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**A INFLUÊNCIA DAS POLÍTICAS DE COMPRAS GOVERNAMENTAIS EM
RELAÇÃO AOS ASPECTOS DA SUSTENTABILIDADE E DO BEM-ESTAR
PSICOSSOCIAL NA AGRICULTURA FAMILIAR DE CASCAVEL-PR.**

**THE INFLUENCE OF GOVERNMENTAL PURCHASING POLICIES IN
RELATION TO THE ASPECTS OF SUSTAINABILITY AND PSYCHOSOCIAL
WELL-BEING IN FAMILY AGRICULTURE IN CASCAVEL-PR**

[TRADUÇÃO INGLESA]

PEDRO LACHOVICZ NETO

CASCAVEL/PR

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Dissertation presented in partial fulfilment of the requirements for the degree of **Master of Science in Administration** in the Department of Administration, Western Paraná State University. Dissertation Supervisor: Professor Doctor Sandra Mara Stocker Lago

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A influência das políticas de compras governamentais em relação aos aspectos da sustentabilidade e do bem-estar psicossocial na agricultura familiar de Cascavel-PR

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DEDICATION

First of all, to God, who guided me, granted me the gift of life and illuminated every step for me to reach this longed goal.

To my beloved wife, Andressa, who encouraged and took care of our home and daughters while I spent hours studying.

To my daughters, Alice and Laís, who, on a daily basis, motivated me not to give up.

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RESUMO

Lachovicz Neto, P. (2022). *A influência das políticas de compras governamentais em relação aos aspectos da sustentabilidade e do bem-estar psicossocial na agricultura familiar de Cascavel-PR*. Dissertação de mestrado, Universidade Estadual do Oeste do Paraná, Cascavel, PR, Brasil.

Na presente dissertação, o objetivo proposto foi analisar a influência das políticas de compras governamentais em relação aos aspectos da sustentabilidade e do bem-estar psicossocial na agricultura familiar no município de Cascavel (PR). Para responder ao problema da pesquisa e atender aos objetivos elencados, a metodologia foi moldada de forma qualitativa e quantitativa, objetivo exploratório e descritivo, bem como procedimentos de levantamento e documental. A literatura e estudos semelhantes evidenciaram modelos que possibilitam analisar de forma singular os aspectos do desenvolvimento sustentável. Dessa forma, a obtenção de dados possuiu, em seu cerne, três eixos de avaliação, compostos pelo modelo VAPERCOM, Escala de Bem-Estar Psicológico e Barômetro da Sustentabilidade. Além disso, do ponto de vista econômico, pretendeu-se analisar os custos ao setor público, como ferramenta de garantia de mercado para a agricultura familiar, com base no banco de dados do 15º Batalhão Logístico, órgão público gerenciador do Programa de Aquisição de Alimentos do Exército Brasileiro na cidade de Cascavel (PR). Os principais resultados indicaram que o perfil sociodemográfico dos agricultores familiares é homogêneo e está alinhado com o desenvolvimento sustentável regional. Majoritariamente, os participantes do Programa de Aquisição de Alimentos (PAA) possuem faixa de lucro mensal acima de três mil reais, são vinculados ao Programa Nacional de Fortalecimento da Agricultura Familiar (PRONAF) e têm diversificadas formas de comercialização dos seus produtos, como o PNAE e Feiras, que, somadas ao PAA, representam 80% das formas de vendas dos produtos. Assim, infere-se que há forte influência das compras governamentais no desempenho sustentável da agricultura familiar de Cascavel (PR), mas existem demandas de melhorias no relacionamento entre os agentes públicos de apoio aos agricultores familiares. Quanto à percepção ambiental, possuem grande possibilidade de se tornarem consumidores ecológicos, além de frequente preocupação com o ciclo de vida dos produtos e alta percepção ambiental. Ademais, possuem elevado grau de bem-estar psicológico, sendo destacadas as dimensões de crescimento pessoal e propósito de vida. Os resultados do Barômetro da Sustentabilidade indicaram que os respondentes da agricultura familiar possuem potencial sustentável. Como sugestão de pesquisas futuras, recomenda-se a replicação da metodologia em agricultores que não participam das compras governamentais e em outros atores sociais como fundamentação para elaboração de políticas públicas de intervenção social.

Palavras-chave: Agricultura Familiar. Desenvolvimento Sustentável. Aquisições Governamentais. Programa de Aquisição de Alimentos. Qualidade de Vida.

ABSTRACT

Lachovicz Neto, P. (2022). *The influence of governmental procurement policies in relation to the aspects of sustainability and psychosocial well-being in family agriculture in Cascavel-PR*. Master's degree dissertation, Western Paraná State University, Cascavel, PR, Brasil.

In the present dissertation, the proposed objective was to analyze the influence of government procurement policies in relation to aspects of sustainability and psychosocial well-being in family farming in the Cascavel (Paraná). To respond to the research problem and meet the objectives listed, the methodology was shaped in a qualitative detailed, exploratory, and descriptive way, as well as survey and documentary procedures. Literature and similar studies have shown models that make it possible to analyze aspects of sustainable development uniquely. In this way, the data collection had at its core three evaluation axes, composed of the VAPERCOM model, Psychological Well-Being Scale and Sustainability Barometer. In addition, from an economic point of view, it was intended to analyze the costs to the public sector, as a market guarantee tool for family farming, through the database of the 15th Logistics Battalion, a public agency that manages the Food Acquisition Program of the Brazilian Army in the Cascavel. The main results indicate that the sociodemographic profile of farmers and family members is aligned with regional sustainable development. Most of the participants in the Food Acquisition Program have a monthly profit range above three thousand *reais*, are linked to the National Program for the Strengthening of Family Farmers, and have diversified ways of marketing their products, such as the National School Feeding Program and Fairs that, added to the Food Acquisition Program, represent 80% of how the products are sold. Thus, it is inferred that there is a strong influence of government purchases on the sustainability of family farming in Cascavel, but it demands improvements in the relationship between the support groups and family agents. Regarding environmental perception, they have a great possibility of becoming ecological consumers, in addition to frequent concern with the life cycle of products and high environmental perception. Moreover, they have a high degree of psychological well-being, highlighting the dimensions of personal growth and purpose in life. The results of the Sustainability Barometer indicated that family farming respondents have sustainable potential. As a suggestion for future research, replication of the methodology is recommended for farmers who do not participate in government purchases and other social actors as a basis for elaborating public policies for social intervention.

Keywords: Family Farming. Sustainable Development. Government Procurement. Food Acquisition Program. Quality of life.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACARPA - Rural Credit and Assistance Association in Paraná

LCA – Life Cycle Assessment

AGRIVEL - Association of Family Farmers of the Municipality of Cascavel

AOPA - Association for the Development of Agroecology in Paraná

PWB - Psychological Well-Being

CAPES - Coordination for the Improvement of Higher Education Personnel

COOAVI - Iguçu Valley Agroecological Cooperative

COOPRACOR - Cooperative of Rural Producers of Corbélia

COOPRAFA - Cooperative of Family Farmers

COVID-19 – Coronavirus Disease

DAP - Declaration of Aptitude for Pronaf

DHAA - Human Right to Adequate Food

EB – Brazilian Army

PWBS - Psychological Well-Being Scale

EMATER - Technical Assistance and Rural Extension Company

FAO - Food and Agriculture Organization

IBGE - Brazilian Institute of Geography and Statistics

IBICT - Brazilian Institute for Information in Science and Technology

HDI - Human Development Index

IDR-PR - Rural Development Institute of Paraná

INCRA - National Institute for Colonization and Agrarian Reform

IPARDES - Parana Institute of Economic and Social Development

LOSAN - Organic Law on Food and Nutritional Security

MDA - Ministry of Agrarian Development

UN – United Nations

MB – Military Branch

PAA - Food Acquisition Program

PDR Log - Logistics Resources Decentralization Plan

PFZ – Zero Hunger Program

GDP - Gross Domestic Product

PNAE - National School Feeding Program

PRONAF - National Program for Strengthening Family Farming

SAG - Management Monitoring System

SEAD - Brazilian Special Secretariat for Family Farming and Agrarian Development

UASG - General Services Administration Unit

MU – Management Unit

PMU – Participating Management Units

UNESCO - United Nations Educational, Scientific and Cultural Organization

UNIOESTE – Western Paraná State University

ICF - Informed Consent Form

VAPERCOM – Environmental Variable, Perception and Purchase Behavior

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1 INTRODUCTION

Since the time of the great savannas, agriculture has always been part of humanity due to the need to obtain food for the species' survival. After visualizing its importance, humans developed hunting, fishing, and harvesting techniques to facilitate communities' sustenance and maintenance (C. R. Reis, 2017; Wilson, 2006).

As societies evolved, the dynamics of territorial organization became driven by laws and social contracts that govern what is best for each community. In Brazil, rural and urban scenarios are transformed by socioeconomic relationships established in space, developed mainly by capitalism (Elias & Pequeno, 2007). The city of Cascavel, in the state of Paraná, is an example of this dynamic relationship between rural and urban; according to data from the Census of Agriculture 2017, the city has 176,460 hectares of agricultural establishments, comprising 3,221 agricultural properties, where 8,976 people work (IBGE, 2017). With a history of creating opportunities for investment in the agricultural sectors, Cascavel underwent a process of modernization and urbanization that transformed it into a hub of the urban network in western Paraná, with specialization in services, urban activities, and industries linked to agribusiness (A. J. C. R. Reis, 2017).

However, cities with configurations similar to Cascavel should be cautious with the spatial modifications unrolled by socioeconomic relations, such as migratory movements and new locations of industrial sectors, aiming at the maintenance of their rural and urban landscapes (A. J. C. R. Reis, 2017; Elias & Pequeno, 2007). A society's sustainability level is the ability to include all its members in their respective territories and guarantee minimally adequate, sufficient, and decent lives (Boff, 2012).

As an agent of public power, the State is responsible for formulating policies and programs for sustainable development. Sustainable rural development should be a resource for the guidance and promotion of actions aimed at the formulation of public policies that meet the demands, observing, equally, the economic, environmental, and social aspects that take place in social bodies (Duarte, Silva, & Machado, 2015; Elkington, 2004; Garcia, 2016). Consequently, the state has the function of formulating and programming public policies to prioritize relevant aspects, such as encouraging the protection of nature, public research, and commercialization, and building fairer policies without privileging some sectors. Thus, the effectiveness of these tools is enhanced with the active participation of individuals in

collaboration during the construction and review of the proposed activities (Gregolin, 2016; Paz, 2016).

It is necessary to analyze the economic, social, and environmental aspects correlated to family farmers since they are essential agents in sustainable rural development. Family farming is indispensable and plays a protagonist role in the search for this aspect of development because, at the same time that it produces food, it has a protective function for landscapes and conserves biodiversity. Besides, it offers the best form of occupation of territory according to socio-environmental criteria (Sachs, 2001). However, to achieve sustainable objectives, it is necessary to apply public policies in the rural environment that create knowledge for individuals about the potential in the environment and develop skills to transform these resources with the least possible impact (Sachs, 2002).

As for environmental aspects, with the intensification of exacerbated consumption of products, there has been an increase in social concern about sustainable environmental issues. Environmental education is fundamental for improving the relationship with the environment as a developer of environmental awareness (G. F. Dias, 1994). Thus, many tools were created seeking to adapt to this new scenario and ensure the rational use of natural resources (Brandalise, 2008).

In the scenario of environmental aspects of sustainability, one of the methods to assess these issues is the analysis of environmental perception, which considers the pillars of sustainability as a way to support results that identify the processes related to the rational consumption of natural resources (Fujihara *et al.*, 2017). This assessment provides information about consumer behavior and perception of environmental issues based on the product life cycle, focusing on resource reduction, reuse, and recyclability. Hence, communities can adapt their processes and design public policies according to the demands and expectations of their individuals (Brandalise *et al.*, 2009; Tomasetto & Brandalise, 2018).

From the economic perspective of the sustainability tripod, the Federal Decree 8,473 of June 22, 2015, stands out as a fundamental milestone for the acquisition of foodstuffs by public agencies and entities. It determines the allocation of at least 30% of the total resources allocated in the fiscal year for purchasing foodstuffs to acquiring products from family farmers and their organizations. With this, public agencies that did not yet acquire foodstuffs through public calls began to do so, as was the case with the Armed Forces, which prompted the decentralization and directing of many financial resources to these sectors (Silveira, 2018).

The *Programa de Aquisição de Alimentos* (PAA) (Food Acquisition Program, our translation) is operationalized in conjunction with local farmers and cooperatives. The prices of

the products purchased are based on values estimated by local businesses, with purchases from other agencies considering the particularities of each Brazilian region (Triches & Grisa, 2015). Many difficulties were encountered in the first acquisitions and operationalization of the PAA by the Management Units (MU) of the Public Administration. However, as the processes proceeded, public managers and family farmers gained minimal expertise, highlighting the products from family farming compared to typical acquisitions through bidding. Some highlights are the quality of the products (with less or no pesticide effects and healthier) and fast and flexible supply logistics induced by the proximity of the farmers to the units (Silveira, 2018). Nevertheless, given so many logistical and nutritional benefits, the need for the public administration to investigate the economic advantage of acquiring family farming products is emphasized.

The concept of sustainable development is constantly evolving, and it no longer represents only the economic and environmental aspects but also the social and cultural dimensions, through the search and supply of quality of life, as well as the fulfillment of fundamental human rights (Gregolin, 2016; Petrilli, Rachid, & Sacomano, 2019). It also values robust collective participation in developing social policies as active agents for democratizing access to essential services.

Regarding the family farmers, marked by characteristic episodes of rural exodus, with family members leaving for urban centers, there is a need for planning actions to understand these subjects as active beneficiaries of the programs (Martins, 2002; Zarban, 2019). Because of its high importance in the balance of the tripod of sustainable development, there must be interest in the toil and defense for the rights of this socioeconomic class through appropriate social opportunities, in which occurs the effective participation in the construction of their contexts (Gregolin, 2016). Given that, seeking to improve the conditions imposed on this segment, the opportunity to investigate the well-being of family farmers stands out given the range of circumstances and occupations performed by agricultural workers, as well as the lack of psychological health services existing in Brazil and exclusive to this portion of society (Poletto *et al.* 2008; K. B. Silva & Macedo, 2017).

Currently, the creation of innovative strategies that promote the sustainable development of the various Brazilian regions is eminent, especially regarding the establishment of family social reproduction, modernization of the sector, and maintenance of the economic viability of the properties (Goulart, Vieira, & Bittencourt, 2021). An alternative is the evaluation of government purchases as a guarantee of farmers' remuneration since these tools stimulate the increase of resources for farming families (J. A. Oliveira & Baccarin, 2021).

Therefore, it is necessary to investigate the socio-environmental and economic aspects that permeate the development of public policies for the promotion of Brazilian family agriculture in order to identify proposals for intervention to implement practices that conjugate human dignity and sustainable development (Pietro & Moreira, 2021).

1.1 RESEARCH PROBLEM

The Brazilian territory is graced by the possession of fertile land that enables the exploitation of activities such as cultivating and herding several species of crops and animals. From north to south, farmers work with the ultimate goal of delivering food to more than two hundred million Brazilians, one of the country's primary economic sources (K. D. B. Souza, 2016).

With a history that has traversed the entanglements of social inequality, Brazil is also marked by asymmetric social and economic levels. Public policies are elaborated to direct actions to support populations in vulnerability and social risk to minimize such disparities.

The colonization process influenced Brazilian family farming and, as its relevance in the country's economic development increases, political and social interferences are amplified. In recent years, sustainable rural development has positioned the spotlight on family farming, turning the topic into a source of studies for academia, especially after the implementation of laws and the creation of public policies that enhanced production in the field (M. G. Teixeira & Crubellate, 2011; Zarban, 2019).

For the execution of the 2017 Census of Agriculture, researchers visited more than five million Brazilian rural properties and identified that 77% of them are characterized as family farming components (BRAZILIAN INSTITUTE OF GEOGRAPHY AND STATISTICS [IBGE], 2017).

In this context, the PAA became essential as a public policy to foster sustainable rural development, aligning with strategies to reduce food insecurity for certain at-risk groups (Zarban, 2019). Thus, Brazilian family farming gained international prominence in 2013 after the publication of the study "Structured Demand and Smallholder Farmers in Brazil: the Case of PAA and PNAE" by the United Nations, which depicts these programs as one of the most significant global food procurement initiatives by public agencies (UNITED NATIONS [UN], 2013). These national policies' elemental strategies were the creation of public institutional markets that expanded and provided priorities for small-scale producers, who often required family labor as a form of social reproduction (Chayanov, 1986).

The National School Feeding Program (PNAE) is one of the oldest public doctrines in the country, which has undergone several changes over the years and is established as one of the main tools to ensure the permanence of family farmers in the countryside along with PAA, in addition to granting the increase in the supply of food produced in the Brazilian territory, developing the family autonomy of producers (Cassol, 2019). In these programs, the purchases of foodstuffs occur without the need for bidding, in which values are paid similar to those practiced in local markets. As a modality of exemption from bidding, the Public Call reduces bureaucratic requirements and benefits family farmers from an economical and sustainable point of view. Given the excessive importance of these public mechanisms, the need to analyze their *modus operandi* and verify the results provided to family farmers is amplified (Batista *et al.*, 2016; Zarban, 2019).

With technological advancement and mass production, the concern about the production and procurement of sustainable materials has increased, notwithstanding environmental issues. Sustainability can be divided into three harmonic pillars, corresponding to economic prosperity, environmental quality, and social integrity (Duarte, Silva, & Machado, 2015; Elkington, 2004). The economic approach has aspects of profits, spending, and cost reduction. The environmental aspect deals with pollutants, recycling, and water use; finally, the social aspect emphasizes health and social responsibilities (Savitz, 2013).

The academy has developed studies dealing with the economic effectiveness of procurement programs (A. M. V. Alves, 2017; Carneiro, 2019; Libânio & Cirino, 2020; A. P. Moreira, 2017), dynamics of acquisitions and bidding by public entities (Franzoni & Silva, 2016; D. W. Silva, 2015), analysis of the implementation processes of government procurement (Nardi, 2018), and investigation regarding food security with foodstuffs coming from family farming (Villar, 2017). However, essays that seek to analyze, in a consistent manner, the farmer's well-being in the field, aspects linked to the quality of life, and, in even smaller quantities, investigations on the environmental perception of rural producing families are uncommon (L. G. Oliveira, 2015; A. J. C. R. Reis, 2017; A. Q. A. Ribeiro, 2016; L. M. R. Santos, 2017; Saron, 2014).

Given the above, the relationship between human beings and nature should be investigated as a research gap, also conditioning the existence of public policies that guarantee the quality of life, psychosocial well-being, and permanence of the farmer in the field, making a diagnosis of the balance between the economic, social and environmental dimensions (Altemburg, 2011; Exime *et al.*, 2021).

