Periódico Eletrônico "Fórum Ambiental da Alta Paulista"
Electronic Journal "Environmental Forum of Alta Paulista"

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

# Characterization of Family Farming in the *Portal da Amazônia* Territory in a Pre-Pandemic Context

**Wagner Gervazio**
Post-doctorate, UFSCar, Brazil
wagnergervazioengagro@gmail.com

**Adriana Cavalieri Sais**
Assistant Professor, UFSCar, Brazil
acsais@ufscar.br

**Jessica Helena Christofoletti**
Master's Student, UFSCar, Brazil
jessicahelena@estudante.ufscar.br

**Renata Evangelista de Oliveira**
Associate Professor, UFSCar, Brazil
reolivei@ufscar.br

Periódico Eletrônico "Fórum Ambiental da Alta Paulista"
Electronic Journal "Environmental Forum of Alta Paulista"

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

**ABSTRACT**

In this paper, we characterized family farming in the *Portal da Amazônia* territory (TPA) by analyzing family farming as a socio-ecological system. The study was carried out using bibliographical research and secondary data. The data were organized based on four dimensions: ways to occupy the landscape, relationships with the market, social organization, and governance and institutions. In the TPA, there are 19,947 rural enterprises, of which 16,422 are of family farming and 78 are settlement projects of agrarian reform. Pasture occupies 38% of the area and deforestation accounts for 36.6% of it. The gross domestic product is responsible for 5.7 % of the state total. The gross value of temporary crop production corresponds to 4.5% of MT value, while permanent crops account for 16.10%. The commercialization of products is carried out directly to the neighbors, in farmers' markets and through apps. The population is 282,328 inhabitants, 32% of which living in rural areas. In addition to family farmers, there are nineteen traditional peoples and communities and nine ethnic groups of indigenous peoples. 54% of agricultural enterprises belong to people aged between 45 and 65 years. The infant mortality rate is 16.02. The territory has 249 schools, 93 of which are located in the rural area, comprising 37% of the total schools in the region. There are a large number of civil society organizations working in this area. The territory also relies on PAA, PNAE, and PRONAF. The pre-pandemic scenario indicates weaknesses that characterize family agriculture.

**Keywords:** Mato Grosso, resilience, socio-ecological system

## 1 INTRODUCTION

Family farming accounts for 70% of the food production consumed by Brazilians. It is of great importance for food security and sovereignty, for employment and income generation, and for the preservation of the environment. However, despite its socioeconomic and ecological relevance, it still suffers from the lack or insufficiency of public policies. In this scenario, it is necessary to study the characterization of family farming in the *Portal da Amazônia* territory - TPA, particularly in times of advancing agricultural borders and monocultures, especially - and more recently - of soybean, with all its impacts, added to those brought by the COVID-19 pandemic.

The concept of territory covers a geographically defined physical space, usually continuous, comprising cities and fields, and characterized by multidimensional criteria such as environment, economy, society, culture, politics, and institutions, and a population, with relatively distinct social groups, which relate between themselves internally and externally, through specific processes, where one or more elements can be identified to indicate social, cultural and territorial cohesion (SDT/MDA, 2005).

The TPA is located in the far north of the Mato Grosso state, comprising 16 municipalities, on the border with the states of Pará and Amazonas. It is an area with relatively recent colonization, since the 1970s, located in the so-called "arch of deforestation of the Amazon forest" and in an area of agricultural border, a pressure point where natural preservation areas and the advancement of agricultural production collide (OLIVAL *et al.*, 2006). The TPA carries all the marks of an agricultural occupation process and its economic, sociocultural, and environmental consequences, particularly regarding the unequal way these effects affect rural populations (OLIVEIRA *et al.*, 2021).

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

The production model used in the TPA - and in the state of MT - where business and family farming interact, highlights the disconnection between agricultural production and maintenance/conservation of the characteristics of natural ecosystems, having generated historical socio-environmental impacts. There is a tendency to increase commodity production in the state and the TPA, a growth that tends to include mainly degraded pasture lands and family farming properties (BUSCHBACHER *et al.*, 2021). In addition to the striking presence of large rural properties and agriculture that is considered modern by technological standards, in the state of Mato Grosso, family farming also plays an important role in rural development (ABREU *et al.*, 2021).

The characterization of family agriculture, in this paper, starts from the understanding of this sector (family agriculture) as a socio-ecological system (FIGUEIREDO *et al.*, 2017; OLIVAL *et al.*, 2021). Socio-ecological systems are complex, integrated, and adaptive systems, in which human beings are part of nature (RESILIENCE ALLIANCE, 2010) and where cultural, political, social, economic, ecological, and technological components interact (FIGUEIREDO *et al.*, 2017).

According to Weihs and Olival (2021), the impacts of COVID-19 on the TPA have different vulnerabilities and disproportionalities, with an emphasis on the rural population, comprised mainly of family agriculturalists. In their analysis, historically constituted social and structural vulnerabilities and the susceptibility of agriculturalists as individuals should be considered.

For the authors:

> All populations, regardless of socioeconomic status, are affected by changes. However, it is known that the populations with lower income and formal education levels, who live in areas of higher risk and/or occupy the worst jobs, are the ones who face the greatest threat to the maintenance of their health and life. This is the scenario that needs to endure the emergence of a pandemic and the political and socio-economic problems associated with it. Some families may not have the capacity to withstand such impacts and might collapse economically in the face of the crisis if there are no adequate social and agricultural policies to increase their resilience (WEIHS; OLIVAL, 2021, p.. 290).

To create this paper, we used the contributions of a program developed from a collaborative research network, started in 2016 ("*Programa de Pesquisa emResiliência da Agricultura Familiar no Norte e Noroeste do Mato Gross*", the Resilience Research Program of Family farming in the North and Northwest of Mato Grosso), aimed at assessing and strengthening the resilience of family farming in the Amazon territory of Mato Grosso, highlighting the *Portal da Amazônia* as a place of analysis, and a more recent research project ("*Resiliência frente à COVID-19: adaptações para fortalecimento da agricultura familiar emregião de fronteira agrícola amazônica*", Resilience vs. COVID-19: Adaptations to strengthen in an Amazon agricultural border region"), aimed at understanding the impacts of COVID-19 on the area and defining lines of action for public policies aimed at its resilience in a post COVID-19 context.

