Territorial Diagnosis of Santa Bárbara do Pará

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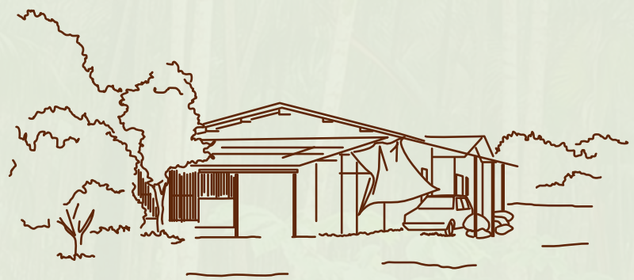
This document consists of a diagnostic of the socioeconomic, and socioenvironmental status of the rural producers of the municipality of Santa Bárbara do Pará (PA) - Brazil, conducted under the scope of the Regenerative Regional Entrepreneurship Program (RREP) developed by reNature in partnership with FARFARM whose aim is to strengthen the social fabric where it is present and to promote regenerative agriculture entrepreneurship in the municipality.

This study was conducted using both qualitative and quantitative methods, using a comprehensive survey and secondary data collection, mainly from national research institutes, such as the Brazilian Institute of Geography and Statistics (IBGE), as well as academic research dedicated to this locality. It relied on the systematization of in-depth interviews conducted by Tewá 225 with local producers, government representatives (municipality and state) and representatives from the universities.

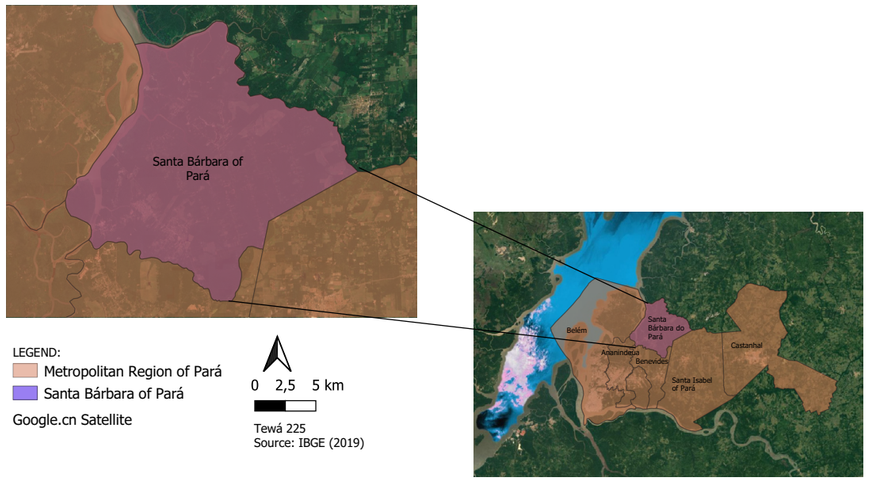
The **first chapter** presents a characterization of the municipality and its territorial context, including economic, social, geophysical and environmental aspects; the **second chapter** presents the characterization of agricultural production, including an analysis of the rural establishments and producers profile; the **third chapter** provides a discussion of four case studies - Red April, Expedito Ribeiro, Colonia and Yandê; the **fourth chapter** presents diagnostic for regenerative agriculture entrepreneurship, presenting the main challenges reported for local associativism.

1.
Santa Bárbara do Pará and its territorial context



The municipality of Santa Bárbara do Pará was founded in 1991 and is located close to the main urban conglomerates of the state of Pará, which has influenced the life dynamics and productive chains of the city. It happened, mainly, after the construction of the state highway PA-391 (1975) that connected Santa Bárbara do Pará to the municipality of Benevides and to the federal highway BR-316, offering better integration of the municipality into the Metropolitan Region of Belém (MRB), established in 1974.

Map 1
Metropolitan Region of Belém (MRB) and Santa Bárbara do Pará



Initially, the MRB was restricted to the municipalities of Belém and Ananindeua, the most populous of the state, and was created with the purpose of integrating the municipalities that were part of a socioeconomic community. However, in 1995, the MRB incorporated the municipalities of Benevides, Marituba and Santa Bárbara do Pará, and Castanhal and Santa Izabel do Pará between 2010 and 2011. The lack of consistency and transparency regarding the criteria used to define or expand the metropolitan regions in Brazil has created regions composed of very diverse municipalities in terms of population and socioeconomic aspects, complicating the definition of public policies, planning, management and application of

public functions of common interest (SEDOP, 2018). It is a fact that, although Santa Bárbara do Pará integrates the MRB, it is the most differentiated municipality due to its social-spatial dynamic, with a rural profile and the smallest population: about 21 thousand people (IBGE, 2020), while Belém has 1.5 million people and Ananindeua 526 thousand.

Taking advantage of the road network integration and its geographical location, Santa Bárbara do Pará started to play a strategic role in supplying the MRB with vegetables and other agricultural products, but has also suffered the consequences of an intense population growth between 2000 and 2010. In 2010, the population was 17,141 people, most part of it living in rural areas (68.2%) (IBGE, 2010), resulting in a rapid and precarious land occupation, with invasions, intensification of natural resources exploitation and topsoil removal for construction material.

The municipality's GDP (Gross Domestic Product) is considered low - R$8,325.10 (IBGE, 2018) - that places it on the 102° position in a rank of 144 municipalities of the state of Pará. Labor and income status show 14.7% of people occupied. The average monthly wage of formal workers is approximately R$1,700.00. In spite of that, an alarming index of 47.5% of people with a nominal per capita income of up to half the minimum wage shows that half the population of Santa Bárbara do Pará is in poverty.

An important information to measure social vulnerability is the municipal human development index (HDI-M)[1]. In Santa Bárbara do Pará, the HDI-M showed an increase of 21.39% between the years of 2000 and 2010, raising from 0.613 to 0.627 (considered a medium HDI-M). The analysis of dimensions that form the HDI-M show that Lifespan increased by 9.57%, Education increased by 46.77% and Income, 11.43% between 2000 and 2010. This development is common for several Brazilian municipalities during this period due to the national development.

The population growth during this period has also resulted in an insufficiency of public services provision, particularly those regarding basic sanitation. According to the IBGE (2018), the municipality has only 10.6% of residencies with proper sewage disposal, occupying the 67° position in the rank of 144 municipalities of the state. This reflects a serious problem in the state of Pará because, although Santa Bárbara do Pará does not perform badly in the state, when we check against the national ranking, the rate of sewage disposal places the municipality in 4,305 among 5,570 municipalities.

Regarding access to drinking water, 32% of the population in Santa Bárbara do Pará use

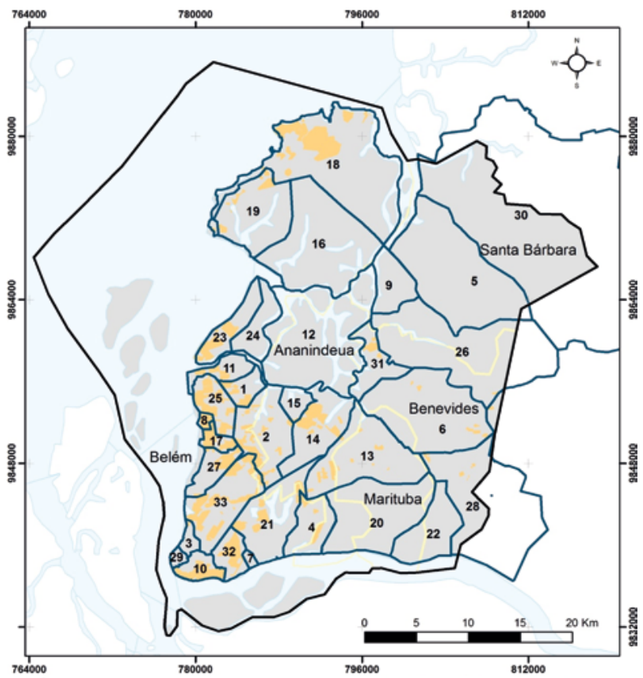
1 Municipal Human Development Index (HDI-M) is a measurement formed by three human development dimensions: lifespan, education and income. The index varies from 0 to 1. The closer to 1, the better the human development. Data are collected every ten years; however, due to the COVID-19 pandemics, information were not updated in 2020.

water from wells or directly from springs, rivers, dams, ponds and streams, without access to the water supply network. According to the rural Census (2017), 41.64% use wells and/or conventional tanks, followed by forest-protected rivers and streams (22.19%) and forest-protected springs (21.90%). This maximizes the risk of contamination, both of water bodies and individuals. Correlation between the lack of basic sanitation and the incidence of diarrhea and intestinal parasitosis (especially among children) is undeniable; in fact, those are the main health issues in Santa Bárbara do Pará, exacerbating the burden on the public health system: hospitalization due to diarrhea in the municipality is 0.1 to 1,000 inhabitants, what places the municipality in the 139ª position in the state among 144, and 4734ª in Brazil, among 5570.

1.1. Environmental aspects

The state of Pará, the second largest in area in Brazil, is located in the Northern region, and characterized by a landscape of small depressions and small plateaus and the Amazon plains to the north of the state. The highest point is Serra do Araci, with 1906 meters of altitude, where the Araci river basin is born with approximately 89 km² and perimeter equivalent to 63,300 meters. This basin is located in the municipality of Santa Bárbara do Pará, and splits in Benevides. The basin encompasses rivers Candeua, Tauá, Paricatuba, Araci and its affluent Buiuçu. Soil typology varies between plateaus and valleys, with petroplintic soils, yellow latosols on plateaus, and hydromorphic podzols and gleisols on the valleys (IBGE, 1999).

