



**Verified Carbon
Standard**

NON-PERMANENCE RISK REPORT YELLOW IPÊ GROUPED REDD PROJECT



Ecológica

Document Prepared by Ecológica Assessoria Ltda.

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1 INTERNAL RISK

Project Management		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Species planted (where applicable) associated with more than 25% of the stocks on which GHG credits have previously been issued are not native or proven to be adapted to the same or similar agro-ecological zone(s) in which the project is located. Not applicable. The project area's vegetation is 100% native, with no planting occurring.	Not applicable
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. Project proponents consider that less than 50% of the carbon stocks are fragile to encroachment by outside actors. The project proponent's strategy to manage possible conflicts is to promote benefits to the community, through the generation of jobs and to establish a good relationship with them. The main deforestation agents are timber harvesting, livestock and the illegal road that crosses the project area at its northwestern border, which is the most likely area to be invaded. These agents affect less than 50% of stocks as it can be seen in deforestation projection, where 27,228.38 hectares would be deforested in 30 years, representing 31,6% of total project area.	0
c)	Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (ie, any area of required experience is not covered by at least one individual with at least 5 years of experience in the area) The work of the Ecológica Assessoria is included here under the direction of Stefano Merlin, co-founder and CEO of Ecológica Assessoria, co-founder the Ecológica Institute NGO in 1998, in the state of Tocantins Brazil. Ecológica Institute experience in forest projects dates back to 1998 with ten projects and contracts. To give two examples: the reforestation project located at the INCRA project called "Assentamento Manchete", in Tocantins State, of which the project document was published on 25/August/2008¹; and the conservation, regeneration and agroforestry systems projects on the Ilha do	0

¹ More details at: <<http://iecologica.blogspot.com.br/2009/06/entre-os-meses-de-janeiro-e-maio-de.html>> and <<http://www.ecologica.org.br/en/carbono-florestal/>>. Last visit on: 05/06/2020

	Bananal, consisting of two phases from 1998-2003 and 2000 - 2002, details of which can be found at the following web address: http://www.ecologica.org.br/en/sequestro-de-carbono-na-ilha-do-bananal/, and in peer-reviewed scientific journals². In addition, the Ecológica Assessoria team under the leadership of Marcelo Haddad, has successfully validated and verified more than 50 voluntary emission reduction projects, over twelve years, details of which can be found on Mr. Haddad's CV: http://buscatextual.cnpq.br/buscatextual/visualizacv.do?id=K4491762P1. Four forestry projects were developed: "Ecomapuá Amazon REDD Project" in the State of Pará, "Genesis Forest Project: Reducing Greenhouse Gas Emissions from Deforestation and Degradation in the State of Tocantins, Brazil"; "Genesis Forest Project: Reforestation of Brazilian Savannah with Native Species in the State of Tocantins, Brazil" and "Agrocortex REDD Project" in the States of Amazonas and Acre³. He also participated in the development of Environmental and Socio-Economic Indicators for REDD projects to be used under the SOCIALCARBON Standard⁴. Moreover, Mr. Haddad participated in several activities in charge of the Governors Climate and Forests Task Force (GCF) in the State of Tocantins (workshops, REDD+ course, creation of database with landowners, estimates of GHG emission reductions by REDD+ in Tocantins, and development of reports to Environmental Agencies)⁵. Finally, Mr. Haddad's master thesis, entitled: "An analysis of REDD+ mechanisms and their benefits in Brazil"⁶, obtained in May 2013, has the main aim of identifying the benefits of applying REDD+ mechanisms in Brazil, in accordance to the VCS requirements.	
d)	Management team does not maintain a presence in the country or is located more than a day of travel from the project site, considering all parcels or polygons in the project area.	2

² Boyd *et al.* Exploring socioeconomic impacts of forest based mitigation projects: Lessons from Brazil and Bolivia. Environmental Science & Policy. Number 10 (2007). pp. 419 – 433.