The evaluation process of socio-ecological resilience (RESILIENCE ALLIANCE, 2010; BUSCHBACHER et al., 2021) involves five steps, namely: (i) System definition – key issues, spatial and temporal limits, and focal scale; (ii) History – building a timeline and defining the triggering factors of each phase in a historical trajectory; (iii) Definition of system attributes

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

and variables (in order to define "resilience of what" and "against what"); (iv) Building of possible scenarios (desired and undesired); (v) Considerations about management and defining how to promote the desirable scenarios.

The theoretical model used by the World Health Organization (WHO) to understand the social determinants of health in territories and communities is based on scales, starting from the macro scale - general socioeconomic, cultural, and environmental conditions (socioeconomic and political context and socioeconomic status - education, occupation, and income), to then analyze structural factors, social influences, and community relationships, health habits, ways of life, and other determinants (WEIHS; OLIVAL, 2021).

The building and strengthening of family farming resilience in a post-COVID19 context, therefore, demands the analysis and understanding of its characteristics, strengths, and weaknesses prior to the impacts of the pandemic. Therefore, the collection of secondary data is fundamental to characterize the socio-environmental and economic context that surrounds family farming in the TPA.

The present is based on the approach adopted by the collaborative research network, which includes two social sector organizations and researchers from six universities, which defined, in a pre-pandemic context (called T0) four analysis dimensions for the socio-ecological system of family agriculture: Ways to occupy the landscape and use natural resources; Economic and market relationships; Social interactions, education, and culture; Governance and institutions. In previous studies, the elements associated with resilience and their mediating factors, in the TPA, were approached based on these dimensions.

## 2 OBJECTIVES

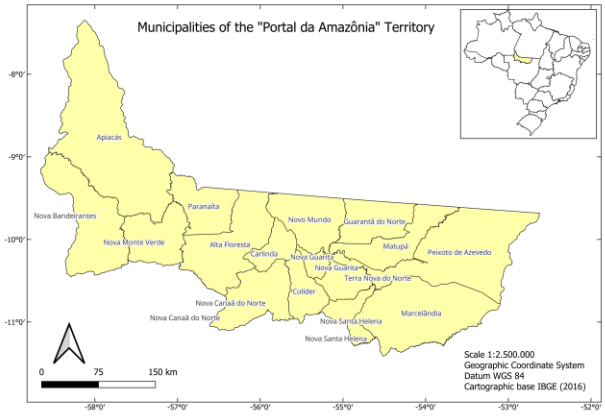
The objective of this research is, therefore, to characterize family farming in the TPA, as a socio-ecological system, considering the pre-Covid-19-pandemic context, based on economic and socio-environmental data.

## 3. METHODOLOGY / METHOD OF ANALYSIS

This study was carried out in the 16 municipalities of the Portal da Amazônia territory, namely: Alta Floresta, Apiacás, Carlinda, Guarantã do Norte, Colíder, Marcelândia, Matupá, Nova Bandeirantes, Nova Canaã do Norte, Nova Guarita, Nova Monte Verde, Nova Santa Helena, Novo Mundo, Paranaíta, Peixoto de Azevedo, and Terra Nova do Norte (Figura 1). This is a set of 16 municipalities that experienced different economic cycles until the establishment of livestock as the fundamental basis of the regional economy, in the mid-1990s. The choice of the TPA for this study was due to the ongoing research carried out by the collaborative research network.

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

Figure 1.Location of the *Portal da Amazônia* territory.




Source: Authors, 2023.

This research stage refers to the collection of secondary data, related to the four dimensions defined to characterize the socio-ecological system of family farming in the TPA, which are: (1) Ways to occupy the landscape and use natural resources; (2) Economic and market relationships; (3) Social interactions, education and culture; (4) Governance and institutions (Figure 2).

Dimension 1 involves the general characterization and assessment of production systems and their impacts at different scales (from the productive layer to the *Portal da Amazônia* territory). Dimension 2 addresses ways of life and work organization, highlighting elements such as competition, reciprocity, and solidarity. Dimension 3 seeks to understand the spaces of public and private participation, highlighting how they impact and are impacted in the context of the TPA. The fourth dimension addresses the understanding of the economic dynamics between heterogeneous groups in the territory (OLIVAL *et al.*, 2016).

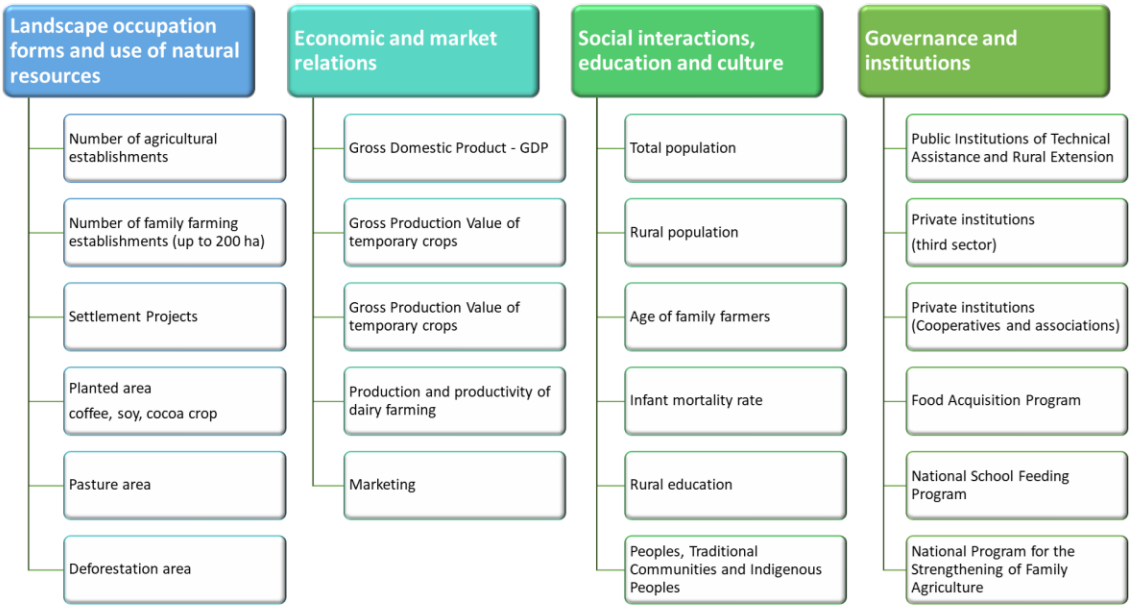
Data were collected from official databases, as well as publications and reports from government and non-governmental agencies. Among the available databases, we used the *Sistema IBGE de Recuperação Automática*(SIDRA) of the 2017 Agricultural Census and the VIS DATA 3 database of the *Secretaria de Avaliação, Gestão da Informação e Cadastro Único* - SAGICAD of the federal government.