Map 2
The highest population density part of the Metropolitan Region of Belém with the delimitation of the river basins



1. Ananin
2. Ariri
3. Armas
4, Aura
5. Baiacu
6. Benfica
7. Betina
9. Cajé
9. Das marinhas
10. Estrada Nova
11. Fox do maguari
12. Ilhas menores
13. Macajatuba
14. Maguari-açu
15. Maguarizinho
16. Marimari
17. Mata fome
18. Mosqueiro
19. Murubira
20. Murucutum
21. Murucutum
22. Oriboquinha
23. Outeiro I
24. Outeiro II
25. Paracuri
26. Paricatuba
27. São Joaquim
28. Taiacui
29. Tamandaré
30. Tauá
31. Tucum
32. Tucunduba
33. Una

Source: Companhia de Saneamento do Pará – Cosanpa (2008); Cohab (2007); Idesp (2010); Secretaria Municipal de Coordenação Geral do Planejamento e Gestão – Segep (2010); Secretaria Municipal de Obras e Terras Patrimoniais – Semot-PMM (2010).

The region's climate is humid equatorial, with average annual temperature of 27oC. The period between December and May is rainier, favoring some crops like açai. Native vegetation is composed of mangroves, fields and the Amazon forest. However, Santa Bárbara do Pará (as well as the entire MRB) is losing natural coverage over the years as a result of extractivism and monoculture, mainly.

Between 1986 and 1994, the average rate of natural coverage loss was 2%, dropping to 0.5% between 2002 and 2006. Although the MRB encompasses areas of biological interest considered key to environmental conservation, over two thirds of the remaining forests are not yet protected as Environmental Protection Units (in Portuguese, UPA). In addition to that, the existing UPAs, particularly the ones established as parks, are unevenly distributed across the metropolitan region and part of the UPAs already established have not been implanted, which means that they lack the basic infrastructure (visitation center, trails, safety etc.) and, therefore, fail to perform its function as an area of recreation and/or environmental conservation (IPEA, 2016).

A study conducted by the State Department of Urban Development and Public Works (2018) revealed that the municipality of Santa Bárbara do Pará lacks any integrated actions with other municipalities of the MRB regarding the environment and needed to articulate an action plan to improve basic sanitation conditions, protect natural and conservation areas, and drain and control the river basin, since Santa Bárbara hosts the microbasin Araci that, in the last 30 years, has been intensively affected by human occupation without adequate environmental management[2].

Currently, the municipality of Santa Bárbara do Pará does not take part or hosts any public conservation units for the protection of the remaining water bodies. In 1996, the Japanese Association Gunma Kenjin-Kai acquired an area of 540 hectares, that has been called Gunma Ecological Park, of which 140 hectares would be destined to the practice of agroforestry systems (AFS), and the remaining 400 hectares of primary forest to implement a Private Natural Heritage Reserve (in Portuguese, RPPN). Between 2003 and 2006, the project Forest Conservation and Environmental Education in the Eastern Amazon has developed educational activities aimed at the local population addressing the importance of forest conservation. This project was sponsored by the japan International Cooperation Agency (JICA) in partnership with the Emílio Goeldi Museum of Pará, the Executive Office of Science, Technology and Environment of the state of Pará (SECTAM), the Brazilian Agricultural Research Corporation in the Eastern Amazon (EMBRAPA) and the Santa Bárbara do Pará city hall. A second wave was planned for 2007 planning to transferring the reforestation and AFS technology to local farmers; however, in 2006, the Association reported to the competent bodies

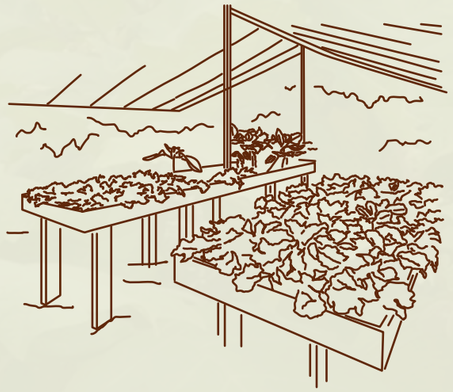
2 *Defined by the federal law 2249 of 1991.*

and to SECTAM the occupation of the area by 150 families, resulting in the discontinuation of all activities (Agência Brasil, 2006).

According to the State Department of Environment and Sustainability (SEMAS), responsible for environmental policies and management, the municipalities could be motivated to preserve its natural areas with the creation of Municipal Parks, for instance, and they could receive environmental compensation, such as the green ICMS (Tax over Merchandise and Services Circulation)[3]. Although the municipality of Santa Bárbara do Pará has a municipal office for the environment, it lacks autonomy to issue permits or to monitor its economically active rural area, which is under the state's scope. This hinders the resolution of environmental problems in the municipality, particularly those related to regularization and control of logging activities, fires and exploitation of water resources in the rural area (SEDOP, 2018).

3 *Green ICMS is a tax incentive policy that increases the tax collection of those that meet technical criteria, according to https://www.semas.pa.gov.br/municipios/icms-verde/.*

2. Status of the Rural Production



Aiming to portray the Brazilian rural scenario, the Brazilian Institute of Geography and Statistics (IBGE) carries the Agricultural Census every ten years in all cities in the country. The data acquisition methodology used by this census, conducted in 2017, is aligned with the foundations recommended by the World Program for the Census of Agriculture, devised by the Food and Agriculture Organization (FAO)[1] in 2016. In this sense, the Agricultural Census of 2017 is a national survey that relies substantially on the dynamics of the means of production and use of land, the relationship between labor and occupation, the degree of labor specialization and technification, as well as the growing interest in the consequences to environmental assets. This census considers as a data collection unit the **"rural establishment"**, which is:

> *All production/operation unit dedicated wholly or partially to agricultural, forestry or fishery activities, regardless of its size, legal status (whether belonging to one producer, several producers, a company, a group of companies, etc.), or location (urban or rural zone), with the purpose of production, whether for sale (commercialization of the production) or subsistence (to provide for the producer and his/her family) (IBGE, 2018a, pg. 17).*

In this sense, the agricultural census sample encompasses active rural producers located by the census officer, regardless of their ownership status. Regarding methodology aspects, IBGE notices that

> *The information registered on the Agricultural Census are declaratory, stated by the interviewee at the moment of the visit. The census officer does not count the number of animals, weights the production or measures the production area. All information registered are according to the interviewee's statements (IBGE, 2019, pg.2).*

1 *For more information, please refer to: http://www.fao.org/world-censusagriculture/wcarounds/wca2020/es/*

2.1. How are the rural establishments in Santa Bárbara do Pará?

The Census has interviewed 447 rural establishments in Santa Bárbara do Pará, among which 57.49% are leases or settlements waiting for regularization, 41.61% are owners, and only 0.89% are producers without a defined land area. The main economic activities among rural establishments are related to permanent crops (42.51%), followed by temporary crops (35.35%). It is worth mentioning that the temporary crops are concentrated on lands with the status of lease and settlement (29.53%), while the permanent crops are mainly on owned lands (22.60%).

Table 1
Economic activity groups according to status of the land in Santa Bárbara do Pará (PA)

Economic activity group	Typology vs status of the land			
	Total (%)	Owner	Lease or settlement waiting for regularization	Producer without defined area
Temporary crops	35.35%	5.82%	29.53%	
Horticulture and Floriculture	2.68%	1.79%	0.89%	
Permanent crops	42.51%	22.60%	19.91%	
Production of seeds and certified seedlings				
Cattle ranching and other animal production	12.08%	4.92%	7.16%	
Forestry - planted forest				
Forestry - native forest	1.12%	0.45%		0.67%
Fishing	5.82%	5.82%		
Fish Farming	0.45%	0.22%		0.22%

Source: Agricultural Census 2017

In permanent crops, the main products[2] are Açaí berries with 48.47%, followed by Cupuacu with 20.54%, and Pupunha with 10.45%. Regarding animal production, 94.65% of respondents state that they raise hens, roosters and chicks. The interviews for this study pointed for these products as the main crops in Santa Bárbara do Pará, thus corroborating the Census data. *"Açaí berries is in the first place, then comes Pupunha, and third the Rambutan"*; some communities mentioned Cupuacu as third. Regarding animal production, the producer states: *"In the financial aspect, eggs have added value and larger demand"*.

2 *Permanent crops are those that remain linked to the soil and provide more than one harvest, usually with minimal duration of 4 years.*

Table 2
Main permanent crops production in Santa Bárbara do Pará (PA)

Main products of permanent crops*	Total (%)
Açaí berries	48.47%
Acerola	0.18%
Banana	5.23%
Cacao (seed)	7.57%
Coffea arabica beans (green)	0.36%
Cashew (fruit)	0.72%
Bahia Coconut	0.36%
Palm (nut)	0.18%
Graviola	0.54%
Orange	0.90%
Lime	0.72%
Mango	0.18%
Papaya	0.18%
Passion fruit	0.72%
Black pepper	0.36%
Tangerine	0.36%
Achiote	0.18%
Pupunha	10.45%
Cupuaçu	20.54%
Other	1.80%

*Source: Agricultural Census 2017 *This question allowed multiple choices.*

Regarding the temporary crops[3], the main food is cassava with 78.26%. All other products are less representative in comparison with the cassava, but the second largest percent corresponds to corn, with 9.06%. However, the interviews revealed several other temporary crop products, such as vegetables.