³ The details of these projects can be found here: Ecomapuá Amazon REDD Project: <https://registry.terra.org/app/projectDetail/VCS/1094>; and Genesis Forest Projects: <http://www.climate-standards.org/2009/02/13/genesis-forest-project-reforestation-of-brazilian-savannah-native-species-in-the-state-of-tocantins-brazil/> and <http://www.climate-standards.org/2009/02/13/genesis-forest-project-reducing-greenhouse-gas-emissions-from-deforestation-and-degradation-in-tocatins-state-brazil/>; and Agrocortex REDD Project <https://registry.terra.org/app/projectDetail/VCS/1686>. Last visit on: 05/06/2020.

⁴ Available at: http://www.socialcarbon.org/wp-content/uploads/2012/11/Template_Submission_of_Indicators-for-an-Amazon-REDD-Project_v1-1_08_11_20131.pdf. Last visit on: 05/06/2020.

⁵ Available at: <http://www.ecologica.org.br/en/projeto-gcf-tocantins-a-forca-tarefa-dos-governos-para-clima-e-florestas/>. Last visit on: 05/06/2020.

⁶ Available at: <http://carbonosustentavelbrasil.files.wordpress.com/2013/09/dissertac3a7c3a3o-marcelo-h-s-haddad.pdf>. Last visit on: 05/06/2020.

	The management team, responsible for reporting and responding to any events, such as unpermitted deforestation, degradation, or unauthorized resource use, is located more than a day of travel from the project site. The entire team is located outside the State of Amazonas, and, once in Novo Aripuanã city, it is necessary to travel more than 120 km by road and river to reach the project area. To reach the furthest point in the area, it takes another 95 km by river.	
e)	Mitigation: Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting (eg, individuals who have successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs. Ecológica Assessoria team includes members responsible for the validation of verification of more than 20 voluntary emission reduction Projects, as described on item (c), above.	-2
f)	Mitigation: Adaptive management plan in place The Yellow Ipê Grouped REDD Project applies the SOCIALCARBON® Standard, which includes, as the relevant tool specifies, “processes for monitoring progress and documenting lessons learned or corrections that may be needed”. At the end of each monitoring period, an action plan will be carried out for improvements in the next period. Therefore the relevant mitigation score was applied here. This methodology is an innovative concept developed by the Ecológica Institute to measure the contribution of carbon projects to sustainability. The SOCIALCARBON® Methodology is based on six main indicators: Biodiversity; Natural; Financial; Human; Social and Carbon Resources and aims to deliver high-integrity benefits to each resource. A set of indicators has been developed as part of the efforts from the Project Proponents to properly measure the impacts and cobenefits resulting from the Yellow Ipê Grouped REDD Project, which are available on the SOCIALCARBON website⁷.	-2
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.		-2

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating

⁷ SOCIALCARBON indicators are available at: <<http://www.socialcarbon.org/documents/>>.

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 less than 10 years from the current risk assessment	0
c)	Project cash flow breakeven point between 4 and up to less than 7 years from the current risk assessment	0
d)	Project cashflow breakeven point is less than 4 years from the current risk assessment Calculations of cash flow breakeven point revealed that it would be attained in less than 4 years from the current risk assessment.	0
e)	Project has secured 15% of funding needed to cover the total cash out before the project reaches breakeven	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	0
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven The agreement between Ecológica Assessoria Ltda. and the project participants of the Yellow Ipê Grouped REDD Project considers that Ecológica is responsible for all the related project development costs, including validation, verification and most of registry expenses, while project participants are responsible for carrying out socioenvironmental activities and forest conservation measures. Therefore, the project participants have secured more than 80% of funding needed to cover the total cash out before the project reaches breakeven.	0
i)	Mitigation: Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven The project does not have any available callable financial resources to cover the total cash out	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.		0

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	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	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	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 As described on the VCS PD, the most likely alternative scenario is considered to be cattle ranching. Although having a lower IRR, the cattle ranching activity has a higher NPV, as demonstrated in the cashflow spreadsheet. Carbon credits compose a significant income to the project activity to maintain its operations and benefits. Simulations on the projected cashflow indicate the NPV from the alternative land use scenario would be 15% higher than NPV project activities. Other land uses are not considered credible alternatives or to provide lower NPV. The scenario involving the continuation of current (pre-project) land use scenario is not expected to provide financial returns, as unplanned deforestation is performed by unrelated third parties, instead of a single entity.	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	0
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity	0
g)	Mitigation: Project proponent is a non-profit organization Project proponent is not a non-profit organization.	0
h)	Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over the length of the project crediting period (see project longevity)	0