The data collected were related to 2019, in a pre-Covid-19-pandemic context. This scenario, called T0 by the researchers of the collaborative research network, is the starting point for the assessment of family farming resilience in the TPA that will be carried out later.

The data collected were selected and organized in spreadsheets. From the data, we also carried out a literature review to understand and discuss the results.

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

Figure 2. Description of the variables collected (secondary data) related to the dimensions of the socio-ecological system of Family farming in the TPA.




Source: Authors, 2023. Adapted from Olival *et al.* (2021).

## 4. RESULTS

### 4.1Ways to occupy the landscape and use natural resources

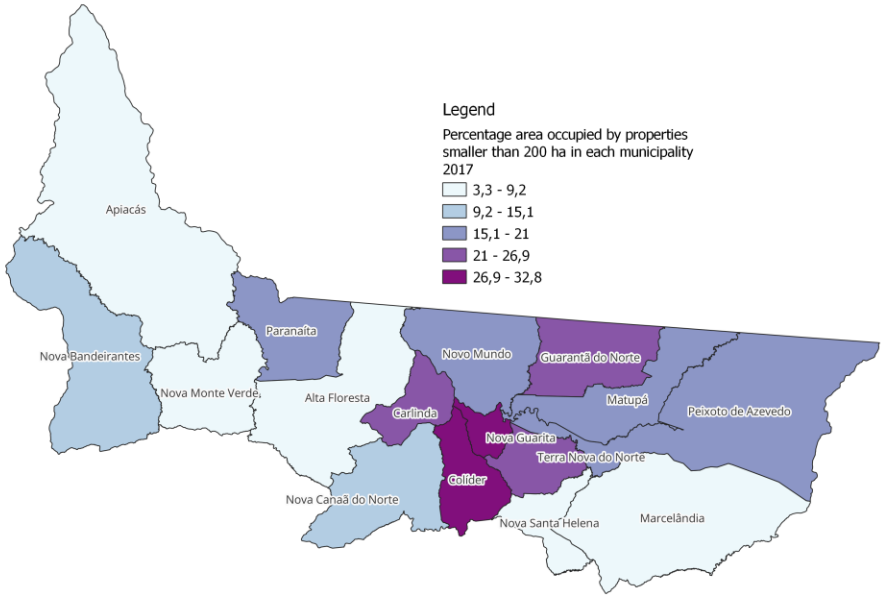
The Mato Grosso state has approximately 120 thousand rural enterprises. Of the total, 69% are of (IBGE, 2017). However, almost 70% occupy only 9.43% of the total area of the state enterprises (ABREU *et al.*, 2021).

In the *Portal da Amazônia* territory, there are 19,947 rural enterprises, of which 16,422 (approximately 80%) are of family farming- up to 200 ha (Figure 3). The municipality of Peixoto de Azevedo has the largest number of family farming enterprises, 1,715, followed by Colíder, Paranaíta, Nova Bandeirantes, Alta Floresta, and Nova Canaã do Norte, all with over 1,000 enterprises each, with up to 200 ha. However, enterprises with up to 200 ha occupy an area of just over 13% of the entire *Portal da Amazônia*.

The municipality of Marcelândia occupies the smallest area of family farming enterprises, about 3%, followed by Apiacás, Nova Monte Verde, Nova Santa Helena, and Alta Floresta, all below 10% of the area. Family farming is present throughout the state territory; however, with emphasis in the north (TPA), in the Amazon biome, and in the south, in the region that comprises the Pantanal biome (ABREU *et al.*, 2021).

Periódico Eletrônico "Fórum Ambiental da Alta Paulista"
Electronic Journal "Environmental Forum of Alta Paulista"
ISSN 1980-0827 – Volume 19, Number 6, Year 2023

Figure 3. *Portal da Amazônia* territory with the % area occupied by properties smaller than 200 ha in each municipality.




Source: Authors, 2023.

The TPA presents 78 settlement projects of agrarian reform, created and recognized by the *Instituto Nacional de Colonização e Reforma Agrária* (INCRA). In the state of Mato Grosso, according to the INCRA settlement panel, there are 82,424 families, in 549 settlements. Thus, TPA settlement projects represent 14.20% of the state total.

The planted area in the TPA is 563,194 ha, which represents 3.4% of the planted area of the entire MT state. The area planted with soybeans in the TPA had a growth of 1,287.5% in the last few years prior to the pandemic, while in MT the growth was 54.74%. Nova Santa Helena and Guarita are the municipalities with the largest planted area of soybean, 12% and 10% respectively. With the exception of Apiacás, all municipalities produce soybeans. Due to the paving of BR-163 (Cuiaba-Santarém) and the opening of the Port of Miritituba, in the state of Pará, cattle farms of the far north of Mato Grosso have been transformed into grain crops - traditional corn-soybean intercropping systems (WEIHS, 2020).