Table 3
Main temporary crops production in Santa Bárbara do Pará (PA)

Main products of temporary crops	Total (%)
Pineapple	2.54%
Pumpkin	2.54%
Paddy rice	0.36%
Sugar cane	1.45%
Colored beans	2.17%
Cowpea	2.17%
Green beans	0.36%
Cassava	78.26%
Watermelon	0.36%
Corn	9.06%
Forage corn	0.72%

*Source: Agricultural Census 2017 *This question allowed multiple choices.*

Data also show that almost half (48.77%) producers produce for their own consumption and their families. The other half (51.23%) is destined to commercialization (including exchange and barter). Regarding income pertaining to the establishment and other income sources of the producer, the production of vegetables (28.53%), animal products (16.72%), and other agroindustry products stand out, complemented by other income sources (not mentioned) of the establishment (18.39%).

3 *Temporary crops are composed by products planted every year, soon after harvest, usually in a short cycle.*

Table 4
Main sources of income of the establishment and other sources of income in Santa Bárbara do Pará (PA)

Sources of income of the establishment and producer*	Total (%)
Income from the establishment's production - vegetables	28.53%
Income from the establishment's production - animal products	16.72%
Income from the establishment's production - Agroindustry products	16.82%
Other sources of income of the establishment	18.39%
Other sources of income of the producer - pensions	9.40%
Other sources of income of the producer - from government's (city, state or federal) aid programs	10.14%

*Source: Agricultural Census 2017 *This question allowed multiple choices.*

2.2. Who is the producer from Santa Bárbara do Pará?

The Census also sought to understand the producers' socioeconomic profile. More than half of the rural establishments are run by male producers (58.39%). Most of them are adults, peaking in the range of 35 to 45 years of age (22.15%).

Table 5
Age and gender of rural producers in Santa Bárbara do Pará (PA)

	Age vs Gender of producer		
	Total (%)	Man	Woman
Younger than 25 years old	4.70%	2.68%	2.01%
From 25 to 35 years old	16.11%	8.95%	7.16%
From 35 to 45 years old	22.15%	11.63%	10.51%
From 45 to 55 years old	21.70%	13.65%	8.05%
From 55 to 65 years old	20.58%	10.96%	9.62%
From 65 to 75 years old	11.19%	7.61%	3.58%
Older than 75	3.36%	2.91%	0.45%
No answer	0.22%	-	-

Source: Agricultural Census 2017

More than half the rural producers have finished Primary School (54.14%), which is the transition between children's education and high school. There is a significant drop in the number of producers who have finished high school (22.60%). Most producers who have never attended school are male (5.59%), while women are the majority among those who have not attended high school (12.08%).

Table 6
Education and gender of rural producers in Santa Bárbara do Pará (PA)

Education vs Gender of producer			
Level of education of the producer	**Total (%)**	**Man**	**Woman**
Have never attended school	7.38%	5.59%	1.79%
Alphabetization class - AC	5.59%	3.36%	2.24%
Alphabetization of young people and adults	0.67%	0.22%	0.45%
Primary School	3.80%	2.46%	1.34%
Secondary School	0.45%	0.45%	0.00%
Enrolled in primary school	54.14%	33.33%	20.81%
Education of adults or primary and secondary school equivalency	0.89%	0.45%	0.45%
High school	0.00%	0.00%	0.00%
Enrolled in high school	22.60%	10.51%	12.08%
Technical education or A.A. degree	0.89%	0.67%	0.22%
Education of adults or high school equivalency	0.22%	0.00%	0.22%
College	3.13%	1.34%	1.79%
Master degree or PhD	0.00%	0.00%	0.00%
Not applicable	0.22%	0.00%	0.00%

Source: Agricultural Census 2017

Regarding ethnicity/color, most producers regard themselves to be brown, which in IBGE definition are those descending from more than one ethnicity. This group is followed by those who identify themselves as white, 16.14%. Only 6.95% of producers regard themselves to be indigenous.

Table 7
Ethnicity/color and gender of rural producers in Santa Bárbara do Pará (PA)

Gender vs ethnicity/color of producer			
	Total (%)	**Man**	**Woman**
White	16.14%	10.31%	5.83%
Black	8.30%	3.81%	4.48%
Yellow	0.00%	0.00%	0.00%
Brown	68.61%	40.58%	28.03%
Indigenous	6.95%	3.81%	3.14%

Source: Agricultural Census 2017

AGRARIAN REFORM in Brazil

In Brazil, land-ownership is a complex, long-lasting structural problem. All regions across the country reflect the inequalities of access to land; in the Northern region, the problem persists since the 1970s. "Here in the Amazon, land ownership is hugely complex. No one knows who owns the land. Is it federal? Is it the state's? Is it the municipality's? The large landowner's? It's no one's" (Interviewee). In face of these challenges, legal orders and public policies arise to try and solve problems related to land access, rural production and housing in rural territories.

- ***Agrarian reform settlement[4] policy and agrarian reform program:*** *allow the elaboration of rural settlement projects with housing and production structure for the settlers. House building, access to electricity, support for productive credit, training of producers, access to markets, among others, so that the settlers are emancipated with the land acquisition. In Brazil, this is one of the better structured policies of land regularization; it is, however, insufficient, since until today not a single settlement has been emancipated.*

- ***Food Acquisition Policy (PAA, from Portuguese):*** *created to promote domestic market adequate to family agriculture, allowing states and municipalities to purchase products by means of public calls with their own resources with simplified bureaucracy that waives the bidding process. The innovation comes with associating products from family agriculture with the Brazilian policies of Nutrition and Food Safety, directly linking these two ends; this policy was highlighted in the recent reports of Food and Agriculture of FAO. PAA purchases these products and donate to public institutions dedicated to food and nutrition, social welfare and families in social vulnerability. While in Brazil 25% of resources have been accessed by the agrarian reform, in the state of Pará, this number drops to 7%. According to reports from interviewees, the municipality of Santa Bárbara do Pará is making efforts to adhere to the program since 2019 and it is expected that resources become accessible in 2021. Only 1% of the amount destined to PAA was assigned to the state of Pará. Among the public institutions, the main buyers are, currently, the universities.*

- ***Family Agriculture Strengthening Program (Pronaf):*** *consists in a funding program by the Federal Government destined to farmers, family producers, natural and legal persons. There are several categories, called subprograms aimed at each specific audience. In Santa Bárbara most producers have access to Pronaf B, aimed at family producers with a declaration of aptitude issued by Pronaf (DAP) - Group B (microcredit), with gross family income of up to R$20,000.00. In this category, the producer can take a loan of up to R$5,000.00 with an annual interest rate of 0.5% payable in 2 years. The program also offers Pronaf Women, a program that funds female farmers with up to R$330,000.00 (individually) and R$800,000.00 (collective) on the farming of pig, poultry, fish, shrimp and fruits, with an interest rate of 2.75% per year. There is also Pronaf Youth that funds family farmers that are natural persons older than 16 and younger than 29 years old with up to R$16,500.00, with an interest rate of 2.75% per year.*

4 *"According to Decree #80/2002 from MDA (Ministry of Agrarian Development), the rural settlement is a set of independent agricultural units implemented by INCRA through the Agrarian Reform Program".*

3.

Case studies: the rural communities of Santa Bárbara

Santa Bárbara do Pará has 18 rural districts plus the urban center. The largest of these districts is Red April followed by Reduto (with ten communities), Araci, Caiçaua, Livramento, Pau D'arco, Novo Paraíso, among others. The largest distance to the city center is 17 km. All of these territories are considered peri-urban to the Metropolitan Region of Belém due to their proximity to the capital, which complicates their characterization as strictly rural.

This rural area was born with a national historic milestone, the Revolution of Cabana (1823 to 1840) and the take-over of Belém by the insurgents. During 10 months, the insurgents held a revolutionary government formed mostly by indigenous people until being stifled by the national troops in 1840. To avoid the insurgents to settle in the region, the government auctioned the lands close to Belém to big land-owners who then occupied it with cattle, monocultures or kept them as unproductive areas (that recently motivated occupations by movements fighting for land).

Nowadays, there are several rural modules with up to 4 hectares; these characterize over 70% of the territory as family agriculture (modules with up to 20 ha), according to the Rural Environmental Registry. According to the Agricultural Census, 95% of establishments have self-declared as family farms, of which 99.5% claim to have accessed PRONAF. It is possible to assume that these family farmers have had access to credit from the Federal Government for some kind of investment in production such as modernization of the productive system. It is worth stressing that in order to access such subsidies, the producer must be qualified with the Declaration of Aptitude issued by EMATER. According to SEDAP (the state department of agriculture and supplies), there are 208 federal properties registered at CAR (the Environmental Rural Registry) as family farms, about 5 thousand inhabitants in the rural area, of which 1008 have the declaration of aptitude (324 are active).

The rural districts in the municipality can be divided into two main groups: communities on dry land and riverside communities; the first group is characterized by family farming, and the second by extractivism (due to the impossibility of growing crops). Soil, severely degraded by traditional monoculture, is acid and needs continuous application of limestone for the crops.

"The economy is not solid, is based on logging, palm trees crop (that were abandoned and there was an occupation by MST [the movement of landless workers] in 2 settlements); there is a very big farm, Teretawá, where lots of cattle circulate as well. The farm owner owns other farms in Marajó and the cattle circulates and stays on this farm to be exported to China. And there are several coops for poultry farming, about 15. And there is a local commerce and several communities (supported by UPRA, by the Ministry of Agriculture) of organic vegetables. And there are lots of people supported by social programs, both in the rural and the urban areas" (Interviewee).

Two communities in the municipality are agrarian reform settlements that, considering its particularities, should be understood within a wider national context - the Red April and Expedito Ribeiro. They are both organized by the MST (the movement of landless workers). According to Paulino et al., proximity to the city hinders its consolidation as settlement, but facilitates access to PAA.