	The project does not have any legal agreement or requirement to continue the management practice.	
i)	Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over at least 100 years (see project longevity) The project does not have any legal agreement or requirement to continue the management practice.	0
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)] Total may be less than 0.		0

Project Longevity		
a)	Without legal agreement or requirement to continue the management practice The project does not have any legal agreement or requirement to continue the management practice.	18
b)	With legal agreement or requirement to continue the management practice The project does not have any legal agreement or requirement to continue the management practice.	0
Total Project Longevity (PL) May not be less than zero		18

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	16

2 EXTERNAL RISKS

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Ownership and resource access/use rights are held by same entity(s) Yes, both ownership and resource access/use rights are held by the same entity.	0
b)	Ownership and resource access/use rights are held by different entity(s) (eg land is government owned and the project proponent holds a lease or concession) Both ownership and resource access/use rights are held by the same entity.	0
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership There are no disputes over land tenure or land ownership within the project area.	0
d)	There exist disputes over access/use rights (or overlapping rights) There are no disputes over access/use rights or overlapping rights within the project area. There are approximately 8 families living in the Leakage Management Area. These people are known in the region as riverine, fishermen and small farmers, and use the area for subsistence plantation. There are no conflicts with this community.	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	Not Applicable
f)	Mitigation: Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period The project area is not protected by legally binding commitment to continue management practices that protect carbon stocks over the length of the project crediting period.	0
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 There are no disputes over land tenure, ownership or access/use rights within the project area.	0

Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)]	0
Total may not be less than zero.	

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted There are approximately 8 families living in the Leakage Management Area. These families have been consulted during the validation of the project, as part of the Local Stakeholder Consultation. The project was presented in simple and accessible language, appropriate to the colloquial discourse used by this community.	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 There are approximately 8 families living in the Leakage Management Area. These families have been consulted during the validation of the project. The project was presented in simple and accessible language, appropriate to the colloquial discourse used by this community.	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 A proportion of funds from the sale of carbon credits will be used for socially and environmentally beneficial programs run within the leakage management area. Besides forest conservation, the present project aims to improve and quantify its social and environmental benefits through application of the SOCIALCARBON® Methodology. This methodology is an innovative concept developed by the Ecológica Institute to measure the contribution of carbon projects to sustainability. The SOCIALCARBON® Methodology is based on six main indicators: Biodiversity; Natural; Financial; Human; Social and Carbon Resources. The SOCIALCARBON® Standard will help to demonstrate social and environmental benefits beyond GHG emissions reductions or removals.	-5
Total Community Engagement (CE) [where applicable, (a + b + c)]		-5

Total may be less than zero.

