Verified Carbon Standard

BURITIRANA GROUPED REDD+ PROJECT

FUTURE CARBON GROUP

Document Prepared by FUTURE Forest

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1 PROJECT DETAILS

1.1 Summary Description of the Project

In Brazil, 58.39% of its entire 851,034,553.8 ha territory[1] is covered by forests, representing almost 497 million hectares of forest area[2] and putting it in second place for nations with most forest area worldwide. Brazil has also been at times the country with the highest levels of deforestation in the world, having lost almost 15 million hectares of its forest area from 2010 to 2020[3]. The expansion of the agriculture frontier due to cattle ranching, soy farming, mining, timber collection, infrastructure and colonization by subsistence agriculturalists has contributed to this historically high deforestation rate.

The state of Tocantins is in the Northern region of Brazil, which main biomes are Amazon and Cerrado. The region also holds cities with highest deforestation[4] rates and beef producers[5], which is a deforestation driver for the region, besides mining and agriculture. Although Tocantins state is located in the administrative region known as Legal Amazon, it is also covered by Cerrado biome, which is similar to savannah with a rich biodiversity. In addition, the region named as MATOPIBA, composed by several municipalities from four states (Maranhão, Tocantins, Piauí and Bahia), also registers high deforestation rates in the Cerrado biome. Between August 2020 and July 2021, the region reached a deforestation record of 5,200 km[2], which represents more than 60% of national Cerrado deforestation for the period[6].

Under a negative context, the primary objective of the Buritirana Grouped REDD+ Project is to avoid the unplanned deforestation (AUD), consisting of Cerrado biome, known as the Brazilian savannah. Such biome is severely threatened by agriculture and cattle ranching, and, as a

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[1] IBGE – Instituto Brasileiro de Geografia e Estatística. Brazil. 2021. Available at: <https://www.ibge.gov.br/cidades-e-estados>.

[2] FAO and UNEP. 2020. The State of the World's Forests 2020. Forests, biodiversity and people. Rome. Available at: <https://doi.org/10.4060/ca8642en>.

[3] FAO. 2020. Global Forest Resources Assessment 2020: Main report. Rome. Available at: < https://doi.org/10.4060/ca9825en>.

[4] https://imazon.org.br/publicacoes/ameaca-e-pressao-de-desmatamento-em-areas-protegidas-sad-de-janeiro-a-marco-de-2022/. Last visit on May 20th, 2022.

[5]https://www.comprerural.com/top-5-municipios-com-maior-rebanho-no-pais-confira/#:~:text=O%20maior%20rebanho%20continua%20em,quinta%20para%20a%20terceira%20coloca%C3%A7%C3%A3o. Last visit on May 20th, 2022.

[6] https://ciclovivo.com.br/planeta/meio-ambiente/matopiba-bate-recorde-historico-de-desmatamento-no-cerrado/. Last visit on May 20th, 2022.

REDD+ project under VCS rules, offers the possibility to expand the conservation to other areas in the future.

The first Project activity instance is located at Fazenda Surreal, with an area of 4,037.145 ha, in Ponte Alta do Bom Jesus municipality – TO, Brazil and consists of 100% Cerrado biome and owned by ZX Participações S/A (hereafter, ZX or "the farm"). The project's crediting period start is 03-September-2020. However, other REDD project instances could be inserted into this grouped project activity in the future, as long as they comply with the eligibility criteria defined in sections below.

The project reduces the emission of greenhouse gases through activities that avoid deforestation and degradation of the forest area and, consequently, keep the forest standing and conserve carbon stocks. To achieve this objective, monitoring and surveillance actions are fundamental to ensure the forest will stand and for that, the project will implement actions such as frequent patrols, satellite images that help to identify actions such as encroachment attempts and fire outbreaks on the project area and surroundings.

Beyond the project's ecological and carbon benefits, a proportion of the carbon credits generated will be dedicated to improving the social and environmental conditions in the project region, specifically contributing to improving deforestation control, and developing environmental education and other social activities. The contribution to sustainability is being monitored through the application of the SOCIALCARBON® Standard, which is based on six main indicators: Biodiversity; Natural; Financial; Human; Social and Carbon Resources.

The present REDD project is expected to avoid a predicted 1,042 ha deforestation, equating to 154,467 tCO_2e in emissions reductions over the 30-year project lifetime (03-September-2020 to 02-September-2050), with an annual average of 5,149 tCO_2e.

1.2 Sectoral Scope and Project Type

Sectoral Scope: 14 - Agriculture, Forestry, Land Use

Project Category: Avoided Unplanned Deforestation (AUD project activity)

This is a grouped project.

1.3 Project Eligibility

According to the VCS Methodology Requirements v4.1[7], for Reduced Emissions from Deforestation and Degradation (REDD) projects, eligible activities are those that reduce net GHG emissions by reducing deforestation. Thus, the project is eligible under the scopes of the VCS Program Version 4.2[8]:

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[7] https://verra.org/wp-content/uploads/2022/01/VCS-Methodology-Requirements_v4.1.pdf

[8] https://verra.org/wp-content/uploads/2022/02/VCS-Standard_v4.2.pdf

- The project meets all applicable rules and requirements set out under the VCS Program;
- The project applies a methodology eligible under the VCS Program;
- The implementation of this project activity does not lead to the violation of any applicable law;
- This is an eligible AFOLU project category under the VCS Program: reduced emissions from deforestation and degradation (REDD);
- This project is not located within a jurisdiction covered by a jurisdictional REDD+ program;
- Implementation partners are identified in the project activity;
- This project does not convert native ecosystems to generate GHG. The project area only contains native forested land for a minimum of 10 years before the project start date;
- This project does not occur on wetlands and does not drain native ecosystems or degrade hydrological functions;
- Non-performance risk will be analyzed in accordance with the VCS Program document AFOLU Non-Permanence Risk Tool.

1.4　Project Design

☐ The project includes a single location or installation only

☐ The project includes multiple locations or project activity instances, but is not being developed as a grouped project

☒ The project is a grouped project

This project has been designed as an Avoided Unplanned Deforestation applying VM0015 methodology, Version 1.1 from December 3rd, 2012.

Eligibility Criteria

To be defined.

1.5　Project Proponent

Organization name	FUTURE Forest (Future Carbon Consultoria e Projetos Ambientais LTDA)

Contact person	Alan de Brito Carolina Pendl Abinajm Eliane Seiko Maffi Yamada Gabriel de Toledo Piza Laura Cristina Pantaleão Lyara Carolina Montone Amaral Yara Fernandes da Silva
Title	Alan de Brito – Technical Coordinator Carolina Pendl Abinajm – Technical Coordinator Eliane Seiko Maffi Yamada – Technical Consultant Gabriel de Toledo Piza – Technical Coordinator Laura Cristina Pantaleão – Technical Analyst Lyara Carolina Montone Amaral – Technical Coordinator Yara Fernandes da Silva – Technical Coordinator
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Telephone	+55 11 3045 3474
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1.6   Other Entities Involved in the Project

Organization name	Future Carbon Group (Future Carbon Holding S.A.)
Role in the project	Holding Company and Registry Manager
Contact person	Thiago de Avila Othero Cíntia Donato
Title	Thiago de Avila Othero – COO Cíntia Donato – Legal Coordinator
Address	Rua Elvira Ferraz, 250, Conj. 601, Edifício F.L. Office – Vila Olímpia, São Paulo/SP, Brazil
Telephone	+55 11 3045 3474
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Organization name	ZX Participações S/A
Role in the project	Owner of property composing instance 1

Contact person	Roberto Taiar Arbex Marcelo Taiar Arbex Fernanda Schaefer Arbex
Title	Property owners
Address	Rodovia TO-110, km 23, Lotes 8/1 e 8/2 do Loteamento Ribeirão Bonito – Zona Rural, Tocantins/TO, Brazil
Telephone	Not avaiable
Email	roberto.arbex@zxenergia.com.br marcelo.arbex@zxenergia.com.br fernanda.arbex@zxenergia.com.br

Organization name	Roberto Taiar Arbex
Role in the project	Owner of property composing instance 1
Contact person	Roberto Taiar Arbex
Title	Landowner
Address	Rua Caraíbas, 684, Apto 52 – Perdizes, São Paulo/SP, Brazil
Telephone	Not avaiable
Email	roberto.arbex@zxenergia.com.br

Organization name	Marcelo Taiar Arbex
Role in the project	Owner of property composing instance 1
Contact person	Marcelo Taiar Arbex
Title	Landowner
Address	Rua Alberto de Faria, 1969, Alto de Pinheiros – São Paulo/SP, Brazil
Telephone	Not avaiable
Email	marcelo.arbex@zxenergia.com.br

Organization name	Fernanda Schaefer Arbex
Role in the project	Owner of property composing instance 1
Contact person	Fernanda Schaefer Arbex
Title	Landowner
Address	Rua Alberto de Faria, 1969, Alto de Pinheiros – São Paulo/SP, Brazil
Telephone	Not avaiable
Email	fernanda.arbex@zxenergia.com.br

1.7   Ownership

The grouped project covers a region called MATOPIBA, composed by several municipalities from four states (Maranhão, Tocantins, Piauí and Bahia), and registers high deforestation rates in the Cerrado biome. The first instance project area is located at Ponte Alta do Bom Jesus municipality, in the state of Tocantins, and is composed by the property named Fazenda Surreal.

The property is owned by ZX Participações S/A, besides Fernanda Schaefer Arbex, Marcelo Taiar Arbex, and Roberto Taiar Arbex, as informed in the section 1.6. The legal documents proving the land title and ownership of the property will be made available to the auditors during the validation process.

The agreement which regulates the partnership between the project proponent and other entities, observing the applicable legislation, establishes that the parties will appear as proponents and participants in the project and will work together putting effort and human and financial resources to ensure that the project is validated and verified against the standard and methodology. The carbon credits generated will be divided between the project proponents and other entities of instance 1 and future instances that may compose the grouped project, according to internal contract. Thus, who owns the project and who can claim the carbon credits generated from this project are the project proponent and owners of the properties of instance 1 and future instances.

As per the rules stated at Section 3.6 Ownership of the VCS Standard v.4.2, an enforceable and irrevocable agreement was set between, ZX Participações, Roberto Taiar Arbex, Marcelo Taiar Abex and Fernanda Schaefer Arbex – the holders of the statutory, property and contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions or removals –, and Future Carbon Holding S.A., which vests project ownership in the

project proponent (Future Forest[9]). Evidence of such agreement will also be made available at the audit.

1.8 Project Start Date

According to Methodology VM0015, section 1.2.2, the project start date is the date which additional activities have started or will be started to avoid unplanned deforestation.