Coffee crops in the TPA are produced by family agriculturalists. Coffee production occupies an area of 1,533 ha, which represents 11.9% of the planted area of coffee in MT, a 13.8% drop in the planted area over the last 10 years (IBGE, 2017). In addition to coffee, family agriculturalists also produce cocoa, about 50 ha, which represents 7.8% of the planted area of cocoa in MT, a 49% drop in the planted area of cocoa in the last decade.

Pasture in the TPA occupies 38% of the total area. The municipality with the largest pasture area in the TPA is Terra Nova do Norte, with 70%, followed by Colíder, 62%; Nova Guarita, 60%; and Carlinda, 51%. The other municipalities occupy a pasture area of less than

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

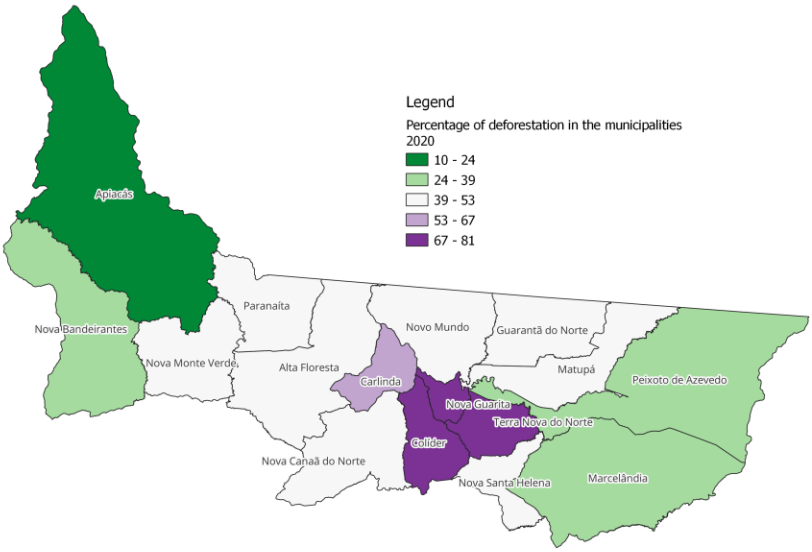
50%. The municipality with the smallest pasture area is Apiacás, with 9.8%. Dairy cattle are an expressive activity in the municipalities that have the largest pasture area in the TPA. Family farming produces the largest amount of milk in the region. Despite the economic importance of livestock farming, this activity has caused the municipalities in the territory, with few exceptions, to have currently degraded much of its natural resources, including areas of permanent preservation, causing problems in the water supply to become common since 2000 (BUSCHBACHER *et al.*, 2021).

Despite the importance of family agriculture, small farms face several challenges as it becomes increasingly clear, due to the number of cases of little or no success, that neither livestock nor large-scale agriculture will allow for significant advances in the quality of life of farmers' families (BUSCHBACHER *et al.*, 2021).

The deforestation area in the TPA is 36.6% (Figure 4). The municipality of Nova Guarita is the most deforested, with 80% of the area. Eight other municipalities have a deforested area above 50%. Apiacás is the municipality with the lowest rate of deforestation in the PTA with 10% of the area. In the municipality of Apiacás, there are five protected areas, four Conservation Units (two Private Natural Heritage Reserves, the Juruena National Park, and the Apiacás Ecological Reserve), and the Kayabi Indigenous Territory (ICV, 2011).

When we deal with socio-ecological systems, formed by the relationship and interdependence of natural and social systems, we are always talking about dynamic systems in which we cannot identify a central controlling force (BUSCHBACHER *et al.*, 2021). In terms of land occupation and income generation strategy, most agriculturalists work mainly with cattle raising (beef, sale of weaned calves, and milk production) as their main source of income (RODRIGUES *et al.*, 2021).

Figure 4. Percentage of deforestation in the municipalities of the *Portal da Amazônia* territory.




Source: Authors, 2023.

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

**4.2 Economic and market relationships**

The gross domestic product (GDP) of the TPA is R$8,082,638, accounting for 5.7 % of the state total. The livestock market is consolidated with slaughterhouses and dairy industries in the region, acquiring products from all municipalities (RODRIGUES *et al.*, 2021). In addition to breeding/rearing and cutting livestock, dairy cattle are the main activities of family farming in the TPA. Milk production reached 137,031,000 l in 2019, accounting for 20% of the production in the state of MT (IBGE, 2020).

The gross value of temporary crop production in the TPA accounts for 4.5% of the MT total. The gross value of production in the municipality of Matupá accounts for 19.46% of the TPA total, followed by Nova Canaã do Norte, Novo Mundo, and Peixoto de Azevedo, with 15.42%, 15.17%, and 10.87% respectively. Rice, bean, soybean, cassava, and leaf vegetable crops are responsible for most of the gross value of production in the TPA.

Regarding the gross value of permanent production, the municipalities in the TPA are responsible for 16.10% of the MT total. The municipality of Guarantã do Norte is responsible for 21.3% of the gross value in the TPA. The municipalities of Peixoto de Azevedo, Matupá, and Terra Nova do Norte are responsible for 13.68%, 13.52%, and 11.82% respectively. The crops that stood out in their production and contribution to the gross value were coffee, cocoa, guaraná, passion fruit, palm tree, banana, orange, and lime. Annual crops, such as squash, okra, beans, and sweet potato, fruit trees such as pineapple and graviola, and condiments, such as sesame and saffron, also have considerable importance for agricultural income (WEIHS e OLIVAL, 2021).

The commercialization of TPA products is carried out directly to its neighbors, in farmers' markets and through apps, such as SISCOS (*Sistema de Comercialização Solidária*). SISCOS is a solidarity economy enterprise that aims to bring consumers and producers closer together, creating a network of services that values fair trade and responsible consumption (IOV, 2023). Family agriculturalists also sell to supermarkets, restaurants, snack bars, cooperatives, associations, and the public institutional market. Despite direct sales, intermediaries play the main role in the market process, in over 65% of cases (RODRIGUES *et al.*, 2021).