Political Risk																																																																																																																							
Risk Factor	Risk Factor and/or Mitigation Description										Risk Rating																																																																																																												
a)	Governance score of less than -0.79										Not Applicable																																																																																																												
b)	Governance score of -0.79 to less than -0.32										Not Applicable																																																																																																												
c)	Governance score of -0.32 to less than 0.19 Mean of the 6 World Bank Institute Worldwide Governance Indicators for Brazil across the most recent five years of available data (2015 – 2019)⁸ : -0,18. Please, see table below: <table><tr><th colspan="12">Worldwide Governance Indicators (WGI) - Brazil</th></tr><tr><th colspan="2">Voice & Accountability</th><th colspan="2">Political Stability and Absence of Violence</th><th colspan="2">Government Effectiveness</th><th colspan="2">Regulatory Quality</th><th colspan="2">Rule of Law</th><th colspan="2">Control of Corruption</th></tr><tr><th>Year</th><th>Rank</th><th>Year</th><th>Rank</th><th>Year</th><th>Rank</th><th>Year</th><th>Rank</th><th>Year</th><th>Rank</th><th>Year</th><th>Rank</th></tr><tr><td>2015</td><td>0,460</td><td>2015</td><td>-0,330</td><td>2015</td><td>-0,180</td><td>2015</td><td>-0,190</td><td>2015</td><td>-0,150</td><td>2015</td><td>-0,400</td></tr><tr><td>2016</td><td>0,450</td><td>2016</td><td>-0,380</td><td>2016</td><td>-0,170</td><td>2016</td><td>-0,210</td><td>2016</td><td>-0,160</td><td>2016</td><td>-0,380</td></tr><tr><td>2017</td><td>0,450</td><td>2017</td><td>-0,420</td><td>2017</td><td>-0,290</td><td>2017</td><td>-0,110</td><td>2017</td><td>-0,280</td><td>2017</td><td>-0,530</td></tr><tr><td>2018</td><td>0,400</td><td>2018</td><td>-0,390</td><td>2018</td><td>-0,450</td><td>2018</td><td>-0,320</td><td>2018</td><td>-0,250</td><td>2018</td><td>-0,400</td></tr><tr><td>2019</td><td>0,340</td><td>2019</td><td>-0,550</td><td>2019</td><td>-0,190</td><td>2019</td><td>-0,180</td><td>2019</td><td>-0,180</td><td>2019</td><td>-0,330</td></tr><tr><td>Mean</td><td>0,420</td><td>Mean</td><td>-0,414</td><td>Mean</td><td>-0,256</td><td>Mean</td><td>-0,202</td><td>Mean</td><td>-0,204</td><td>Mean</td><td>-0,408</td></tr></table> The mean of the Governance Scores across the six indicators of the World Bank Institute’s Worldwide Governance Indicators (WGI), averaged over the most recent 5 years of available data (between 2015 and 2019) for Brazil was equal to -0,18.										Worldwide Governance Indicators (WGI) - Brazil												Voice & Accountability		Political Stability and Absence of Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption		Year	Rank	Year	Rank	Year	Rank	Year	Rank	Year	Rank	Year	Rank	2015	0,460	2015	-0,330	2015	-0,180	2015	-0,190	2015	-0,150	2015	-0,400	2016	0,450	2016	-0,380	2016	-0,170	2016	-0,210	2016	-0,160	2016	-0,380	2017	0,450	2017	-0,420	2017	-0,290	2017	-0,110	2017	-0,280	2017	-0,530	2018	0,400	2018	-0,390	2018	-0,450	2018	-0,320	2018	-0,250	2018	-0,400	2019	0,340	2019	-0,550	2019	-0,190	2019	-0,180	2019	-0,180	2019	-0,330	Mean	0,420	Mean	-0,414	Mean	-0,256	Mean	-0,202	Mean	-0,204	Mean	-0,408	2
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d)	Governance score of 0.19 to less than 0.82										Not Applicable																																																																																																												
e)	Governance score of 0.82 or higher										Not Applicable																																																																																																												
f)	Mitigation: Country implementing REDD+ Readiness or other activities such as:										-2																																																																																																												

⁸ Available at: < <http://info.worldbank.org/governance/wgi/Home/Reports> >. Last visit on: 12/06/2020.

	The Project Area is located in the State of Amazonas. The State/jurisdiction is participating in the Governors' Climate and Forest Taskforce (GCF) ⁹	
Total Political (PC) [as applicable ((a, b, c, d or e) + f)]		0
Total may not be less than zero.		

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

3 NATURAL RISKS

Natural Risk - Fire	
Significance	Insignificant Between 2013 and 2019, only 24 fire outbreaks were identified within the project's region, 21 of which were considered low risk¹⁰. Higher fire risks are located over 2 km distant from the project area, where several fire spots were identified over the analyzed period. The analyzes were made based on data from the Brazilian National Institute of Space Research, INPE¹¹, with satellite images (from PRODES) and records of fire outbreaks.
Likelihood	Less than every 10 years INPE sources report that the project area is within a minimal-low fire risk region¹². No high risk was detected from 2014 to 2019, however there are occurrence of fires in the region due to deforestation (slash and burning practices).
Score (LS)	2

⁹ Available at: < <https://www.gcftf.org/who-we-are/> >. Last visit on: 15/09/2021.