In the warm months of 2020, the property was frequently subject to non-planned visitors who wanted to spent pleasure hours and sometimes days at a waterfall. Such practice has invocated owners to send a letter to Environmental Police Department in order to have security control in the area. Despite signal in the property, the visitors used to access the property without communicating owners and installing tents for spending more than one day. It can be considered an uncontrolled tourism, once it was possible to observe waste and fireplaces in natural areas. Such illegal practice has impacted in the property, which influenced the owners in sending such letter to Environmental Police Department, which occurred in 03/September/2020.

Thus, for the AUD REDD Project, the Project Start Date was defined on 03-September-2020.

	Project Start Date
AUD	03 September 2020

1.9 Project Crediting Period

The project has a crediting period of 30 years, from 03-September-2020 to 02-September-2050.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

The estimated annual GHG emission reductions/removals of the project are:

☒ <20,000 tCO$_2$e/year

☐ 20,000 – 100,000 tCO$_2$e/year

☐ 100,001 – 1,000,000 tCO$_2$e/year

☐ >1,000,000 tCO$_2$e/year

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[9] Future Forest (Future Carbon Consultoria e Projetos Florestais Ltda.) is a company controlled by Future Carbon Holding S.A. Therefore, partnership agreements for project developments are signed on behalf of Future Carbon Holding.

Project Scale	
Project	x
Large project	

Year	Estimated GHG emission reductions or removals (tCO$_2$e)
2020	8,152
2021	5,508
2022	5,508
2023	5,508
2024	5,508
2025	5,508
2026	5,508
2027	5,508
2028	5,508
2029	8,152
2030	5,230
2031	5,232
2032	5,232
2033	5,232
2034	5,232
2035	5,232
2036	5,232
2037	5,232
2038	5,232
2039	4,703
2040	4,708
2041	4,708
2042	4,708
2043	4,708
2044	4,708
2045	4,708
2046	4,708
2047	4,708
2048	4,708
2049	4,708
2050	4,708
Total estimated ERs	154,467
Total number of crediting years	30

Year	Estimated GHG emission reductions or removals (tCO$_2$e)
Average annual ERs	5,149

1.11 Description of the Project Activity

The main objective of the present Grouped REDD+ project is the conservation of the Matopiba region and the Cerrado biome within the area described in section 1.12 of the present VCS PD. This will be achieved through avoidance of unplanned deforestation. The first instance of this Grouped Project presents 4,037.145 ha of forest area within the ZX property (Fazenda Surreal). In the future, new instances may be added to the project, expanding the conservation of the forest.

It is important to note that this project is not located within a jurisdiction covered by a jurisdictional REDD+ program.

The ex-ante estimate for the predicted avoided deforestation within the first instance project area over the 30-year project lifetime would be 25,860.81 ha.

The present REDD project is expected to avoid deforestation, equating to 154,467 tCO2e in emissions reductions over the 30 year project lifetime (03-September-2020 to 02-September-2050), including buffer (RF), leakage (DLF) and project efficiency (EI) reductions.

In addition to the impacting activities that might put the local population and biodiversity at risk, the project area is also located in a region named MATOPIBA, known for its agriculture vocation, mainly focused in grains and cotton. However, the region is also sadly known for several agrarian conflicts, including human right violation and violent episodes.

The main deforestation agents within Buritirana Grouped REDD+ Project region are: cattle ranching, timber extraction, soy bean, corn and cotton harvesters, acting both legally and illegally. In recent years, the expansion of agricultural and livestock activities is promoting high rates of deforestation and degradation to clear space for such economic activities, small-scale subsistence farming, logging, and, increasingly, soybean production for world markets . This pressure is expected to continue, given the globalization of markets and international pressure for commodities produced in the region.

The characteristic savanna vegetation is abundant in the project region. The biodiversity richness and vulnerability are the same found in the Amazon biome. Known as Brazilian Savana, The Cerrado biome has diversified fauna and flora, being inserted in a region of approximately 2.036.448 km² throughout South America. It is located in the central region of the country and the uncontrolled deforestation removing the forest for the same reasons mentioned for the Amazon biome. However, only 8% of Cerrado coverage is still preserved inside Unit Conservations. Without necessary care, entire regions of fauna and old centers of species have the risk of being extinct.

According to NASA studies using satellite images, deforestation in the Matopiba region is occurring rapidly specifically in some deforestation polygons, pushed by agriculture expansion. One of polygons is located in the project region, in the limit between Tocantins and Bahia states (Figure 1), where Cerrado biomes is highly threatened.

Figure 1. Agriculture expansion around project area
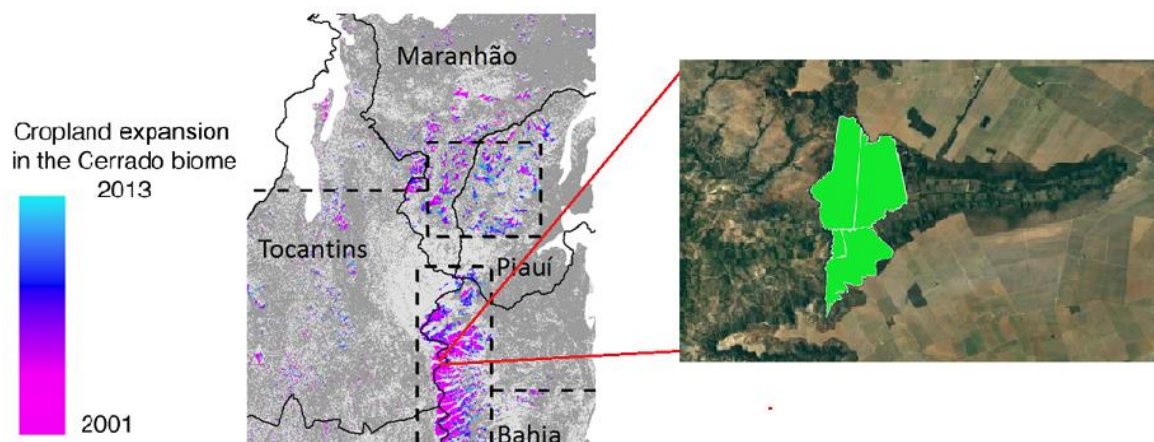
Thus, conservation actions are essential in the region, establishing a barrier against the advancement of deforestation, making an important contribution to the Cerrado biodiversity conservation and to climate regulation in Brazil and South America.

The revenue from the sales of the Verified Carbon Units (VCUs) is essential for the project activity to compete with profitable alternative land use scenarios. In addition, the carbon credit revenue is important to mitigate encroachment and illegal actions within and around the Project Area. This surveillance allows the management of the environmental situation of the property during the development of the forest exploration work, in addition to ensuring compliance with the requirements set out in the current legislation.

To conserve biodiversity, avoid unplanned deforestation and reduce GHG emissions, the project will implement activities that will allow the forest to remain standing. These activities include increasing monitoring of areas, surveillance frequent patrols, increase actions against activities such as encroachment attempts and fire outbreaks on the project area and surroundings.

Environmental education and other social activities that benefit the local community will be supported, as well as improving the control of deforestation. The SOCIALCARBON® Standard is being applied to assess and monitor the project's contribution to sustainability using six key indicators: Biodiversity; Nature; Financial; Human; Social and Carbon Resources, thus improving the social and environmental conditions in the project region[10]. All SOCIALCARBON indicators will be monitored in the Buritirana Grouped REDD+ Project. The SOCIALCARBON standard will be a complementary standard to the VCS standard. Thus, there will be no double counting and a project ID will not be generated in SOCIALCARBON.

1.12 Project Location

The Buritirana Grouped REDD+ Project is located a region called MATOPIBA (acronym formed with the initials of the states of Maranhão, Tocantins, Piauí and Bahia, states in the north and northeast of Brazil), known for its agriculture vocation, mainly focused in grains and cotton.

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10   Available at: <https://www.socialcarbon.org/https://verra.org/wp-content/uploads/2022/01/VCS-Methodology-Requirements_v4.1.pdf>. Last visited on July 2022.

The area of the first project activity instance comprehensively belongs to ZX Energia and its located in Ponte Alta do Bom Jesus municipality, which belongs to Tocantins state. This municipality is located around 400 km from Palmas, capital of Tocantins state. The project location is also close to Novo Jardim, Barreiras and Luis Eduardo Magalhães municipalities, where the two latter belong to Bahia state. From a biodiversity perspective, the project area is covered by Cerrado biome, composed by 4,037.145 ha of native vegetation.

Figure 2. Project Location and surrounding municipalities
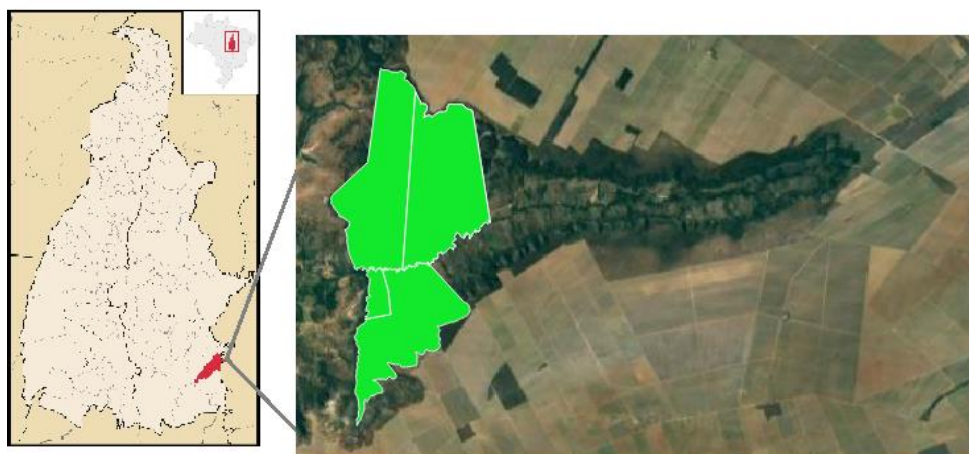
1.13 Conditions Prior to Project Initiation

General characteristics of the project area, leakeage belt, leakage management area and reference region Buritirana Grouped REDD+ Project makes an important contribution to the conservation of Cerrado's biodiversity as well as to climate regulation in Brazil and South America. The region is an important agriculture, cattle ranching, and wood-related center, putting Cerrado biome in a vulnerable situation. The general characteristics of the project area and reference region are described below. Further information will be inserted into PDD Version 1.

