (in spanish "Proteccion Ante Incendio Forestales") which is an aggrupation of forestry companies to combat forest fires) and archived as part of the project documentation.

Natural Risk (Pest and disease outbreak)	
Significance	Minor (5% to less than 25% loss of carbon stocks)
Likelihood	Every 50 to less than 100
Score (LS)	1 <i>Eucalyptus grandis</i> , one of the most planted eucalypt species in Uruguay, is well known to be the least susceptible to pest and diseases in Uruguay's growing conditions. According to Morey and Porcile ³ (who conducted a thorough historical analysis of pest and disease events in Uruguay) concluded that there were few incidents or losses due to those events: 1937: first detection of <i>Gonipterus</i> sp. It had reduced impact on biomass losses due to the prompt introduction of its natural enemy in 1941. This insect is present in forest plantations all over the country, but it does not represent a significant threat and it is not declared as a plague. Significance: 4%, assuming conservative values. 1981: <i>Platypus</i> sp. affecting <i>E. grandis</i> and red gum Eucalyptus in

³ "Aspectos fitosanitarios del desarrollo forestal en Uruguay". Carlos S. Morey Tremoleras y Juan Francisco Porcile Maderni

	Paysandú (Western Uruguay). It had an important incidence in <i>Populus sp.</i> but it does not significantly affect <i>Eucalyptus sp.</i> Significance: 0% • 1983: <i>Diloboderus abderus</i> larvae affecting young plantations. It did not have any influence on Eucalyptus plantations. Significance: 0% • 1989: in 1932 it was detected by the first time <i>Phoracantha semipunctata</i>. Twelve years later it was declared as a plague in agricultural fields. Damages related to this insect are associated to the occurrence of adverse weather conditions. In the 1989 drought, it was the first and only time when the plague affected forest plantations in the Uruguayan territory; all other diseases and pest were always located on specific sites and weather conditions. There is no official record about the magnitude of the incidence in volume or area affected. According to Morey and Porcile the pest attacked more than 5% of all planted trees in stands larger than 3 ha. Significance: 10%, assuming conservative values. • 1990: <i>Phytophthora ssp</i> and leaf spots diseases. It has not been estimated and it is not possible to determine the real loss value. In the same year, a natural enemy was introduced. Significance: 0% Currently, some other minor diseases could be found (<i>Thaumastocoris</i>, <i>Phoracantha</i>, <i>Botryosphaeria</i>, <i>Puccinia</i>) mainly associated with periods of stress (drought, frosts, high density stands or improper silvicultural management practices). Damages due to these agents are considered as insignificant. Considering the information presented above and the relatively low level of information available at the National or local level, a conservative approach has been applied. The risk of pest and disease outbreak is assumed as of mean significance (selected value is 5%); and with likelihood of every 50 to less than 100 years.
Mitigation	0.5 In 1995 the Uruguayan Government signed and became part of the Montreal Process which involved the adoption of several indicators and criteria related to the Sustainable Forest Management. Third criterion refers specifically to the Maintenance of Health and Vitality of Forest Ecosystems. Uruguay has freely committed itself to periodically evaluate the evolution of the forest health in time and space and maintain its health. When referring specifically to “<i>Guanaré</i>”, the same procedures are applied within the entire project boundaries: a continuous forest inventory has been implemented which monitors and assessed –among several variables –the actual health of plantations in order to detect in advance any disease spread or plagues attack. The person in charge of project management visiting the project plantations to monitor the health status and observe the possible appearance of pest and disease agents on an almost daily basis. Evaluation reports are available to the validation team.

Natural Risk (Extreme Weather)	
Significance	Insignificant (less than 5% loss of carbon stock) and transient (full recovery of lost carbon stocks expected within 10 years of any event)
Likelihood	Less than every 10 years
Score (LS)	2 According to Morey and Porcile, there were 12 extreme weather events during the last 140 years (study done at a National level). Most of them were droughts but also some flood events took place: • 1869/70: Severe drought • 1877/79: drought • 1891/1893: drought • 1903: drought and harvest losses in agriculture fields • 1906/08: drought and lobster invasion (incidence in crops) • 1914: floods • 1915/16: drought and lobster invasion (incidence in crops) • 1942: drought • 1959: floods • 1964/1965: drought • 1988/89: severe drought • 1997/98: severe drought • 2005: severe wind storm • 2009/2010: drought Some other events were also registered by the Emergency System (Presidency of the Republic)⁴: • 10/10/2007: storm, wind and heavy rains. Fallen trees and roofs blown: http://www.elpais.com.uy/07/10/11/pciuda_307507.asp • 17/11/2010: Wind and heavy rain, hail. Plantations affected: http://climacanelonesuruguay.blogspot.com/p/tiempo-severo-en-uruguay.html The severity of these events was not measured for the particular case of forests. The only weather condition that directly affected the forest sector was the 2005 wind storm. However, there is no information available on its impacts, which were mostly localized in several spots in the South of the country.
Mitigation	0.5

Natural Risk (Geological risk)	
Significance	No Loss.
Likelihood	Risk associated to earthquakes and volcanoes are not applicable to the project

⁴ http://www.sne.gub.uy/index.php?option=com_docman&task=doc_download&qid=119&Itemid=36

	area since no such activities have occurred during the last 100 years in Uruguay. According to CERESIS (Regional Center for Seismology for South America – acronyms in Spanish), there were no earthquakes in the project activity region in the last 100 years (http://www.ceresis.org/ceresis/consulta.htm). In relation to volcanoes, the book <i>Physical Geography</i>, developed by Mcknight, T., Hess, D. (2008) demonstrates that distribution of such geological events are associated to tectonic plates boundaries (Mcknight, T., Hess, D., 2008). The location of the project activity and the whole of Uruguayan territory are far from any plate edge.
Score (LS)	0
Mitigation	Not applicable

Score for each natural risk applicable to the project (Determined by $LS \times M$)	
Fire (F)	0.5
Pest and Disease Outbreaks (PD)	0.5
Extreme Weather (W)	1
Geological Risk (G)	0
Other natural risk (ON)	0
Total Natural Risk (as applicable, $F + PD + W + G + ON$)	2

4 OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

4.1 Overall Risk Rating

Risk Category	Rating
a) Internal Risk	2
b) External Risk	0
c) Natural Risk	2
Overall Risk Rating (a + b + c)	4

4.2 Calculation of Total VCU

The minimum risk rating is selected (10 percent, according to the Non-Permanence Risk Tool), given the fact that the overall risk rating does not overpass the minimum applicable holding percentage. The amount of VCUs retained in the buffer account can be modified according to subsequent risk assessments at the verification stage.

The estimated amount of GHG credits for the 60-year crediting period is presented in the following table.

GHG Credit Calculation	tCO ₂
Change in carbon stocks	7,644,973
Leakage	0
Net GHG Benefits (change in carbon stocks minus leakage)	7,644,973
Buffer credits (10% of Net GHG benefits)	764,497
GHG credits issued (VCUs)	6,880,476

The estimated amount of GHG credits for the first verification is presented in the following table.

GHG Credit Calculation	tCO ₂
Change in carbon stocks	3,068,303
Leakage	0
Net GHG Benefits (change in carbon stocks minus leakage)	3,068,303
Buffer credits (10% of Net GHG benefits)	306,831
GHG credits issued (VCUs)	2,761,472