1.1.1 Research Question

Public policies aimed at sustainable rural development are developed in the Brazilian scenario aiming at the development of alternatives to strengthen family farmers; thus, the question is: **What is the influence of government procurement policies in relation to aspects of sustainability and psychosocial well-being in family farming in Cascavel-PR?**

1.2 OBJECTIVES

1.2.1 General

The main objective of this study was to analyze the influence of government procurement policies in relation to aspects of sustainability and psychosocial well-being in family farming in Cascavel-PR.

1.2.2 Specific

- a) To identify the profile of family farmers in Cascavel (PR), participants in sustainable procurement policies of a government agency, and compare local data with national data from the Census of Agriculture of 2017.
- b) To verify the level of environmental perception of farming families.
- c) To analyze the psychological well-being of farming families.
- d) To analyze the relationship between local food purchases by the Brazilian Army and the sustainability of family farming.
- e) To measure the influence of government purchases on the sustainable performance of family farming.

1.3 JUSTIFICATION AND CONTRIBUTION OF THE TECHNICAL PRODUCTION

Agriculture is an activity that has accompanied human beings and provided favorable conditions for their subsistence throughout history; it has suffered the influences of technological advances and transformations in social organization. Environmental sustainability and the country's economic growth have already been the target of conflicts in developing their goals. However, family farming, in the current Brazilian scenario, besides

being directly related to the food and nutritional security of the population, has a fundamental commitment to sustainable rural development (Pietro & Moreira, 2021). For this to occur, public policies have been developed for its economic strengthening, aiming to increase the quality of life and reduce the rural exodus, ensuring its permanence in the countryside.

Family farmers have specific configurations in the interaction with work and, to make possible the supply of food in regional markets, they need economic, environmental, and social balance in their various contexts of operation (D. D. C. Bittencourt, 2020). In recent years, legal mechanisms have been developed that have influenced the acquisition of foodstuffs from family farming, such as Decree 8,473/2015, which determines the targeting of at least 30% of annual resources for food purchases by federal public administration bodies. Investigating the effectiveness of these public policies in promoting family farming has become a strategic challenge for many researchers, especially regarding the aspects of economic strengthening. However, few studies carried out in the various Brazilian contexts have engaged with the concern of the psychological aspects and the quality of life of family farmers.

Despite the increase in the supply of family farming products to public agencies, there are still financial weaknesses by portions of this population, as many have difficulty modernizing production, financial planning, and access to technology (Pietro & Moreira, 2021). Moreover, in recent years, family farmers have suffered the effects of rural exodus, especially with the discrepancy between large urban centers and the countryside, influencing young people to leave their farms, often encouraged by the absence of public policies, the fragility of rural infrastructure, and the difficulty in access to education (Foguessato *et al.*, 2016; Gris, Lago, & Brandalise, 2017; S. B. Souza, Doula, & Carmo, 2016). To minimize the effects of this social phenomenon, it is crucial to investigate the quality of life and well-being of farmers, in addition to listing the psychosocial particularities that influence the routine of rural workers, creating subsidies for developing efficient public policies.

The modern consumer has become more demanding with several aspects of the products he consumes, not only about their quality but also about the production processes and the origin of the materials in relation to the environment. Considering the environmental conditions of proximity to the field and nature, the notorious investigation about the concern of these workers regarding environmental aspects is growing since it is their primary source of financial resources. The evaluation of the environmental perception provides the analysis of how the subject interacts with environmental phenomena and his or her vision of insertion in them. Through it, it is possible to identify possible elements of future interventions, to improve the

relationship between farmers and the environment in which they are inserted, besides the adequacy to the demands of "green marketing" (Brandalise, 2008; D. D. C. Bittencourt, 2020).

As a personal challenge for this researcher, the opportunity to investigate the economic, environmental, and psychosocial aspects was of great value, enhancing the opportunity to produce enriching multidisciplinary knowledge that this Postgraduate Program offered. In addition, a model for the analysis of national family farming that considers the three basic aspects of sustainable development was intended.

1.4 REPORT STRUCTURE

The paper is structured into six chapters.

Chapter 1 presents the work through a brief introduction, presentation of the research problem, objectives, and aspects that justify the choice of the theme.

Chapter 2 presents the theoretical framework of the research, based on bibliographic research and analysis of the scientific production on the subject in recent years. The following topics were addressed: family farming, the Food Acquisition Program (PAA) and sustainable government purchases, environmental perception, psychosocial well-being in the field, measuring sustainable performance, and similar experiences in Brazil and worldwide.

Chapter 3 presents the research methods and techniques of technical production, detailing the research design, data collection procedure, data analysis procedure, limitations of the research methods and techniques, the context of the study, and family farming in the municipality of Cascavel (PR).

Chapter 4 presents the context of the project, highlights the relationship between the municipality of Cascavel (PR) and family farming, and outlines the food within the Brazilian Army (EB).

Chapter 5 is composed of the analysis of the results, consisting of the farmers' profile, environmental perception, psychological well-being, economic-financial viability, and the sustainability of regional family farming.

Finally, Chapter 6 leads into the final considerations.

2. THEORETICAL AND PRACTICAL REFERENCES

2.1 FAMILY FARMING AND SUSTAINABLE DEVELOPMENT

The concept of family farming is not consonant at the international level; the main pillars considered in the debates are the relations between family, management, and rural extension. Most definitions specify that a family member must own, operate, or manage the farm partially or totally. Non-critical and broad definitions risk being meaningless because they cover many family farming configurations. The Food and Agriculture Organization (FAO) emphasizes that family farming has distinct characteristics and dynamics from non-family farming; family members share management of the farm, and farming activities are the main source of income (G. A. Bittencourt & Abramovay, 2001; Schneider, 2014; Shucksmith & Brown, 2016).

In Brazil, the term family farming began to be inserted into the political and academic spheres in the mid-1990s. Before this period, they were called small farmers, family producers, or subsistence farmers (Mattei, 2006). Today, a more restrictive definition of family farming is employed based on economic value and family farm size, which significantly favors the analytical and political aspects. However, several heterogeneous and unequal configurations are spread throughout the national territory, making a specific classification difficult (Shucksmith & Brown, 2016).

Family farming is more than just a mode of production; it goes beyond the commercial aspects linked to mass industrialization and establishes a way of life. In the country, there are both farmers, who have greater productive capacity and degree of modernization, and those more similar to the peasantry, in which production is focused on self-consumption. Therefore, the political, cultural, and natural characteristics of each territory influence the profile of the producer, such as those who obtain a financial return and those who do not, those who have advanced technologies, and those who use rudimentary equipment (Matos, 2020; Nardi, 2018; Paz, 2016; Turpin, 2008).

Studies developed through a partnership between the Technical Cooperation Project between the Federal Government, based on the National Institute for Colonization and Agrarian Reform (INCRA) and the FAO, categorized Brazilian agriculture into two models: patronal and family farming (Avelar, 2016), as can be seen in Chart 1.

Chart 1

Main Models and Characteristics of Brazilian Agriculture

COMMERCIAL FARMING	FAMILY FARMING
Separation of management and labor	Management and labor closely related
Central organization	Farmer-driven production process
Focus on specialization	Focus on diversification
Predominance of wage labor	Wage labor is complementary
Technology seeks to reduce workforce needs	Decisions made on site conditioned by the specifics of the production process.
Focus on the use of purchased products	Focus on the use of internal products

Source: Adapted from Avelar (2016).

Family production is focused mainly on satisfying the family's needs and survival, contrary to the commercial model, which is based on the exploitation of wage labor and profit increase. These two poles diverge the management and work model that crosses generations (Chayanov, 1974).

The paradigms impregnated to the concept of rural as something old and antagonistic to modernity emerged with the transformations generated by the European capitalist strengthening in the seventeenth century. The archaic feudal labor was what opposed the advances of large factories towards progress and growth (Silva, 2013, as cited in Garcia, 2016). In the Brazilian rural setting, the stigma of the farmer as shabby, sick, and lazy was disseminated by Monteiro Lobato's works through the character Jeca Tatu in the first decades of the 20th century. This protagonist grew in importance and relevance, leaving the magazines to debates encompassing the country's socioeconomic problems (Coimbra, 2018).

Only in the twentieth century, with the effects of the technological evolution that came from World War II, that agriculture began to receive a new look, with the idea of rural development linked to growth. The modernization process of world agriculture was named the "Green Revolution." This event was enhanced by the propaganda of the conflict generated by the global population increase and rationalization of food, besides being characterized by a series of technological innovations that enabled more excellent production of foodstuffs through genetic manipulation of seeds that obtained better results in the use of fertilizers (V. G. Costa, 2013; Pozzetti, Magnani, & Zambrano, 2021).

In addition, this technological package included actions to strengthen the monoculture of large landowners, the use of agrochemicals, and the mechanization of production. These processes were aggregated by high investments, which sometimes were not supported by small rural producers, preventing competition with large agricultural producers (Araújo, 2016; Pozzetti, Magnani, & Zambrano, 2021; Turpin, 2008).

The unbridled race for progress generated economic inequalities that, combined with the illusory vision of a better urban life, culminated in the departure of family farmers from the countryside. In the Brazilian scenario, the increase in the number of underemployment and peripheries combined with the concentration of income and land resulted in farmers' impoverishment, unemployment, and "favelaization." Due to the rural exodus, these workers were subjected to social exclusion and precarious living conditions. These facts generated many agrarian problems in the country so that large producers progressively accumulated wealth, and small farmers gradually became hostages of poverty (R. J. Moreira, 2000; Niederle, Almeida, & Vezzani, 2013; Palmeira, 1989; S. A. Santos & Busnello, 2021).

Six levels of sustainable development crises have affected multiple layers of society in different ways. The first is the ecological crisis caused by the overexploitation of natural resources, soil degradation, and increased effluents discharged into the environment. The second crisis is the social one, caused by the intense rural exodus and lack of jobs. The food crisis is the third one, in which the increase in the triad production-consumption-waste threatens human health. Next, there is a cultural crisis by devaluing the knowledge obtained throughout the history of agriculture. The fifth crisis is the political one, which makes family farmers hostages of social-political measures. The last is the economic one, marked by the concentration of land and income of large farmers and, in return, indebtedness, and bankruptcy of small farmers (Zonin, 2007; Gregolin, Gregolin, Triches, & Zonin, 2020).

With the presentation of these crises on a national level, it was necessary to rebuild a model that would offer sustainability and health to the production and consumption of food by increasing the appreciation of the variety of foodstuffs, strengthening family farmers, reconnecting producer and consumer, and balancing rural and urban. Since family agriculture could not compete with the large agricultural industries, it became essential to apply public policies that would enable the production and distribution of their products, making them remain in the countryside. The reduction of rural exodus reduces the impacts generated by the unbridled growth of municipalities, observed by the lack of basic infrastructures, such as sanitation, health, education, housing, and transportation services in urban areas (Araújo, 2016; Gregolin, 2016; Tugoz, 2015).

The level of sustainability of a society is the capacity to include all its members and, in their respective environments, guarantee an adequate, sufficient, and decent life (Boff, 2012). Family farming is essential and plays a leading role in the search for sustainable rural development because, at the same time as it produces food, it plays a protective role in

landscapes and conserves biodiversity. In addition, it offers the best form of occupation of territory, according to socio-environmental criteria (Sachs, 2001).

From a social and productive point of view, family farming has a significant magnitude when formulating national development projects. Currently, Brazilian family agriculture is responsible for supplying the domestic market; it is part of the basic food for the population and establishes a counterpart to the national production commodity system, offering greater food security to its products. Due to this notoriety, it is fundamental to stimulate production through public policies that strengthen its expansion in the environment where farmers are inserted (Araújo, 2016; Constanty, 2014; Gregolin, 2016; Nardi, 2018). Public policies foster economic and social changes; those involved act according to the policy and the modifications established (Lee, 2011).

In recent decades, family farmers have initiated negotiations together with sociopolitical representatives and conducted several public debates (Cassol, 2019). The first public policy oriented to generate improvements in this sector was the National Program for Strengthening Family Farming (PRONAF), created in 1995 to release differentiated credit lines for this public, an important social-economic milestone. Some of the goals of this program are improvements in the infrastructure of the properties so that farmers can improve the quality and quantity of their products (Nardi, 2018).

Therefore, in view of its notability on the national scene, the National Policy for Family Farming and Rural Family Enterprises was drawn up on July 24, 2006, established by Federal Law 11,326. This policy defines what family farming is and who its subjects are, and must meet, simultaneously, the requirements detailed in its Article 3, with our translation:

- I - Does not hold, for any reason, an area larger than four fiscal modules
- II - Predominantly use the family's own labor in the economic activities of their establishment or enterprise
- III - Has a family income predominantly derived from economic activities related to the establishment or enterprise itself;
- III - Has a minimum percentage of family income originating from economic activities of their establishment or enterprise, as defined by the Executive Branch;
- IV - Manages his establishment or enterprise with his family.

Paragraph 2 of the same article exemplifies other frameworks that can be used: foresters, aquaculturists, extractivists, fishermen, indigenous peoples, and members of the remaining communities of rural *quilombos*, each with its own specificity.

One of the most challenging tasks is to equally distribute the resources due to each Brazilian region's historical particularities and climatic conditions (Dalcin, & Hartmann, 2021; C. S. Santos, 2014). Hence, PRONAF has been improved over the years, always aiming to

transform it into an effective mechanism to meet the heterogeneous range of family farmers. Some of these advances are the increased resources offered, more flexible financing conditions, less bureaucratic access to credit, and expansion in region and number of people served (Grisa *et al.*, 2014; Nardi, Leismann, & Bertolini, 2021).

2.1.1 The development of Family farming in the Western region of Paraná

The South region of Brazil, even before the creation of PRONAF, already had better technological conditions, higher levels of schooling, and more accessible interactions with financial agents. This region is the one that has the most PRONAF contracts and, in the state of Paraná, the West and Southwest regions stand out. Some factors are the existence of a larger number of bank branches, credit cooperatives, and the high income of the agricultural population; the latter offers a greater guarantee to the banks of the return of the resources offered. The modernization of Paraná stood out at the national level due to the efforts of ACARPA (Rural Credit and Assistance Association in Paraná), which was renamed to EMATER (Technical Assistance and Rural Extension Company). This agency currently incorporates the IDR-Paraná (Rural Development Institute of Paraná), which provides technical assistance for the reception and acceptance by farmers of new market strategies, such as taking out loans, expanding the agroecological base, and modernizing the property, seeking to increase food production with high quality, in an agile and effective manner (Nardi, 2018; Nardi, Leismann, & Bertolini, 2021).

Historically, Paraná has fertile land and opportune indexes for agricultural production. One of the references to the rural producer is present in the State coat of arms¹, designed by the Norwegian Alfredo Emílio Andersen, in 1910, in which a farmer with human clothes for field activities is displayed, representing the agricultural strength of the region (Canto, 2018). The environmental factor, coupled with the good climatic conditions, hydrography, fauna, and flora, attracted many settlers, who initially settled on small farms in the exercise of polyculture.

The colonization of Western Paraná comes from European descendants coming from Rio Grande do Sul and Santa Catarina, after the territorial depletion of these states, known as the *Marcha para o Oeste* (March to the West) (Paz, 2016). This movement was implemented in the mid-1930s, to horizontalize the population distribution in the country, causing the Brazilians who remained on the coast of the country to migrate to the West. Thus, the hitherto known as *sertão paranaense* (Paraná's countryside) ceased to be occupied chiefly by

¹ Appendix A

obrageros, who illegally exploited the yerba mate and timber native from Paraná (Wachowicz, 1982 as cited in Reolon, 2007).

Due to Brazilian socio-historical factors, the land tenure model of the Western Region of Paraná was also influenced by the political movement toward Brazil's Legal Amazon. In this way, the owners of extensive properties from Paraná sold their southern lands and headed for the Amazon territory with greater purchasing power, with the possibility of acquiring land with an area up to three times larger. Nevertheless, the export model was strengthened, as many lands remained in possession of an increasingly smaller number of Paraná farmers, strengthening the evolution of soybean and wheat cultivation, chicken farming, and reservation of areas for livestock (M. G. Lima, Ferreira, & Negrão, 2009).

Even with so much progress, there are still different types of family establishments, some set up for subsistence and others geared towards the domestic marketing market, for example, in the participation of the PAA (Mendes, Sousa, & Mattos, 2021).

2.2 FOOD ACQUISITION PROGRAM AND SUSTAINABLE GOVERNMENTAL PROCUREMENT

The PAA has two existential pillars: promoting access to food and stimulating family farming production. The program was created by Article 19 of Law No. 10,696 of July 2, 2003, to ensure the purchase of food from family farmers at a fair price, stimulating income generation and creating marketing channels. Similar to PRONAF, the program has undergone several changes since its elaboration and is currently considered one of the leading public policies for strengthening family farming (J. A. Oliveira & Baccarin, 2021; Tugoz, 2015).

With the establishment of the Organic Law on Food and Nutritional Security (LOSAN) in 2006, the Human Right to Adequate Food (DHAA) was ensured. Thus, the promotion of family farming was encouraged by actions focused on food production and availability issues. In 2012, the PAA Institutional Procurement modality was created, ratified by Decree No. 775 of July 4, 2012, defining the purchase of family farming production through a public call for the supply of food according to the demands of food consumption by a body, entity, or institution of the direct and indirect administration of the Union, the states, the Federal District, and the municipalities. From then on, to participate in the public call for food purchases, the family farmer must be part of a cooperative or associative organization (Matos, 2020; J. A. Oliveira & Baccarin, 2021; Tugoz, 2015).

Until 2015, the PAA's main objective was to supply the Zero Hunger Program (PFZ); until then, public calls were held as a bidding waiver and the materials acquired were distributed

to people in a situation of food and nutritional insecurity, in addition to those served by the social assistance network, such as asylums, hostels, public hospitals, popular restaurants, and community kitchens (Cassol, 2019; Zarban, 2019).

Currently, the PAA enables income generation and distribution, enhances social actions for food security, strengthens marketing networks, values biodiversity, encourages healthy eating habits, and stimulates cooperativism and associativism (Nardi, 2018). Therefore, it is considered one of the most effective public policy programs channeled toward sustainable development (Matos, 2020; C. A. Teixeira & Norder, 2015). In 2015, a revolution occurred in government procurement in support of sustainability; Federal Decree 8,473, of June 22 of that year, determines, in its Article 1, §1, that:

Of the total resources destined in the financial year for the acquisition of foodstuffs by the bodies and entities mentioned in the caput, at least 30% (thirty percent) must be destined for the acquisition of products from family farmers and their organizations, rural family entrepreneurs, and other beneficiaries that fit into Law n. 11,326, of 2006, and that have the Declaration of Aptitude for Pronaf - DAP. (our translation)

Given the above, the government has the function of formulating and programming public policies to prioritize some relevant aspects, such as encouraging the protection of nature, public research, and the formation of production and marketing cooperatives (Paz, 2016). As a result of these actions, public agencies that did not yet acquire foodstuffs through public calls for proposals began to do so, as was the case with the Armed Forces, which directed millions in financial resources to this sector. In the Brazilian Army, through the Logistics Resources Decentralization Plan (PDR Log), there is a determination that each military garrison must carry out a public call procedure to obtain food from family agriculture. Furthermore, this military institution stands out as one of the most important promoters of family farming in the national territory due to its wide distribution in the Brazilian scenario and the significant amount of food purchases directly from family farming for the troops (Matos, 2020).