Aspect	Characteristics
Ecosystem type	The Project Area, leakage belt, leakage management area and reference region are located entirely in the Brazilian Cerrado biome. Due to its characteristics, the Cerrado is the biome recognized as the Brazilian Savanna.
Current and historical land-use:	The property has pasture areas authorized in accordance with Brazilian environmental legislation. The remaining of the property remains as standing native vegetation and there's no activity being currently conducted, and it is considered as Project Area. The leakage belt, leakage management area and reference region are areas with a high rate of deforestation caused by cattle ranching, timber extraction, soybean, and cotton harvesters.

Vegetation cover	The territory of the state of Tocantins comprises 9% of the Amazon and 91% of the Cerrado – the Brazilian Savanna – biomes that have conservation importance. The State of Bahia comprises 27% of the Cerrado biome. The Buritirana Grouped REDD+ Project's boundaries are 100% covered by Cerrado. Three vegetation types were present in the project area: savanna park (campo cerrado) with gallery forest, savanna park (campo cerrado) without gallery forest, and savanna woodland. The savanna park predominates herbaceous and shrubby components, with scattered trees. The park savanna (campo cerrado) with gallery forest represents the park savanna areas where riparian formations are present. The woodland savanna corresponds to the savanna formation itself, with a shrub-tree component with an expressive herbaceous stratum, subject to annual fire[11]. In addition to the phytophysiognomies found in the project area, other vegetation types present within the leakage belt, leakage management area and reference region are submontane deciduous forest, grassy-woody savanna with gallery forest, grassy-woody savanna without gallery forest, and park savanna without gallery forest.
Climate and hydrography	The project area, leakage belt, leakage management area and reference region are located in a region classified as a Tropical, dry winter climate type – Aw category – according to the Köppen climate classification[12]. This means it has a rainy season in summer, from November to April, and a distinct dry season in winter, from May to October (July is the driest month). The average temperature of the coldest month is above 18°C. Annual precipitation in the project region is on average 1,932.8 mm[13]. The areas located in the State of Tocatins belongs to Tocantins-Araguaia hydrographic region. The areas located in the State of Bahia belongs to São Francisco hydrographic region. The project area is located within the Tocantins-Agarguaia hydrografic region, specifically in the Rio Palma watershed.
Territory	The following table details each municipality area:

Municipality	Area (km²)
Ponte Alta do Bom Jesus, TO	1,718.791

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[11] Avaiable at:. http://www.dados.mt.gov.br/publicacoes/dsee/vegetacao/uso_ocupacao/mt/DSEE-VG-US-MT-045.pdf

[12] KÖPPEN, W.; GEIGER, R. Klimate der Erde. Gotha: Verlag Justus Perthes. 1928

[13] EMBRAPA. Clima. https://www.cnpf.embrapa.br/pesquisa/efb/clima.htm

Novo Jardim, TO	1,213.893
Barreiras, BA	8,051.274
Luís Eduardo Magalhães, BA	4,036.094

Buritirana Grouped REDD+ Project is located in the eastern portion of Tocantins state, which has more than 277,000 km² and is the 10th largest state in Brazil. Although Tocantins belongs to Northern region of Brazil, it is in the boundary with other regions, such as Northeast and Middle West, what places the state in a multiple biodiversity and culture position.

Geology, Topography and Soils	The state of Tocantins is characterized by a predominance of flattened surfaces and extensive mountain ranges. Tocantins was divided into 16 (sixteen) Geomorphological Domains, where several relief patterns are inserted. The municipalities Ponte Alta do Bom Jesus and Novo Jardim are located in the Chapadão Ocidental Baiano geomorphological domain. In this region, deeper soils and low natural fertility, largely related to the Cretaceous sandstones of the Urucuia Group, especially for Orthic Quartzarenic Neosols, and occurrence minor of medium texture Red-Yellow Latosols and Dystrophic Haplic Cambisols, these in general in areas more worn down by erosion. On the dissected slopes and the sloping terrains of the erosive edges, shallow soils predominate, generally dystrophic, such as Litholic Neosols and Haplic Cambisols, and subordinately Red-Yellow Argisols, for eutrophic, in addition to rock outcrops. The project area is composed of dystrophic yellow latosols and dystrophic litholic neosols. The dystrophic yellow latosols have low fertility and are generally intensively used for sugarcane cultivation and pasture. The dystrophic litholic neosols are shallow and with low fertility, normally indicated for the preservation of flora and fauna[14].
	Most of the municipality of Barreiras is located in the Chapadas do Rio São Francisco. This unit is supported by sandstones from the Urucuia Group, from the São Francisco Province. The slope is very low, being considerable only in the areas bordering the drainage channels. The valleys are open and poorly fitted, constantly promoting large flooded areas and numerous paths. In pedological terms there is a great variability of soils, predominating Yellow Latosols, Neosols – Quartzarenic and Litholic – and Haplic Cambisols[15]. The municipality of Luís Eduardo Magalhães the has two geomorphological regions, Chapadas de São Francisco and Depressões da

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[14] Avaiable at: https://www.embrapa.br/busca-de-publicacoes/-/publicacao/1118037/origem-das-paisagens-do-estado-do-tocantins

[15]Available at: http://lsie.unb.br/ugb/sinageo/7/0040.pdf. Last visited on July 2022

	Margem Esquerda do São Francisco. The predominant soils are Red-Yellow Latosols, Quartzarenic Neosols and Haplic Gleysols[16] .
Biodiversity	The Brazilian Cerrado is recognized as the richest savanna in the world, home to more than 10,000 species of native plants. There is a great diversity of habitats, which determine a remarkable alternation of species between different phytophysiognomies[17]. The Biome is habitat to some large emblematic mammals such as the maned Wolf (*Chrysocyon brachyurus*) and the jaguar (*Panthera onca*). In addition, the biome is also home to the giant armadillo (*Priodontes maximus*), the most impressive member of the Cerrado armadillos' fauna. The number of maned wolves, jaguars, and giant armadillos is decreasing due to destruction and habitat fragmentation and direct threats such as illegal hunting. Due to its biodiversity and constant threat, it is considered one of the world's hotspots, and a priority for conservation[18]. Regarding the fauna of the Tocantins state, 17 species of chelonians, six of crocodilians and 628 species of birds and 96 species of snakes were found[19]. According to the Mapping of phytoecological regions and forest inventory of the state of Tocantins, the vegetation of the Rio Palma basin is the richest among the basins of the southern part of the state. The greater diversity of plant species can be explained by the geographical position of this part of the state in an area of contact with the Caatinga and Amazon biomes, by the high heterogeneity of soils and relief. The forest inventory conducted in the Palma River basin accounted for a total of 131 tree species were found in 2.6 hectares of Cerrado.
Socio-economic conditions	**Municipality** Ponte Alta do Bom Jesus[20]

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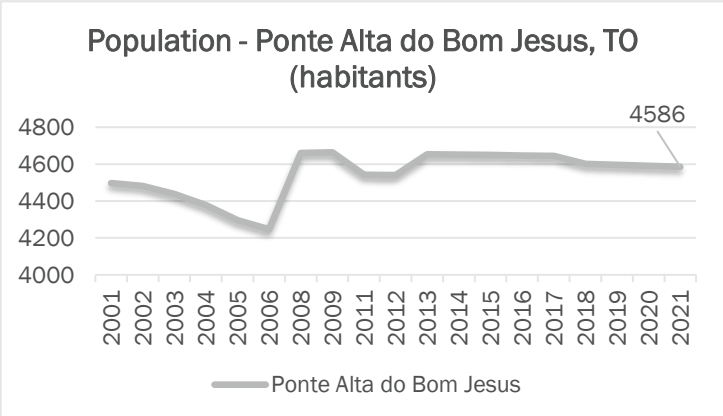
[16] Avaiable at.: https://www.infoteca.cnptia.embrapa.br/bitstream/doc/891209/1/bolpd288.pdf . Last visited on July 2022.
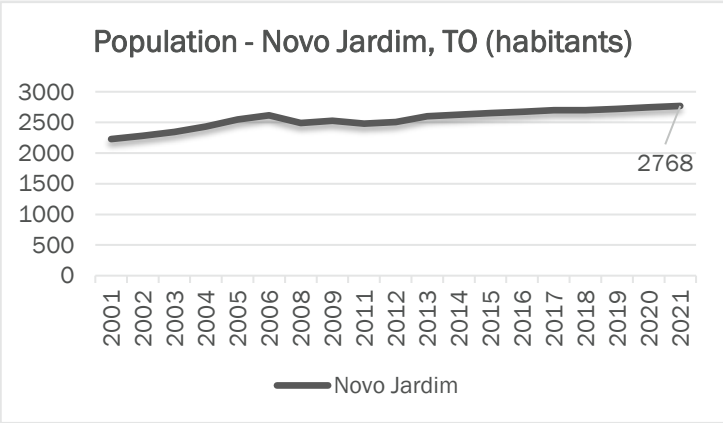
[17] Available at: https://antigo.mma.gov.br/biomas/cerrado.html. Last visited on 28/04/2022.

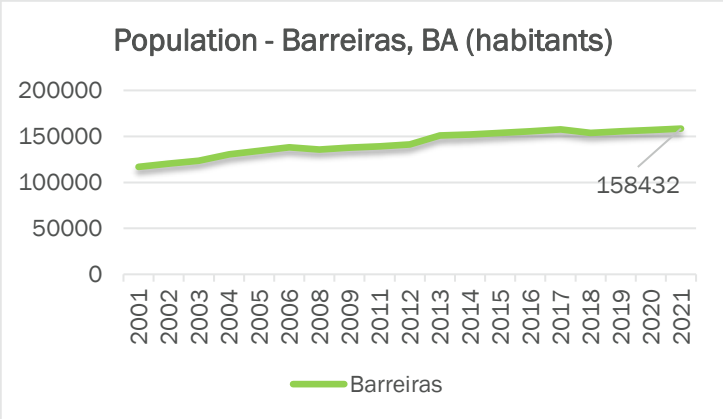[18] Avaiable at.: https://www.cepf.net/sites/default/files/cepf-cerrado-ecosystemprofilesummary-pr.pdf