¹⁰ Fire risk calculation methodology: <http://queimadas.cptec.inpe.br/~rqueimadas/documentos/RiscoFogo_Sucinto.pdf> Last visit on 22/06/2020

¹¹ Available at: < <http://queimadas.dgi.inpe.br/queimadas/bdqueimadas#>>

¹² Fire risk map. Available at: <<https://queimadas.dgi.inpe.br/queimadas/risco-de-fogo-meteorologia>>. Last visit on: 22/06/2020

Mitigation	No measures are taken for addressing this matter.
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Natural Risk - Pest and Disease outbreaks	
Significance	No loss There was no record of any pest and disease outbreak in the project areas of the Yellow Ipê Grouped REDD Project. The project area is covered by 100% old-growth Amazon Rainforest; therefore, this system in equilibrium reduces the significance of pest and disease outbreaks. In such environments, plants live in harmony with pests and diseases. The plants are well adapted to the place they are living in, there are sufficient quantity and quality of nutrients in the soil, with good humidity conditions, incidence of light and the presence of natural predators and biological pest and disease controllers. Thus, pests and diseases do not increase their population, as the environment does not favor the expansion of these agents¹³.
Likelihood	Every 50 to less than 100 years
Score (LS)	0
Mitigation	No measures are taken for addressing this matter.

Natural Risk – Extreme Weather	
Significance	Insignificant The significance of blow-down winds was determined using a search of the BDMEP (Meteorological Database for Research and Education) platform¹⁴, created by the INMET (Meteorological National Institute)¹⁵. There is no measurement station in Nova Aripuanã, so the database of <i>Manicoré</i> Station was used. <i>Manicoré</i> is a city 126 km distant from the Nova Aripuanã center.

¹³ ZANUNCIO JUNIOR, José Salazar et al. Manejo Agroecológico de Pragas: alternativas para uma agricultura sustentável. Revista Científica Intelletto, Venda Nova do Imigrante, v. 3, n. 3, p. 18-34, 2018. Available at: <https://biblioteca.incaper.es.gov.br/digital/bitstream/123456789/3582/1/Manejo-agroecologico-de-pragas-v3-n3-2018.pdf>. Last visit on: 15/02/2021.

¹⁴ Available at: < <http://www.inmet.gov.br/portal/index.php?r=bdmep/bdmep> > Last visited on 22/06/2020

¹⁵ Available at: < <http://www.inmet.gov.br/portal/index.php?r=home2/index> > Last visited on 22/06/2020

	From 2010 to 2020, the wind speed has never exceeded 10 m/s, which is significantly below the wind speed for the categories of tropical storm or hurricane ¹⁶ .
Likelihood	Every 10 to less than 25 years No extreme weather events damaging the project area were reported by the land owner. The likelihood of blow-down winds was determined using a search of the BDMEP platform wind records during 2010 to 2020. In continental equatorial regions of the Amazon, hurricane damage does not occur. However, Espírito-Santo et al. (2010)¹⁷ used Landsat images of the Brazilian Amazon to detect large natural gaps (>30 ha) with fan-shape forms (blowdowns), probably caused by high-velocity wet downburst winds. Blow-down occurrence frequency and the associated disturbance area are usually greater where severe storms occurred more frequently. Nevertheless, the conclusion of this study shows that the recurrence interval for blow-downs in the western Amazon region is around 27,000 years, based on the occurrence of new blow-downs and the assumption of a constant disturbance rate for the western region.
Score (LS)	1
Mitigation	No measures are taken for addressing this matter.

Natural Risk – Geological Risks	
Significance	No Loss No geological events damaging the project site were reported by the landowner. Furthermore, the Novo Aripuanã's geological report¹⁸, developed by Brazilian's geological service (CPRM)¹⁹, does not indicate any of the project areas as high and very high geological risk, with the geological risk of the municipality concentrated in the urban area.
Likelihood	Every 50 to less than 100 years

¹⁶ National Weather Service (USA): weather categories determined using Saffir-Simpson Hurricane Wind Scale: <<http://www.nhc.noaa.gov/aboutsshws.php>>. Last visit on 15/06/2020

¹⁷ Espírito-Santo et al. (2010). Storm intensity and old-growth forest disturbances in the Amazon region, Geophysical Research Letter, Volume 37, L11403. Available at: <<http://onlinelibrary.wiley.com/doi/10.1029/2010GL043146/pdf>>. Last visit on: June 12th, 2020.