On the other hand, several obstacles still hinder the optimal implementation of the PAA for farmers and public agencies. Furthermore, there is little connection between production and consumption, bureaucratic difficulties in the payment process, and logistical problems with transportation and delivery of products, which often make family farmers abandon this *modus operandi* (Matos, 2020; K. D. B. Souza, 2016).

Sustainable government purchases are mechanisms of public administration that aim to introduce a more sustainable behavior to suppliers by adopting criteria for the need of the purchase and the social, economic, and environmental circumstances related to the production

and availability of materials to the State (Tardan, 2020). The Brazilian amounts destined for government procurement configure from 10 to 15% of the national Gross Domestic Product (GDP) (C. Ribeiro & Inácio, 2014). For example, there are around 44 billion *reais* in purchases of materials and 1.2 trillion *reais* in the provision of services approved in the 2020 fiscal year, in more than two hundred thousand bidding processes (Ministry of Economy, 2021). This fact highlights the impact of the State's acquisitions on the economy as a stimulator of the supply chains of materials and services and as a gearing of public policy that seeks to enhance social justice, environmental preservation, and economy (Cabral & Castro, 2020).

From a legal standpoint, these modalities of sustainable government procurement are based on the Federal Constitution of 1988, which establishes the need for unequal treatment in light of the environmental impacts of products and services, including in their production and delivery processes (Cabral & Castro, 2020). These principles are inserted in the principles of economic order and environmental protection, in addition to being based on the pillars of sustainable development that bring together the social, economic, and environmental approaches described in Chapter VI, Art. 225: "Everyone has the right to an ecologically balanced environment, an asset for common use by the people and essential to a healthy quality of life, imposing on the public authorities and the community the duty to defend and preserve it for present and future generations" (our translation) (Constitution of the Federative Republic of Brazil, 2021).

In the scenario of stimulating regional development, the policies of purchasing food through family farmers were designed to provide the population with healthy habits, balancing the diet of individuals in situations of social and food vulnerability, especially children, based on the PNAE. Currently, this public tool directs the purchase of at least 30% of the food for schools in products from family agriculture, ensuring proper eating habits, regionalization of menus, and strengthening the rural producer by increasing sales and marketing of their products. In addition, one of the objectives of this public policy is to contribute to the biopsychosocial growth and development of students, determining the duty of school feeding to the State (Bressan, 2015; A. D. F. A. Lima, Grzebieluckas, Fontoura, & Pimenta, 2021; Schneider, 2014).

In the school context, learning is the main focus of the social actors involved, who act to enhance each student's education. Food is one of the main factors influencing educational performance, together with a welcoming, safe, and healthy space. In a trajectory historically marked by malnutrition, it is challenging for the State to ensure that students have daily meals that provide nutritional values and are culturally and environmentally adequate to the diverse

Brazilian scenarios. The current mismatches in food for *quilombolas* and culture are examples of opportunities for equalization of school feeding policy (Correa, Cardoso, & Silva, 2020).

Human beings are in a constant process of transformation, but in early childhood, the main biopsychosocial modifications occur, especially in the context of eating habits. Therefore, the school environment acquires high importance in conducting and offering adequate food, dedicating to students the right to feed themselves with dignity during their stay at school (K. Santos *et al.*, 2019). Food procurement policies for schools are opportunities for teachers and professionals involved in the process of school feeding of children, youth, and adults to contribute to the effectiveness of the legal precepts. However, in some cases, due to lack of staff training, lack of adequate food, or sloppiness in strategic planning in the conduct of the program, students may suffer a violation of their food rights (A. Souza *et al.*, 2016).

In addition to socioeconomic policies, the State must build doctrines to regulate the link between human beings and the environment. This relationship has been transformed after the increase in production technologies. Environmental perception has taken on a mediating function, providing the basis for developing environmental education actions. In turn, environmental education is the set of activities aimed at building values, concepts, attitudes, and skills in order to make social actors aware of their behavior in the environmental scenario (Pelicioni, 1998; Schwanke & Moura, 2021).

2.3 ENVIRONMENT PERCEPTION

The word perception is epistemologically derived from the Latin term *perceptiō*. Both in English and Portuguese, it can be defined as the combination of the senses in recognition of an object, reception of a stimulus, intellectual representation, and sensation (Marin, 2008; Aurélio, 2021). This psychological process is one of the most speculated and researched topics by humanity in an attempt to explain the world and what exists in it (Hochberg, 1966, pp. 11-12). The first laboratory studies on human perception were developed, in 1879, by the father of scientific psychology, Wilhelm Wundt (1832-1920) (Robinson & Groves, 2012, p. 118). From the environmental perspective, the MAB13 (Man and the Biosphere) Project, developed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1973, focused on the importance of perception in planning actions in the environment, enhanced the studies on environmental perception, spreading, internationally, the research on the subject. Since then, many theoretical approaches have been developed with different interpretations about the link between perception and environment. However, Heimstra and MacFarling (1978) were

pioneers in investigating the relationship between the physical environment and human perception (Marin, 2008; Marques & Santana, 2021).

For Piaget (1986-1980), knowledge is acquired through a direct relationship with objects; therefore, the greater the proximity and interaction with the environment, the greater the level of knowledge about it (Saltini & Cavenaghi, 2020). Perception occurs in the enchainment of brain activities with the sensory organs. It has individuality characteristics because its meanings derive from the interpretation based on the environment in which the subject is inserted, which is full of particular cultural, historical, and social characteristics. Thus, each individual interprets, responds, and processes the information the environment perceives differently. These cognitive processes suffer too much influence of internal judgments and relational contexts with the environment and are transformed into expressions developed in the construction of individual spaces (K. Oliveira & Corona, 2011).

In this scenario, the importance of understanding individuals' environmental perception level grows, enabling the construction of tools for environmental protection, such as sensitization and awareness, through the interpretation of data held with the target audience, their satisfactions, and dissatisfactions. The planning of actions involving the use of natural resources is based on the understanding of the various perceptions of the subject-actors for the construction of environmental public policy proposals that aim at the development of sustainable societies (P. S. Alves *et al.*, 2021; Hoeffel, Sorrentino, & Machado, 2004).

Furthermore, with the increasing concern of consumers and society with environmental issues, organizations that manage to adapt to this scenario by adopting less aggressive practices to the environment in their organizations, such as the reduction of raw materials and rational use of resources, will obtain competitive advantages over organizations that do not follow the same sustainable path (Brandalise, 2008). Organizational practices focused on sustainable aspects are related to the brand value addition obtained by incorporating excellent practices related to environmental issues (G. F. Dias, 1994).

The planet's environmental future will be defined as the result of human actions. A tool developed to evaluate the awareness of environmental aspects by human beings is the analysis of Environmental Perception. Through this mechanism, it is possible to understand the relationship with the environment in which we are inserted, harmonizing practices for more excellent protection and preservation of biodiversity, besides strengthening the modification of unsustainable attitudes and behaviors (Brandalise, Bertolini, Lezana, Rojo, & Possamai, 2009; C. C. Costa & Maroti, 2013).

Developed by Brandalise (2008), the VAPERCOM method provides information about the behavior and perception of those involved in environmental issues based on the analysis of a product's life cycle assessment (LCA) from the perspective of reduction, reuse, and recyclability of natural resources. With its application, organizations can know the environmental aspects to be developed and adapt their processes facing legal demands and market expectations (Tomasetto & Brandalise, 2018). Moreover, it considers the three pillars of sustainability (environmental, economic, and social) to contribute to convenient, sustainable performance (Fujihara *et al.*, 2017).

Environmental education is essential for the enhancement of environmental awareness. According to Law No. 9,795, of April 27, 1999, the environmental education process involves the organs of the National Environmental System (SISNAMA), the Public Power, educational institutions, the media, private organizations, and the entire society:

- I - the development of an integrated understanding of the environment in its multiple and complex relationships, involving ecological, psychological, legal, political, social, economic, scientific, cultural, and ethical aspects;
- II - the guarantee of democratization of environmental information;
- III - the stimulation and strengthening of critical consciousness about environmental and social problems
- IV – the encouraging of individual and collective, and permanent and responsible participation in preserving the balance of the environment, with the defense of environmental quality being understood as a value inseparable from the exercise of citizenship;
- V - the stimulation of cooperation among the various regions of the country, at the micro and macro-regional levels, to build an environmentally balanced society based on the principles of liberty, equality, solidarity, democracy, social justice, responsibility, and sustainability
- VI - the fostering and strengthening of integration with science and technology;
- VII - the strengthening of citizenship, self-determination of peoples, and solidarity as the foundations for the future of humanity. (our translation)

The Brazilian environmental education practices need to break away from traditionalism, making the subjects involved go beyond the passive aspects and become agents in their various contexts. The analysis of environmental perception can contribute to strengthening public policies aimed at family farmers, helping the State fulfill its legal powers in achieving sustainable development. With the effort to develop alternatives to balance human actions on the environment, strategies can be developed to organize society towards sustainability in the short, medium, and long terms (Nunes Neto, Ferreira, & Kaminski, 2021; Tugoz, 2015).

2.4 PSYCHOSOCIAL WELL-BEING IN THE FIELD

In the West, the roots of the definition of the good life originate in Greek philosophy, and it took centuries to be investigated as a scientific phenomenon (Diener, 1997). The first

studies with this purpose were driven by the aftermath of World War II and focused on feelings of contentment, satisfaction, and happiness (Waterman, 1993). Carol Ryff developed the Psychological Well-Being (PWB) assessment model in the late 1980s, comprising the analysis of positive relationships with other individuals, autonomy, personal growth, environmental mastery, purpose in life, and self-acceptance. To do this, she used the Aristotelian philosophical foundations of eudaemonia, which are related to personal development, self-actualization, and the meaning of life (Waterman, 2008).

Thus, the scale of the PWB assessment model was developed, taking into account the six dimensions, each one focused on investigating the psychosocial particularities of individuals, as shown in Chart 2.

Chart 2

Description of the Dimensions of the Psychological Well-Being Assessment model developed by Ryff

Dimension	Description
Autonomy	Having self-determination and independence, being able to evaluate, think, and act upon experiences according to personal criteria, and being able to resist social pressures.
Positive relationships	Developing and having warm, safe, intimate, and satisfying relationships with others, being concerned about meeting interpersonal needs, and caring about the well-being of others.
Personal growth	Perception about the experience of a continuous personal development, adaptation to new experiences, and interest in the improvement and enrichment of personal potentialities.
Environmental mastery	The ability to manipulate and create the environment in line with personal values and needs, and the effective use of these skills to intervene or modify life situations.
Purpose in life	Ability to recognize the sense of direction, beliefs, purposes and goals in life, and how goals influence behavior and provide meaning to the individual's life.
Self-acceptance	Understanding of the attitude towards personal positive and negative qualities, ability to accept multiple aspects of one's personality, and evaluation of reactions concerning one's past.

Note. Data based on studies by Ryff (1989); Ryff and Keyes (1995); Ryff and Singer (2008); M. I. D. Oliveira (2013).

The aging process of human beings is fraught with biopsychosocial changes, such as physical, cognitive, and relationship losses. This set of suppressions is directly related to individuals' mental health and well-being (Mackenzie, Karaoylas, & Starzyk, 2018). The increase in the Brazilian quality of life highlights a crucial factor for the development of new public policies regarding the increase in life expectancy and, therefore, the aging of the population. This expansion is a result of improvements in vaccines, basic sanitation, and health

treatments in general. In rural areas, the countryside's modernization has increased farmers' indebtedness, forcing them to work longer (Schneider, 2014).

Before the industrialization of the large urban centers, heirs used to help in the execution of local routines. As a reflection of the rural exodus, a situation in which young people leave the countryside searching for opportunities in the cities, these perspectives of family succession have been shaken. The producing families located in the west of Paraná have several workers with an average age above 25 years old, including many retirees, showing the aging of the local rural population. In some situations, at least one youngster is working on the property without financial conditions to buy a place for their sustenance, facts that generate tendencies to hand over the properties to the agribusiness due to the lack of stimulus for social reproduction. In other cases, one or two of the older children have left the property to study or work and have not returned to live in the countryside (Constanty, 2014; Engel, 2012; Garcia, 2016; Zarban, 2019).

In this context of an aging rural population, the need for action by the whole society to maintain the sustainability of family farming is growing, observing it more holistically and humanely due to its potential to act in society. Enjoying sustainability is a constitutional right and can be translated as the guarantee of the quality of life and appropriation of human rights (Gregolin, 2016; Zarban, 2019). Some of these actions are the responsibility of the State, in designing programs and provisions, in order to guarantee all farmers' work, health, education, and food (Nardi, 2018).

Realizing the integration of the forces of nature, economics, and sociology to address the aging agricultural population, health, and sustainability of rural communities is a major challenge for researchers, governments, and society. Creating positive integrative strategies that work with aging farmers can improve personal health and well-being, stabilize economic viability, and strengthen civic sustainability (O'Meara, 2019).

The approximation of associative entities and public agencies with family farmers enhances the development of local quality of life. Actions such as technical assistance, capacity building, and training for farmers are examples of support programs for Family Farming (Gregolin, 2016; Parana Institute of Economic and Social Development [IPARDES], 2005). In addition, these actions develop awareness in farmers that they can be advocates for their own interests, stimulating the search for the socioeconomic rights of the category (Nardi, 2018).

The development of strategies, policies, and programs aimed at the sustainable development of family farming should be based on the participation of this target audience, recognizing the proposals in a participatory and democratic way. Therefore, the evolution of

sustainable development is highlighted, covering social aspects in the dimensions of culture, territory, and quality of life (Gregolin, 2016).

2.5 MEASUREMENT OF SUSTAINABLE PERFORMANCE

Still, in the sustainability scope, challenges are faced in measuring sustainable performance, especially concerning environmental issues, since little is known about the performance of ecosystems. Tools were developed to help measure the degree of sustainability to reduce the difficulties of these investigative setbacks. Thus, the Sustainability Barometer is a mechanism to mathematically condense a scenario's qualitative and quantitative information on sustainable development (Kronemberger *et al.*, 2008).

Sustainable development assessment tools have gained academic and socio-political ground in recent years on a global scale, as they are increasingly being recognized as facilitators in policy-making and assessment of the information surrounding countries' relationship to the environment, society, and economy (Singh *et al.*, 2009).

For that matter, the Barometer of Sustainability model, developed by Prescott-Allen (2001), is based on a bivariate conception of well-being. One of the variations, human well-being, deals with the conditions of satisfaction of human needs within the scope of the possibilities of their decisions. The other variation addresses the ecosystem conjunctures, named ecosystem welfare, which considers the evaluation of the amplitude of the ecosystem foundation when faced with changes to be made in the future. Hence, by employing a set of indicators, the data collected from the environment in which the Sustainability Barometer was applied are processed, associated, and ranked according to their relevance. After their statistical treatment, they are used as possibilities in decision-making for the improvement of human and environmental conditions of a context (Prescott-Allen, 2001b; Engert; Rauter, & Baumgartner, 2016).

2.6 SIMILAR EXPERIENCES IN BRAZIL AND WORLDWIDE

In this chapter, the studies identified in the scientific production survey on this study's theme are presented. The first fragment addresses similar studies at the national level, followed by the results of research carried out at the international level; both deal with cases of family farming in relation to aspects of sustainable development (environmental, social, and economic). Studies that began the analysis of the relationship between family farming and well-being were conducted by Arraes and Sousa (2011), Comassetto *et al.* (2013), and J. S. Costa *et*

al. (2013), showing a link between the practice of agriculture and concern for the environment, health, and one's well-being and that of others. Moreover, it was found that farmer-oriented social projects enhance the sense of belonging and that redistribution among the resources of rural settlements is needed to raise the well-being of the family farmer.

Other research has sought to clarify the link between socio-historical aspects of the configuration of family farming. The results point out that the listing of geographical areas as heritage sites is a way to curb urban sprawl and ensure employment and income and perpetuate farmers' traditions (Bredariol, 2015); furthermore, there is a patrimonialist configuration in Brazilian family farming (Medeiros & Cazella, 2016; Vizeu, 2011).

Studies that aimed to analyze the health and living conditions of family farmer families were also found, conducted by Navolar, Rigon, and Philippi (2010), Litre and Bursztyn (2015), Faria and Santana (2016), C. C. Oliveira, Moro, and Ulbricht (2017), and by Nogueira, Landmann, and Damacena (2019). Based on these studies, it was learned that there are rural workers in unfavorable living conditions, with lower purchasing power and much exposure to solar radiation and chemical agents. In addition, there is a higher frequency and severity of work accidents derived at times from ergonomic conditions and infrastructure that are inadequate to the demands of the families' daily workload.

In the research scenario, as a focus on identifying the existing relationships between government purchases to foster family farming, as an example of the health promotion tool for farmers, the studies of T. F. Dias and Rocha (2014) and Kroth, Geremia, and Mussio (2019) were listed. Based on these works, it is observed that it is necessary to empower all agents involved in the functionality of the PNAE and PAA programs and that the acquisitions of the Federal Government through public calls significantly strengthen the growth of the per capita GDP of municipalities. Finally, Nascimento, Johann, and Basso (2018) analyzed the feasibility of creating a method to evaluate the degree of satisfaction of family farmers with the programs.

Studies were found that analyzed the management and implementation of Food Procurement Processes (PNAE and PAA) in various socio-historical contexts. Amorim, Ribeiro, and Bandoni (2020) identified that, amid the pandemic derived from COVID-19, PNAE faced several challenges to meet its objectives, among them the guarantee of food and nutritional security for students. In the implementation bias of PNAE, Triches and Schneider (2010), P. M. O. Machado *et al.* (2018), and Zani and Costa (2014) found that the program offers new market prospects for farmers and fosters less environmentally harmful cultivation practices. However, these authors found deficiencies in the technical assistance system. In the same vein, L. F. Ribeiro *et al.* (2010) and Bressan (2015) identified in their reports that family

farm food handlers have levels of knowledge about food safety issues but stressed the need for recycling and conducting new periodic training.

From the perspective of essays focusing on the analysis of public policies aimed at family farming, Grisa and Nierdele (2019), Batista *et al.* (2016), and Fornasier, Demarchi, and Martins (2014) concluded that half of the Brazilian municipalities do not invest the minimum required by law. Nevertheless, there is a high level of satisfaction on the part of farmers with the PAA, given the increase in family income and, consequently, in food and health generated by the expansion of the market and security in payment for the marketing of food. E. H. F. M. Silva and Bernardes (2014) and Godoi, Búrigo, and Cazella (2016) reported that PRONAF enabled the access of family farmers with more economic vulnerability to financial capital. However, there is still much to be developed for sustainability to be fully incorporated into this program. Through a case study, Vasco (2012) reported the success of the actions of a cooperative system in the lives of farmers in a municipality in Paraná.