[19] Avaiable at.: http://umbu.uft.edu.br/handle/11612/2014

[20] Available at: https://cidades.ibge.gov.br/brasil/to/ponte-alta-do-bom-jesus/panorama. Last visit on May 19th, 2022.
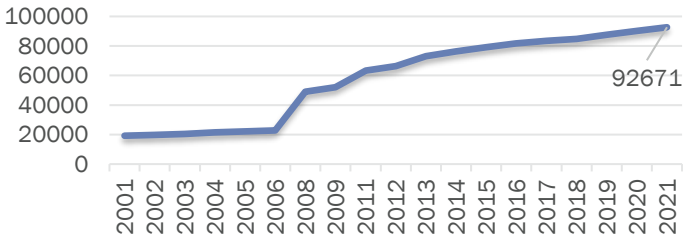
Population	Estimated (2021): 4,586 habitants. The following graph represents the historical Ponte Alta do Bom Jesus population: **Figure 3. Ponte Alta do Bom Jesus population**
Land occupation	The demographic density is 2.668 hab/km², considering 2021 population projection.
Economy	GDP per capita is R$11,586.25. The average income is of 1.3 minimum wages, and 7.3% of the population is categorized to carry out a professional activity (formal or informal, paid or not), which places the city far away from first positions in the Tocantins state ranking for such indicators: 133 out of 139 cities and 101/139, respectively. Considering families with monthly income up to half a minimum wage per person, 51.1% of Ponte Alta do Bom Jesus population live in such conditions (state ranking: 15/139).
Education	The municipality has 96.7% of its 6-14 years population in school. State and national Education ranking places city in 92/139 and 3987/5570.
Health	The average infant mortality rate in the city is not available, what can be indirect evidence of underdeveloped location.
Infrastructure	1.8% of households have adequate sanitation; 90.6% of urban households are located on public roads with trees, while 0% of public roads are provided with adequate urbanization (presence of manhole, sidewalk, paving and curb).
HDI	0.603

Municipality	Novo Jardim[21]
Population	Estimated (2021): 2,768 habitants. The following graph represents the historical Novo Jardim's population:

Figure 4.Novo Jardim population

Population - Novo Jardim, TO (habitants) |
Land occupation	The demographic density is 2.280 hab/km², considering 2021 population projection.
Economy	GDP per capita is R$11,326.95. The average income is of 2.0 minimum wages, and 10.3% of the population is categorized to carry out a professional activity (formal or informal, paid or not), which places the city close to first positions in the State ranking for the first indicators: 8/139, while the employed population indicator places the municipality in 55/139. Considering families with monthly income up to half a minimum wage per person, 44% of Novo Jardim population live in such conditions (state ranking: 77/139).
Education	The municipality has 97.8% of its 6-14 years population in school. State and national Education ranking places city in 54/139 and 2411/5570.
Health	The average infant mortality rate in the city is 34.48 deaths per thousand live births, which places the city in a negative state comparison (7/139).
Infrastructure	28% of households have adequate sanitation; 53% of urban households are located on public roads with trees and 0% on public roads with adequate urbanization (presence of manhole, sidewalk, paving and curb).
HDI	0.596

[21] Available at: https://cidades.ibge.gov.br/brasil/to/novo-jardim/panorama. Last visit on May 19th, 2022.

Municipality	Barreiras, BA[22]
Population	Estimated (2021): 158,432 habitants. The following graph represents the historical Barreiras population: **Figure 5. Barreiras population** Population - Barreiras, BA (habitants)
Land occupation	The demographic density is 19.678 hab/km², considering 2021 population projection.
Economy	GDP per capita is R$33,313.17. The average income is of 2.2 minimum wages, and 21.9% of the population is categorized to carry out a professional activity (formal or informal, paid or not), which places the city in the following positions in the State ranking for such indicators: 14/417 and 411/417, respectively, which can indicate the city is full of workers with low incomes. Considering families with monthly income up to half a minimum wage per person, 38.2% of Barreiras population live in such conditions (state ranking: 411/417).
Education	The municipality has 97.5% of its 6-14 years population in school. State and national Education ranking places city in 185/417 and 2904/5570.
Health	The average infant mortality rate in the city is 13.75 deaths per thousand live births.
Infrastructure	35% of households have adequate sanitation; 53% of urban households are located on public roads with trees and 7% on public roads with adequate urbanization (presence of manhole, sidewalk, paving and curb).
HDI	0.721

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[22] Available at: https://cidades.ibge.gov.br/brasil/ba/barreiras/panorama. Last visit on May 19th, 2022.

Municipality	Luís Eduardo Magalhães, BA[23]
Population	Estimated (2021): 92,671 habitants. The following graph represents the historical Luís Eduardo Magalhães population: **Figure 6. Barreiras population** Population - Luís Eduardo Magalhães, BA (habitants) — 92671
Land occupation	The demographic density is 22.961 hab/km², considering 2021 population projection.
Economy	GDP per capita is R$69,761.10. The average income is of 2.1 minimum wages, and 30.7% of the population is categorized to carry out a professional activity (formal or informal, paid or not), which places the city in the following positions in the State ranking for such indicators: 49/417 and 3/417, respectively. Again, it can be assumed the city is full of workers with low incomes. Considering families with monthly income up to half a minimum wage per person, 32.1% of Luís Eduardo Magalhães population live in such conditions (state ranking: 417/417), what can indicate the city has the best performance in a state with a terrible context.
Education	The municipality has 96.4% of its 6-14 years population in school. State and national Education ranking places city in 317/417 and 4281/5570.
Health	The average infant mortality rate in the city is 14.25 deaths per thousand live births.
Infrastructure	18% of households have adequate sanitation; 68% of urban households are located on public roads with trees and 0% on public roads with adequate urbanization (presence of manhole, sidewalk, paving and curb).
HDI	0.716

[23] Available at: https://cidades.ibge.gov.br/brasil/ba/luis-eduardo-magalhaes/panorama. Last visit on May 19th, 2022.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

In the federal legislation level, the following definitions of the Brazilian Forest Code (Law nº 12,651, of May 25, 2012) stand out as being relevant:

> I. Permanent Preservation Area (APP): protected areas covered or not by native vegetation, with the environmental function of preserving water resources, landscape, geological stability, biodiversity, gene flow of plants and animals, protecting the soil and ensuring the well-being of human population.

> III – Legal Reserve (LR): area located inside a rural estate, excluding the Area of Permanent Preservation, necessary for sustainable use of natural resources, conservation and recovering of ecological processes to conservation of biodiversity and to shelter and protection of native fauna and flora.

The Legal Reserve (LR) must be registered in property deed in the Real Estate Registry Office: its location must be publicly known, and future landowners must know where it is located, its boundaries and frontiers. The LR can be located anywhere inside a rural estate. Brazilian Forest Code determines that, once allocated, LR may not be changed even in cases of real estate transfer, land dismembering or area rectification.

According to the Brazilian Forest Code:

> Article 12. Every rural property must maintain an area with native vegetation cover, as a Legal Reserve, without prejudice to the application of the rules on Permanent Preservation Areas (APP), observing the following minimum percentages in relation to the area of the property:

> b – thirty five (35%), in rural estates located in savannah/cerrado zones located in the Legal Amazon.

Thus, in compliance with Brazilian Forest Code, the farm have allocated 35% of its total area as LR.

In spite of the legal provisions intended to preserve at least this percentage of the Cerrado biome, lack of law enforcement by local authorities along with public policies seeking to increase commodities production and encourage land use for intensive grain monoculture and low-technology extensive livestock farming created a scenario of almost complete disregard of the mandatory provisions of the Forest Code. The constant use of intensive soil utilization techniques causes the depletion of local resources, in addition to the indiscriminate use of pesticides and fertilizers that also contaminate the soil and water jeopardize efforts concerning law enforcement improvement. In addition to that, to cover vast distances of areas with low demographic density makes tracking of illegal activities and land surveillance very difficult for the authorities.

One of the main ways to combat deforestation in Brazil are the command-and-control mechanisms, such as effective monitoring, requiring compliance with environmental legislation along with a greater state presence. Accordingly, policies implemented to address illegal deforestation only by means of command-and-control approaches have proven to be ineffective so far (IPAM, 2011), mainly because the failure of the government to fulfil these responsibilities in comparison with other social goals and economic interests has put Brazil among the world's largest deforesters [24].

Therefore, all calculations will be made assuming that the reference region has a general non-compliance with the Brazilian Forest Code. Thus, the baseline scenario will consider the potential of unplanned deforestation in the project area to surpass the limits stipulated by the Law.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

Not applicable: the project is not engaged in any other emissions trading program and the host country has no binding limits on GHG emissions yet. The project has not been registered or is seeking registration under any other GHG programs.

1.15.2 Projects Rejected by Other GHG Programs

Not applicable. This project is not requesting registration in any other GHG Programs nor has the project been rejected by any other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program. The VCS Program has a central project database, which lists each approved project. The VCS Project Database is the central storehouse of information on all projects validated to VCS criteria and all Verified Carbon Units issued under the program. Every VCU can be tracked from issuance to retirement in the database, allowing buyers to ensure every credit is real, additional, permanent, independently verified, uniquely numbered and fully traceable online. This project has not been registered under any other credited activity, and no VCUs have been assigned to the project area so far. Thus, any possibility of double counting of credits is eliminated.

As mentioned in Section 1.1 - Description of the Activity-, the SOCIALCARBON standard will be a complementary standard to the VCS standard. Thus, there will be no double counting and a project ID will not be generated in SOCIALCARBON.

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[24] Food And Agriculture Organization Of The United Nations (FAO) (2011), "State of the World's Forests 2011." FAO Forestry Paper. Rome, Italy.

1.16.2 Other Forms of Environmental Credit

The project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates.

1.17 Sustainable Development Contributions

The Buritirana Grouped REDD+ Project main contributions to the Brazilian Priority Goals are listed below[25]:

- **SDG 1: No poverty**

Part of the funds from the sale of carbon credits will go to the education and sustainable development of the communities present in the reference region. Thus, the project collaborates with targets such as:

- 1.3 "Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable";

- 1.4 "By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance";

- 1.5 "By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters".

- **SDG 2: Zero hunger**

The project aims to expand training related to the management of non-timber forest products, such as nuts and fruits. Guideline targets are:

- 2.4 "By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

- **SDG 3: Good health and well-being**

Part of the funds from the sale of carbon credits will go to the communities surrounding the project. Social Carbon Report contains the indicator "Public Health", thus the project may contribute to the following targets:

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[25] Available at: < https://odsbrasil.gov.br/>. Last visited on May 2022.

- 3.3 "By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases".

- **SDG 4: Quality education**

The project aims to invest in education for the communities affected by the project, such as basic education, professional training, environmental education, among others. The targets determined by the UN that will act as a guideline for monitoring actions are:

- 4.1 "By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes";

- 4.4 "By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship";

- 4.5 "By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations";

- 4.6 "By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy";

- 4.7 "By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development".