Although the production is relevant, the internal supply of the *Portal da Amazônia* territory comprises mainly products from other Brazilian states, such as Paraná, São Paulo, and Goiás (OLIVAL, 2005). Therefore, the creation of new spaces and means of commercialization of family agricultural products through the seed network and local farmers' markets, and facilitated access to public policies resulted in a greater diversification of activities and means of commercialization to which agriculturalists have access (MAKISHI *et al.*, 2021).

**4.3 Social interactions, education and culture**

The PTA has a population of 282,328 inhabitants, mostly located in in Alta Floresta, Colíder, Guarantã do Norte e Peixoto de Azevedo. The total population of the TPA represents 8% of the population of the MT state. Approximately 32% of the TPA population lives in rural

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

areas. The municipality with the largest rural population is Nova Bandeirantes, with 65% of its total. The municipalities of Nova Guarita and Novo Mundo have just over 60% of rural population, and three other municipalities have over 50% of their population in the countryside. Alta Floresta is the municipality with the lowest rate of residents in the rural area, 13%.

In addition to family agriculturalists, there are nineteen traditional peoples and communities and nine ethnic indigenous peoples in the TPA. Among the traditional peoples and communities in the TPA, are the extractivists and rubber tappers; fishermen and riverine communities; and quilombolas. Indigenous peoples are present in Apiacás, Guarantã do Norte, Marcelândia, Matupá, and Peixoto de Azevedo (MITRAUD *et al.*, 2021). The state of Mato Grosso is the scenario of a "cultural mosaic of identities" formed by several social groups (SILVA e SATO, 2010), revealing the diversity of rural Mato Grosso, responsible for the production and supply of various vegetables and fruits (ABREU *et al.*, 2021).

In the TPA, 54% of agricultural enterprises belong to people aged between 45 and 65 years. Apiacás presented the highest percentage, 61%, of enterprises belonging to people aged between 45 and 65 years. Only 6.6% of family enterprises belong to younger people aged between 25 and 35 years. Nova Bandeirantes is the municipality with the highest number of enterprises belonging to young people aged between 25 to 35 years, 10% of its total.

This shows that there are few agriculturalists under 45 years of age, thus presenting work potential for a longer period, while at the same time showing that rural succession is a challenge in family farming (ABREU *et al.*, 2021). Increasing urbanization, population aging, and increasing income concentration are factors that make up a scenario that directly impacts rural areas and, in particular, family-based agriculture, which always relies on labor and a dynamic local market (BUSCHBACHER *et al.*, 2021).

The infant mortality rate (per 1000 live births) in the TPA is 16.02. Nova Santa Helena is the municipality with the highest infant mortality rate, 40.19. The population is still affected by diseases of the circulatory system and infectious and parasitic diseases. Regarding the coverage of Primary Care (PC) and Family Health Teams, all the municipalities in the TPA have coverage above 70%. Nova Guarita is the only TPA municipality that has 100% coverage (BRAZIL, 2023). The territory has three regional hospitals that meet the demands of the entire region. The distance between rural properties and urban centers, as well as the distance between the municipalities and, furthermore, the poor quality of the roads, many of them without paving, contribute to the health problems (WEIHS e OLIVAL, 2021) in the TPA.

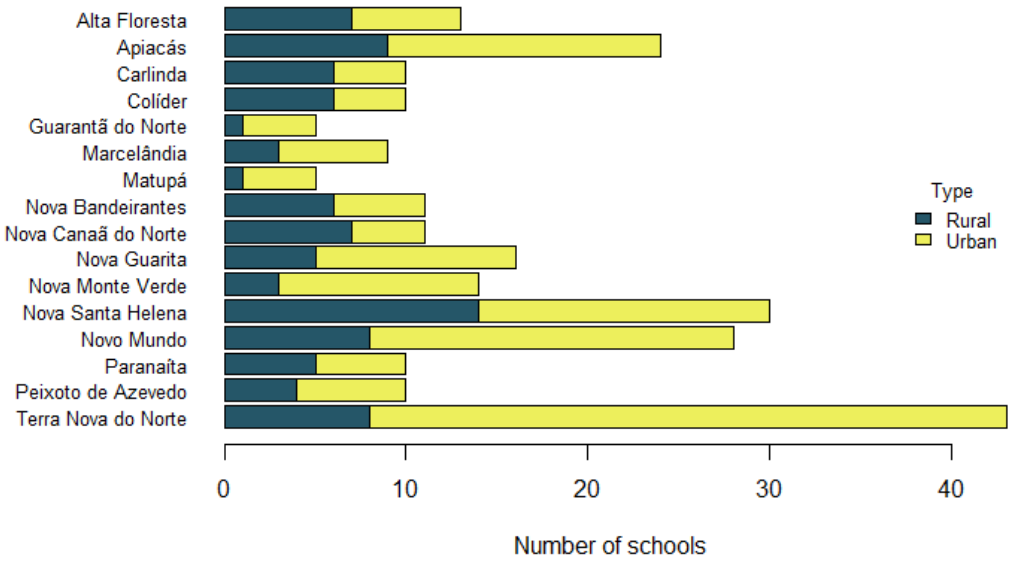
The *Portal da Amazônia* territory has 249 schools, 93 of which are located in rural areas, comprising 37% of the total schools in the region (IBGE. 2017). There are approximately 76,289 students in total, of which at least 20,613 are enrolled in rural schools in the region, which is 27%, while the number of teachers totals 2,968, allocated in 780 rural schools (26.3%). Education in rural areas is of extreme importance since it has the potential to articulate knowledge and practice, strengthening socio-environmental management in communities (MERÇON, 2016; SUŠKEVIČS; HAHN; RODELA, 2019).