"The insertion of capital into the agricultural sector through technology and new production dynamics has brought deep changes in the rural area where new territories were re-territorialized (re-created) from old ones; therefore, the conflicts that marked the development of the space and the day-by-day of the families should be noted. The insertion of capital into the rural space has redefined the territory (re-territorialization [reconstruction] of the capital) through technology and economic dynamics that influenced the space's organization, conditioned ways of production and accelerated the deterritorialization (exclusion or abandonment) of family agriculture. (...) With this perspective, it is necessary to consider the settlers' profile, who have a different trajectory from that of family farmers already consolidated." (Paulino et al. 2019, pg. 112)

"The Movement of Landless Workers (MST) has a key role on the territorialization (creation) of settlements since through camps, occupations and settlements, in summary, the fight for the land, seeks to rebuild the identity of its people, what can be transformed into a real opportunity to these workers once excluded from the country's social and economic order if they have support from the State" (same, pg.117)

Hence, we understand that in Santa Bárbara do Pará families with different profiles have been settled by the agrarian reform, among them are those with a sense of belonging to the rural environment and agricultural production, and other that were already adapted to the urban context of jobs and services. This complicates the socioeconomic context demanding an update of the national settlement policies.

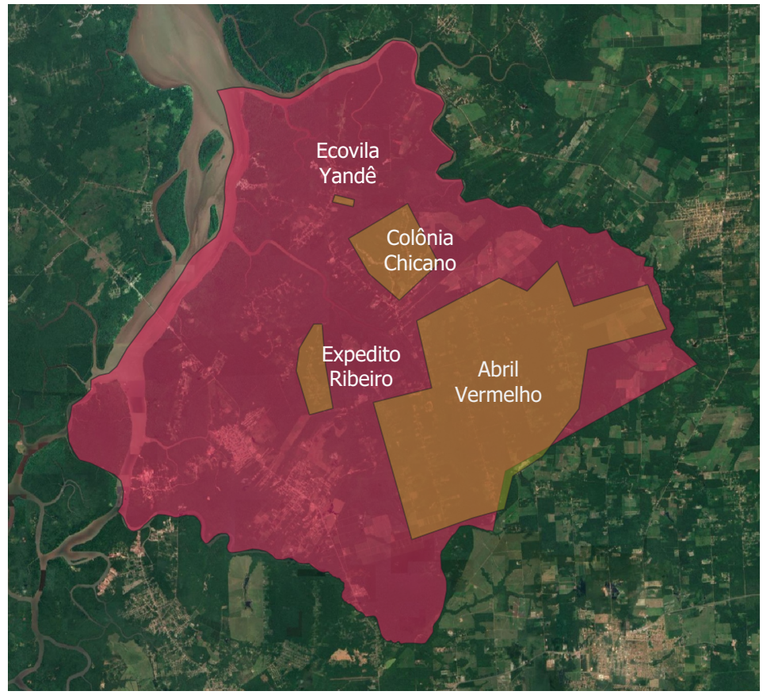
Four communities with diversified profile were selected for the case studies, aiming to understand **a heterogeneous sample of the territory of Santa Bárbara do Pará** as a whole. The selection criteria were 1) have agroforestry initiatives already consolidated and 2) have a relationship with previous projects (FARFARM).

These 4 communities have different sizes and different legal framework, as shown in the Table below:

Community	Size	Legal characteristic	Number of associations/ cooperatives
Red April	394 lots of 10 or 20 hectares Total area of 6,803,146 hectares	Agrarian reform settlement (formal)	7 producers associations 1 cooperative
Expedito Ribeiro	128 families 600 hectares, of which 80% are forest reserves	Agrarian reform settlement (non-formal)	1 producers association
Colônia Chicano	+- 600 residents 320 hectares	Private properties	1 producers association 1 women's association
Yandê	6 families 29 hectares	Private property	1 private institute (ongoing formalization process)

Source: Tewá 225.

Map 3
Communities of Santa Bárbara



3.1. Red April[1]

The Red April is the largest settlement in the region of Santa Bárbara, representing 31% of the total area of rural settlements in the MRB. It borders the municipalities of Santo Antônio do Tauá and Santa Isabel do Pará, is located 30km from the Capital (Belém) and 8km from the town's center; has 394 lots[2] and a peculiar nature. Born during the occupation of April 16 of 2004, when more than 800 families from the MST occupied the Paricatuba Farm owned by the company DENPASA (Dendê Pará SA), it was transformed from a land used for palm oil monoculture[3] into an area used for the agrarian reform that was regularized by INCRA (National Institute for Colonization and Agrarian Reform) in 2009, 5 years after the occupation. It is worth mentioning that the occupation took place after a pest had rendered the palm crop unproductive and abandoned.

The settlement project is very recent (as are all MRB settlements) and is still in the stage of implementation, which will be followed by the stage of structuring or consolidation with INCRA's follow up. The profile of the settlers is heterogeneous due to the proximity with the urban area, including campesinos and families coming from Belém's outskirts, not necessarily

1 *As a tribute to the struggle of the 19 victims of the Eldorado dos Carajás massacre in 1996, the settlement was named "Red April".*

2 *According to the interviewees, this number varied between 370 and 394 lots. The number 394 was given by the interviewee with most references, therefore, used here as final figure.*

3 *It is worth mentioning that many monoculture projects, similar to big latifundiums such as Denpasa's, have arisen during the military period along with the occupation via big infrastructure works promoted by the government. This movement has intensified the fight for land, whether the campesino fight, squatters or even the demarcation of indigenous land.*

with rural origins. *"At least half of the settlement are not producers. They are people who live in the settlement and live off urban activities in Mosqueiro and Belém. They are not farmers; they don't have a farmer's life." (Interviewee)*. In this sense, according to researchers, in the community there is.

> *"A part of the farmers in the settlement that had no history with agriculture before being settled, who had lived, for instance, in the city in extreme social and economic vulnerability and need support from other settlers to develop the farming practice" (. 2019, p. 121).*

Also, it is estimated that the number of families is much larger than the families formally registered, both because of migration (from the urban area to the rural area - this movement was observed in 2020 due to the pandemic) and family growth, with children and grandchildren getting married and building their own houses, thus splitting the family land.

The settlement was divided initially in 4 centers (I, II, III and IV) from which the 4 major associations of producers originated. Due to internal disputes, one of the centers was divided into other associations, totaling 7 producers associations registered with INCRA (plus other forms of informal internal organization), with different sizes (while one has 27 families, another one has 120). There are reports of an eighth association, leaded by women, that has not been recognized. *"I remember that there was always a woman on the meetings who would stand up and say 'it's not 7 associations, it's 8' and INCRA hadn't recognized this specific one" (Interviewee)*.

With an area of more than 6 thousand hectares, at the beginning Red April was characterized by the environmental degradation caused by the palm crops that preceded the settlement. Since then, after going through a forest regeneration process, as described by researchers, "nowadays, the settlement has areas such as forest reserves, hybrid palm crops and areas not suited for agriculture. Some lots have agricultural, forest and fruit crops, characterizing the agroforestry system" (Paulino et al., 2019, p.122).

In the period between occupation and regularization of the settlement, producers report a series of "robberies" for illegal logging, sand and stones (nowadays, these events are scarce).

> *"I teach this area of development and I used to take my students there to see issues of degradation, erosion, deforestation. Mainly in the regularization stage, extractivism was out of control. Several trucks would enter to remove stones and soil. But after regularization, it reduced a lot" (Interviewee).*

Currently, the settlement produces several crops, such as cassava, açai, pupunha, vegetables, among others, in addition to livestock such as fish and chicken, almost always mixed with cassava crops (basic local food). *"We want to keep it as diverse as possible, thinking on consumption and commerce. We host wonderful fairs, our settlement is largely visited, it is close to the capital, everyday packed pick-ups go out" (Interviewee)*. However, the amounts produced, mostly for subsistence, still prevent some crops to be characterized within a productive chain: *"there are no big crops. The word 'productive chain' is too big for what it is. Ultimately, it goes to the kitchen, the road, there is nothing chained. Some raise pigs, but on a pigsty, it is not pig farming. It is small and for subsistence" (Interviewee).*

The Red April settlement is considered one of the largest food producers in the MRB, with several agroecological initiatives. According to the interviewees, such initiatives are still incipient, but they are offered technical support on a constant basis: - Ideflor, in partnership with the State Department for Agriculture and Fishery Development (SEDAP), implementing seedling nurseries in 2018 (an amount of 10 to 15 thousand seedlings that have already been planted); - Sebrae (Brazilian Micro and Small Business Support Services) and EMATER (Company for Technical Assistance and Rural Extension) sponsoring agroforestry system models; - The State Department, with the program Quintal Produtivo (Productive Backyard), has offered workshops and seeds of some species as heirloom corn, as well as equipment for mechanization; it also promotes opportunities for the commercialization through the Annual Fair of Products from the Agrarian Reform[4]. Other long-term partnerships, such as with UFRA (the Rural Federal University of Amazonia), have been following the families for over ten years funding regenerative systems.