- **SDG 5: Gender equality**

Part of the funds from the sale of carbon credits will go to the communities surrounding the project. Social Carbon Report contains the indicator "Women inclusion" thus the project may have initiatives that contribute to the following targets:

- 5.2"Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation";

- 5.4 "Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate";

- **SDG 8: Decent work and economic growth**

The Social Carbon indicators and perspectives aim to offer training and income generation in the project region. Guideline targets are:

- 8.3 "Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small-and medium-sized enterprises, including through access to financial services";

- 8.6 "By 2020, substantially reduce the proportion of youth not in employment, education or training";

- **SDG 12: Ensure sustainable production and consumption patterns**

The project is based on encouraging sustainable development and maintaining the standing forest through the sustainable use of its resources, and it aims to optimize access to non-timber forest products and the consumption of local inputs. One of the main objectives is to reduce illegal deforestation and profit from this activity, offering alternatives for income and extraction. The Buritirana Grouped REDD+ Project has the following target and guideline:

- 12.2 "By 2030, achieve the sustainable management and efficient use of natural resources"

- **SDG 13: Take urgent action to combat climate change and its impacts**

Another of the main objectives of the REDD project is to reduce greenhouse gas emissions through the conservation of standing forest. Thus, its activity is already an action to combat climate change and its effects. The targets and guidelines for this objective are:

- 13.2 "Integrate climate change measures into national policies, strategies and planning";

- 13.3 "Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

- **SDG 15: To protect, restore and promote the sustainable use of terrestrial ecosystems, to manage forests sustainably, to combat desertification, to halt and reverse land degradation, and to halt the loss of biodiversity.**

The project is based on the conservation and restoration of forests in the Amazon biome, ensuring forest services, preservation of natural resources and biodiversity. The targets and guidelines related to this objective are:

- 15.1 "By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements";

- 15.2 "By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally";

- 15.5 "Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species";

- 15.9 "By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts";

- 15.a "Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems";

- 15.c "Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities".

Reducing deforestation and promoting sustainable development in the Amazon is also a key component to Brazil's Nationally Determined Contribution (NDC) under the Paris Agreement. According to the Brazilian Government Ministry for the Environment (in Portuguese, Ministério do Meio Ambiente), the implementation of REDD+ activities are an important component to meet the Country's contribution under the United Nations Framework Convention on Climate Change while preserving natural forest resources26.

The following components of the Brazilian commitments under the Convention are reinforced by the development of the Buritirana Grouped REDD+ Project:
- Strengthening and enforcing the implementation of the Forest Code, at federal, state and municipal levels;
- Strengthening policies and measures with a view to achieve, in the Brazilian Amazon, zero illegal deforestation by 2030 and compensate for greenhouse gas emissions from legal suppression of vegetation by 2030;
- Enhancing sustainable native forest management systems, through georeferencing and tracking systems applicable to native forest management, with a view to curb illegal and unsustainable practices.

1.18 Additional Information Relevant to the Project

Leakage Management

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1[27].

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

Further Information

26 Commitments available in Brazil's iNDC, from 2016, and reinforced in its update in 2020/2021. Available at <https://www4.unfccc.int/sites/NDCStaging/Pages/Party.aspx?party=BRA>

27 According to the VCS Registration and Issuance Process v.4.1, "A draft project description shall include (at a minimum) the cover page and drafts of sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 3.1 and 3.2, of the VCS Project Description Template".

No further information to disclose.

2 SAFEGUARDS

2.1 No Net Harm

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

2.2 Local Stakeholder Consultation

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

2.3 Environmental Impact

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

2.4 Public Comments

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

2.5 AFOLU-Specific Safeguards

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Approved VCS Methodology VM0015 "Methodology for Avoided Unplanned Deforestation", Version 1.1, 3 December 2012. At: http://www.v-c-s.org/methodologies/VM0015 (last visited 15/06/2022).

Tool for the demonstration and assessment of additionality in VCS agriculture, forestry and other land use (AFOLU) project activities Version 3.0, 1 February 2012. At: http://www.v-cs.org/methodologies/VT0001 (last visited 15/06/2022).

AFOLU "Non-Permanence Risk Tool" VCS Version 4, Procedural Document, 19 September 2019, v4.0. At: http://www.v-c-s.org/program-documents (last visited 15/06/2022).

CDM – Executive Board "Tool for testing significance of GHG emissions in A/R CDM project activities (Version 01)" EB 31. At:

https://cdm.unfccc.int/methodologies/ARmethodologies/tools/aram-tool-04-v1.pdf   (last visited in 15/06/2022).

3.2   Applicability of Methodology

VM0015	
Applicability Conditions	**Justification of Applicability**
a) Baseline activities may include planned or unplanned logging for timber, fuel-wood collection, charcoal production, agricultural and grazing activities as long as the category is unplanned deforestation according to the most recent VCS AFOLU requirements.	None of the baseline land-use conversion activities are legally designated or sanctioned for forestry or deforestation, and hence the project activity qualifies as avoided unplanned deforestation. This is in accordance with the definition of unplanned deforestation under the VCS Standard v4.2. The primary land uses in the baseline scenario are: cattle ranching, timber extraction, soy bean, corn and cotton harvesters, acting both legally and illegally. Therefore, the present criteria are fulfilled.
b) Project activities may include one or a combination of the eligible categories defined in the description of the scope of the methodology (table 1 and figure 2).	Within the categories of Table 1 and Figure 2 of the methodology, the present grouped project falls within category A, "Avoided Deforestation without Logging". The project area contains 100% native vegetation. In addition, it is important to note that degradation is not included in either the baseline or project scenario.

c) The project area can include different types of forest, such as, but not limited to, old growth forest, degraded forest, secondary forests, planted forests and agro-forestry systems meeting the definition of "forest".	The forest classes that compose the project area are named as per Technical Manual for Brazilian Vegetation[28]. The area is considered forest as per the definition of forest adopted by FAO[29]: Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10%, or trees able to reach these thresholds *in situ*. No deforested, degraded or areas otherwise modified by humans were included in the project area at Project Start Date.
d) At project commencement, the project area shall include only land qualifying as "forest" for a minimum of 10 years prior to the project start date.	The project area was composed 100% for savanna park (campo cerrado) with gallery forest, savanna park (campo cerrado) without gallery forest, and savanna woodland in 2010 – 10 years prior to the project start date – all of which conformed to the Brazilian definition of forest[30]. This was ascertained using satellite images, as described in the section Project Location of the present VCS PD.
e) The project area can include forested wetlands (such as bottomland forests, flood plain forests, mangrove forests) as long as they do not grow on peat. Peat shall be defined as organic soils with at least 65% organic matter and a minimum thickness of 50 cm. If the project area includes a forested wetlands growing on peat (e.g. peat swamp forests), this methodology is not applicable.	Project Area is composed of Orthic Quartzarenic Neosols, Red-Yellow Latosols and Dystrophic Haplic Cambisols. Therefore, none of the project region grows on peat, satisfying this applicability criterion.

VT0001	
Applicability Conditions	Justification of Applicability

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[28]   Available at <https://www.terrabrasilis.org.br/ecotecadigital/pdf/manual-tecnico-da-vegetacao-brasileira.pdf>

[29] Available at <
https://www.fao.org/3/y4171e/y4171e10.htm#:~:text=FAO%202000a%20(FRA%202000%20Main,of%20other%20pre
dominant%20land%20uses.>

[30] Brazil adopts the FAO forest definition: "Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ." Available at: <http://www.fao.org/docrep/006/ad665e/ad665e06.htm>.

AFOLU activities the same or similar to the proposed project activity on the land within the proposed project boundary performed with or without being registered as the VCS AFOLU project shall not lead to violation of any applicable law even if the law is not enforced;	The activities in the proposed project boundary does not lead to violation of any applicable law even if the law is not enforced. The sustainable forest management, whenever applicable, plan is an activity authorized and endorsed in Brazil, and the landowner could submit all the environmental and legal authorizations necessary to conduct the activity.
The use of this tool to determine additionality requires the baseline methodology to provide for a stepwise approach justifying the determination of the most plausible baseline scenario. Project proponent(s) proposing new baseline methodologies shall ensure consistency between the determination of a baseline scenario and the determination of additionality of a project activity.	The methodology provides a stepwise approach to justify determination of the most plausible baseline scenario.

3.3   Project Boundary

The Grouped REDD project boundaries are defined by the limits of the reference region. The first project instance area is in Ponte Alta do Bom Jesus municipality and is composed by the property named Fazenda Surreal, as described at section 1.7 and shown below.

Figure 7. Project Area
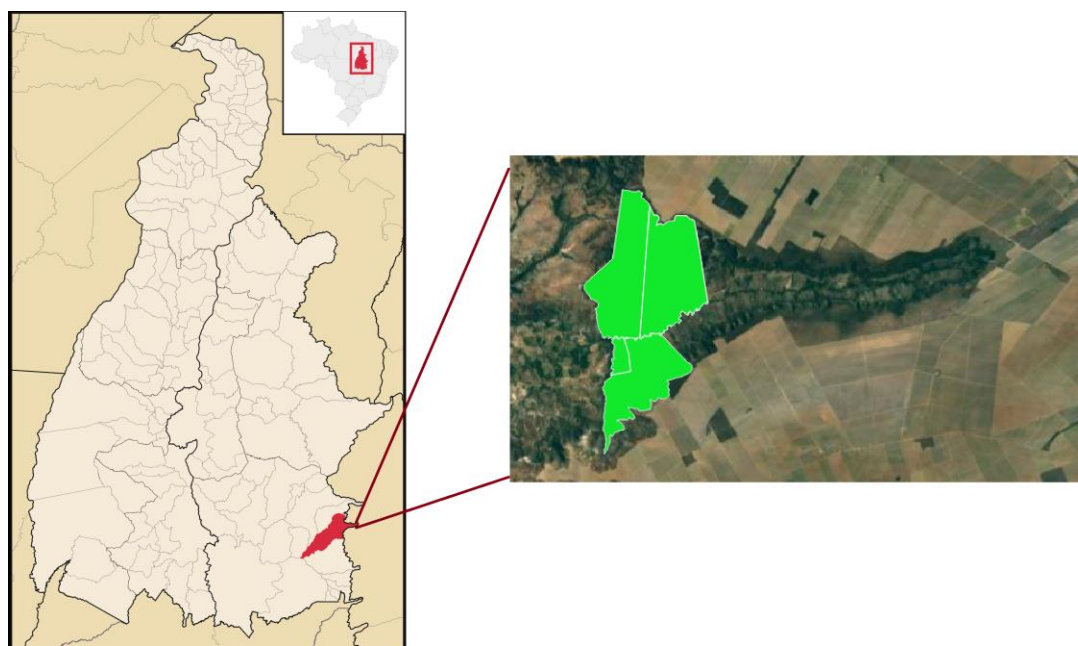
Project Area

In accordance with VCS requirements defined in the Approved VCS Methodology VM0015, version 1.1, the project area may only include areas composed of "forest"[31] for a minimum of ten years prior to the project start date. Therefore, satellite images between 2011 and 2021 were analyzed and classified. The areas within the properties that were defined as forest in 2010 and in 2020 were identified and utilized to compose the project area. In addition, some non-forest areas were also excluded, such as rivers, rocks, and non-forest vegetation.