Among the municipalities of the TPA, Guarantã do Norte is the one with the largest number of rural schools in the region, 14 in total, followed by Peixoto de Azevedo with 9, and Alta Floresta with 8 schools. In the urban area, the municipality that stands out in total of

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

schools is Alta Floresta, with 35 schools, followed by Colíder, with 20; Guarantan do Norte, with 16; and Peixoto de Azevedo, with 15. Figure 5shows all rural and urban schools per municipality in the territory.

Figure 5. Total of rural and urban schools in the Portal da Amazônia territory per municipality.




Source: Authors (2023).

The municipality of Alta Floresta has the highest number of schools in the region and is the municipality with the greatest number of enrollments and teachers, totaling 16,943 and 616 respectively. Of these totals presented, 11.76% of enrollments are in rural schools, and 13.64% of teachers are allocated in the rural area of the municipality. Followed by Alta Floresta, the second municipality that receives the highest number of enrollments is Guarantã do Norte with 10,040 enrollments, approximately 28% in rural schools, while the number of teachers working in the municipality in question is 351, 31.34% allocated in the rural area.

The municipalities with the lowest number of schools are Nova Guarita and Nova Santa Helena, with 5 schools each, 4 in urban areas and 1 in a rural area, followed by Nova Monte Verde with 9 schools in total, 6 in urban areas and 3 in rural areas. Regarding the number of students enrolled in these regions and the number of working teachers, Nova Santa Helena has the lowest number of enrollments, 2034, and the lowest number of teachers, 35 (14.63% allocated in rural schools), followed by Nova Guarita, with 1200 enrollments and 57 teachers (13.64% allocated in rural schools); and Nova Monte Verde, with 2034 enrollments and 67 teachers (16.25% allocated in rural schools).

Thus, given the data presented in relation to the number of rural and urban schools, such as the number of enrollments and working teachers, we can assume, using the metric of 1000 family farmers, that the municipality of Guarantã do Norte presents the largest number of rural schools, with approximately 13 schools/1000 family agriculturalists, followed by Apiacás, with approximately 9, and Matupá, with 7. Regarding the number of enrollments and working teachers in this area, the municipality of Guarantã do Norte leads with approximately 2 enrollments per family agriculturalist and 104 teachers per 1000 family agriculturalists.

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

The municipalities that presented the lowest number of rural schools per 1000 family agriculturalists were Nova Guarita with approximately 2 schools, followed by Nova Santa Helena, with 3, and Nova Canaã do Norte and Carlinda, with 4 each. As for the municipalities with the lowest number of working teachers in the rural area, we have Nova Guaritá, with approximately 18 per 1000 family agriculturalists, and Nova Monte Verde and Nova Santa Helena with about 23 teachers per 1000 family agriculturalists.

**4.4 Governance and institutions**

One of the main characteristics of the *Portal da Amazônia* is the large number of institutions related to family agriculture, both governmental and non-governmental (OLIVAL, 2005). In the TPA there are offices of several public institutions working with rural development. In addition, there are several civil society organizations working in this area. In Terra Nova do Norte, the Cooperativa Agropecuaria Mista Terranova Ltda (COOPERNOVA) operates in 10 municipalities, about 98% family agriculturalists, whose properties are part of several settlements. The main activity developed is milk cattle. The municipality of Terra Nova do Norte, is considered the largest milk producer in the North region of the State and COOPERNOVA is the agroindustry with the highest milk uptake (LOVATO, 2017).

The public and private institutions in the TPA are the technical assistance agencies, such as the municipal secretariats of agriculture, the Empresa Mato-grossense de Pesquisa, Assistência e Extensão rural (EMPAER), the councils; the cooperatives, associations, unions of rural workers; non-governmental organizations such as the Instituto Ouro Verde (IOV) and the Instituto Centro de Vida (ICV); the networks, such as Rede Sementes do Portal da Amazônia and the Rede de Produção Orgânica da Amazônia Mato-grossense (REPOAMA); and social movements. Another highlight is the Banco Comunitário Raiz, a solidarity finance system articulated by the IOV, which, through the creation and operation of different credit lines supports the process of agroecological transition and the commercialization of family agricultural products (IOV, 2023).

Actions by players in the social sector, particularly non-governmental organizations (NGOs), have an important effect on the operationalization of environmental preservation and recovery policies associated with the socioeconomic inclusion of rural families (MAKISHI *et al.*, 2021).

The territory relies on the Food Acquisition Program (*Programa de Aquisição de Alimentos* - PAA) and the National School Feeding Program (*Programa Nacional de Alimentação Escolar* - PNAE) that acquires local family farming products, articulated by the Companhia Nacional de Abastecimento - CONAB (WEIHS e OLIVAL, 2021). In January 2020, only four municipalities featured in the VIS DATA 3 panel list in the TPA as family agriculturalists supplying the PAA - Conab Execution (extraordinary credit). The municipalities of Matupá, Nova Santa Helena, Peixoto de Azevedo, and Nova Guarita, featured 43, 10, 7, and 6 agriculturalists, respectively, as food suppliers to the PAA (VIS DATA 3, 2020). Although PAA and PNAE have a potential for great local impact, access to producers in the region is negligible (RODRIGUES *et al.*, 2021).

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

In the TPA there were 3,361 family farming enterprises that obtained funding. The family farmers in the municipality of Nova Canaã do Norte obtained funding 401 times. Colíder and Peixoto de Azevedo obtained funding 385 and 302 times respectively. The family agriculturalists in the municipalities of Apiacás and Nova Santa Helena were the ones who received the least funding, with 77 enterprises in each municipality.

The National Program for Strengthening Family farming (*Programa Nacional de Fortalecimento da Agricultura Familiar* - PRONAF), "group V" was the one that obtained the most funding, 2427 times, followed by PRONAF "group B", with 849 in total. Peixoto de Azevedo and Colíder received funds from PRONAF - B 127 and 101 times, respectively. Colíder and Nova Canaã do Norte obtained the largest funding in Group V, 330 and 276 times respectively.