Moreover, among the surveys of national studies conducted, Coelho (2019) compared the use of pesticides of illicit origin against the level of environmental perception of family farmers in Cascavel and found that they have a high possibility of becoming ecological consumers, with high environmental perception and strong concern about the LCA steps of a product. At the state level, A. A. L. Silva *et al.* (2017) sought to analyze the environmental perception of poultry farmers in the municipality of Toledo-PR and identified that they have an ecological environmental perception, potential possibility of becoming ecological consumers, and medium concern about the steps of the LCA.

In a study conducted in the Western region of Paraná, Brandalise *et al.* (2009) once identified the environmental perception of UNIOESTE university students, highlighting that the sample had environmental perception, the potential to become green consumers, and frequent concern with the life cycle of a product. Moreover, by applying the VAPERCOM method to entrepreneurs of the industrial sector of Marechal Cândido Rondon-PR, Thomas, Sontag, and Brandalise (2014) obtained comparable results to the present study, reporting that they have a high environmental perception, potential possibilities of becoming ecological consumers, and frequent concern. Trento, Lachovicz Neto, Meneghatti, and Lago (2021) identified that retail entrepreneurs of glass bottles from 750ml to 1L in the city of Cascavel have ecological perception, potential possibility of becoming ecological consumers, and showed themselves as intensely concerned with the analysis of the life cycle of products.

As for the investigation of well-being, Zachow *et al.* (2019) concluded, through a case study of a settlement in Cascavel, that it is possible to corroborate 8 of the Sustainable

Development Goals, besides contributing to sustainable agriculture and the well-being of its residents. Nationally, Sousa, Ferreira, and Oliveira (2020) conducted an investigation on the Life Quality Index of family farmers in the state of Ceará, comparing suppliers and non-suppliers of PNAE, so that they found that those who participated in the program had a better level of education, housing and sanitary conditions, housing structures, water for human consumption, and economic and food conditions. In the same sense, Poletto *et al.* (2008) identified a national lack of mental and psychological health care services for farmers and stressed the importance of conducting studies on the mental health of agricultural workers, given the complexity of the activities developed.

Using the sustainability barometer in family farmers participating in the PAA of Toledo (PR), K. D. B. Souza (2016) identified their sustainability potential. On the other hand, aiming to analyze the sustainable development of the mesoregion West of Paraná for the years 2000 and 2010, Hachmann and Rippel (2017) showed that the mesoregion was classified, in the year 2000, as Almost Unsustainable and, in 2010, as Unsustainable. At the national level, seeking to verify the level of sustainability of the states of Paraná, Santa Catarina, and Rio Grande do Sul, the authors Dalchiavon, Baço, and Mello (2017) detected that the development of the Southern region of Brazil is between the intermediate and high-performance level.

O'Callaghan and Warburton (2017) and Winterton and Warburton (2012) analyzed how Australian farmers shape their identity during aging. They found the relationship between aging with success, self-actualization, and financial security. Furthermore, they report that society must support this group by providing policies, services, and public support systems. Similarly, Rogers *et al.* (2013) and McManus *et al.* (2012) surveyed the same country, surveying relationships between farmers' retirement and on-farm welfare implications. The authors identified a paradigm shift from "who will take care of the farm for me" to "who will be there to take care of me."

In the Australian territory, still regarding rural aging, Davis and Barlett (2008) and Davis *et al.* (2012) identified the problems and challenges for healthy rural aging and the implications for public policy. They argue that there are difficulties in matching good aging conditions between those living in the city and the rural population. Furthermore, participation in social activities is associated with feeling connected to the community. Neville *et al.* (2016) conducted similar studies in New Zealand, identifying the building of rural communities with strengthened public policies as essential in the quest for sustainability.

In the American setting, Reed (2008) described the importance of older farmers in the food security of communities. Mitchell *et al.* (2008) analyzed the consequences of aging

farming communities on the viability of family farming. In Ireland, Walsh and O'Shea (2008) found relationships between well-being and retirement groups and that they are potential promoters of health and community cohesion. According to the authors, public policies aimed at older farmers are essential elements that can support the region.

Aiming to demonstrate how agrochemicals result in physical toxicity and impair the mental well-being of cotton farmers in India, Kannuri and Jadhav (2018) concluded that the disciplines of public health and agriculture suffer from a lack of interdisciplinary linkages that could address farmers' suffering. Also, on the Asian continent, Ali, Khan, and Hasan (2018) investigated the psychological well-being of farm workers in two villages in Bangladesh. The study sample included 402 respondents who answered the Memorial University of Newfoundland Scale of Happiness (MUNSH). The study results revealed that the psychological well-being of the sample from these villages is relatively good, with differences when comparing the male and female genders, with the male being better. In addition, they point out that the level of education is a strong predictor of mental well-being. In the same context, Bhuiyan and Ivlevs (2018) sought to analyze the effects of microcredit provision on the subjective well-being of rural Bangladeshi workers. They concluded that this act indirectly negatively affects overall life satisfaction through increased worry.

In Europe, a study group composed of researchers of various nationalities analyzed the situation of working conditions in the European labor market after the crisis and its effects on worker welfare. To do this, they distinguished between the countries of Southern Europe (Portugal, Italy, Ireland, Greece, and Spain) and the 10 Northern countries that were, *a priori*, less affected by the crisis (farmers). The samples comprised 7,867 workers from the five southern countries and 13,894 from the ten producing countries. The results broadly confirmed that ensuring well-being is vital to workers, groups, and organizations' sustainability, growth, and success (Ariza-Montes, Giorgi, Hernández-Perlines, & Fiz-Perez, 2019).

In a study that sought to examine the relationships between farm-related stress, social support, and psychological health in Norwegian farmer spouses, Melberg (2003) found that the psychological well-being of farmer couples is, to a high degree, influenced by exposure and vulnerability to the stressful elements of rural work. To do so, she relied on an investigation that sampled 2,918 individuals spread across 1,401 farms.

With rural Vietnam as the setting, Markussen, Fibæk, Tarp, and Tuan (2017) evaluated the effect of self-employment in agriculture on psychological well-being. The results indicated that rural self-employment generates stronger feelings of kinship among family members

working on their farms. Therefore, it benefits psychological well-being and economic growth by facilitating improvements in rural workers' health and education.

In China, Silverstein, Cong, and Li (2006) examined how family composition and supportive exchanges with adult children influenced the psychological well-being of older parents in rural Anhui province. A total of 1,561 people participated in the research. The authors concluded that older parents living in three-generation households had better psychological well-being than those living in single-generation households. Stronger emotional cohesion with children also improved well-being, so they stressed that living with grandchildren was beneficial.

Akbarian Ronizi and Rezvani (2015) applied the Sustainability Barometer to assess tourism's sustainability in rural areas of the central district of Damavand County, a mountainous area in northern Iran. The survey results showed that the sustainability of the studied villages is at a poor level, evidencing that there is not enough attention paid to tourism sustainability, and there is a long way to go for sustainable tourism. A similar study was conducted in Iran by Akbarian Ronizi (2016) to assess the sustainability level of tourism development in the targeted villages of Sepidan County in Fars Province. The results showed that the tourism development of the studied villages has a medium level of sustainability, and among the dimensions of sustainability, the socio-cultural aspect had the best level of the economic and bio-environmental aspects.

Barzegar and Nazari (2020) aimed to identify and explain the development trends in the environmental structure of rural settlements and the position of environmental components in the sustainability of villages in the central part of Behshahr city, Iran. The results show that environmental sustainability in mountain villages, with a score of 0.532, is at an average level; flat villages, with a score of 0.488, are at the level of potentially weak instability, and in mountain villages, with a score of 0.353, there is an unstable level. In the same country, Yazdani, Zarangi, and Yariihsar (2019) aimed to analyze and rank the stability of the four dimensions of sustainability (sociocultural, economic, environmental, and physical) of informal settlements in Ardabil city and their prioritization of future planning. They evidenced that the sustainability of the targets is at a superficial level in terms of average overall ecosystem well-being (0.231) and human well-being (0.249).

To analyze the environmental perceptions of rural residents of an impoverished region in northeastern South Africa, Hunter, Strife, and Twine (2010) sought to understand the factors that shape concern for local environmental issues. The results suggest some associations between household characteristics and environmental perceptions and concerns. Concerning

the physical environment, consideration of village location significantly enhanced environmental concerns, suggesting that location may shape environmental perceptions. Concerning culture, the results provide evidence of gender interaction with the material environment, as respondents from female-headed households expressed more concern about aspects of the environment, such as the quality of water used for cooking.

To assess the environmental perception of high school students from rural and urban residences in Bavaria, a border state in southeastern Germany, Bogner and Wiseman (1997) relied on a sample of 2,400 students from urban residential locations and 1,100 students from rural residences. The results indicated no differences between the groups' responses, except in the 'Verbal Commitment' dimension, as urban students professed a more substantial verbal commitment to the environment than rural students.

In the Peruvian Amazon region, Swierk and Madigosky (2014) examined how residents of rural communities around Iquitos, Peru use their local environment to acquire household items and analyzed local perceptions of the environment and environmental resources. The results revealed that respondents rely heavily on the local environment for their household needs, while residents of rural communities highly value the local environment. Furthermore, although residents have mixed perceptions about what constitutes overuse of resources, rural community members strongly desire to implement sustainable practices to ensure that natural products remain available in the future.

Chart 3 demonstrates the similar main studies found in this study and their respective results, which were organized and classified according to common issues in the research presented in the first column of the table.

Chart 3

Similar Studies and Their Main Results

	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
VAPERCOM	Bogner & Wiseman	1997	To evaluate the environmental perception of high school students from rural and urban households.	- Urban students professed a more substantial verbal commitment to the environment than rural students.
	Brandalise	2009	To evaluate the environmental perception of UNIOESTE's students.	- The university students showed environmental awareness, the potential to become green consumers, and frequent concern about the life cycle of a product.
	Strife & Twine	2010	To understand the factors that shape concern for local environmental issues.	- The results suggest associations between household characteristics and environmental perceptions and concerns.
	Swierk & Madigosky	2014	To examine how residents of rural communities use their local environment to purchase household items and analyze local perceptions of the environment and environmental resources.	- Respondents rely heavily on the local environment for their household needs, while residents of rural communities highly value the local environment.
	Thomas, Sontag & Brandalise	2014	To evaluate the environmental perception of entrepreneurs from the industrial sector in Marechal Cândido Rondon-PR.	- The sample showed high environmental awareness, the potential to become green consumers, and frequent concern about the LCA of a product.
	Silva, Stradiotto, Saggin & Brandalise	2017	To analyze the environmental perception of poultry farmers in Toledo-PR and their concern with the LCA steps of the Photovoltaic Panel.	- The sample showed ecological and environmental awareness, potential to become green consumers, and a medium concern for the LCA steps. - They showed little knowledge about the product.
	Coelho	2019	To identify the environmental perception and behavior of farmers in the Western region of Paraná and relate it to the use of illegal pesticides.	- The sample showed a high possibility of becoming green consumers, with high environmental awareness and strong concern about the LCA steps of a product. - Weak ecological profile for pesticides of illicit origin.

	Trento, Lachovicz Neto, Meneghatti & Lago	2021	To identify the environmental perception of retailers of glass bottles from 750ml to 1L in the city of Cascavel-PR.	- The sample showed ecological awareness and potential to become green consumers, and were strongly concerned about product LCA.
	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
Psychological Well-Being	Melberg	2003	To examine the relationships between farm-related stress, social support, and psychological health in spouses of Norwegian farmers.	- To a high degree, farmer couples' psychological well-being is influenced by exposure and vulnerability to the stressful elements of rural work.
	Silverstein, Cong & Li	2006	To examine how family composition and supportive exchanges with adult children influenced the psychological well-being of older parents in rural Anhui province.	- Older parents living in three-generation households showed better psychological well-being than those living in single-generation households. - There is stronger emotional cohesion with children. - Living with grandchildren was beneficial to well-being.
	Davis and Barlett	2008	To identify the issues and challenges for healthy rural aging and the implications for policy and practice.	- The elderly in rural communities have become marginalized by old misconceptions about rural life and urban politics.
	Poletto, Souza, Hembecker & Gontijo	2008	To investigate the subjective well-being of older rural people in two villages in Bangladesh.	- The psychological well-being of the sample is relatively good. - There are differences in the comparison between the male and female genders, the male being better. - Educational attainment is a strong predictor of mental well-being.
	Reed	2008	To investigate what life and work is like for elderly producers.	- The older generations have more than just experience; they carry the love of land stewardship and cultural history that those in urban environments now covet.
	Mitchell <i>et al.</i>	2008	To understand the challenges aging farmers face, including the declining economic viability of family farming, the aging population of working farmers, and the likelihood or disabilities related to aging farmers.	- They recommend attention to the definition and measurement of rural residence to include variability in rural and non-farm populations and reorienting the occupational health literature in older farmers to include a life course perspective.
	Walsh & O'Shea	2008	To examine the internal dynamics of farmer groups and their contribution to individual and community well-being.	- Retirement groups contribute substantially to the well-being of elderly farmers.
	Arraes & Sousa	2011	To verify the impact of PRONAF installation credits on the household income of rural workers in the Santa Rita settlement.	- There is a need to redirect settlement policies to promote public resources' effectiveness in providing increased well-being and sustainability to family farmers.

	Winterton & Warburton	2012	To investigate how older rural Australians use place to sustain and build a sense of identity when many are susceptible to age-related loss.	- Location-related change or growth can threaten the elderly's identification as a "rural" person.
	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
Psychological Well-Being	McManus <i>et al.</i>	2012	To identify how farmers in the Australian hinterland perceive their interactions with their local town.	- The relationship between farmers and city communities is important to maintain rural populations and services, along with a strong local economy and environment.
	Davis <i>et al.</i>	2012	To understand productive aging in different communities in rural Victoria, Australia.	- Seniors develop strong community connections. - Participation in social activities was associated with feelings of connection to the community.
	Comasseto <i>et al.</i>	2013	To understand the meaning of Urban Agriculture as a consumer phenomenon, identifying the different theories that are linked to it and their interrelationships.	- There is a linkage of the practice of Urban Agriculture with concern for the environment, one's own and others' health and well-being, with nostalgic respect and pride in cultural heritage.
	J. S. Costa <i>et al.</i>	2013	To unravel the contribution of the Mandalla project to the construction of meaning and significance of work for the family farmer.	- The Mandalla Project enhances the pleasure of work as it increases the rural workers' sense of belonging, their social relations, and the perception of the significance of their work, helping to prevent their migration to urban centers, and strengthening family farming.
	Rogers <i>et al.</i>	2013	To investigate healthy aging and barriers to retirement from three different perspectives.	- As farmers age, many with little prospect of intergenerational succession, there is growing concern that some farm families are beginning to experience extraordinary isolation, reduced health, and quality of life.
	Neville <i>et al.</i>	2016	To identify the theories and concepts related to building rural communities.	- Rural communities are changing rapidly and are becoming increasingly diverse environments.
	Markussen, Fibæk, Tarp & Tuan	2017	To assess the effect of self-employment in agriculture on psychological well-being.	- Self-employed rural labor generates stronger feelings of kinship among family members as they work on their farms. - It benefits psychological well-being and economic growth by facilitating improvements in the health and education of rural workers.

	O'Callaghan & Warburton	2017	To unravel the impact of aging, the possible loss of family farming, and how they construct their self-identity.	- There is a growing number of widowed and older women aging alone on farms with little social attention.
	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
Psychological Well-Being	Kannuri & Jadhav	2018	To demonstrate how local, national, and international vectors are interconnected to shape social distress among cotton farmers in India.	- The fields of public health and agriculture suffer from a lack of imagination to forge vital interdisciplinary links that could address the suffering of farmers.
	Ali, Khan & Hasan	2018	To investigate the psychological well-being of farm workers in two villages in Bangladesh.	- Psychological well-being is relatively good, with differences when comparing male and female genders, with males being better. - Educational attainment is a strong predictor of mental well-being.
	Bhuiyan & Ivlevs	2018	To analyze the effects of microcredit provision on the subjective well-being of rural Bangladeshi workers.	- There is an indirect negative effect on overall life satisfaction through increased concern about finances.
	Ariza-Montes, Giorgi, Hernández-Perlines, & Fiz-Perez	2019	To analyze the situation of working conditions in the European rural labor market after the crisis and its effects on workers' welfare.	- Wellness is the key to sustainability, growth, and success for workers, groups, and organizations.
	Zachow <i>et al.</i>	2019	To understand how agrarian reform can promote sustainable rural development in the Valmir Mota de Oliveira settlement in the city of Cascavel.	- The settlement develops several sustainability practices, meeting 8 of the 17 sustainable development goals proposed by the UN.

	Sousa, Ferreira and Oliveira Ariza-Montes, Giorgi, Hernández-Perlines, & Fiz-Perez	20192020	To measure the quality of life of family farmers who participate in the National School Feeding Program (PNAE) <i>vis-à-vis</i> those who do not participate in the hinterlands and North of the state of Ceará, Brazil. To analyze the situation of working conditions in the European rural labor market after the crisis and its effects on the workers' well-being.	<ul style="list-style-type: none"> - Farmers who provide food for school meals have a better quality of life than those who do not participate in this program. - Well-being is the key to sustainability, growth, and success for workers, groups, and organizations.
	Souza	2016	To evaluate the Food Acquisition Program (PAA) as a factor for promoting sustainability through the family farmers participating in the program in Toledo-PR.	<ul style="list-style-type: none"> - The average for the social and economic aspects was 64.58, while the average response for the environmental issues was 91.33. - Sustainability is framed as potentially sustainable.
	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
Sustainability Barometer	Akbarian Ronizi & Rezvani	2015	To assess the sustainability of tourism in the rural areas of the central district of Damavand County.	<ul style="list-style-type: none"> - The sustainability of the studied villages is at a poor level, evidencing that there is not enough attention given to tourism sustainability, and there is a long way to go for sustainable tourism.
	Akbarian Ronizi	2016	To assess the level of sustainability of tourism development in the targeted villages of Sepidan County, Fars Province.	<ul style="list-style-type: none"> - The tourism development of the studied villages shows a medium level of sustainability, and among the dimensions of sustainability, the socio-cultural aspect had the best level of sustainability than the economic aspects and the bio-environmental aspects.
	Dalchiavon, Baço & Mello	2017	To verify the level of sustainability of the states of Paraná, Santa Catarina, and Rio Grande do Sul.	<ul style="list-style-type: none"> - The development of the states in the southern region of Brazil is between intermediate and high-performing sectors.
	Hachmann & Rippel	2017	To analyze the Sustainable Development of the Western mesoregion of Paraná state, in comparison with the rest of the state, for the years 2000 and 2010, evaluating the well-being of the Human System and the well-being of the Environmental System.	<ul style="list-style-type: none"> - In 2000, the area was classified as a region of near unsustainable development. - In 2010, it was classified as unsustainable.
	Yazdani, Zarangi & Yariihesar	2019	To analyze and rank the sustainability status of the informal settlements in the city of Ardabil and their prioritization of future planning.	<ul style="list-style-type: none"> - The regions studied are very low in terms of average overall ecosystem well-being (0.231) and human well-being (0.249). - Development plans are essential for the strengths and weaknesses of each locality and based on the levels of sustainability.