Therefore, the estimated Project is 4,037.145 ha to avoid the unplanned deforestation (AUD).

Table 2. Sources and GHG included or excluded within the boundary of the proposed AUD project activity

Source		Gas	Included?	Justification/Explanation
Baseline	Biomass burning	CO_2	Excluded	Excluded as recommended by the applied methodology. Counted as carbon stock change.
		CH_4	Included	Included as non-CO2 emissions from biomass burning in the baseline scenario, according to the methodology.

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[31] Brazilian Forestry Service. Brazil adopts FAO forest definition: "Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ." http://www.florestal.gov.br/snif/recursos-florestais/index.php?option=com_k2&view=item&layout=item&catid=14&id=158.

Source		Gas	Included?	Justification/Explanation
		N_2O	Included	Included as non-CO2 emissions from biomass burning in the baseline scenario, according to the methodology.
		Other	Excluded	No other GHG gases were considered in this project activity.
	Livestock emissions	CO_2	Excluded	Not a significant source
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
		Other	Excluded	No other GHG gases were considered in this project activity.
Project	Biomass burning	CO_2	Excluded	No biomass burning increase is predicted to occur in the project scenario compared to the baseline case. Therefore, considered insignificant.
		CH_4	Included	Included as non-CO2 emissions from biomass burning in the project scenario, according to the methodology.
		N_2O	Included	Included as non-CO2 emissions from biomass burning in the project scenario, according to the methodology.
		Other	Excluded	No other GHG gases were considered in this project activity.
	Livestock emissions	CO_2	Excluded	Not a significant source
		CH_4	Excluded	No livestock agriculture increase is predicted to occur in the project scenario compared to the baseline case. Therefore, considered insignificant.
		N_2O	Excluded	As above.
		Other	Excluded	No other GHG gases were considered in this project activity.

Reference Region

The reference region (RR) is an analytical domain through which information on rates, agents, drivers and underlying causes of land-use and land-cover (LU/LC) change are obtained, and subsequently used for future projection and monitoring.

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According to the applied methodology, as no applicable sub-national or national baseline is available, and the country or subnational region has not been divided in spatial units for which deforestation baselines will be developed, a baseline must be developed for a reference region.

The Reference Region must encompass the project area, the leakage belt and any other geographic area that is relevant to determine the baseline of the project area.

A geographic area with agents, drivers and overall deforestation patterns observed during the 10-year period preceding the start date, i.e. September-2010 to September-2020, was determined, representing a credible proxy for possible future deforestation patterns in the project area.

The RR will be defined in accordance with two criteria:

● The methodology recommends that projects under 100,000 ha in size should have RRs 20 – 40 times bigger than the project area.

● The conditions determining the likelihood of deforestation within the project area being similar or expected to become similar to those found within the reference region, depending on: the landscape configuration and ecological conditions (elevation, slope, vegetation, and rainfall), socio-economic and cultural conditions, and agents and drivers of deforestation (agent groups, infrastructure or other drivers). The latter condition was the most important for adjusting the RR in order for it to more accurately represent the land-use dynamics. Specifically, this was based on the waterways (watersheds) and infrastructure (roads), which are the principal means of human and product transportation in the region. As such, from the areas directly surrounding the project, the RR was expanded to meet the nearest main waterways and roads.

It is possible to assume that the deforestation in the Project Area is likely to occur in a similar way to the observed in the Reference Region. The RR is yet to be defined.

Leakage Belt

The Leakage Belt (LB) is the land area or land areas surrounding or adjacent to the Project Area in which baseline activities could be displaced due to the project activities implemented in the project area. To define the boundary of the Leakage Belt, Opportunity cost analysis (Option I) will be applied, in accordance with Approved VCS Methodology VM0015 "Methodology for Avoided Unplanned Deforestation", Version 1.1, from December 3rd, 2012, Sectoral Scope 14.

The boundary of the Leakage Belt will be revisited at the end of each fixed baseline period, as opportunity costs are likely to change over time. In addition, this boundary of the Leakage Belt may have to be revisited if other VCS AFOLU projects are registered nearby the Project Area.

Opportunity cost analysis (Option I) is applicable where economic profit is an important driver of deforestation. In this context, literature studies, surveys and other credible and verifiable

sources of information were used to demonstrate profitability of the main products of deforestation in the region: soy and corn plantation, wood and cattle.

The LB is yet to be defined.

Leakage Management Area

The leakage management area (LMA) complies non-forest areas located outside the project boundary in which the project proponent intends to implement the activities which reduce the risk of leakage in the project scenario. These activities must include the agents of deforestation and involve seeking new sources of income which contribute to forest conservation. Leakage management could involve agricultural, agroforestry, reforestation, education, or other activities.

The LMA is yet to be defined.

Forest

According to the Brazilian Forests at a Glance 2019, the Brazilian Forest Service considers as forests the lands that correspond to the vegetation typologies according to the Classification System of the Brazilian Institute of Geography and Statistics (IBGE), updated by the SIVAM project. Brazil endorses the definition of forest adopted by FAO: Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 %, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. The compliance of the project area with these definitions is further explained in section 1.13.

In addition, as per VM0015 methodology, the Minimum Mapping Unit (MMU) size of the LULC maps created using RS imagery shall not be more than one hectare irrespective of forest definition. Thus, the 30 m resolution LANDSAT images used for mapping have the minimum mapping unit defined at 30x30m (0.09ha), therefore falling easily to the methodology requirement.

Temporal boundaries

● Starting date and end date of the historical reference period

The adopted historical reference period is September 2010 to September 2020.

● Starting date of the project crediting period the AUD project activity

The project has 30 years of crediting period: from 03-September-2020 to 02-September-2050.

● Starting date and end date of the first fixed baseline period

The first baseline period is from 03-September-2020 to 03-September-2030.

Carbon pools

The applied Methodology VM0015 considers six carbon pools. Their inclusion or exclusion within the boundary of the proposed AUD project activity, as well as the respective justification/explanation, are described in Table below.

Table 3. Carbon pools included or excluded within the boundary of the proposed AUD project activity

Carbon pools	Included / Excluded	Justification / Explanation of choice
Above-ground	Tree: Included	Carbon stock change in this pool is always significant
	Non-Tree: Excluded	No existence of perennial crops as final class
Below-ground	Included	Stock change in this pool is significant
Dead wood	Excluded	Excluded for simplification. This exclusion is conservative.
Harvested wood products	Included	Stock change in this pool is considered significant
Litter	Excluded	Excluded as it does not lead to a significant over-estimation of the net anthropogenic GHG emission reductions of the AUD project activity. This exclusion is conservative.
Soil organic carbon	Excluded	Recommended when forests are converted to cropland. Not to be measured in conversions to pasture grasses and perennial crop according to VCS Methodology Requirements, 4.0.

In accordance with the methodology, approximately 1/10 of the carbon stock in the below-ground pool of the initial "forest" class will be released in a ten-year interval. This is further discussed in the section Baseline Emissions.

3.4   Baseline Scenario

The baseline scenario described in this section is valid for the Buritirana Grouped REDD+ Project and its instances, present and future.

In the baseline scenario, forest is expected to be converted to non-forest by the agents of deforestation acting in the reference region, project area and leakage belt, as described below. Therefore, the project falls into the AFOLU-REDD category, specifically: Avoided unplanned deforestation (AUD). The revenue from the present REDD project is essential to maintain this area as standing forest, as described under additionality (section 3.5), as well as to carry out the present project's leakage management activities.

Degradation was not considered in the present REDD project, in accordance with methodology requirements, which define "forest" and "non-forest" as the minimum land-use and land-cover classes.

Analysis of agents, drivers, and underlying causes of deforestation

As specified in the methodology, it is necessary to understand "who" the deforesting agent is and what drives land-use decisions ("drivers" and "underlying causes"). This analysis is important for two main reasons: (i) Estimating the quantity and location of future deforestation; and (ii) Designing effective measures to address deforestation, including leakage prevention measures.

● **Identification of agents of deforestation**

In recent years, the project region has been deforested for the expansion of livestock and agricultural activities. This pressure is expected to continue, given the globalization of markets in the Cerrado region, mainly the expansion of the soybean[32] and livestock[33].

The main agents of deforestation identified in the area are detailed below:

a) Cattle ranching

Cattle farming in the Cerrado is primarily due to favorable climate environment[34]. Tocantins currently has the 10th largest herd in the country, with around 10 million head of cattle[35].

The Matopiba region attends to internal and external markets. The region has drawn attention for its increasingly growing production and productivity[36]. This scenario is highly worrying concerning Cerrado deforestation levels.

Livestock farmers do not pay for the public lands which they acquire legally or illegally, and furthermore they harvest timber without paying the government and, in this way, they accumulate capital freely to reinvest into their operations. Thus, land speculation and cattle farming contribute to the advancement of deforestation in more isolated regions[37].

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[32] Avaiable at: https://chainreactionresearch.com/wp-content/uploads/2019/04/CRR_Tocantins-Report-Portuguese.pdf Last visited on July 2022.

[33] Avaiable at: https://csr.ufmg.br/pecuaria/portfolio-item/tocantins/. Last visited on July 2022.

[34] Avaiable at: https://chainreactionresearch.com/wp-content/uploads/2019/04/CRR_Tocantins-Report-Portuguese.pdf Last visited on July 2022.

[35] Avaiable at: https://oeco.org.br/noticias/para-beneficiar-pecuaria-tocantins-reduz-em-mais-de-60-imposto-sobre-comercializacao-de-gado/ Last visited on July 2022.

[36] Avaiable at: https://ruralpecuaria.com.br/tecnologia-e-manejo/agricultura/matopiba-se-destaca-por-sua-vocacao-agricola.html. Last visited on July 2022.

[37] RAZERA, Allan. Dinâmica do desmatamento em uma nova fronteira do sul do Amazonas: uma análise da pecuária de corte no município do Apuí. 2005. 109 f. Thesis (Master grade) - Curso de Biologia, Universidade Federal do Amazonas - UFAM, Amazônia, 2005.

b) Soy production

Soy production in the project region is also an important agent of deforestation. This agricultural production contributes to the deforestation of the Cerrado biome, both directly through forest clearing for new soy farms and by displacing other farmers who then move into forest areas. Further pressure comes from the development of infrastructure (like roads and ports) to support soy expansion. This infrastructure attracts other agents of deforestation (such as timber harvesters, cattle ranchers, and colonists who have been displaced from elsewhere), who therefore may increase deforestation[38].