¹⁸ 2014's report available at <<http://rigeo.cprm.gov.br/jspui/handle/doc/19348>> Last visited on 22/06/2020

¹⁹ Available at: <<http://www.cprm.gov.br/>> Last visited on 22/06/2020

	The project area is located in a stable geological area with no faults. No geological events damaging the project site were reported in the interview. In addition, the average altitude is about 140 m, and slope between 4 and 5%, characterizing a flat region with low chances of mass movement and landslide. Generally, land slide events may occur in areas with slopes above 20°-25°, when forested lands begin to be subject of landslides²⁰. Therefore, there is a minimal risk of landslides within the project area. In addition, such event has never happened according to the project owner and his management team.
Score (LS)	0
Mitigation	No measures are taken for addressing this matter.

Natural Risk – Other Natural Risk	
Significance	No Loss No other sources of natural risk were identified in interview or literature sources.
Likelihood	Risk is not applicable to project area
Score (LS)	0
Mitigation	No measures are taken for addressing this matter.

Score for each natural risk applicable to the project (Determined by (LS × M))	
Fire (F)	(2 × 1) = 2
Pest and Disease Outbreaks (PD)	(0 × 1) = 0
Extreme Weather (W)	(1 × 1) = 1
Geological Risk (G)	(0 × 1) = 0

²⁰ Ministérios das Cidades. Capacitação em Mapeamento e Gerenciamento de Risco. Available at: <<http://www.defesacivil.mg.gov.br/images/documentos/Defesa%20Civil/manuais/mapeamento/mapeamento-grafica.pdf>>. Last visit on: June 12th, 2020.

Other natural risk (ON)	$(0 \times 1) = 0$
Total Natural Risk (as applicable, F + PD + W + G + ON)	$(2 + 0 + 1 + 0 + 0) = 3$

4 OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

4.1 Overall Risk Rating

Risk Category	Rating
Internal Risk	16
External Risk	0
Natural Risk	3
Overall Risk Rating (a + b + c)	19

4.2 Calculation of Total VCU

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Ex ante buffer credits (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
2020 (01-March-2020 to 31-December-2020)	24,901	1,023	0	4,290	23,877
2021	34,638	1,424	0	5,971	33,215
2022	52,874	2,173	0	9,118	50,701
2023	61,637	2,533	0	10,635	59,104
2024	87,549	3,598	0	15,107	83,950
2025	86,641	3,561	0	14,964	83,080
2026	119,619	4,917	0	20,657	114,703
2027	157,159	6,459	0	27,141	150,699
2028	172,821	7,103	0	29,861	165,718
2029	195,556	8,038	0	33,801	187,518
2030	225,836	9,282	0	39,038	216,554
2031	227,359	9,345	0	39,327	218,014

2032	284,548	11,695	0	49,201	272,853
2033	303,482	12,474	0	52,492	291,009
2034	345,178	14,187	0	59,702	330,990
2035	405,979	16,686	0	70,212	389,293
2036	449,102	18,459	0	77,677	430,644
2037	524,746	21,568	0	90,745	503,178
2038	629,291	25,865	0	108,801	603,426
2039	747,147	30,709	0	129,162	716,438
2040	858,576	35,289	0	148,428	823,288
2041	943,369	38,774	0	163,123	904,595
2042	1,032,245	42,427	0	178,520	989,819
2043	1,097,470	45,108	0	189,856	1,052,363
2044	1,132,776	46,559	0	196,038	1,086,217
2045	1,256,631	51,649	0	217,468	1,204,982
2046	1,301,654	53,500	0	225,330	1,248,154
2047	1,313,665	53,993	0	227,498	1,259,672
2048	1,334,018	54,830	0	231,087	1,279,188
2049	1,267,573	52,099	0	219,707	1,215,474
2050 (01-January-2050 to 28-February-2050)	225,946	9,287	0	39,154	216,659
Total	16,899,988	694,613	0	2,924,111	16,205,376