	Barzegar and Nazari	2020	To identify and explain development trends in the environmental structure of rural settlements and the position of environmental components in Behshahr's village sustainability.	- Environmental sustainability in mountain villages with a score of 0.532 is at an average level; flat villages, with a score of 0.488, are at the potentially weak instability level; and in mountain villages, with a score of 0.353, there is an unstable level.
	Vizeu	2011	To analyze the modernization process of family farming in light of the characterization of the colonial heritage.	- Currently, protectionism based on political influence and privileges granted to the businessman, which characterizes the relations among the economic elite in Brazil, is preferred. - The subordination of the professional manager's formal authority and technical competence to the patriarchal personalist logic favors family ties and personal loyalty.
	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
Socio-historical Dynamics	Bredariol	2015	To analyze and discuss the process of listing the area known as Serra dos Cocais as a heritage site and the conflicts generated by this action.	- The listing of the area as a heritage site is the only way to stop urban expansion and a form of resistance that generates the preservation of nature and the permanence of family farmers on their land.
	Medeiros & Cazella	2016	To analyze the process of the social construction of a new socio-technical code that has been triggering rural development dynamics appropriate to the socio-economic, environmental, and cultural specificities of the Northern coast of the Brazilian state of Rio Grande do Sul.	- There is an unleashing of creative strategies of knowledge production in the operationalization of new connections between the development of technologies and the social context to which the actors are enmeshed.
	Navolar, Rigon & Philippi	2010	To identify aspects that relate to ecological family farming and health promotion of farmers who are members of the Association for the Development of Agroecology in Paraná (AOPA).	- The practice of ecological family farming can be considered a health-promoting action for farmers and their families.
Health and	Litre & Bursztyn	2015	To describe cattle ranchers' perceptions and adaptation strategies in the face of climate and socioeconomic risks they face in the <i>Pampa</i> biome.	- Social and cognitive barriers condition the transition from risk situations to risk perception; this hinders the ways of adapting and equating the conflicts inherent to global changes in contemporary societies.
	Faria & Santana	2016	To analyze the spatial variations and regional inequalities in the infant mortality indicator in the state of Minas Gerais, Brazil.	- The need for expansion and qualification of access to prenatal care and interventions in the regional context in sectors not always linked to the health system but fundamental for reducing infant mortality.

	C. C. Oliveira, Moro & Ulbricht	2017	To identify how the work is organized and the main difficulties of the dairy farms of family agriculture belonging to the Community of Municipalities of the Campo Mourão Region (COMCAM).	- Problems were identified referring to high workload, inadequate infrastructure, lack of incentive from government agencies, and low remuneration for the liter of milk.
	Nogueira, Landmann & Damacena	2019	To compare living and working conditions and access to health services between agricultural and non-agricultural workers.	- The differences among these workers imply distinct patterns of illness and define specific health needs.
	T. F. Dias & Rocha	2014	To analyze the effects of the operationalization of the Food Acquisition Program (PAA) of Family Farming in Rio Grande do Norte (RN) from 2005 to 2011, with an emphasis on the impacts of federal public spending, with regard to purchases of products offered in RN, on the growth of per capita GDP of the municipalities involved.	- The largest volume of resources is concentrated in the modality of operations via the Purchase for Simultaneous Donation (CPR <i>Doação</i>). The regression model estimates with panel data showed that the purchases made by the Federal Government from the cooperatives contribute significantly to the growth of the per capita GDP of the municipalities.
	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
Government Procurement and Family Farming	Nascimento, Johann & Basso	2018	To develop a Satisfaction Assessment Model (SAM) of family farmers regarding the Food Acquisition Program (PAA), Purchase with Simultaneous Donation modality.	- A model was developed to contribute to a standardized collection of perceptions about the PAA, enabling operational and socioeconomic adjustments by public agencies and cooperatives, thus improving the efficiency of the public policy and the cooperatives' organizational processes.
	Kroth, Geremia & Mussio	2019	To analyze the National School Feeding Program (PNAE) as a Healthy Public Policy.	- The PNAE contributes to health promotion and can be understood as a healthy public policy. - The PNAE, by articulating actions from different sectors, makes the public policy more effective and more efficient.
	Triches & Schneider	2010	To approach the relationship between consumption, production, and public food policies from the Brazilian School Feeding Program (PAE), seeking to understand how the consolidation of differentiated food production and consumption systems occurs.	- In the last decade, the State has provided policies that support the approximation of consumers and producers at the local level. However, contradictory regulations, such as the bidding processes for public purchases and the legal and sanitary requirements for formalizing these small farmers, still keep these propositions from materializing.

Implementation dos Processos	L. F. Ribeiro <i>et al.</i>	2010	To inspect the hygiene conditions of the companies in the food sector in the city of Ivaiporã/PR to identify possible irregularities and train the food handlers, making them aware of the importance of producing safe food, and to ensure a healthy quality standard for all consumers.	- The handlers have minimum knowledge equalization about hygienic sanitary practices, showing the need for periodic training applications to minimize possible sanitation problems that compromise safe food supply.
	Zani & Costa	2014	To evaluate the implementation of PRONAF designed from the axes content, context, capacity, commitment, and clients/coalitions.	- Significant advances were identified regarding the governance structure, which enables the equating of the demands brought by the different players and fosters constant updates in the program's scope, ensuring the operational quality achieved.
	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
Implementation of the Procurement Processes	Bressan	2015	To diagnose the hygienic-sanitary situation of the bakery agribusinesses in the city of Marmeleiro/PR.	- The agro bakery industries, which supply their products for school meals in the city of Marmeleiro, do not meet all the safety and sanitary quality requirements, offering health risks to the children who consume the products in the school meals.
	P. M. O. Machado <i>et al.</i>	2018	To characterize the Brazilian municipalities regarding the purchase of food from family farms by the National School Feeding Program (PNAE).	- 50% of the municipalities have not invested the minimum required by law, demanding educational and technical assistance to comply with the legislation, especially in the states and regions that presented the most significant difficulties.
	Amorim, Ribeiro & Bandoni	2020	To analyze the contribution of the National School Feeding Program (PNAE) to the fight against hunger and food insecurity by proposing a set of strategies for PNAE to guarantee school meals in this time of crisis.	- In periods when classes are suspended, one should distribute kits or meals to schoolchildren, if possible, keeping the universal nature of the policy or benefiting students from families eligible to receive the financial Emergency Aid; increase the amount passed on by PNAE for municipalities with low and very low Human Development Indexes; maintain and encourage the purchase of food from family farms.

	Vasco	2012	To understand the dynamics of the actions of these organizations in the life situation of family farmers in the community. Specifically, this work focused on the Cresol Rural Credit Cooperative.	- The good/reasonable conditions of Cresol's cooperative members were identified, resulting mainly from the <i>Água Limpa</i> (Clean Water) Program accessed by the community via the city hall and apparently from the strategies set up by the farmers themselves.
	Fornasier, Demarchi & Martins	2014	To observe which individual competencies managers of reference family collaborative organizations use and compare them with those of Design Thinkers in transmitting knowledge and fostering learning.	- A management model used in these organizations was developed, as well as the competencies of managers when inserting and integrating innovation.
	AUTHOR(S)	YEAR	OBJECTIVE	MAIN RESULTS
Analysis of public policies aimed at family	E. H. F. M. Silva & Bernardes	2014	To analyze the objectives of PRONAF in the context of economic development.	- No projects were found, only the legislation. The analysis did not allow the matrix to be completed, indicating inconsistency. - A complete matrix was proposed.
	Batista <i>et al.</i>	2016	To identify farmers' perceptions of the meaning of being part of the PAA and their understanding of food, nutrition, and health concepts.	- The PAA needs to become a strengthening instrument for family agriculture, health and food and nutritional security, and nutritional actions increasingly, as proposed in its creation law.
	Godoi, Búrigo & Cazella	2016	To analyze how the issue of sustainability is reflected in the formulation and incorporation of rural credit public policies in Brazil.	- The incorporation of sustainability is already part of the general guidelines of PRONAF, but it does not translate into significant results for family farmers.

	Grisa & Nierdele	2019	Analyze how ideas, policies, and instruments of public action for family farming are transferred within the framework of the Specialized Meeting on Family Farming (REAF).	- A space for the voluntary transfer of public policies has been created, allowing flexibility for translation and adaptation of policies in local spaces.
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Source: Elaborated by the author (2022).

The analysis of the studies shows evidence of the importance of the scientific community's approach to agriculture. Family farming is fundamental for maintaining social order concerning its socio-geographic and economic characteristics. Research on family farming makes it possible to develop strategies and measures to promote sustainability and well-being for this social group. As for the assessment models, the PWB scale is a tool for detecting psychosocial elements. The analysis of environmental perception helps to understand how the subject relates to the environment in which they are inserted. In addition, these two dimensions can also be analyzed through the Sustainability Barometer. Finally, the synergy arising from the confrontation of these results can contribute to identifying aspects to be developed by public policies.

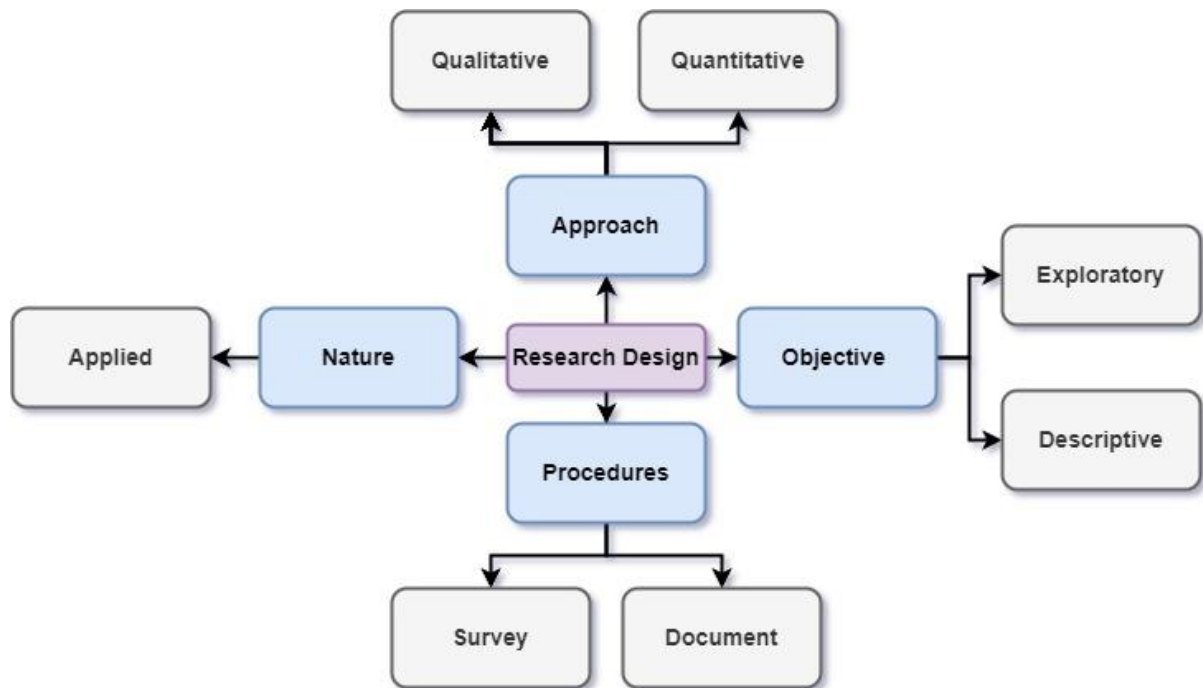
3 TECHNICAL PRODUCTION RESEARCH METHOD AND TECHNIQUES

This chapter discusses the methodological procedures that guided the development of this study, including its design, data collection procedures, sample definition, data analysis tools, and data analysis methods.

3.1 RESEARCH DESIGN

The research development's design was fragmented regarding the specifics of approach, nature, objective, and procedures. As to the approach, this study used both qualitative and quantitative methodology. Regarding the analysis procedures, quantitative data were used, in which the researcher makes objective measurements and quantifies the results, avoiding as much as possible to create distortions in the interpretation of the data, in addition to listing a certain degree of security in relation to the results obtained. On the other hand, qualitative data were used as a tool to approximate and deepen the reality under analysis. In this way, its nature was applied because it was taken as a premise the aid in the elaboration of public policies through the analysis of the data extracted from this work.

Furthermore, the objective was characterized by exploratory and descriptive approaches. Exploratory research is characterized by providing greater familiarity with the problem investigated, making it more explicit, and improving ideas (Gil, 2002). In this case, data collection was conducted in the natural setting of the phenomenon; participants' perspectives are privileged, and the focus of analysis is the process, meaning, and understanding of these actors (Merriam, 2002). Also, the descriptive approach was adopted, as it established relationships between the variables analyzed and described the characteristics of a given population as its primordially (Gil, 2002). As for the procedures, considering that this study involved data collection through questionnaires, it must be considered a survey since this procedure is characterized by the direct questioning of people whose behavior it is desired to know. Finally, the documentary procedure was used, using materials that had not yet received analytical treatments (Gil, 2017). Figure 1 illustrates the research design.

Figure 1*Research Design*

Source: the author (2022).

3.2 DATA COLLECTION PROCEDURES

The survey conducted for the systematic literature review was carried out in two stages; the first aimed to identify theses and dissertations related to the theme, and the second sought articles and technical reports.

3.2.1 Theses and dissertations

The first stage was composed of a search for theses and dissertations registered in the CAPES (Coordination for the Improvement of Higher Education Personnel) database and in the Brazilian Digital Library of Theses and Dissertations of IBICT (Brazilian Institute of Information in Science and Technology). The search period covered the months of September to November 2020. Initially, the following keywords were used in both platforms: family farming, public policies, and food acquisition program, totaling 196 documents (49 from CAPES and 147 from IBICT).

3.2.2 Articles and technical reports

The second stage was composed of an individual search in journals classified in the Qualis System of the CAPES *Sucupira* Platform in the area of Public and Business Administration, Accounting Sciences, and Tourism. The search period covered the months of October to December 2020. First, 2,254 journals were found, distributed among the A1, A2, B1, B2, and B3 ratings.

After identifying which journals fit the established search profile, specific searches were conducted in each of the journals, using the keywords and the inclusion and exclusion criteria. As for the execution, the search was carried out individually in the electronic portal of each journal through the search tools. Thus, journals that did not have this functionality were excluded from the sample. Therefore, the selected articles came from 61 journals. The keyword "family farming" was used in the publication search tools, resulting in 175 articles.

In addition, complementary searches were performed on the Google Scholar platform, aiming to find internationally produced documents. The search period was from August to October 2021. The keywords used were "environmental perception," "sustainability barometer," and "psychological well-being farmers," with 2,740 results.

3.2.3 Study selection criteria

After searching the theses, dissertations, and articles, the analysis and selection were duly carried out according to the inclusion and exclusion criteria. As for the time of publication, the parameter used was the period from 2010 to 2020. For the selection of studies, three analysis criteria were adopted in the following order: analysis of titles, analysis of abstracts, and final selection. Thus, after a complete reading of the documents that met the prerequisites, four theses, 25 dissertations, and 48 scientific articles were selected, which make up, for the most part, the theoretical framework of this study, 24 national articles and 24 international articles.

3.2.4 Data obtained from systems and questionnaires

The collection of quantitative data on the implementation of the PAA in Cascavel-PR was carried out through government systems VIS DATA 3 beta, MDS², Brazil's Price Panel (*Painel de Preços*)³, and Management Monitoring System (SAG)⁴. Information on the

² Secretariat of Evaluation and Information Management System (SAGI) - aplicacoes.mds.gov.br/sagi/vis/data3/

³ System used by the Federal Public Administration - paineldepocos.planejamento.gov.br

⁴ The Brazilian Army's internal system used for administrative management – sag.2icfex.eb.mil.br

characteristics of family farmers was obtained based on the virtual system of IBGE's 2017 Census of Agriculture.

Furthermore, to reach the other objectives of this research, three models were applied, individually composed of structured questionnaires that seek to broaden the diaphaneity and greater understanding of the phenomena researched. These research methods were developed based on similar tests. Each questionnaire has features that aided the detailed analysis of the three aspects of sustainability (economic, social, and environmental).

Thus, the VAPERCOM model was used to investigate the environmental aspects, and the PWB scale was the instrument focused on the psychological and social aspects. The Sustainability Barometer served as a tool for understanding the three biases. These tools were applied in person to family farmers in the municipality of Cascavel-PR (all PAA participants). The questionnaires were transcribed into the Google Forms platform. To access the questionnaire, respondents had to be aware of and accept the Informed Consent Form (ICF) requirements.⁵

3.2.5 VAPERCOM Model

Developed by Brandalise (2008), the VAPERCOM model consists of a tool to identify the perception of the environmental variable based on a product's life cycle, i.e., in order to analyze the production chain from the standpoint of resource reduction, reuse and recyclability. The model applied was made up of three stages with individual objectives and results. Thus, it was composed of 20 statements, divided into the following focuses: environmental perception, ecological consumption, and stages of analyzing a product's life cycle. In each of these areas, there are five ranges of degrees for analysis parameters, where each one represents the position on the results found, shown in Table 1.

⁵ Appendix A.

Table 1*VAPERCOM Model Analysis Parameters*

Result	Environmental Perception (EP)	Eco-consumption	LCA
0.0 – 0.8	No EP	None	No concern
0.9 – 1.6	Little EP	Low possibility	Low concern
1.7 – 2.4	Potential EP	Potential possibility	Medium concern
2.5 – 3.2	Present EP	High possibility	Frequent concern
3.3 – 4.0	High EP	Eco-consumer	Deep concern

Note. Adapted from Brandalise (2008).