Soybean cultivation is expanding in the Matopiba region. In the latest 36 years, 16,8 milion of hecatres was occupied by soybean plantations. In 2020, the cerrado accounted for 42% of Brazilian agriculture, after an expansion of 464% between 1985 and 2020[39].

c) Timber harvesting

Timber logging (both legal and illegal) is an expressive economic activity within the reference region. In regions of the Matopiba, illegal timber is an intense activity, that result in conflicts with traditional communities, especially indigenous.

Usually, deforestation in the region involves spatially overlapping activities: firstly, extraction of commercially valuable tree species for sale to timber companies. The final step is the slash-and-burn deforestation of the area above for cattle ranching or agriculture production[40].

After harvesting the most valuable commercial species, the deforestation continues both in areas already explored and unexplored, and thus providing conditions for further expansion of logging, cattle ranching and agriculture production.

● Identification of deforestation drivers

Some of the factors that characterize, and drive deforestation are the low cost of the forested area; reasonable soil fertility (provided by the ashes after the burning of the forest); well-structured soil and mainly flat conditions of the area; tradition of farming existing in the municipalities and the meat/soy market of the region[41].

Key driver variables are detailed in section below.

a) Driver variables explaining the quantity (hectares) of deforestation:

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[38] BUTLER, Rhett. Why is soy bad for the Amazon rainforest? Mongabay. July, 2020.

[39] Available at: https://globorural.globo.com/Noticias/Sustentabilidade/noticia/2021/10/matopiba-teve-76-da-expansao-agricola-sobre-vegetacao-nativa-nos-ultimos-5-anos.html. Last visited on July 2022.

[40] Available at: https://redecerrado.org.br/matopiba-concentra-mais-da-metade-das-queimadas-no-cerrado/. Last visited on July 2022.

[41] Available in <https://chainreactionresearch.com/wp-content/uploads/2019/04/CRR_Tocantins-Report-Portuguese.pdf> Last visited on July 2022.

● Population growth and density

Population is a variable that significantly predicts future deforestation quantity. Residents are expected to carry out unplanned deforestation, which involves economic activities.

The population growth is tightly correlated with deforestation. Local population is primarily composed of migrants, crop and livestock farmers, and timber harvesters, the majority of whom come from other regions of Brazil. The lack of economic alternatives then turns this population into the primary deforestation agents in the region. As these cities rely on livestock and agriculture for income generation, forest areas will likely be deforested for cattle ranching, soybeans, and other land uses, following historical patterns.

The increasing rate identified in the population data is an important variable affecting the amount of deforestation in the reference region.

● **Prices of timber, cattle and soybeans**

Timber, cattle and soybeans prices have much higher value than other products exploited in the region. Detailed information and analysis will be presented in the final PD.

Furthermore, forested property values are almost 4 times cheaper than established pasturelands or agricultural lands[42]. Thus, this disparity promotes the purchase of new forested areas, deforestation, and further creation of new pasturelands.

b) **Driver variables explaining the location of deforestation:**

● Access to forests

The region of Ponte Alta do Bom Jesus in the State of Tocantins, is very well connected to other regions of Brazil. This condition makes the land in these regions extremely attractive to agricultural and livestock activities, due to easy transportation and access to other regions.

● Slope

The project area has very low slope class, being considered mostly flat. This is a great condition to cattle ranching and agricultural expansion.

● <u>Identification of underlying causes of deforestation</u>

Underlying causes of deforestation include the political scenario related to environment in the baseline period. This political instability would probably reflect in the increase of deforestation.

Environmental governance in Brazil can be divided into three major periods: pre-2005, a period with very poor governance and high rates of deforestation; 2005-2011, a period with

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[42] REYDON, Bastiaan Philip. O desmatamento da floresta amazônica: causas e soluções. Economia Verde: Desafios e Oportunidades, Campinas, v. 8, p.143-155, jun. 2011. Available at: <https://silo.tips/download/o-desmatamento-da-floresta-amazonica-causas-e-soluoes>. Last visited on December 2020.

improvements in environmental governance and effective results in reducing deforestation; and after 2012, when governance suffered a gradual erosion with the large amnesty granted to past illegal deforesters in the revision of the Forest Code and a return of deforestation rates to the peak levels of the last decade.

2012's political scenario, with the flexibilization of the forest code legislation and amnesty to deforesters, the interruption of the creation of protected areas, including the unprecedented reduction of several of these protected areas in the Amazon, among other actions, proved to be the beginning of a series of setbacks, which have continued over the past 5 years.

In the pre-election period in 2018, the country was already discussing the threat of political bargaining to climate mitigation and the forest conservation in general. In exchange of political support, the government offered landholders to increase deforestation, and the signature of provisionary acts and decrees lowering environmental licensing requirements, suspending the ratification of indigenous lands, reducing the size of protected areas and facilitating land grabbers to obtain the deeds of illegally deforested areas.

In the beginning of 2019, the fusion of Environment and Agriculture Ministries was a clear attempt to obtain more rights for the expansion of agriculture and livestock. The decision was canceled a few days later, after pressure from environmentalists and others in the sector; however, major changes occurred in the ministerial office, limiting the reach and autonomy of the Environmental Ministry, with the absence of mention to combat of deforestation in the office's functions being highlighted by specialists[43].

In addition, the transference of policies and instruments of water resources, including the National Water Agency (ANA) to the Ministry of Regional Development and the Brazilian Forest Service and the Rural Environmental Registry (main instrument for controlling the regularization of large and small properties in forest regions) to the Ministry of Agriculture, Livestock and Supply demonstrated the dismantling of the Environment Ministry. The officialization of indigenous lands, in addition to other land issues, such as the agrarian reform and land regularization in the legal Amazon and traditional territories has been also transferred to the Ministry of Agriculture, Livestock and Supply.

Consequently, the deforestation of Cerrado vegetation in Matopiba in 2021 was the largest recorded in the historical series of Prodes - Project for Monitoring Deforestation in the Legal Amazon by Satellite (2002-2021), surpassing the year 2017, when the region was responsible for 61.1% of deforestation in the Cerrado. Between August 2020 and July 2021 there were 8,523.44 km² of clearcutting, an increase of 8% compared to the 7,905.16 km² suppressed in the previous 12 months[44], The number of wildfires in Brazilian forests increased 70% in 2019,

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[43] Available at < https://www.socioambiental.org/pt-br/blog/blog-do-isa/a-anatomia-do-desmonte-das-politicas-socioambientais > Last visited on December 2020.

[44] Available at < https://ipam.org.br/matopiba-bate-recorde-historico-de-desmatamento-no-cerrado/> Last visited on July 2022.

the highest rate in 7 years. The government tried to deviate attention from the fires, claiming they were fake news[45].

This situation is the same for the others biomes, mainly the Amazon. Therefore, there is a clear increasing deforestation trend in Brazil, which have underlying political and historical causes mentioned in this section.

Even though deforestation and fire alerts increased in the period between 2019 and 2021, the Brazilian Government reduced the budget for forest fire prevention and deforestation control personnel. A reduction of 58% reached the brigade teams[46].

Government agencies such as INPE and IBAMA, responsible for deforestation monitoring have suffered funding cutoffs, dismissals and had their functions and increasing deforestation data publicly questioned and denied by the government[47].

The number of national parks and conservation units in the country's forests was already questioned by the government, which intended to extinguish those by decree[48], an unconstitutional action, after announcing the intention to review the conservation units law (SNUC) and the existing units[49]. In addition, the former Minister of the Environment speaks publicly, in a video released during investigations, of his intention to take advantage of the Covid-19 pandemic to approve several controversial changes to environmental protection and avoid critics and Justice processes.

There are also several threats to the national environmental license process, which has existed since 1981, including from the Minister of the Economy, who wants to loosen the process to favor mining companies, even with the several recent cases of environmental crimes of breaches of poorly executed and maintained mining dams from companies in the country[50].

Specialists affirm that, with the current pace of dismantling of the inspection structure and environmental legislation demonstrated since the first 6 months of the current government, the forest destruction can reach an irreversible limit in 4 to 8 years[51].

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[45] Available in <https://www.theguardian.com/environment/2019/sep/09/amazon-fires-brazil-rainforest> Last visited on December 2020.

[46] Avaliable in < https://g1.globo.com/natureza/noticia/2020/09/12/em-um-ano-governo-bolsonaro-corta-verba-para-brigadistas-em-58.ghtml> Last visited on December 2020.

[47] Available in < https://g1.globo.com/natureza/noticia/2019/08/02/cronologia-reacao-do-governo-ao-uso-de-dados-sobre-desmatamento-leva-a-exoneracao-de-diretor-do-inpe.ghtml> Last visited on 29/12/2020

[48] Available in <http://www.ihu.unisinos.br/78-noticias/589958-em-live-bolsonaro-reclama-que-nao-consegue-extinguir-parques-por-decreto> Last visited on December 2020.

[49] Available in <https://www.oeco.org.br/noticias/ricardo-salles-quer-rever-todas-as-unidades-de-conservacao-federais-do-pais-e-mudar-snuc/.> Last visited on December 2020.

[50] Available in <https://brasil.elpais.com/brasil/2019/01/27/opinion/1548547908_087976.html> Last visited on December 2020.

[51] Available in <https://www.bbc.com/portuguese/brasil-48805675> Last visited on December 2020

The development of REDD projects and a new culture of sustainable management and production, in addition to the profit from carbon credit sales, to encourage the maintenance of standing forest, goes against the non-environmental policy currently adopted by the country.

- **Analysis of chain of events leading to deforestation**

The analysis of chain events leading to deforestation within the reference region was based on the facts presented above, analyzing the relations between main deforestation agents, drivers and underlying causes that caused and most likely will lead to deforestation.

The project region is located in the Matopiba, a region of high vulnerability, deforestation risk and rate, mainly caused by the soybean production. Furthermore, it is a region of intense and traditional livestock activity, followed by a growing market. The historical deforestation that has been occurring over the past 15 years within the reference region has followed this same pattern.

Furthermore, location of deforestation usually occurs nearby already deforested areas, along rivers, and in low sloped areas. In addition, roads are an important driver explaining the location of future deforestation.

It is possible to relate the deforestation curve to the increase in livestock, agricultural and wood production in the region, all of which are growing. Those land-use changes are the main deforestation agents in the region. The profit from these products is also considerably higher than the production of other common products in the region.

The socioeconomic conditions of the population of the region, the fact that it is predominantly dominated by large properties landowners (with political and historical contributions that made the region an important livestock and agricultural center), and the demographic growth implies the need for new infrastructure projects and the arrival of new habitants coming from other regions of the country, attracted by the favorable conditions of production in low-cost forested areas. This increases the pressure on the forests in the project area.