> *"Initially we are in partnership with the OCB System, Sebrae, the state and municipal departments for agriculture, seeking for fairs and events to bring our cooperates, always seeking for partnerships to approve projects and improve the quality of life in the community" (Interviewee).*

The settlers' income comes from several sources, including jobs in the city. According to an interviewee from UFRA, less than 30% of the settlers live off agriculture. Now, according to a local leadership, most families are farmers, mainly because in Red April the environmental degradation was so severe that extractivism is not possible. "They even planted palm trees by the springs" (Interviewee). Among the farmers, most produce for their own subsistence and generate income by selling the surplus in fairs (local and in other municipalities of the MRB such as Ananindeua, Belém and Mosqueiro) and to final costumers (basket of organic products) and

4 *The fair is hosted annually, offers more than 100 different products and boosts around 50 thousand reais in direct sales for farmers, according to the State Department.*

companies (that buy açaí, cupuaçu and palm - DENPASA itself[5]) - despite the assessment of residents and specialists as frustrating experiences, particularly with the dynamics of delayed and underpriced payments.

> *"Until now sales for companies have not worked well. Not because of lack of demand: cupuaçu received offers to buy, then we had an offer to buy açai here at colonia chicano... We have had several issues with return, payment, direct sales became more attractive and more dynamic. And also prices: way below what we could obtain in the market." (Interviewee)*

> *"I represent UFRA in a state committee for organic agriculture and we 'supervise' this relationship [between producers and companies] so that it is good for both sides. It is usually good only for the company's interests. When it is not interesting anymore, the company abandon them and they lose all the diversity of products they used to have. I followed the promotion of palm tree production: they refused this partnership because it becomes risky. They drop their subsistence production to emphasize only one production and, when the company changes its mind, they have to go back to what they used to have and lost. It is a criticism they have on the private partnerships." (Interviewee)*

5 *Paulino et al. 2019 apud Gomes et al, 2013; Pires et al, 2015; Souza et al, 2016.*

Recently, the settlement managed to access PRONAF (National Program for the Strengthening of Family Agriculture) policy, with emphasis on expanding crops and food processing. They also accessed PRONAF - Women. The average value is 5 to 6 thousand reais. The program strengthens the investment capacity, because the revenue from the crops allows only small investments. *"When it reaches 15 thousand in a year, it is a lot" (Interviewee)*.

Regarding access to public policies, there is dissatisfaction among residents, in general, due to a lack of basic structure: *"We are trying to open a health center for 17 years" (Interviewee)*, opened recently in the community's common area. The community relies on a primary school, but not secondary or high school.

MAIN CROPS by priority

Açaí, cassava, cupuaçu, cacao, banana, vegetables, beans, corn, pupunha and livestock: chickens, pigs, fishes, cattle, goats and sheep, murumuru, priprioca, styrax

3.2. Expedito Ribeiro

The rural agroecological workers settlement Expedito Ribeiro is an occupation in the regularization stage, occupied by the MST since 2006. With 128 families[6], it is the second largest territory in the sample, according to the interviewees. Located 40 km from capital (Belém), it used to be an unproductive property without land regularization. The negotiations for the purchase of this area were initiated by INCRA after the company's legal attempts to remove the occupants. Due to the lack of documents proving the company's ownership, the case is stalled. Regularization is currently being done by INCRA while the producers' association is formed and the division of lots is defined. It is expected that regularization is finished in 2021.

> *"Everyone's dream is to receive the ownership certificate to get credit, because the credit we can access at the moment is only from PRONAF, but the amount is too little, this year it dropped to 2.5 thousand. If you have the certificate proving that this is yours, you go to the bank and get a much larger credit with time to pay." (Interviewee)*

The area, initially in a process of degradation, was an area of secondary vegetation, unproductive. Since occupation, the changes such as access to electricity, tap water, road access, the construction of a health center, among others, allowed occupants to organize and to produce for their own subsistence. Currently, only 45 of the 128 families are part of the association and work with agroecological methods but it is estimated that 100% of those are productive with diverse

6 *Studies conducted in this location in 2019 indicate 54 families. In this study, conducted in 2021, 128 families were identified, which suggest an increase in population density during this period.*

crops. The association, called "Association of rural agroecological workers Expedito Ribeiro", has "an administrative office, an outbuilding for meetings, trainings and activities of different kinds, and a common area for planting" (Tavares et al.,2018, pg. 69) of approximately 2.5 ha.

The settlement is known for the agroforestry system, which is one of the main sources of income along with conventional plantings of vegetables and fruits and poultry farming. This is due to partnerships with the third sector and multilateral and public bodies in training and inputs projects. Programs such as Pará Produtivo, coordinated by Sedap and carried out by EMATER, that fosters family agriculture for the production of food without the use of pesticides with greater productivity, work on the territory providing training for the farmers.

Partnerships established with the NGO Instituto Amigos da Floresta have initiated projects to restore the riparian forest and recovery of areas where the families live. Partnerships with the Pará state government and funds from IADB allowed the construction of the association's headquarter, the local health center and the purchase of equipment such as pick-ups and cutters, as well as demonstration units (between 2013 and 2015). However, the partnership most frequently mentioned by interviewees is with the mixed rural cooperative Tomé-Açu (CAMTA), a well-regarded cooperative[7] that provides assistance to producers on agroforestry systems and have allowed Expedito Ribeiro to be recognized as a model project for the multiplication of technology, including in Japan.

> *"The project aimed to develop the local community (100% funded, they would go, implement, provide training, leave everything set). The families who adopted this project are harvesting from it today" (Interviewee). According to Tavares et al., "there is also, in this camping, the influence of public environmental and teaching institutions (EMBRAPA, CAMTA, Tokyo University, EMATER, UFPA, UEPA) that work in tandem with the association to improve the environmental quality in the area" (Interviewee)*

7 *According to interviewees, "nowadays, the best pulp in the region belong to them".*

Regarding life quality, residents claim that the health center meet their needs, while the other public services do not. There are no schools in the community, but children receive support with the city school bus that take them to and from the association headquarter every day. Garbage collection is non-existent, which make them resort to incineration and composting.

> *"Based on the observation of the residents' reports, it is noted that the rural associations in the locality are key for the provision of basic public services and maintenance of life quality of the settlement, since they establish partnerships with public and private initiatives, and protect and mediate the residents' interests with the public authorities." (Interviewee)*

> *"Many residents keep vegetable gardens, crops (cassava, pepper or other vegetables) and/or agroforestry systems in their properties and use these products to feed their families and/or as source of income. Those that do not own land work or help in the crops of other settlers in exchange for some benefits" (Tavares et al. 2018, pg. 70).*

Another source of income is the sale of coal and household products such as cosmetics, that are sold on-site (Tavares et al., 2018). However, differently from the Red April, the main source of income of Expedito Ribeiro is agricultural production, currently varying from 50% to 90% destined to sales (depending on the crop).

> *"Annually I harvest 3 to 4 thousand reais in production. Then, there is the community share from the association that divides profits, around 500 reais per year for each associate that are part of the community shares (there are currently 7 families making part of this community share that is obtained with the products harvested by the families that work in the common production area)" (Interviewee)*

MAIN CROPS by priority

Cassava, açaí, pupunha, cupuaçu, rambutan, mangosteen, cacao, pigs and chickens, orange, lime, guava, papaya, acerola and vegetables.

3.3. Colônia Chicano

With about 100 years, the community Colônia Chicano is a family colony named after Francisco Antônio Mescouto, its founder. His name - Francisco or Chico - dubbed the colony chicano, although his origin is indigenous. This community has grown organically with the division of the property among his family (the patriarch had 12 descendants). Nowadays, on the sixth generation, 9 Mescouto families (85% of residents) from the same familial branch run several initiatives on the territory, from planting to craftsmanship.

Although isolated (without road access) for a long time, other relationships were established along the years. Through marriage, initially only among cousins, and later with people from other regions, community begin to gain new influences such as Lebanese. According to the Mescoutos: *"There are other people who live here, entire families, but before they were native from here. A cousin would meet a wife, married and come. And this would keep happening. But now, there are entire families who came and stayed at the place" (Interviewee)* Also, road access, a little longer than 25 years ago, has substantially modified life means: from a life essentially agricultural to residents start seeking jobs in the city.

The territory, that was once 129 thousand ha, after divisions and sales is now 320 ha plus two streets, according to interviewees. The number of farmer families is being reduced as well. Only 2 enterprises are regarded by the interviewees as aimed at commercialization. One of them is the farm of Mr. Procópio, with a consortium of bananas, cupuaçu and cassava.

"Taking after my brothers: one is a mechanic, the other is a driver and the other a teacher. None of them works on farming. They have their area that produce for their own consumption. And I have cousins who work on agriculture, selling cupuaçu, açai and pupunha. There are about two families that still produce in scale and sell it. The remaining is for own consumption. We have açai, chicken, pupunha, eggs for our own consumption in our backyard" (Interviewee).

"Only a few people produce here nowadays. There is Mr. Procópio with a strong production of cassava, banana, large crop, and açaí and cupuaçu, large crop. He is the most successful producer here. Now, there is this lady, Suzane, with a work of verticalization of products derived from cassava, tucupi, tapioca and her father-in-law's family still plants cacao and keep bees. There is another family, Mrs. Socorro's, that farm fish. There is also Mr. Cassianinho, mr. Copaiba, who have crops; also Mrs. Maria, all of cassava. About 10 to 12 families have been interested. We, that are not from here, produce in the agroforest, 13.5 ha" (Interviewee).