3.2.6 Psychological Well-Being Scale (PWB)

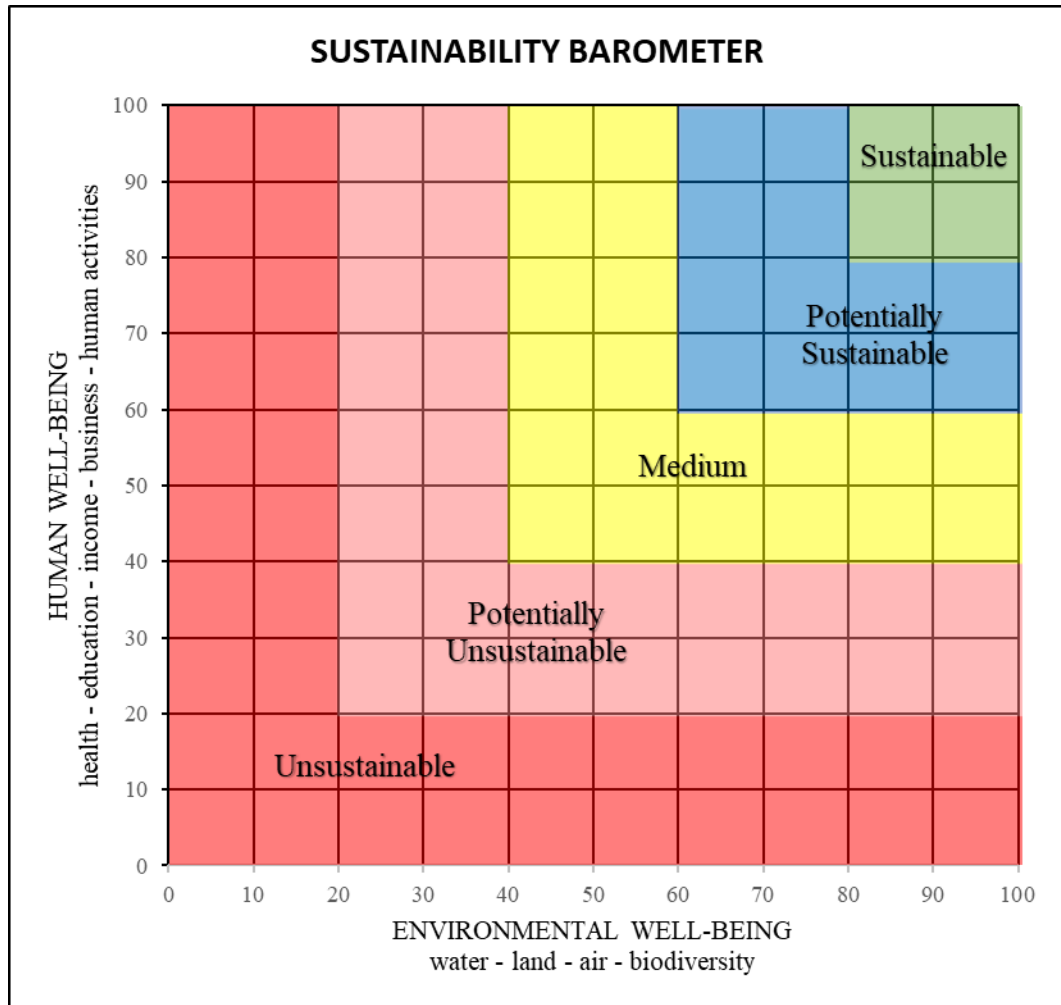
Carol Ryff developed the Psychological Well-Being Scale (PWB) in the late 1980s. This method was validated in Brazil by W. L. Machado, Bandeira, and Pawlowski (2013), who tested various forms and configurations for the country. Therefore, it is a model that considers six dimensions of Psychological Well-Being: positive relationships with others, autonomy, environmental mastery, personal growth, purpose in life, and self-acceptance. Each of these dimensions has four questions randomly distributed in a structured questionnaire. There is a parameterization of answers consisting of six options of answers on a Likert scale, namely: strongly disagree, partially disagree, somewhat disagree, somewhat agree, partially agree, and strongly agree. Finally, a Pearson correlation test is performed to analyze the interaction between the dimensions.

3.2.7 Sustainability Barometer

The Sustainability Barometer was developed by Prescott-Allen (2001), using sustainable development indicators. Its results are evidenced by utilizing a graphic representation of a Cartesian plane, which contrasts the sustainability of human well-being with the ecosystem on a scale of 0 to 100. According to the score obtained, two-dimensional analysis of five classes is performed, which can be understood as Sustainable, Potentially Sustainable, Medium, Potentially Unsustainable, and Unsustainable, as shown in Figure 2 and Table 2.

Figure 2

Sustainability Barometer



Note. Adapted from Prescott-Allen (2001a).

The ecosystem well-being index looks at ecological functions, such as water, land, and biodiversity. On the other hand, the human well-being index represents collective and individual well-being, such as education, health, and poverty.

Table 2

Sustainability Barometer Scale

0-20	21-40	41-60	61-80	81-100
Unsustainable	Potentially Unsustainable	Medium	Potentially Sustainable	Sustainable

Note. Adapted from Prescott-Allen (2001).

3.3 SAMPLE DEFINITION

For the sample calculation, we used the methodology proposed by Barbetta, Reis, and Bornia (2004), through the random probability sampling method, ensuring that all members of the surveyed universe can belong to the drawn sample, with known probability and different from zero. In October 2021, the Association of Family Farmers of the Municipality of Cascavel had 200 members recognized by the Ministry of Agrarian Development (Ministry of Agrarian Development [MDA], 2021). With this, the sample size was calculated with a margin of error of 5.0%, a confidence level of 95.0%, and a 5.0% significance. Therefore, the sample to be interviewed would be 132 family farmers in the municipality of Cascavel-PR, all participants of the PAA. The participants were located through the Brazilian Special Secretariat for Family Farming and Agrarian Development (SEAD) public information system in the subsystem DAP Extract - Legal Entity. Then, contact was made with the managers of the cooperatives participating in the Brazilian Army Public Call in the city of Cascavel to obtain the addresses and phone numbers of the members.

3.4 PROCEDURES AND DATA ANALYSIS

To meet the specific objectives proposed, the data analysis was divided into four stages, configured as shown in Chart 4:

Chart 4

Description of Specific Objectives, Data Collection Procedures, and Data Analysis Technique

SPECIFIC OBJECTIVES	DATA COLLECTION PROCEDURES	DATA ANALYSIS TECHNIQUE
To identify the profile of family farmers in Cascavel-PR participating in sustainable procurement policies of a government agency and compare local data with nationwide data from the 2017 Census of Agriculture.	Survey and document research	Descriptive statistics using Excel Software and Action Stat
To verify the level of environmental perception of the farming families.	Survey	VAPERCOM
To analyze the psychological well-being of farming families.	Survey	Psychological Well-Being Scale
To analyze the relationship between local food procurement by the Brazilian Army and the sustainability of family farming.	Document research	Descriptive statistics using Excel Software
To measure the influence of government procurement on the sustainable performance of family farming.	Survey	Sustainability Barometer

Source: Elaborated by the author (2022).

To achieve the specific objective a) **To identify the profile of family farmers in Cascavel-PR participating in sustainable procurement policies of a government agency and compare local data with nationwide data from the 2017 Census of Agriculture**, the data collection procedure adopted was desk research in the reports of the 2017 Census of Agriculture. A structured survey (Appendix B), directed to family farmers, was also applied, dealing with the characterization of the profile of farmers. The data analysis technique was data crossing with Microsoft Excel software.

Regarding objective b) **To verify the level of environmental perception of the farming families**, the data collection procedure applied was the survey (Appendix C) adapted from Brandalise (2008). For this objective, data analysis was performed using the VAPERCOM tool.

As for objective c) **To analyze the psychological well-being of farming families**, the structured survey (Appendix D) adapted from Prescott-Allen (2001) was applied, and analyzed using its PWB Scale, which considers six dimensions of psychological well-being.

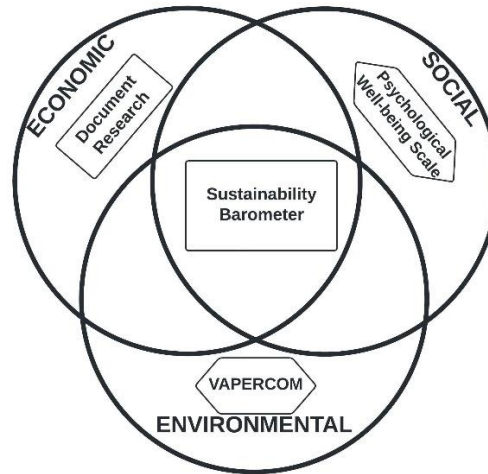
Objective d) **To analyze the relationship between local food procurement by the Brazilian Army and the sustainability of family farming**, was achieved based on data collection in documentary research in the bidding processes of the 15th Logistic Battalion (manager of the Family Farming Public Call of the Military Organizations of the Cascavel-PR garrison) and government websites. In addition, a semi-structured interview (Appendix E) was conducted with the contract supervisor of the public call processes of the aforementioned Military Unit. The definition of this government agency for data collection in order to achieve the results of the specific objective d happened because it was convenient for the researcher to be part of the procurement sector of this government agency. For data analysis, descriptive statistics and content analysis were applied.

Finally, for the specific objective e) **To measure the influence of government procurement on the sustainable performance of family farming**, the Sustainability Barometer tool (Appendix F) and descriptive statistics were applied. The results of the Sustainability Barometer were obtained through the five sustainability scales (Sustainable, Potentially Sustainable, Medium, Potentially Unsustainable, and Unsustainable).

To enhance the unique results based on the isolated methods, as shown in Figure 3, the intention was to analyze the sustainability of the farming families in Cascavel-PR through the data obtained in each method.

Figure 3

Description of Data Triangulation and Research Methods



Source: Elaborated by the author (2022).

Hence, the data triangulation served to better understand the triad of sustainability. The data crossing was carried out qualitatively, considering that each data collection tool has specificities and focuses on different sustainable dimensions.

3.5 LIMITATIONS OF RESEARCH METHODS AND TECHNIQUES

Since this is exploratory research, the limitations of this study are based on:

- a) application delimited to the number of family farmers in the Food Acquisition Program (PAA).
- b) application of surveys that restrict the options of answers and reduce the depth of the investigation of the analyzed phenomena.
- c) application with a temporal delimitation without the periodic follow-up of the evolution of the results.

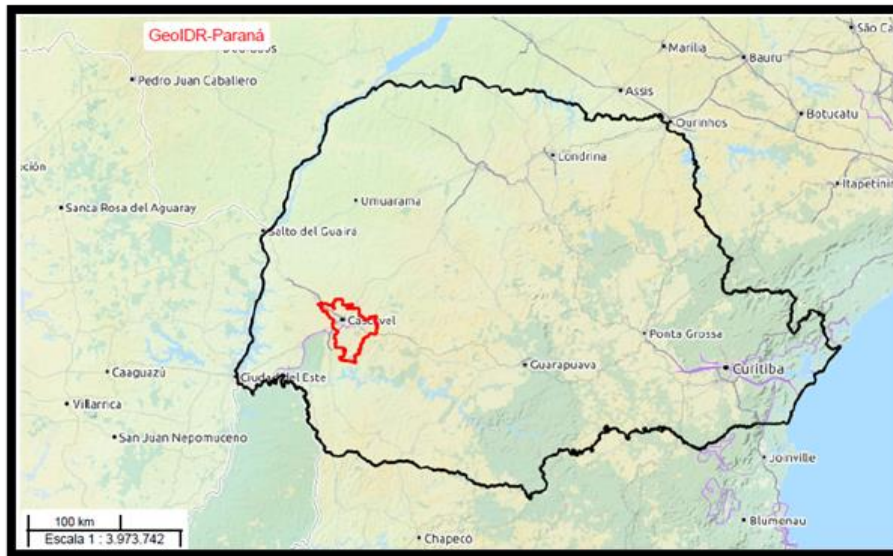
4 CONTEXT OF THE PROJECT OR PROBLEM SITUATION

4.1 THE MUNICIPALITY OF CASCAVEL-PR AND FAMILY FARMING

The municipality of Cascavel is located in the Western part of the state of Paraná, 491 km from the capital Curitiba and 785 meters above sea level. The climate is subtropical, and its urban perimeter equals more than 101 km². According to IBGE estimates from 2020, the capital of the West, as it is known in the region, had 332,333 inhabitants, distributed in an area of 2,100,831 km², and was founded in a region whose biome is the Atlantic Forest. The city's Human Development Index (HDI) is 0.782, the 4th best in the state of Paraná. Figure 4 illustrates the geographical location of Cascavel, referencing the state of Paraná.

Figure 4

Geographic Map of Cascavel



Note. Data extracted from EMATER-PR's GeoIDH-Paraná System (2021).

As of the Brazilian political and economic events of the 1980s, changes occurred in the capitalist system in the Western region of Paraná. Consequently, the rural aspect has modified the social and technological content of Cascavel, developing new vertical and horizontal aspects, and is positioned as a critical element for changes in the content of the Cascavel territory. Thus, currently, it can be seen that the city has a dynamic between rural and urban, evidenced by the existence of the Urban Area and eight districts: Sede Administrativa (sem urbano), Juvinópolis, Rio do Salto, Diamante, São Salvador, São João do Oeste, Espigão Azul and Sede Alvorada. In addition, the city is one of the main road-rail junctions of Paraná, formed

by federal (BRs 277, 369, and 467) and state highways that connect Brazilian regions to the extreme Southern parts of the country, besides Paraguay and Argentina (Shikida, Rodrigues, & Braun, 2004; M. A. P. Souza, 2007).

Despite the social dynamism of the city, family farming is one of the main economic activities of Cascavel, enabling income generation for many families whose source of livelihood is milk production and other agricultural activities (Nardi, Loch, Conto, Meneghetti, & Fariña, 2017). In qualitative research with public managers, K. D. B. Souza and Leismann (2020) identified that the municipality has positive aspects in conducting the PAA: they foster rural producers and the diversification of the products supplied, provide technical training, enable a better quality of life, and encourage the farmer to remain in the field. With the operation of the PAA in the city, rural producers have more market possibilities for selling their products (K. D. B. Souza & Leismann, 2020). Similarly, in a quantitative analysis that investigated the main elements contributing to farmers' happiness in Cascavel, health and family stood out (Shikida, Rodrigues, & Braun, 2004).

One of the government agencies that make use of the purchase of family farming food through PAA in Cascavel is the 15th Logistic Battalion (15° B Log). It is in charge of coordinating, planning, and executing the activities of the Public Call for the Military Units of the Cascavel-PR Garrison. One of the most modern battalions of the Brazilian Army, the 15th Logistic Battalion, founded in 1988, has as its fundamental mission to be responsible for the logistics of the entire 15th Mechanized Infantry Brigade, covering the West and Southwest of Paraná. Besides this, this Military Organization is a national reference in maintaining the *Guarani* armored vehicles. To perform all these tasks, the battalion has a troop of 460 soldiers, who are fed daily and distributed in maintenance, supply, transport, and health logistic functions.

4.2 FOOD IN THE BRAZILIAN ARMY

The Guidelines on Food and Nutrition for the Armed Forces (MD42-M-05) emphasize that military food involves several processes and is vital for the health of military personnel, who must have adequate and nutritionally balanced eating habits to meet their needs in times of peace and conflict. Therefore, it involves the stages of acquisition, transportation, storage, preparation, distribution, and food consumption. Within a Brazilian Army Military Organization, the Procurement Sector is responsible for providing harmonic food in quantity and quality to its military personnel.

Similarly, the Armed Forces Food Guidelines (MD42-M-03) portray the need for meals to guarantee a nutritional contribution relative to adequate quantity, besides being composed of good raw material regarding qualitative nutritional aspects. Thus, military subsistence must be adequate and harmonized according to the items' bioavailability, eating habits, age group, climate, and seasonality.

The Brazilian Army has hierarchy and discipline as fundamental pillars. In a scenario of extreme control of military actions, the Supply Board (D Abst), headquartered in Brasilia-DF, is responsible for coordinating activities related to military food. In this regard, it manages the distribution and use of resources destined to finance the subsistence of the military, spread out in the farthest reaches of Brazil, through the Logistical Resources Decentralization Plan (PDR Log). This document is revised and updated annually or as needed. The PDR Log 2021 foresees the distribution of R\$ 11.65 referring to the daily meal of 1 (one) soldier, totaling, for the entire Brazilian Army, R\$ 284,468,259.00 per year. Considering Decree 8,473/15, R\$ 85,340,477.70 (30%) of this amount must be used to purchase items from family agriculture.

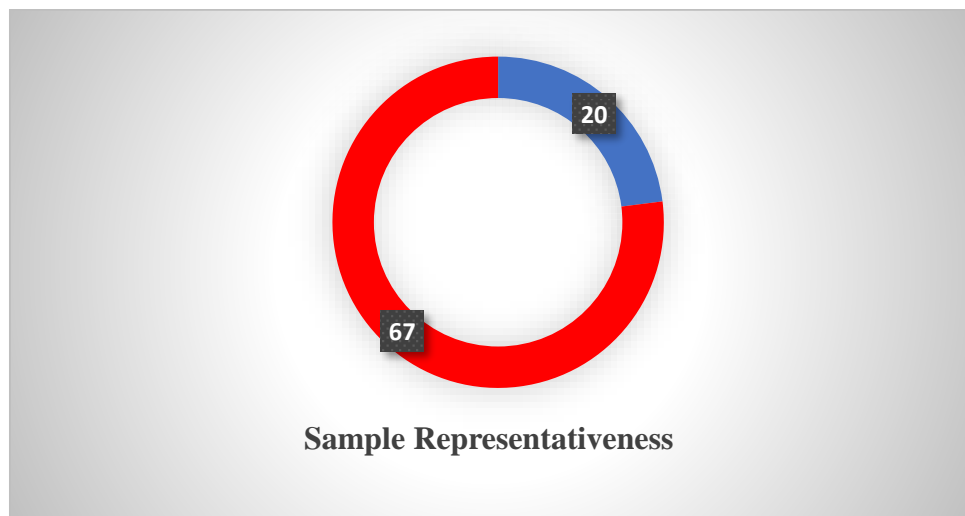
As the Management Units (MUs) increased the expertise required to coordinate Public Calls, the Brazilian Army became one of the prominent institutions promoting Family Farming through the PAA. Thus, it directly assists the development of Brazilian rural social and productive inclusion precisely because of its ability to cover a significant volume of purchases throughout the Brazilian territory (Matos, 2020). This interrelationship that the PAA establishes between the supplier and military institutions helps transform the countryside in its socio-territorial relationships, bringing producing families closer to the final consumers, whether in communities or large urban centers (D. A. Moreira, 2017).

5 ANALYSIS AND INTERPRETATION OF RESULTS

In order to obtain the representativeness of the family farmers, the questionnaire was applied to only one (1) member of each family. Considering the aspects mentioned in item 3.3, the binding document of farmers lists all members, regardless of their family configuration. Thus, there may be families composed of four members, and all of them are cooperative members. The cooperative Agrivel (Association of Family Farmers of the Municipality of Cascavel) was unsuccessfully requested to provide a list of members by producer families. Hence, 20 (twenty) family farmers participated in the research, with a representation of 67 family farmers, highlighted in the question: how many family members (including you) work on the property? Figure 5 shows the level of representativeness of the sample over the population.

Figure 5

Graph of Sample Representativeness Regarding the Population.



Source: the author (2022).

Two visits were made to the administrative headquarters of the Agrivel cooperative (1968 Maringá St., Cascavel-PR) to apply the questionnaire to family farmers who made weekly deliveries there. In addition, two visits were made to the small family farmer fair, at the Wilson Jofre Square (1177 São Paulo St., Cascavel-PR), on Tuesdays, where family farmers associated with Agrivel were also located. Finally, three family farmers from the *Cores da Terra* cooperative were virtually interviewed because they were not present in the city during the research application period.

A larger number of members could not be interviewed for some reasons: many members of some families had already answered the questionnaire, incompatibility of the location of delivery of the products by the farmer members (directly to schools and hospitals), delivery times at the cooperative's administrative headquarters, and location of the farmer properties.