The project area is vulnerable to invasions and illegal deforestation.

The recent history of polemics and anti-environmentalism of the Brazilian government, in addition to not tackling the direct causes, minimizing monitoring and restrictions in critical environmental areas and no investments in sustainable management and farming methods end up influencing and even motivating deforestation, illegal occupation and non-compliance with environmental laws. There is no strong environmental policy, and even with good advances, Brazilian laws have gaps that allows to be taken advantage of by landowners, or the inspection mechanisms suffer dismantling by the interest parties, making the conservation of the extensive Brazilian biomes even more difficult.

- **Conclusion**

The conduction of the Step 3 and available evidence allows to analyze that the most likely future deforestation trend within the reference region and project area is conclusive.

The increasing deforestation rate, added to the region's cattle ranching and agricultural advancement, population increase, lack of effective governmental control and environmental planning are clear evidence that the overall trend in future baseline deforestation rates will be increasing, and this demonstrates the need for conservation measures that encourage a change in the business and production model in the region..

3.5   Additionality

The last version of the VT0001 VCS Tool for the demonstration and assessment of additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) must be applied for all project activities instances.

In additionality assessment, each instance shall determine the appropriate analysis method, whether to apply simple cost, investment comparison or benchmark analysis, according to STEP 2 of VCS VT001 v 3.0.

Instances may or may not include Sustainable Forest Management Plan, as described in Grouped Project Eligibility Criteria in section 1.4.

In case the project activity does not involve Sustainable Forest Management Plan:

- The instance should have financial, technical and scale consistent with the described in this PD, facing similar investments, technological and/or other barriers as the initial instance. As the VCS AFOLU project generates no financial or economic benefits other than VCS related income, the simple cost analysis (Option I) shall be applied.

In case the project activity includes a Sustainable Forest Management Plan:

- A new additionality and AFOLU non-permanence risk analyses shall be provided. In this case, the investment comparison analysis (Option II) or the benchmark analysis (Option III) of the Tool shall be used.

For the present analysis, the VT0001 VCS Tool for the demonstration and assessment of additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) project activities, version 3.0 was applied below for the first project instance. This instance does not have a Sustainable Forest Management Plan.

Other instances shall perform the additionality analysis at the time of their inclusion in the monitoring report.

STEP 1. Identification of alternative land use scenarios to the AFOLU project activity

> **Sub-step 1a. Identify credible alternative land use scenarios to the proposed VCS AFOLU project activity.**

As described in section above of the present VCS PD, and according to the applied methodological tool, the considered alternatives to the project activity are:

- Timber production

- Cattle raising

- Soybeans production

- Continuation of pre-project land use

- Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project

These activities are considered credible alternatives, as shown by official data. Cattle raising and soybeans production are important economic activities in Brazil, especially in the Matopiba region, where the project is located, being an expressive deforestation agent. Meanwhile, timber production represents an important value of production from the municipalities in which the reference region is located.

The pre-project land use is the maintenance of the area as it is, without any activity and actions for conservation. Although no economic activities are carried out in the pre-project scenario, the area is exposed to invasions and illegal deforestation, as detailed in section 3.4.

The application of the project activity could be carried out on the land within the project boundary, nevertheless performed without being registered as the VCS REDD project. This scenario would include avoiding deforestation through security and monitoring installation. Additionally, complementary activities to improve the monitoring of deforestation caused by the agents (identified in section 3.4 above) would have to be carried out, such as: increased surveillance, monitoring and control by satellite images, REDD+ technical studies, social and environmental activities promoted by the SOCIALCARBON or CCB Standards, among others. These investments are usually not made by the Brazilian Government, nor are part of sustainable forest management plans, as they are financially unattractive and not necessary to legally perform the timber harvest. Therefore, the economic feasibility of this scenario would be reduced without additional revenues from the sale of VCUs.

Sub-step 1b. Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations

Timber production:

Timber production may be authorized in the Cerrado as long as the property has an approved Sustainable Forest Management Plan and an Exploration Authorization (AUTEX) issued by the Brazilian Environmental Agency. Furthermore, the land shall follow the Brazilian Federal Law 12,651/2012, that classifies at least 80% of the property located in the Legal Amazon as Legal Reserve, which restricts the activities that could be developed in the area. In addition, there are

other mandatory restriction regulations that limits the legal exploring area, such as the Permanent Preservation Areas.

However, Brazilian legislation and other legal restrictions are not enough to prevent the illegal deforestation of the Cerrado, which is a common practice in the country. According to INPE, the estimated deforestation rate (complete removal of primary forest cover by clear cutting, regardless of the future use of these areas) between August 2020 and July 2021 were at the highest rates since 2002, a significant increase over the rate calculated during the previous annual period.

Furthermore, almost 76% of deforestation in the Cerrado biome within the State of Tocantins between 2013 and 2020 was illegal[52].

Thus, the Project area is exposed to legal and illegal timber activity, which is a common practice in the region; moreover, the related environmental legislation is systematically not enforced.

Cattle raising

Cattle raising in the Cerrado is legal as long as the owner follows the 80% Legal Reserve and Permanent Preservation Areas restriction described in the Brazilian legislation, as explained above. In addition, the landowner must also provide a deforestation authorization for clearing the area for pasture. Therefore, livestock in the region is legalized.

According to IPAM, rural credit is the main funding for Brazilian livestock production. It is essential in the transition to sustainable land use, but in the Cerrado areas, it is used for conventional practices and activities associated with deforestation. Although, since 2014, the Brazilian Central Bank has demanded an assessment of socio-environmental risks from banks to approve public financing and the existence of credit and financing opportunities for sustainable practices and producers in compliance with environmental laws, conventional livestock still represents 20% of the conversion of forest coverage to pasture and other crops. These practices are still used mainly due to their low implementation costs and maintenance, non-intensive use of labor, and as long as it's held in areas with legal authorization, they are legal, although inefficient, with low productivity and high environmental impact.

Soybeans production

The Matopiba region is expressive in soybean production in Brazil. Together, the four states produce around 17.3 million tons of the grain[53]. Soybean produced in this region represents 11% of Brazilian production[54].

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[52] Available at <https://www.icv.org.br/website/wp-content/uploads/2021/05/icv-relatorio-f.pdf> Last visited on July 2022.

[53] Available at <https:// https://www.canalrural.com.br/projeto-soja-brasil/municipios-mais-produzem-soja-matopiba/> Last visited on July 2022.

It is estimated that more than 80% of the soy grain on farms where there was unlicensed deforestation went to international markets, mainly China and the European Union. The high price of soybean is an important driver of conversion of new lands for agricultural production.

Continuation of pre-project activity:

The pre-project activity consists of no activities to be developed within the area, which complies with the Brazilian environmental laws.

Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project

The forest conservation, monitoring, and surveillance comply with Brazilian environmental laws.

Thus, all the land uses listed under sub-step 1a are retained in 1b, being either in accordance with the law or a widespread illegal practice in respect to which the law is not enforced.

Outcome of substep 1b:

List of plausible alternative land-use scenarios to the VCS AFOLU activity that complies with mandatory legislation and regulations taking into account their enforcement:

● Timber extraction;

● Cattle raising;

● Soybeans production;

● No activities.

● Project activity without VCS registration

Sub-step 1c. Selection of the baseline scenario

The project area held no activity in the baseline scenario. There are no economic activities implemented in the area, nor exploration of non-timber forest products (NTFPs) or other land use activities.

Therefore, the lack of presence and monitoring of the area makes it exposed to invasions and illegal deforestation, without any control of the activities carried out within the area.

The identified agents and drivers, combined with underlying causes present in the region, will most likely continue to cause deforestation in the future, and therefore the continuation of the current (pre-project) land use scenario was defined as the most plausible baseline scenario. The future trend for baseline scenario is that deforestation rate in the reference region will probably increase, as verified during the historical reference period.

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[54] Available at <https://www.embrapa.br/busca-de-noticias/-/noticia/33775633/soja-produzida-no-matopiba-representa-11-da-producao-nacional> Last visited on July 2022.

STEP 2. Investment analysis

     Sub-step 2a. Determine appropriate analysis method

     Sub-step 2b. Simple Cost Analysis

The simple cost analysis was determined as the appropriate analysis method once the Project instance does not generate any financial or economic benefits other than VCUs related income. There is no for-profit sale of any products and there is no NTFPs or timber production in the area.

According to the additionality tool applied: If it is concluded that the proposed VCS AFOLU project produces no financial benefits other than VCS related income then proceed to Step 4 (Common practice analysis).

STEP 4. Common practice analysis

Given that no financial benefits were found in the results of the simple cost analysis, the following step according to the VCS additionality tool is the common practice analysis.

The practice of conservation of privately-owned forest areas in the Matopiba and State of Tocantins as a whole, is extremely rare. Conservation activities are usually made in public areas, such as Conservation Units, federal and state protected areas.

The following forms of conservation of private areas are currently promoted in the country:

- **Private Reserve of Natural Heritage (RPPN):** it is a category of conservation unit created voluntarily by the landowner. When the area is categorized as RPPN, the owner is committed to nature conservation, without land expropriation. The benefits of the private reserve are preference in the analysis of applications to acquire rural credit, tax benefits and the possibility of cooperation with private and public entities in the protection, and management of the land. There are no RPPNs close to the project area, and other RPPNs in the State are much smaller properties compared to the project area.

- **Payment for Environmental Services (PSA):** PSA is a voluntary transaction, with the main objective of providing economic incentives to owners of rural or urban properties that have natural areas capable of providing environmental services. Many law projects are in discussion in Brazil's National Congress, and some federal laws mention the service, but currently there is no valid regulation in the entire country. However, there are few programs that benefit landowners. The search for investment and payment for these areas is up to the owners, usually being agreed with banks or private companies, without government participation.

For the aforementioned reasons of the essential difference between the present project instance and similar projects in the area, the proposed VCS AFOLU project activity is not the baseline scenario, and hence it is additional.

3.6   Methodology Deviations

4   QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1   Baseline Emissions

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

4.2   Project Emissions

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

4.3   Leakage

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

4.4   Net GHG Emission Reductions and Removals

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.

5   MONITORING

5.1   Data and Parameters Available at Validation

Data / Parameter	
Data unit	
Description	
Source of data	
Value applied	
Justification of choice of data or description of measurement methods and	

procedures applied	
Purpose of Data	
Comments	

5.2   Data and Parameters Monitored

Data / Parameter	
Data unit	
Description	
Source of data	
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	
Calculation method	
Comments	

5.3   Monitoring Plan

Section not required for DRAFT PD. Further information will be inserted into PDD Version 1.