As reported in other communities, Colônia Chicano also suffers with the environmental degradation and illegal extraction *"They extract timber from the secondary forest, it is not big, but it is illegal, and also sand and boulders" (Interviewee).* Given that this is an area with several streams, the perception of the environmental impact on the water bodies is reported by the residents: *"The water flow has been diminishing in these streams. They used to be much stronger. In the community, in my backyard, there was a spring; 3 summers ago, the water stopped flowing. We reforested the area and started to take care of it and last summer the water started to flow again." (Interviewee).*

The company Top Açai is present in Colônia Chicano, purchasing from several families in the region (both planted and extracted açai). Company Sococo, that supplies coconut oil for Natura, employs a lot of people in the region. This is one source of income among the residents, who have also started small enterprises in the community or in the surroundings. *"They go out for temporary jobs. They are carpenters, contractors, mechanics and keep trying to get a job in the city hall, industries close to the municipality, underemployment."* Small commerce in the community, such as pizza places, tire repair shops, hairdressers, and even the sales of products on weekends at the local riverside (a lot of people come to bathe in the river on weekends) generate extra income for the community.

Among the main local enterprises is the initiative of the Chicano Pottery Association of Women, that produce garden and kitchen artifacts with the clay obtained at the local streams. They are able to produce from 300 to 600 pieces every quarter and have already exported to other countries.

> *"We have the tradition of ceramics. Our history began with a cousin involved in politics, alderman, and he saw a research that showed that the clay in our locality was of high quality and wanted to give it a function, and negotiated SEBRAE's support so that the young people would have a profession." (Interviewee).*

Nowadays, 20 women are part of the association and are directly involved with production, now temporarily halted due to the pandemic. They intend to resume activities with some partnership, including the expansion of production to jewelry. The association is highly regarded in the municipality and is always invited to participate in events dedicated to "women of success", *"I have traveled a lot because of ceramics, to other states, other countries"* says the leader of the association.

Still on the local entrepreneurship, there is the perception that the agroforestry initiatives that are being tested in the community may serve as an example to other communities, including in income generation. *"Many people plant only cassava to make cassava flour. And during the growth of cassava, they have no income and they could produce much more in the AFS" (Interviewee).* There are 2 AFS experiences consolidated in the community. However, there is a certain fear among the community residents about opening new crops, beyond the existing market.

> *"We did an experiment with Beto [FARFARM] of agroforestry planting, with cotton. And he asked me why I didn't do it in my farm. When I was little, I used to produce cotton and it is quite heavy because it pierces your hands. And I regretted having answered what I answered: what is the price of cotton? Having all this work to sell at 10 reais per kg? And I told him that it doesn't pay. And this is also a question to be made: if you're going to produce it, is there market for it? Will someone buy it? Will it generate income for the family? (Interviewee)*

MAIN CROPS by priority

Cassava, cupuaçu, açai, banana, cacao, vegetables, chicken, eggs, sweet potato,
In the AFSs: mahogany, cedar, parica, yams, turmeric (almost 80 species in total).

3.4. Yandê

Yandê Ecovillage was born 9 years ago with the intent of recovering the local soil, initially degraded. With about 6 families (2 of which are residents), the area of 29 ha hosts the first initiative of Communities that Support Agriculture (CSA)[8] of the state of Pará (and the Northern region of Brazil). *"This is a social tool that I have met 2 years ago, when I went visiting an ecovillage in Brasilia and met this production system, this market system, where you form cells of farmers that have no customers, but co-producers"*, says the founder. Nowadays, 18 hectares belong to the founders and 2.5 hectares belong to the other families.

This initiative, being private, cannot be compared with the other communities since its purpose, from the foundation, is socioenvironmental. However, it is one of the best examples of local entrepreneurship with emphasis on agroecology. In this sense, the common dream is big and collective: to make Yandê a big open school to teach agroecology and agriculture.

8 *Still, according to the interviewee, "the CSA movement has begun in Europe with the demand for healthier food. They wanted to leave the market shelf, they wanted this bond to buy directly from the countrymen. Then, they invest in this farmer and develop a relationship with them. These are families that gather together and invest in a farmer for the guarantee of a healthier product, in an organic production, but without this industry that does not fit the pockets of the producer. They start to eat products according to the season. They close a budget for the productive cycle where I present all expenses and fees and they are prorated. My responsibility is to produce a healthy food within the principles of agroecology. They also assume risks with me: if the winter is rigorous, they keep paying their share even if I don't deliver the products and, if my harvest is too big, I deliver a huge basket that they say they don't even know what to do with all that."*

The economy depends on the investing families and all production is earmarked, which avoids issues with commercialization. *"It was a service we managed to put together via WhatsApp, on the gates of condominiums, and by word of mouth" (Interviewee)*. With 2 families producing, the others offering rotating support with one work-day in the field when they go pick their products, which is also environmental education.

> *"So, they come here and understand, in each productive cycle. They must have at least one day in the field, not only to value the farmer's work and pay a fair price, but to understand the differential of this food, the eggs produced here relative to the white eggs in the market. We send a lot of videos on WhatsApp of how there is animal torture. Families that are part of the Yandê ecovillage have individual lots here, they are part of this project, the soil, the recovery. The families of CSA Yandê don't (have a lot), they are partners but not members of the Yandê ecovillage." (Interviewee).*

With the perspective of founding the Yandê Institute, the entrepreneurship has not received many supports or partnerships yet. *"We only received saplings from Embrapa, SEPLAG and UFRA, so we are going to organize a joint effort to implement AFS and we usually get this collaboration. Nowadays, professors at UFRA are a good partnership, they visit, the graduation students want to study. We have partnerships for technical issues and non-financial inputs."*

Income is provided by the families' payment, around 2.5 thousand reais per month. However, *"from 2022 on, I want to implement some different AFS models, because the fruit trees were meant for regeneration, and now we are preparing to implement AFSs with economic focus but within the agroecology principles"*, says the founders. Today, about 70% of production is distributed among the investing families and 30% is for the producers' consumption.

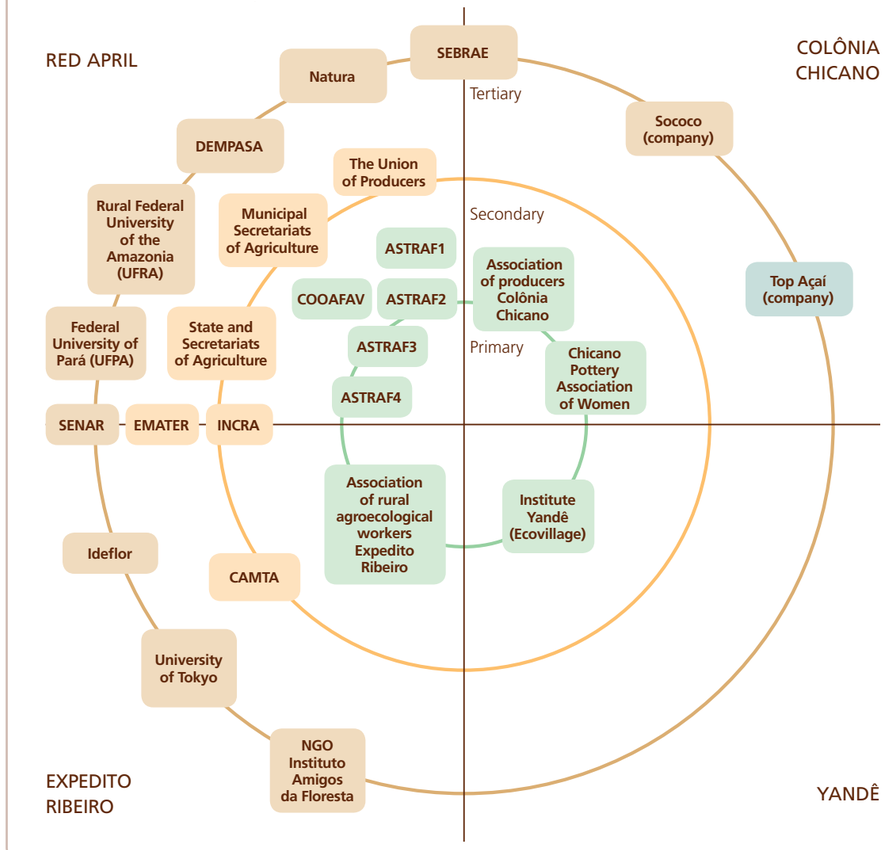
MAIN CROPS by priority

Banana, papaya, pitaya, cacao, coconut, acerola, rambutan, açai, biribá, lime, lettuce, arugula, endive, green amaranth, spinach, amazon spinach, spices, cassava, sweet potato, yams, ginger, tomato, corn, pumpkin, turmeric.

3.5. Map of Stakeholders

The map of stakeholders was designed from the diagnostic of the four communities; the method was based on a division in four quadrants (one for each community) and three levels of incidence. The first level consists of the organizations with social and community participation; the second are governments and public authorities; and the third are organizations that provide technical assistance (public and private) and private companies. Hence, stakeholders are divided according to their main activities on the communities that are part of this case study.

Santa Bárbara do Pará Stakeholders Map



Source: Tewá225

What is observed in this matrix is that the incidence of engagement, technical assistance and partnership offerings are very different for each community, being more frequent in Red April, be it for its size or the public policies into which it is inserted. In this sense, considering only the communities characterized in this way, Colônia Chicano is the community with largest potential for partnerships since there is a gap of public bodies or technical assistance presence.

4.

Diagnostic for regenerative entrepreneurship

Through the interviews - with producers, public authorities and representatives of institutions providing technical assistance - we can state that Santa Bárbara do Pará offers opportunities in the field of regenerative production, particularly in recovery of soil and degraded areas. The characteristics of the territory - the environmental impact caused by extractivism and monocultures, as well as cattle ranching and soil preparation with fire - motivated several initiatives and projects to train producers in differentiated, regenerative models without the use of pesticides.