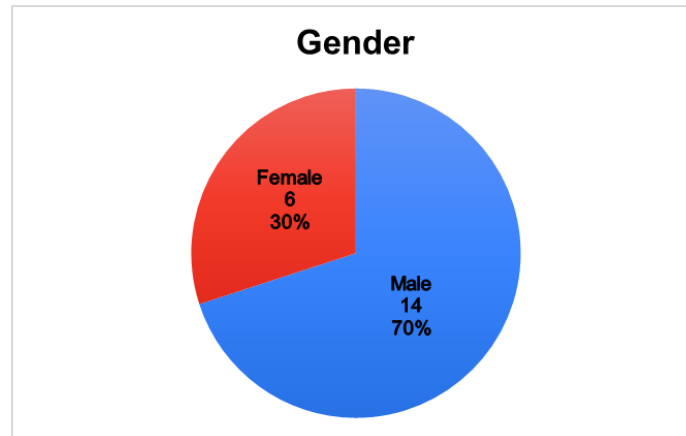
In addition, except for Agrivel, the other cooperatives participating in the public call processes are either in administrative inactivity (*Cores da Terra* Cooperative) or do not have members residing in Cascavel, as is the case of the Cooperative of Family Farming Producers (COOPRAFA – Matelândia-PR), the Cooperative of Rural Producers of Corbélia (COOPRACOR), and the Iguçu Valley Agroecological Cooperative (COOAVI - Cruz Machado-PR).

To access the information on the public call processes of previous years, access to the data was informally requested from the Conformance of Management Records section. This procedure was facilitated by the immersion of this researcher in the analyzed context.

Next, the main results obtained by the methodology aligned in the study are presented. First, the results are shown in their singularity, and finally, the necessary triangulations are performed to better understand the phenomenon in question.

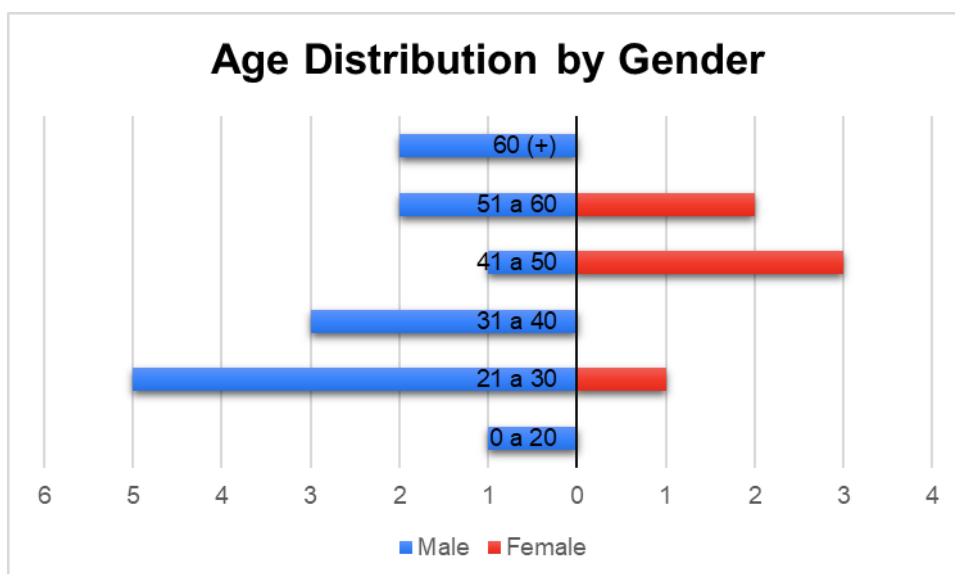
5.1 ANALYSIS OF THE PROFILE OF FAMILY FARMERS IN CASCAVEL

Among all the research participants, men represented a higher percentage (70%) than women (30%), according to Figure 6. Women were numerically less present in family farming activities, but it should be noted that the questionnaire was answered by only 1 (one) family member. Therefore, 30% of the families participating in the survey were represented by women farmers.

Figure 6*Characterization of the Sample by Gender*

Source: the author (2022).

Comparing these results with the national data from the 2017 Census of Agriculture, one can state that the data are similar, as, in that opportunity, the proportion of 81% male farmers (4,110,550) and 19% female respondents (946,075) was identified. As for the age group, the female representation is consolidated between the age groups 41 to 60 years old (83%) and the male group 21 to 40 years old (57%), the largest group in the overall responses. These data are illustrated in Figure 7.

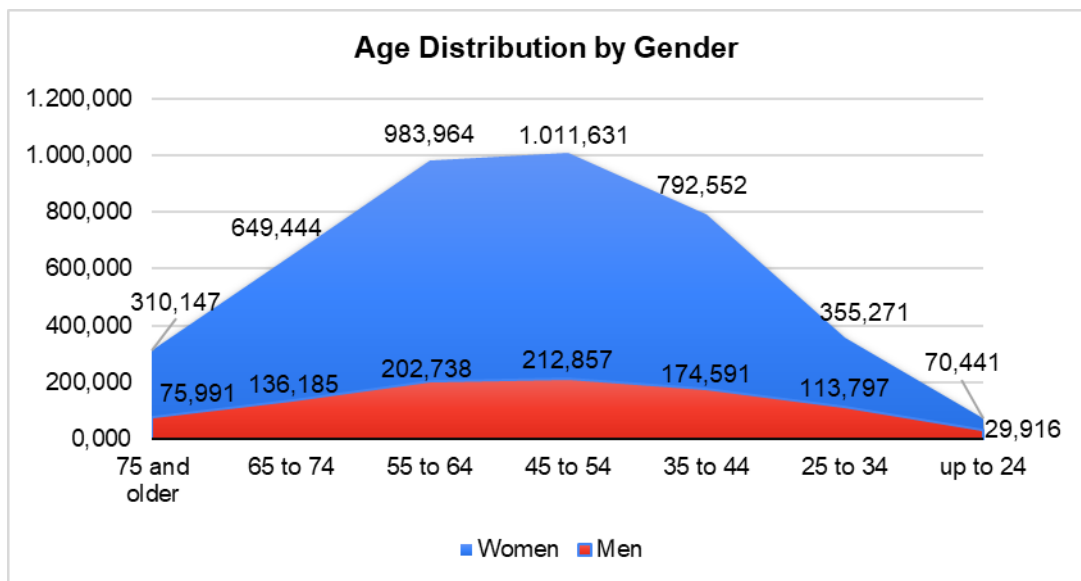
Figure 7*Age Distribution of the Sample by Gender*

Source: the author (2022).

Data show that there is a homogeneous distribution of ages among male farmers. Except for item 21 to 30 years old, 64% of respondents were distributed in the other age groups, showing continuity in the succession process of farms and rural businesses. Thus, young and old are performing activities in family farming in Cascavel, a key issue for regional sustainability. This fact is similar to the 2017 Census of Agriculture findings nationwide, as illustrated in Figure 8.

Figure 8

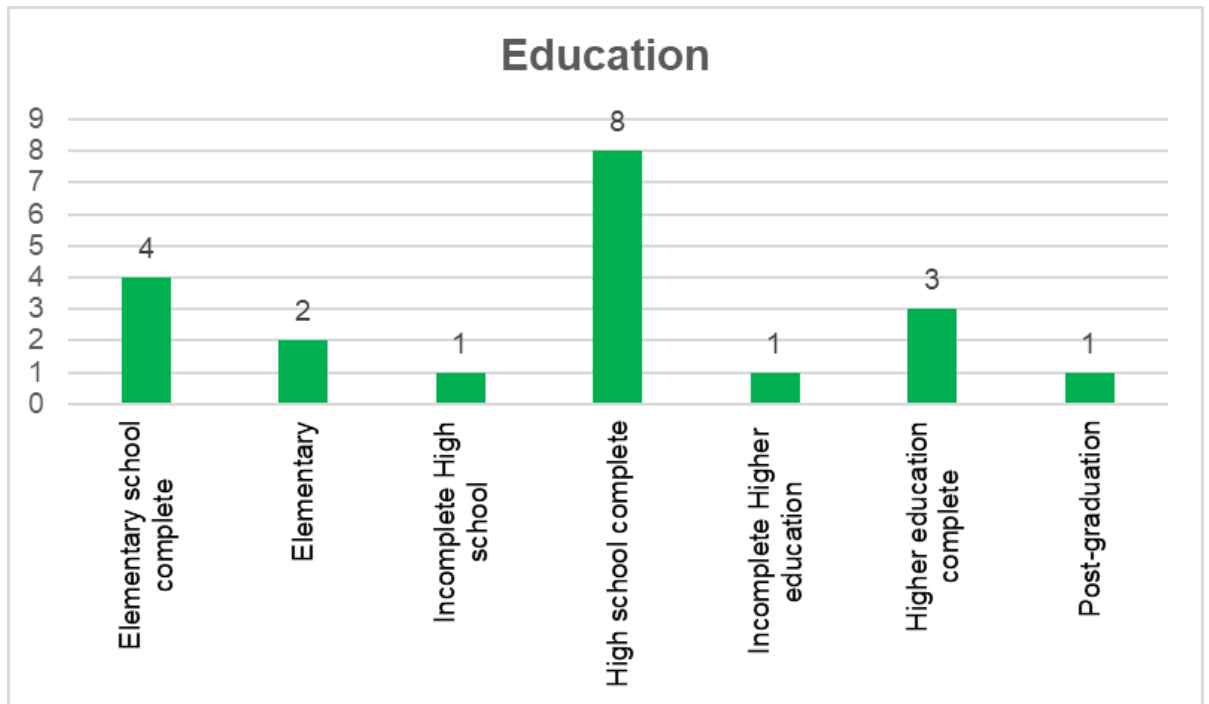
2017 Census of Agriculture Age Range



As for the family farmers' level of schooling, Figure 9 shows that the predominant level of schooling of PAA participants in Cascavel is a High School degree, with 40% of the answers.

Figure 9

Schooling of the sample



Source: the author (2022).

Furthermore, there is also a distribution among various categories of schooling, with 25% having at least started higher education and only 20% having not completed elementary school. Compared with the national data from the 2017 Census of Agriculture, no consonance is obtained since the highest schooling identified in rural producers was primary education, with 23.77% of respondents (1,205,898). In addition, 15.45% of the respondents had never attended school. In Paraná, only 5.75% of respondents with this schooling characteristic were identified. Thus, the high educational power of the city of Cascavel stands out, which, besides offering education in the urban region, develops logistics so that the rural population also has access to education.

Chart 5 illustrates the different possibilities of analysis involving family farmers' economic and financial issues. As for the primary production activity of the family farm, the fruit and vegetable production stood out, represented by 35% of the users with a profit range between R\$ 3,001.00 and R\$ 5,000.00. In this same monthly profit range, milk producers represented 15%. In addition, only 10% of the horticultural producers have a monthly profit range over R\$ 10,000.00.

Chart 5

Characteristics of the Commercialization of Family Farming Products

Monthly Profit Range	Main Activity				PRONAF user	Primary form of commercialization				
	Hort.	Milk	Meat	Others		PNAE	Others	Supermarkets	Fairs	PAA
R\$ 1200 - 3000	0%	0%	0%	5%	0%	0%	5%	0%	0%	0%
R\$ 3001 - 5000	35%	15%	5%	5%	60%	35%	0%	0%	20%	5%
R\$ 5001 - 8000	5%	0%	5%	0%	5%	5%	0%	5%	0%	0%
R\$ 8001 - 1000	5%	0%	5%	0%	5%	0%	5%	0%	5%	0%
Over R\$ 10000	10%	0%	0%	5%	10%	0%	5%	0%	10%	0%

Source: research data (2022).

Regarding the link with PRONAF, 60% of the respondents linked to the program belong to the R\$ 3,001.00 to R\$ 5,000.00 income bracket, and only 10% of the survey participants are not linked to it.

As for the outputs of the products, a high degree of diversification was identified regarding the main ways of marketing family farmers. Only 5% of respondents elected the PAA as the main form of marketing, showing the low degree of importance of the program for the local rural family community. The main form of selling products was the PNAE, with 40% of respondents, followed by Fairs, with 35% of the answers. It should be noted that many producers linked to the cooperatives participating in the PAA also make their individualized sales at urban fairs.

It can be inferred that the family farmers in Cascavel who participate in the PAA have monthly income ranges above R\$ 3,000.00, are linked to PRONAF, and have diversified ways of marketing their products.

5.2 LEVEL OF ENVIRONMENTAL PERCEPTION OF FARMING FAMILIES BY THE VAPERCOM METHOD

The data obtained in the data collection were submitted to analysis procedures based on the VAPERCOM method, which consists of quantitatively verifying the degree of interaction between man and nature. Regarding the environmental profile, the result was that managers have a high environmental perception, with a perception grade of 3.54. On the dimension of ecological consumption, the result was that family farmers have a high possibility of becoming ecological consumers, with a perception level of 2.58. The result indicates that the product LCA has a frequent concern, with a perception grade of 3.15. All this data is shown in Chart 6 and illustrated in Figure 10.

Chart 6

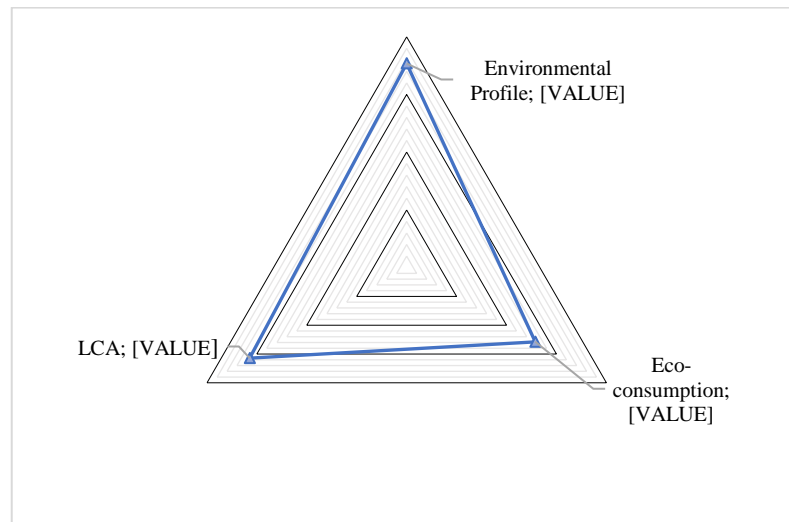
Characteristics of the Commercialization of Family Farming Products

VAPERCOM		Environmental Profile		Eco-consumption		Life Cycle Analysis (LCA)	
Alternative	Value (B)	No. of responses (A)	Result (AxB)	No. of responses (B)	Result (AxB)	No. of responses (C)	Result (AxB)
A	4	56	224	37	148	87	348
B	3	16	48	34	102	65	195
C	2	5	10	27	54	39	78
D	1	1	1	5	5	8	8
E	0	2	0	17	0	1	0
Sum (C)			283		309		629
No. of questions (D)			80		120		200
Result (E=C/D)			3.54		2.58		3.15

Source: research data (2022).

Figure 10

Distribution of VAPERCOM Model Results



Source: research data (2022).

Table 3 presents the research findings based on the scales determined by the VAPERCOM model to better explain the results obtained.

Table 3*VAPERCOM Model Analysis Parameters with the Results*

Result	Environmental Perception (EP)	Eco-consumption	LCA
0.0 – 0.8	No EP	None	No concern
0.9 – 1.6	Little EP	Low possibility	Low concern
1.7 – 2.4	Potential EP	Potential possibility	Medium concern
2.5 – 3.2	Present EP	High possibility	Frequent concern
3.3 – 4.0	High EP	Eco-consumer	Deep concern

Note. Adapted from Brandalise (2008).

In detailing the results, Chart 7 presents the highlights with the highest and lowest average responses for each dimension of environmental perception analyzed.

Chart 7*Items Evaluated in the VAPERCOM Model with Average Responses*

Dimension	Statement	Avg.
EP	1- Before discarding something, you think about reusing it.	4.70
	2- Do you separate the garbage that can be recycled (paper, plastic, aluminum, glass, and metals) and dispose of them for collection?	4.25
	3- Do you turn off the lights, turn off the TV, stereo, fan/air conditioner when you leave the room?	4.50
	4- Do you try not to leave the faucet running when brushing your teeth and/or shaving?	4.70
Eco-consumption	5- Do you consider the environmental variable when buying a product?	3.95
	6- When buying, do you try to know if the manufacturer practices environmental actions?	2.85
	7- Before purchasing, do you check the labels and packaging to identify an eco-friendly product?	3.25
	8- Do you try to buy products and/or packaging that are made from recycled material or have the potential to be recycled?	3.40
	9- Do you check the energy consumption when you are buying a product (e.g. INMETRO label)?	4.10
	10- Are you willing to pay extra for an environmentally friendly product?	3.90
Life Cycle Analysis	11- Origin of the resources (if they are renewable).	3.55
	12- Environmental impact in extraction and transportation.	3.75
	13- Generation of solid waste, liquid effluents, and atmospheric emissions.	4.10
	14- Energy and fuel consumption in production, storage, transportation, and distribution.	3.95
	15- Product life cycle.	4.30
	16- Potential contamination to the environment.	4.15

	17- Possibility of reusing and reusing components.	4.35
	18- Possibility of recycling.	4.60
	19- Hazard or toxicity.	4.40
	20- Volume of the material (including packaging).	4.30

Note. Adapted from Brandalise (2008). Source: research data (2022).

As seen in the table, family farmers are concerned about the destination of the products because they think about reusing the packaging and are concerned about this possibility in a product. In addition, they check the energy consumption labels at the time of purchase. However, they make no effort to verify environmental actions by the manufacturing companies and are not concerned about the origin of the resources used in manufacturing a product. The environmental profile dimension was composed of the two statements with the highest overall averages; besides statement number 1, statement number 4 brought evidence that farmers try "not to leave the faucet running when brushing their teeth or shaving" (average of 4.7). On the other hand, the ecological consumption dimension consisted of the three lowest averages, being, in addition to statement 6, statement 7 (Before purchasing, do you check the labels and packaging to identify an environmentally friendly product?) (3.25) and statement 8 (Do you try to buy products and/or packaging made with recycled material or that has the potential to be recycled?) (average of 3.4).

Given the results presented by the proposed method, it is possible to identify that family farmers in the city of Cascavel, participants of the PAA, have a deep concern for the environment. However, they are not labeled as green consumers. In addition, farmers showed frequent concern about the product life cycle, highlighting demands for reflection on the actions taken by the category for the development of regional environmental education through actions by the state and other responsible agencies.

5.3 PSYCHOLOGICAL WELL-BEING OF FARMING FAMILIES

The PWB Scale was composed of 24 statements, in which farmers should mark, on a 6-point Likert scale, the questions presented in Chart 8. It is noteworthy that, in the study on which the methodology was based, the authors did not put the information about what was being evaluated, trying to avoid biased answers. In addition, the questions were mixed in the text; there was no logical sequence in blocks per dimension.