PRONAF - B is a financing groupfor individual family agriculturalists and rural producers who had a gross family income of up to R$ 23 thousand in the 12 months of regular production prior to the request of the Declaration of Aptitude (DAP) to PRONAF (BNDES, 2023). While PRONAF - V is intended for family agriculturalists with an annual family income of up to R$415 thousand (MAPA, 2023).

The creation of PRONAF represented the recognition and legitimation by the State of the specificities and social category of family farming and, for the first time, the term was featured in formal Brazilian institutions (ABREU *et al.*, 2021). Local organizations need to recognize the multiple ways of acting in rural development since reality is shaped by a complex set of elements that do not point in just one direction (RODRIGUES *et al.*, 2021). The cores or hubs of community organization and management aimed at strengthening family farming in the municipalities of the TPA have become important spaces of unity (MAKISHI *et al.*, 2021).

## 5 FINAL CONSIDERATIONS

The dynamic and complex context of the Portal da Amazônia territory imposes different challenges to the region, particularly to the socio-ecological system of family agriculture. In the pre-pandemic context, the dynamics of the evolution of the landscape and production systems, based on the data collected, featured a great number of family agriculturalists and a transition from dairy-cattle-based agriculture to, in most municipalities, commodity agriculture.

Family farming is characterized by most of the agricultural enterprises of the TPA, with the presence of agrarian reform settlements, as well as traditional peoples and communities and indigenous peoples.

The heterogeneity in the type of landscape and the way it is occupied is reflected in the economic and market relationships, with consolidated areas of commodities and socio-cultural fragility related to the patterns of access to education and health. Access to public policies aimed at the family farming sector can still be considered incipient.

The pre-pandemic context, analyzed herein, indicates previous weaknesses that characterize family farming in the TPA, which may have been amplified by COVID-19 and should be taken into account when making attempts to strengthen the resilience of this socio-ecological system in the northern Amazon of Mato Grosso.

**ACKNOWLEDGMENTS**

This work is part of a research effort entitled "*Resiliência frente à COVID-19:Adaptações para fortalecimento da Agricultura Familiar em região de fronteira agrícola amazônica*", fundedby Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP process 2021/07467-8), to whicht heaut hors thank for the financial support.

It should be noted that the opinions, hypotheses, and conclusions or recommendations expressed in this material are the responsibility of the authors and do not necessarily reflect FAPESP's vision. The authors also thank FAPESP for the post-doctoral grant granted to the first author.

We also thank the team of researchers from the collaborative research network for supporting secondary data collection.

**REFERENCES**

ABREU, C.; OLIVEIRA A. L.; ROBOREDO, D. A agricultura familiar no estado de Mato Grosso: um olhar a partir do Censo Agropecuário 2017. **Revista de Ciências Agroambientais,** v.19, n.2, p.81-92, 2021. DOI: https://doi.org/10.30681/rcaa.v19i2.5276.

BNDES - Banco Nacional do Desenvolvimento. **PRONAF:** Programa Nacional de Fortalecimento da Agricultura Familiar. Available at: https://www.bndes.gov.br/wps/portal/site/home/financiamento/produto/pronaf. Accessed on: 03 April 2023.

Brasil, Ministério da Saúde. **Banco de dados do Sistema Único de Saúde-DATASUS**. Available at:http://www.datasus.gov.br. Accessed on: 3 April 2023.

IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATISTÍCA. **Censo Agropecuário 2017:** Resultados definitivos. 2017(a). Available at: https://sidra.ibge.gov.br/pesquisa/censo-agropecuario/censo-agropecuario-2017. Accessed on: 20 March 2023.

IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATISTÍCA. **Pesquisa da Pecuária Municipal.** Rio de Janeiro, 2020. Available at: https://sidra.ibge.gov.br/tabela/3939. Accessed on: 04 April 2023.

IOV – INSTITUO OURO VERDE. Finanças Solidárias. Available at: https://ouroverde.org.br/financas-solidarias/# Access at: 04 April 2023.

BUSCHBACHER, R.; OLIVAL, A.A.; OLIVEIRA, R. E.; BARTELS, W.; RODRIGUES, C. H. A construção de um programa interdisciplinar de pesquisa e extensão sobre agricultura familiar: integrando os conceitos de resiliência e sistemas socioecológicos. In: OLIVAL, A. A.; OLIVEIRA, R. E.; BARTELS, W.; BUSCHBACHER, R.; RODRIGUES, C. H. (orgs). **Na trilha das mudanças:** ciência e resiliência da agricultura familiar na Amazônia norte mato-grossense. Cáceres, UNEMAT: 2021. 288p.

ICV- INSTITUTO CENTRO DE VIDA. **Diagnóstico Ambiental do Município de Apiacás – MT.** 2011. Available at: https://www.icv.org.br/drop/wp-content/uploads/2013/08/11276diagnostico_ambiental_apiacas.pdf. Accessed on: 30 March 2023.

FIGUEIREDO, R. A.; ALCÂNTARA, L. C. S.; MORAIS, J. P. G.; SAIS, A. C.; OLIVEIRA, R. E. Resiliência em sistemas socioecológicos, paisagem rural e agricultura. **Revista Ciência, Tecnologia e Ambiente**. v. 5, n. 1, p. 49-57, 2017.DOI: 10.4322/2359-6643.05103.

LOVATO, D. M. C. Análise da abordagem territorial rural no Território Portal da Amazônia: exemplo de Terra Nova do Norte, Mato Grosso. **Revista Política e Planejamento Regional**, v. 4, n. 1, p. 31 a 51, 2017.

MAKISHI, F.; MARCELINO, S.; ARRELLAGA, M. M.; VEIGA, J. P. C. OLIVAL, A. A. Políticas públicas e resiliência da agricultura familiar. In: OLIVAL, A. A.; OLIVEIRA, R. E.; BARTELS, W.; BUSCHBACHER, R.; RODRIGUES, C. H. (orgs.). **Na**

**trilha das mudanças:** ciência e resiliência da agricultura familiar na Amazônia norte mato-grossense. Cáceres, UNEMAT: 2021. 288p.