The State of Pará presented a policy that is passing the legislative to fund more sustainable models with emphasis on regeneration, agroecology and organic production. According to SEDAP, the text relied on intense social participation, particularly from Santa Bárbara do Pará (MST) and is now waiting for approval in the House of Representatives. It is possible that it unfolds into programs with dedicated budget to support activities in the field in 2022. Meanwhile, resources from the state's Pluriannual Plan (PPA) are applied to the development of family agriculture, strengthening of low-emission chains, recovery of degraded areas and strengthening of associativism.

Despite the relative financial investment, by means of PRONAF and others, according to the Agricultural Census, most farmers (75.39%) have never received technical guidance from any institutions. On the other hand, 23.94% claim to have received guidance from the government (federal, state and municipality). From the interviews and the in-depth assessment of the communities in the sample, we notice a big difference in access to training and technical guidance between the communities that are assisted by INCRA and other institutions. This shows that the policies of Agrarian Reform, although insufficient, are still an access path to technical assistance and financing.

Table 8
Source of technical guidance received in Santa Bárbara do Pará (PA)

Source of technical guidance received	
Government (federal, state or municipal)	23.94%
Own or the producer's	0.22%
Cooperatives	0.22%
Integrating companies	0.22%
Private planning companies	0.00%
Non-governmental organizations (NGOs)	0.00%
S-system	0.00%
Other	0.22%
Never received	75.39%

Source: Agricultural Census 2017

According to Santa Bárbara do Pará's government, through the Department of Agriculture, the focus of policies will be to provide support for mechanization, aiming to improve quality of life in the field. *"We have tractors being repaired to help their mechanization. We have planters, ploughs, forks. We are registering to make them available to farmers and to provide limestone to recover the soil that has been degraded for a long time" (Interviewee).* SEDAP is also working on the mechanization of production:

> *"Family farmers do not have much access to structure, so the department have been providing equipment for a while now. We are hiring machine-hours because this hinders the increase in productivity. The areas are not very wide, but they are numerous." (Interviewee)*

Regarding infrastructure, 92% of the establishments have access to electricity. However, in terms of equipment, the difference between private establishments and settlements is evident. In our sample, Yandê Ecovillage is the best equipped, followed by the settlements with government support. Colônia Chicano comes in last, with most of the labor done manually.

> *"[Yandê] I have most of the equipment: irrigation, multicropper to till, I have chain saw, cutter, two-stories ladder that helps a lot with the management of the agroforestry systems, I have a microtractor to till the soil." (Interviewee)*

> *"[Red April] Manual harvest, mowing, planting systems, all manual. The only machine is the gasoline cutter, with blade. They don't use tractors or other heavy machinery. If we had machines available to clean the area, to make ploughing systems, our production would double. Our difficulty is in preparing the soil. The old system, where if you want to plant, you have to use fire and we don't want to use it anymore, so we request the city's machines and sometimes we can't get them. Our production would be way more advanced if we had this support." (Interviewee)*

Regarding agricultural practice in the rural establishments, the communities in this sample claim to seek a wide variety, aiming to generate income during the whole year, with different crops and their respective harvests. Cassava crops are considered a monoculture in almost all establishments. The main method used to clear areas is slash and burn, mentioned by all interviewees as a controlled management of fire, despite the risks.

Because they were selected due to their proximity with agroforestry initiatives, the four communities in the sample have shown familiarity with regenerative practices such as recovery of soil, springs and riparian forests. However, if compared with data from the Census, Santa Bárbara do Pará as a whole has a field of opportunities for the expansion of this knowledge. 51.28% claim that they do not use any of the practices listed below. However, among the most used practices are fallow (16.88%), followed by forest management (15.81%).

Table 9
Type of agricultural practice in Santa Bárbara do Pará (PA)

Type of agricultural practice	Total (%)
Leveled planting	0.00%
Crop rotation	1.71%
Fallow	16.88%
Protection and/or conservation of slopes	0.00%
Riparian forest recovery	0.00%
Reforestation for the protection of springs	0.43%
Stabilization of gullies	0.00%
Forest management	15.81%
Other	13.89%
None	51.28%

Source: Agricultural Census 2017

"The forest is not very rich to allow living off extraction, it doesn't offer this support, so we seek to plant crabwood, mahogany, Brazilian walnut, courbaril and cedar. These are agroforestry systems with those forest essences come in-between; in addition to the fruit trees, you have that timber and you are going to work to get the license and cut it [in the future]." (Interviewee)

"The most frequent type of crop in the settlement is slash burn. It is the most traditional, the one being applied, because there is the difficulty of hiring, mechanization, it becomes too expensive and we don't even have access. It is the cheaper and most used." (Interviewee)

Although the focus of governmental bodies is on the mechanization of labor, there is a mutual acknowledgment, from the institutions and the community, that the use of these equipment becomes a problem when you talk about soil recovery. *"When we manage to perform a mechanized cleaning of the soil, you lack the elements to replace it. After burning once, plant coverage is what you have from the farming practice, from pruning" (Interviewee).* It is worth stressing that the soil in the territory is acid and demands constant treatment with limestone, although families experiment with alternatives.

"People is working a lot with fertilization, fertilization that they buy, in the surroundings. To fertilize the açaí crop and clean the area, it uses grubbing that leaves a good plant coverage. Some plants I implemented just to use as plant coverage, without economic interest (achiote, for instance, 1 ha just for plant coverage), inga for shadowing. And later, in the pruning system, you end up with a good plant experience and now we understand that soil without coverage is very harmful because it creates the problem of having to replenish soil (expenditures) later. The peasantry has less domain on this production model or conditions per se, to purchase limestone" (Interviewee).

According to the Agricultural Census, only 2.46% of producers claim to use pesticides, which means that they have been seeking for alternatives for the maintenance of the environmental asset, as well as a diet free of chemicals. This information was corroborated during the interviews. The interviewees declared that they seek alternatives for the use of additives, mainly pesticides; however, they are not strict when it comes to pests and replenishment of soil nutrients. *"The use of additives (potassium) in cases where it is very necessary and in low amounts", "some families use: fertilization is manure, but if some pest appears it is harder to control. Maybe then the guy uses it" (Interviewee).*

There is a perception among the institutions that monitor the producers that they have the prerogative of non-use, mainly those who claim to sell organics, but they have no commitment with the cause. *"If you present the idea that the market of organics makes money, they embark. But when a weed or a pest appears and demands more work, they go and use poison" (Interviewee).* The most committed producers understand the strictness of certification, "production is not exactly organic because we use chicken inputs, that use chemicals." *"They used poison to kill weed on the cassava; now they only use manual weeding" (Interviewee).*

4.1. The challenge of associativism

Regarding data on the association of producers with cooperatives and/or class entity, the Agricultural Census verified that more than half of producers in Santa Bárbara do Pará (52.57%) are organized in associations of residents.

Table 11
Association of producers with cooperative and/or class entity related to the use of pesticides in Santa Bárbara do Pará (PA)

Association of producers with cooperative and/or class entity	Use of pesticides		
	Total (%)	Used	Did not use
Cooperatives	0.67%	0.00%	0.45%
Class entity/union	0.00%	0.00%	0.00%
Association/movement of producers	6.49%	0.00%	6.49%
Association of residents	52.57%	2.01%	50.56%
Not associated	40.27%	0.45%	39.82%

Source: Agricultural Census 2017

However, from the interviews it is possible to notice that many of the associations are *de jure but not de facto*. In other words, they exist formally, as a bureaucratic mechanism to grant regularization, access to credit, issuing of invoices, but they do not exist as an organized society, with an established and functional governance and politically stability. During the interviews, the untimely death of associations and cooperatives (the later as the less effective in Santa Bárbara do Pará) due to political disputes among the leadership were

frequently mentioned. *"Recently it [the association] became politicized and started to face some internal political disputes, even for partisan reasons, and started to face political divisions. It exists legally, but in reality, it became weak and is now inoperative" (Interviewee).*

However, it is necessary to have a differentiated view of the associations in the settlements because they are requirements set by public policies. In this sense, it is hard to assess if they are effective because they are a priori model for the formation of settlements, i.e., it could not be different. In terms of internal conflicts, however, there was a separation between one of the founding association in Red April and the smaller ones. In Expedito Ribeiro, the founding association keeps strong as a unity. Some interviewees state that this is due to a strong religious presence in this settlement. However, as mentioned by the authors, associations should be organized by productive chains: *"In the case of the state of Pará, due to its territorial extension, the participation of only one family is not relevant, instead they should organize themselves in productive chains aiming to ensure consistency and facilitate the logistics of production" (Paulino et al., 2019, pg. 117).*

Despite the difficulties, the associative model still bears the greatest potential to strengthen the local social and institutional capital, particularly for its commitment with the institution, once belonging to it. *"We insist [in the institution] with the producers to reduce fires and they do it [because the association said so]" (Interviewee). "The biggest challenge to organize the community is the human being per se. To unite around a common goal is very hard." (Interviewee).*

4.2. Discontinuity of projects and external offers

The interviews showed that many projects of qualification, demonstration units, seedlings nurseries and others with emphasis in new regenerative models or entrepreneurship have already been performed in Santa Bárbara do Pará. Among those are offers from public institutions (such as Ideflor, Emater and others) or private (such as CAMTA, FARFARM, mandala planting projects, poultry farming, etc.).

Initiatives for AFS demonstration units, and training on AFS and agroecology for producers have been identified in all communities, particularly from state institutions. The Union of Producers have also been spontaneously mentioned as providing training and courses. The same is true for EMATER and the universities. Those two were mentioned particularly by Red April settlement, that clearly receives a large number of projects and assistance (refer also to the Map of Stakeholders).

Other initiatives, such as the mandala planting, where crops are designed in circles instead of straight lines, were identified only in the Red April settlement. There, as well as in Colônia Chicano, a project of poultry farming using a pyramid system had an initial investment offered by the institution promoting the initiative.

> *"We've established several initiatives, discussions and courses. Mainly courses. Some with a more experimental approach. With UFRA we carried this project about production, that included this whole world [of agroecology], but it was a 2-years course with technical follow up. More segmented courses such as fish farming, bee-keeping we've had. The Federal Institute of Pará, SEBRAE; nowadays there is a great influence of the Rural Union that wants to do, offering training on many areas in the settlement." (Interviewee).*

However, most projects presented a common factor: its discontinuity after the withdrawal of the promoting institution. Some interviewees attribute this to practical issues, such as the inability to keep the books, loss of invested resources, cost of keeping the project or even an increase in the amount of work demanded by the project (as is the case for mandala AFS). Other reasons, pertaining to cultural and more subjective orders, have also been identified.

> *"We were supposed to adhere to proposals, projects, and they didn't work. Because the families didn't know which path to take. ... Didn't know how to do it. So, it's about this perspective of what the families can already work with, what they like to work with [that would be welcome in new projects], maybe what lacks is a little incentive, clearness about the future, market, consumption." (Interviewee)*

> *"We started this work with 100 families. In the moments with most positive mobilization, there were 100, that we managed in small groups and then worked in their projects, fruit crops, poultry farming, small family poultry farming... But later it lost power. Nowadays we are working with 7 families. During all this work, we realized that they were producing, commercializing, and living off agriculture [the other producers were not]. We are facilitating their access to the market of organic produce and we are trying to take advantage of all this qualification effort done during this process so that our effort is not lost" (Interviewee).*

> *"The circular vegetable garden, here being a rainy region, this garden is exposed. And it rains a lot in here. Heavy rains. That rain falls on the lettuce and it sticks to*

the ground, destroys the garden. It needs to be covered. None of these initiatives was kept here" (Interviewee).

"The family poultry farming project, that donated everything, the chickens, material, built the coops and all, so that people could own the technology. Then, with the first batch of chickens, they would buy the chicks to restart the cycle and the project assured that the sales earnings would expand the production and they would be able to grow. But they sold the chicken and no one bought the chicks. They wait for another project to bring the chicks again." (Interviewee).

There is a perception among the interviewees of a local culture of donations, of receiving projects and donations and, instead of giving sequence to pilot projects and undertake, they wait for new offers while moving on with their lives as they did before. However, the interviewees brought assessments and suggestions to improve this process, in case new projects are offered the community. *"They think that you are going there to give a speech, no one will listen. But if you go with them to plant, give them opportunity and voice [then it can work]". "Money sometimes is not so important as a tool to convince. In the big urban centers, there is no empathy. But if this connection does not exist, it won't work" (Interviewee).* Proposals that are more suited to the local culture and needs, the producer's, tend to have better adherence a posteriori, in the opinion of interviewees. *"Some suited method, that makes the producers own the idea" (Interviewee).*

4.3. Youth and the field

In regards to continuity of initiatives and crops by the next generation of producers, there is a migratory flow of young people to the urban environment, mainly seeking for jobs. High school and college can only be accessed in the urban environment, what displaces these people during their upbringing to live another lifestyle experience. The lack of Internet access and other technologies in the rural zone also discourage their stay in the field.

"To keep them in the rural area, I think if a project brings what the youth likes, soccer, a moment of fun, a space for training, courses and qualification in the rural environment, teaching them how to plant, perhaps with a scholarship (as the young apprentice), that would be interesting. Nowadays, what motivates the young people to leave the rural environment is seeing their families' suffering and there is nothing for them, no leisure" (Interviewee).

Another difficulty, particularly for the settlements, is the division of land among the children, that get less and less production space at each generation. *"A lot with 4 ha of productive area, divided among 3 children and families, only 1 ha to produce, is not possible" (Interviewee).*

The interviewees identified a smaller flow, however present, of young people that, after living the countryside and experience the hard reality of the urban outskirts and unemployment, go back to the field looking to provide for their families. In this sense, some have returned with technical or college education and this also represents opportunity for innovation in production.

Main difficulties faced by farmers

- *Scarce labor*
- *Flow of production (market), particularly for cacao*
- *Lack of equipment (machinery and car/truck for distribution)*
- *Soil acidity, implying high costs with limestone (scarce input in the region)*
- *Lack of fertilizer*
- *Lack of irrigation system*
- *Pests (witches' broom, fungi and insects)*
- *Effectiveness of public policies de jure (access to PRONAF and others)*
- *Lack of structure to process products (e.g., refrigerators)*

final considerations

The producers from Santa Bárbara are open to the introduction of new production models. Santa Bárbara do Pará is in a territorial context that enables the flow of all production to the MRB complex of cities and there is room for growth. However, for scale production the challenge to be overcome is the use of machinery, agricultural inputs and access to credit, considering a context where the forest, degraded by the previous owner, needs to be restored.

Several initiatives have been employed in the territory to restore the landscape in consortium with economic assets and to increase the producers' income. The producers' main dream is to generate income with less physical effort, because labor in the field is exhaustive and requires the collaboration of the whole family. *"You can't work on an area larger than 4 ha after 40s" (Interviewee)*. Hence, models that increase the producers' income while organizing their labor system with opportunities for improvement in their daily routine are welcome.

There is a wide institutional capital in that territory, mainly due to the proximity with the capital (Belém), for the funding of partnerships and alignment with existing initiatives, particularly regarding courses, technical assistance and follow up after the trainings. However, there is a need to consider the social fabric where the Santa Bárbara producer is inserted when new initiatives are implemented. *"They are different from us. They don't want to undertake, get rich, change their lives. Their lives are great just as it is. Have enough income to survive. Why would they want more than this? It's a matter of culture, of perspective" (Interviewee).* Also, in this sense, the challenges of associativism reduces the success of some initiatives, being a point of attention for the success of local projects.

Also, the context of communities settled by the agrarian reform policies is very different from that of other communities. There is ample social, economic and institutional capital surrounding the settlements, while other communities are marginalized from opportunities. It is also possible to differentiate between producers coming from other regions, bringing technology and innovation into the city, and the producers focused on subsistence and income generation. The settlers are still marginalized and ill-regarded in the society as a whole, even in Santa Bárbara do Pará. *"These people were not welcome in the community, what leads us to believe that this community feels that they belong in that place more than the settlers. Because they look at the settlers and see outsiders" (Interviewee).*

Regarding new businesses and productive chains, there is a perception that *"virtually everything that has a potential for commercialization they are already involved, in a way or the other"* and that a less explored opportunity would be in the processing of products and the development of AFS products chains. *"A project that would train them to use economically these 80% of legal reserve (since they can only use 20% for the crops) would help a lot" (Interviewee).* Other unexplored opportunities are linked to products used by the cosmetics industry and holistic and traditional medicine; however, the study is not yet conclusive on this subject.

From the communities studied, the main dream is not to produce, but to be something. In Red April and Expedito Ribeiro, having their own land regularized is the focus. In Colônia Chicano, is being a reference again, to be acknowledged in the region (and in the country) as innovative; and in Yandê Ecovillage, to disseminate knowledge to other families (access). In a general way, individually, each producer's dream is to build a project for the future so they can retire eventually and be able to support their families without having to stand the hardship of labor in their old age; for that, they wish to invest in projects that secure this dream from now on. *"My personal dream is to build a better house and to expand production thinking about the future; I'm 47 and in a few years, I'll have to stop and I'd like to enjoy what was invested" (Interviewee).*

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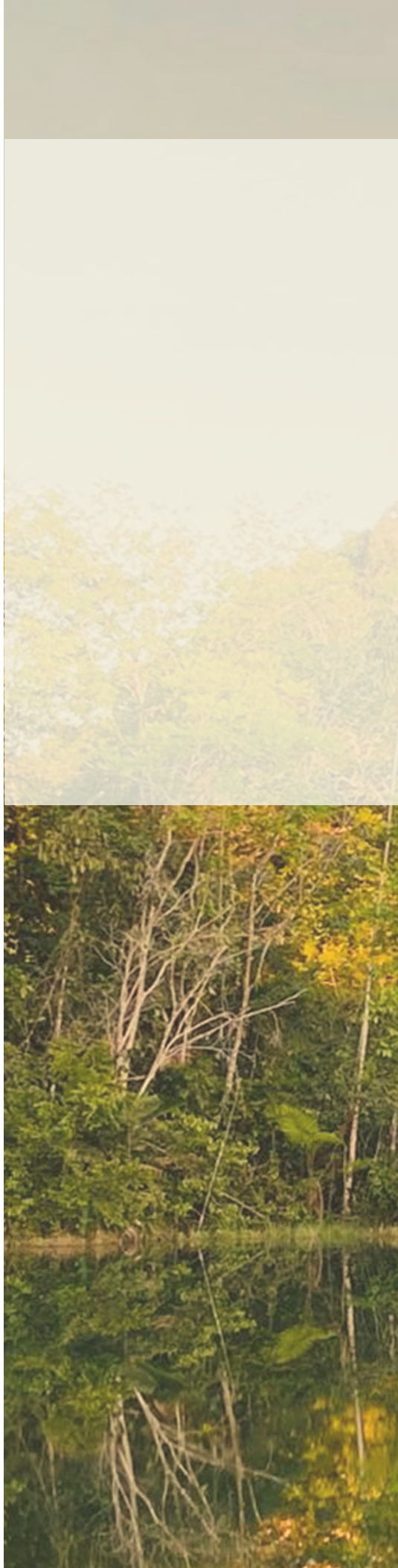

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