MAPA - Ministério da Agricultura, Pecuária e Abastecimento. **Modelos, Grupos e Status da DAP**. Available at: https://www.gov.br/agricultura/pt-br. Accessed on: 03 April 2023.

MERÇON, J. Construyendo nuevos posibles a partir de la articulación entre resiliencia, aprendizaje social y sistema escolar. **Educação**, v. 39, n. 1, p. 105-112, 2016. DOI: https://doi.org/10.15448/1981-2582.2016.1.21407.

Mitraud, S. et al. **Diagnóstico de povos e comunidades tradicionais em Mato Grosso**: Subsídio para processo de inclusão participativa no subprograma de agricultura familiar do REM (2020). REM/MT, 2021. Available at: https://remmt.com.br/novo2022/images/DIAGNSTICODEPOVOSECOMUNIDADESTRADICIONAISEMMATOGROSSO.pdf Accessed on: 03 April 2023.

OLIVAL, A. A.; BUSCHBACHER, R.;OLIVEIRA, R. E.; RODRIGUES, C. H. BARTELS, W.; OLIVAL, A. A. S.; ARANTES, V. T.; FARIAS, R. A.; SCAGLIA, S. **Resiliência da agricultura familiar na Amazônia: co-construção de um programa de pesquisa-ação multi-institucional no Brasil**. In: VIII Congresso da Associação Portuguesa de Economia Agrária e II Encontro Lusófono em Economia, Sociologia, Ambiente e Desenvolvimento Rural, 2016, Évora. Políticas Públicas para a agricultura pós 2020 - Atas do Congresso. Évora, Portugal: APDEA - Associação Portuguesa de Economia Agrária, 2016. p. 1301-1318.

OLIVAL, A. A.; OLIVEIRA, R. E.; BARTELS, W.; BUSCHBACHER, R.; RODRIGUES, C. H. (orgs). **Na trilha das mudanças:** ciência e resiliência da agricultura familiar na Amazônia norte mato-grossense. Cáceres, UNEMAT: 2021. 288p.

OLIVAL, A. A.; SPEXOTO, A. A.; RODRIGUES, J. A. Organização comunitária como estratégia de desenvolvimento sustentável: Os resultados do primeiro ano do Projeto GESTAR? Território Portal da Amazônia, MT, Brasil. **Revista Ciência em Extensão**, v. 3, p. 46-53, 2006.

OLIVEIRA, R. E. *et al.* Resiliência da agricultura familiar no norte e noroeste do estado de Mato Grosso> aprendizagens e reflexões. In: OLIVAL, A. A.; OLIVEIRA, R. E.; BARTELS, W.; BUSCHBACHER, R.; RODRIGUES, C. H. (orgs). **Na trilha das mudanças:** ciência e resiliência da agricultura familiar na Amazônia norte mato-grossense. Cáceres, UNEMAT: 2021. 288p.

RESILIENCE ALLIANCE, 2010. **Assessing resilience in social-ecological systems:** workbook for practitioners. Version 2.0. Available: https://www.resalliance.org/files/ResilienceAssessmentV2_2.pdf. Accessed on: 31 March 2023.

RODRIGUES, C. H.; BUSCHBACHER, R. Resiliência do que: compreendendo a diversidade da agricultura familiar no norte e noroeste de Mato Grosso. In: OLIVAL, A. A.; OLIVEIRA, R. E.; BARTELS, W.; BUSCHBACHER, R.; RODRIGUES, C. H. (orgs). **Na trilha das mudanças:** ciência e resiliência da agricultura familiar na Amazônia norte mato-grossense. Cáceres, UNEMAT: 2021. 288p.

SDT - Secretaria de Desenvolvimento Territorial. **Referências para uma Estratégia de Desenvolvimento Rural Sustentável no Brasil.**Brasília: MDA, 2005. (Documentos Institucional nº 3)
SILVA, R.; SATO, M. Territórios e identidades: mapeamento dos grupos sociais do estado de Mato Grosso – Brasil. **Ambiente&Sociedade**. Campinas, v. 13, n. 2, p. 261-281, 2010. DOI: https://doi.org/10.1590/S1414-753X201000020000

SUŠKEVIČS, M.; HAHN, T.; RODELA, R. Process and contextual factors supporting action-oriented learning: A thematic synthesis of empirical literature in natural resource management. **Society & Natural Resources**, v. 32, n. 7, p. 731-750, 2019. DOI: https://doi.org/10.1080/08941920.2019.1569287

WEIHS, M.; OLIVAL, A. A. Entre ameaças e oportunidades: A construção da resiliência da agricultura familiar na fronteira agrícola da Amazônia mato-grossense. In: OLIVAL, A. A.; OLIVEIRA, R. E.; BARTELS, W.; BUSCHBACHER, R.; RODRIGUES, C. H.(orgs). **Na trilha das mudanças:** ciência e resiliência da agricultura familiar na Amazônia norte mato-grossense. Cáceres, UNEMAT: 2021. 288p.

WEIHS, M.; OLIVAL, A. A. Posfácio. Agricultura familiar e COVID-19: reflexões sobre as ameaças e oportunidades. In: OLIVAL, A. A.; OLIVEIRA, R. E.; BARTELS, W.; BUSCHBACHER, R.; RODRIGUES, C. H.(orgs). **Na trilha das mudanças:** ciência e resiliência da agricultura familiar na Amazônia norte mato-grossense. Cáceres, UNEMAT: 2021. 288p.

ISSN 1980-0827 – Volume 19, Number 6, Year 2023

WEIHS, M. Do boi à soja: agrotóxicos e riscos à saúde na Amazônia mato-grossense. **Novos Cadernos NAEA**, v. 23 n. 2, p.135-159, 2020.DOI: http://dx.doi.org/10.5801/ncn.v23i2.6736