Chart 8

Items Evaluated in the PWB Model with Average Responses

Dimension	Statement	Avg.
Autonomy	1- I am not afraid to express my opinions, even when they are contrary to the opinions of most people.	5.40
	4- I often worry about what others think of me.	3.30
	13- People can hardly convince me to do things I do not want to do.	3.75
	18- I often change my mind if my friends or family disagree with my decisions.	4.40
Self-acceptance	2- In general, I feel confident and positive about myself.	5.70
	11- In general, I feel disappointed with what I have achieved in life.	5.30
	16- In general, I am proud of who I am and the life I lead.	5.55
	21- When I compare myself to friends and acquaintances, I feel good about who I am.	5.35
Positive relations with others	3- I feel that I have many gains from my friendships.	5.35
	8- It seems to me that most people have more friends than I do.	3.70
	12- People would describe me as someone willing to share my time with others.	4.85
	17- Regarding friendships, I generally feel out of place.	4.00
Environmental Mastery	5- I am very good at managing the various responsibilities in my daily life.	5.20
	14- I manage my time well, so I can do everything that needs to be done.	4.85
	19- I get frustrated when I try to plan my daily activities because I never get the things that I had planned done.	4.35
	22- I have trouble organizing my life in a way that is satisfactory to me.	3.95
Personal Growth	6- In my opinion, people of all ages are capable of continuing to grow and develop.	5.70
	9- I have learned many things from life over time, which has made me a strong and capable person.	5.70
	20- For me, life is a continuous process of learning, changing, and growing.	5.80
	23- I like to see how my opinions have changed and matured over the years.	5.75
Purpose in Life	7- Most of the time, I find my activities uninteresting and trivial.	4.90
	10- I like to make plans for the future and work to make them come true.	5.85
	15- I am an active person to execute the goal that I have set for myself.	5.60
	24- I am satisfied when I think of what I have accomplished in life.	5.65

Source: research data (2022).

The positive aspects of psychological well-being indicate that family farmers are not afraid to show their opinions, even when contrary to others. They demonstrate self-confidence, gain a lot from friendships, can organize routine responsibilities, like to make plans for the future, and strive to make them come true. Furthermore, they consider life a continuous learning, change, and growth process. On the other hand, they worry about what others think about them, consider that most people have more friends, and feel "out of place" with others. Sometimes they consider their activities uninteresting and trivial. In addition, they have difficulties organizing their lives satisfactorily, they are rigid in making decisions to do activities, and it is difficult for people to get them to do what is against their will.

To analyze the PWB Scale, it was necessary to calculate the mean of the answers for each dimension analyzed. Furthermore, the scores of statements number 4, 7, 8, 11, 17, 18, 19, and 22 were inverted. Table 4 shows the average of the answers of each respondent per dimension.

Table 4

Mean Scores by Survey Respondents

Respondent	AU	SA	PR	EM	PG	PL	Mean
1	4.500	5.500	4.500	5.500	6.000	5.500	5.250
2	4.750	5.750	4.250	4.500	6.000	5.500	5.125
3	3.750	6.000	5.250	3.750	6.000	6.000	5.125
4	4.000	5.750	4.000	5.500	6.000	6.000	5.208
5	4.250	5.750	6.000	3.250	6.000	5.750	5.167
6	4.500	4.500	2.750	3.750	5.750	4.250	4.250
7	2.750	5.750	3.750	5.750	5.750	6.000	4.958
8	4.500	2.750	2.500	2.000	3.250	5.500	3.417
9	5.250	6.000	4.000	4.250	5.750	5.000	5.042
10	3.750	5.750	4.250	4.500	6.000	5.500	4.958
11	5.250	4.500	5.250	4.500	6.000	5.750	5.208
12	4.250	6.000	5.250	6.000	6.000	6.000	5.583
13	3.750	5.500	5.000	3.000	5.500	4.500	4.542
14	5.000	6.000	5.750	6.000	6.000	6.000	5.792
15	2.000	5.250	2.500	3.750	5.250	4.750	3.917
16	5.000	6.000	4.750	5.250	5.750	5.750	5.417
17	5.000	6.000	5.250	5.500	6.000	6.000	5.625
18	4.750	6.000	5.000	5.750	6.000	6.000	5.583
19	2.750	5.250	4.500	4.500	5.750	5.250	4.667
20	4.500	5.000	5.000	4.750	6.000	5.000	5.042

Note. Scale from 0.0 to 6.0. AU: Autonomy; SA: Self-acceptance; PR: Positive relations with others; EM: Environmental mastery; PG: Personal growth; and PL: Purpose in life. Source: research data (2022).

Chart 9 briefly illustrates the overall averages for each dimension and is categorized by gender.

Chart 9*Distribution of Psychological Well-Being Scale Scores Divided into General, Female, and Male*

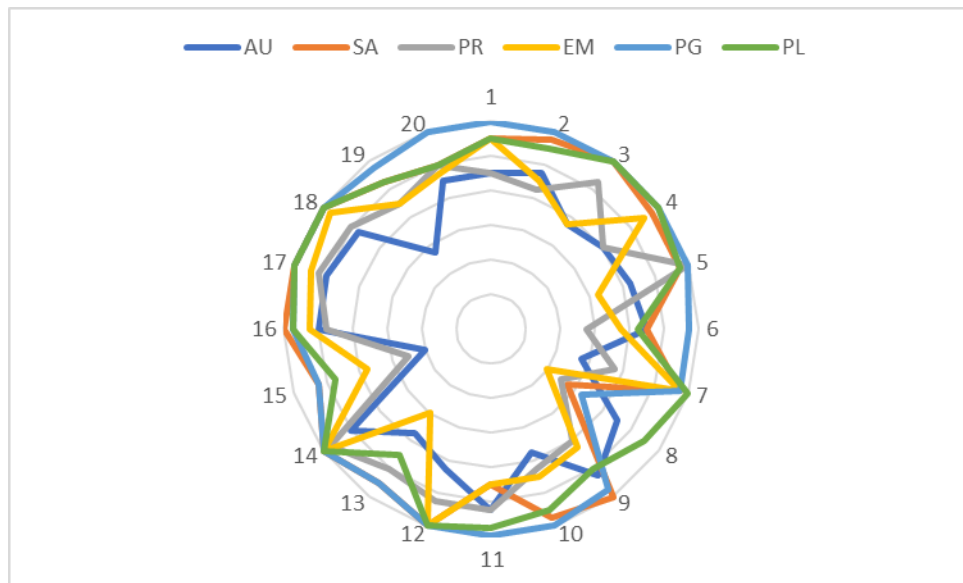
Dimension	Sum of scores (general)	Mean (general)	Sum of scores (female)	Mean (female)	Sum of scores (male)	Mean (male)
Autonomy	337	16.85	86	14.33	251	17.93
Self-acceptance	436	21.80	136	22.67	300	21.43
Positive relations with others	358	17.90	109	18.17	249	17.79
Environmental mastery	367	18.35	105	17.50	262	18.71
Personal growth	459	22.95	138	23.00	321	22.93
Purpose in life	440	22.00	130	21.67	310	22.14

Source: research data (2022).

The Personal growth dimension had the highest average response. In addition, respondents 6, 8, 13, and 15 had the lowest dimensional averages. On the other hand, the respondents with the highest averages were 12, 14, and 18. Notably, the difference between the highest average (respondent 14 - 5.792) and the lowest average on the PWS scale (respondent 8 - 3.417) was 2.375, a considerably high value on a 6-point scale. Thus, there is no homogeneity regarding the PWB of family farmers in Cascavel. Figure 11 illustrates the average distribution of responses per dimension.

Figure 11

Average Dimensions Scores by Survey Respondents



Note. Scale from 0.0 to 6.0. AU: Autonomy; SA: Self-acceptance; PR: Positive relations with others; EM: Environmental mastery; PG: Personal growth; and PL: Purpose in life.

For performing the correlation test between the dimensions of the PWB Scale, it was necessary to verify the normality of the variable data using the Action Stat software. The results of the Normality Test are shown in Chart 10.

Chart 10

Result of the Normality Test Analysis in p-values

Tests	Autonomy	Self-acceptance	Positive relations with others	Environmental mastery	Personal growth	Purpose in life
Anderson - Darling	0.035	0.000	0.089*	0.280*	0.000	0.007
Kolmogorov - Smirnov	0.098*	0.002	0.284*	0.309*	0.000	0.035
Shapiro - Wilk	0.027	0.000	0.086*	0.214*	0.000	0.006
Ryan - Joiner	0.032	0.000	0.112*	0.233*	0.000	0.012

Note. Survey data extracted from Action Stat Software (2022). Source: research data (2022).

From the results shown above, only the variables Positive relations with others and Environmental mastery were considered normal since the p-values of the tests were greater than the level of significance adopted (5%). Therefore, Pearson's Linear Correlation Test was not used, opting for Spearman's Correction Test, as it does not require data with normality configuration. Chart 11 and Figure 12 show the results obtained by the aforementioned calculation of dimensional averages.

Chart 11

Results of Spearman's Correlation Matrix Analysis among the Psychological Well-Being Dimensions of Family Farmers in Cascavel-PR

	Autonomy	Self-acceptance	Positive relations with others	Environmental mastery	Personal growth	Purpose in life
Self-acceptance	0.2874	-				
Positive relations with others	0.2116	0.0521	-			
Environmental mastery	0.3428	0.0211*	0.2503	-		
Personal growth	0.2252	0.0887	0.0024*	0.0198*	-	
Purpose in life	0.5520	0.0024*	0.0333*	0.0019*	0.0095*	-

Note. The indices with an asterisk presented a statistically significant correlation at the established significance level. Source: research data (2022).

After calculating the correlation coefficients between the dimensions, Table 5 was established to interpret the degree of correlation between them. For this, a confidence level (α) of 5% was considered.

Table 5

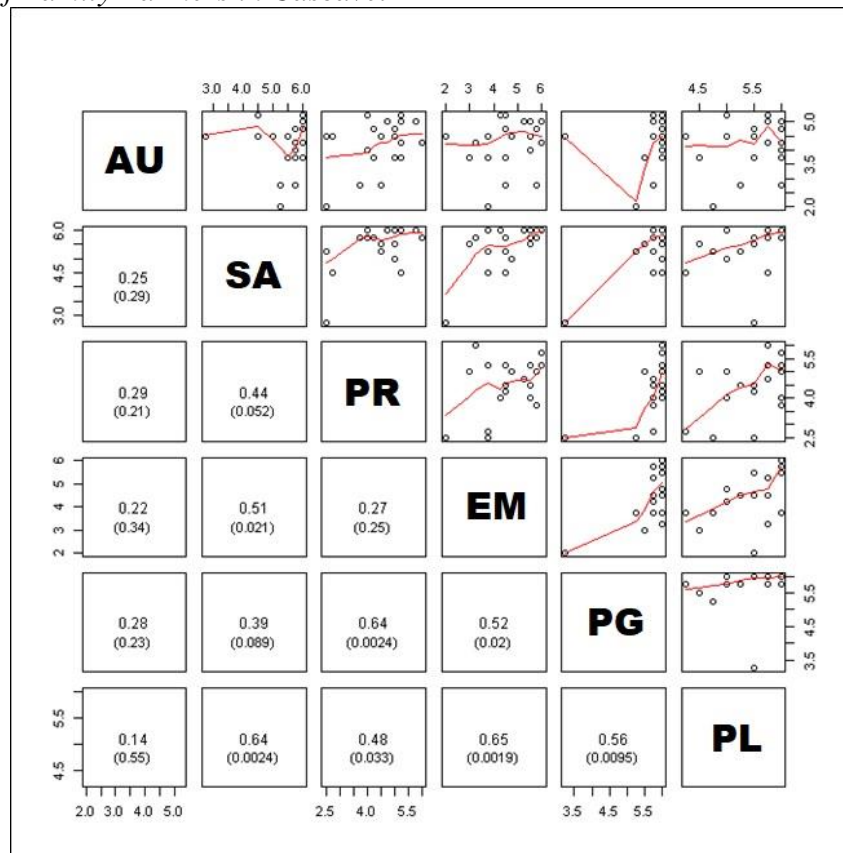
Convention for interpreting the values of ρ for the correlation test

ρ Value	Interpretation
$\rho > \alpha$	There is no statistically significant correlation between the dimensions.
$\rho < \alpha$	There is a statistically significant correlation between the dimensions.

Source: research data (2022).

Figure 12

Results of Spearman's Correlation Matrix Analysis among the Psychological Well-Being Dimensions of Family Farmers in Cascavel-PR



Note. AU: Autonomy; SA: Self-acceptance; PR: Positive relations with others; EM: Environmental mastery; PG: Personal growth; and PL: Purpose in life. Scatter plot presentation and ρ values in parentheses. Source: Research data (2022).

Analyzing the data above, it is notable that the Autonomy dimension was the only one not to have a statistical correlation with the other variables, which may be related to signs of dependence that family farmers have on family members and friends since it was the dimension that obtained the lowest average among the others. Thus, we identify difficulties in self-determination, the ability to evaluate, think, and act in relation to experiences according to personal criteria, and resistance to social pressures. This factor may be related to rural activity, which historically and physiologically requires activities performed by pairs or more people. Gazolla and Schneider (2007) pointed out that food production for self-consumption is a fundamental instrument for the socialization of rural families and communities since it develops closer social relations and strengthens affective bonds between families and individuals.

The dimension Purpose in life correlated with all the others, except for Autonomy. This fact may show that the ability to recognize the sense of direction, beliefs, purposes, and life projects of the farmers goes through several areas of well-being, considering the relationships

with others and the degree of mastery over the context in which they live. Moreover, it shows how Self-Acceptance and Personal Growth influence behavior and provide meaning to the lives of these individuals.

The most statistically consistent correlations were between Purpose in life and Self-acceptance, between Positive Relations with others and Personal growth, both correlations with a p-value of 0.0024. Personal growth did not correlate with the more introspective dimensions (Self-acceptance and Autonomy), showing that the formation of the perception about the experience of continuous personal development, the adaptation to new experiences, the interest for improvement, and the enrichment of the farmers' potentialities are considered more the external factors than the "I" (internal), such as Relations with others and Environmental mastery.

On the other hand, Self-acceptance had correlations only with Environmental mastery and, as already mentioned, Purpose in life. Remarkably, the life project and the ability to manipulate the environment in favor of personal goals and needs are based on the ability to accept multiple aspects of the personality and the evaluation of reactions referring to one's past.

5.4 ANALYSIS OF THE RELATIONSHIP BETWEEN LOCAL FOOD PURCHASES BY THE BRAZILIAN ARMY AND THE SUSTAINABILITY OF FAMILY FARMING

In this step, an analysis of the relationship between the public sector and family farming was developed in the sense of maintaining the producing families in the field and providing a market to guarantee the sale of the products of this public. For this, data from the body that manages the Brazilian Army's food procurement processes in Cascavel was used. The 15th Logistics Battalion, which has the code of the General Services Administration Units (UASG) 160524, is responsible for the management and preparation of the Public Call processes of family agriculture and of the bidding processes for the acquisition of foodstuffs for all the Military Units of Cascavel and sporadic Participating Management Units (PMUs).

The data used were public calls and bids for 2019, 2020, and 2021. For 2019, data from bids: 03/2019, 4/2019, 5/2019, and Public Call 01/2019 were used. For 2020, bids 01/2020, 06/2020, 37/2019 (process started in December 2019 and homologated in 2020) and Public Call 01/2020 were used. Finally, for 2021, data from bids 06/2021, 07/2021, and Public Call 01/2021 were used. Table 6 briefly demonstrates the extracts in Appendices G, H, and I.

Table 6*Demonstration of the public calls made by the Brazilian Army in the Cascavel region*

YEAR	WINNING COOPERATIVES	QTY PC ITEMS	QTY OF COMPATIBLE ITEMS BID x PC	DIFFERENCE IN AMOUNTS PAID BID x CP
2019	2	58	32	R\$ 13,321.28
2020	3	66	34	R\$ 39,005.10
2021	3	101	30	R\$ 40,613.84

Note. PC= Public Call. Data were extracted from the 15th Logistic Battalion archive and public governance systems. Source: research data (2022).

The 15th Logistic Battalion conducted the first Public Call process to acquire foodstuffs from family farming in 2019. Until then, there were no other processes developed by the Brazilian Army in the Western region of Paraná. Therefore, with the development of the processes in the following years, the experience was gained both in the elaboration of bureaucratic procedures and in the treatment and approach with the cooperatives, getting to know their articles qualitatively and quantitatively. This fact is demonstrated by the increase in items that made up the public calls of 2020 and 2021.

When asked about the main incentive for acquiring family farming products, the contract supervisor of the Family Farming Contract of the 15th Logistic Battalion replied that both the legal requirement and the quality of the products are motivating factors for the maintenance of acquisitions based on Public Call. Thus, it was pointed out that "the quality of many items is superior in family farming, but the legal requirement of 30% of the credit to be spent in this type of process makes some not so necessary items need to be included in the process." In addition, this legal requirement "sometimes hinders the planning of credit spending."

Hence, despite the increase in the foodstuff catalog, the number of items that can be compared with the bids did not follow the same evolution. As for the values, only items that are compatible in quality were used to calculate the difference between the amounts paid in the two types of purchases. Thus, in the historical series, it can be seen an increase in the amounts paid. Chart 12 lists the quantity of the most valuable items for public procurement.

Chart 12

Demonstration of Public Call Items by Economic Advantage of Acquisition.

Year	Qty CP items with lowest prices	Most advantageous product by PC	Value advantage in %	Less advantageous product by CP	Value disadvantage in %
2019	10	Salted Pork Ribs	42.2%	Fruit Jam (several flavors)	84.5%
2020	8	Tuscan Sausage	220.5%	Unprocessed strawberry	71.22%
2021	5	Unprocessed <i>Cabotiá</i> pumpkin	516.6%	Whole wheat bread	89.96%

Note. PC= Public Call. Data were extracted from the 15th Logistic Battalion archive and public governance systems. Source: research data (2022).

The chart shows that the most valuable items in the years studied were pork products and vegetables (kabocha pumpkin). This fact is corroborated by the high regional production of these items, being a national reference in the case of pork. According to the semi-structured interview data, the contract supervisor reported that the relationship with the cooperatives is positive and that "family farming suppliers are usually more attentive and helpful than in other bidding processes." In addition, the quality of the family farming products was highlighted in relation to the products from other bidding procedures, which "for the most part, is superior, especially the dairy products."

It should be noted that, in 2021, the Brazilian Army regulated the acquisition of items from the *Quantitativo de Rancho* (portion of the value of the food stage that is intended for the acquisition of other foodstuffs complementary to the basic food basket; the acquisition is made directly by the Military Organizations (OM) that have kitchens), prohibiting the acquisition of many items that, until then, were supplied by family farming, such as tablet candies, homemade cakes, buttery cookies, and fruit candies. In this way, the process for the year 2022, which was being prepared during data collection, had many items deleted. This fact is evidenced in the response of the contract supervisor when asked if the public call processes and the bidding contests for food had any changes in their configuration in recent years. He replied that there was a "decrease of options because of the implementation of the CACEB - Catalogue of Complementary Foods of the Brazilian Army, which regulates all items that can be purchased as *Quantitativo de Rancho*" (Brum, L. A., personal communication, May 03, 2022).

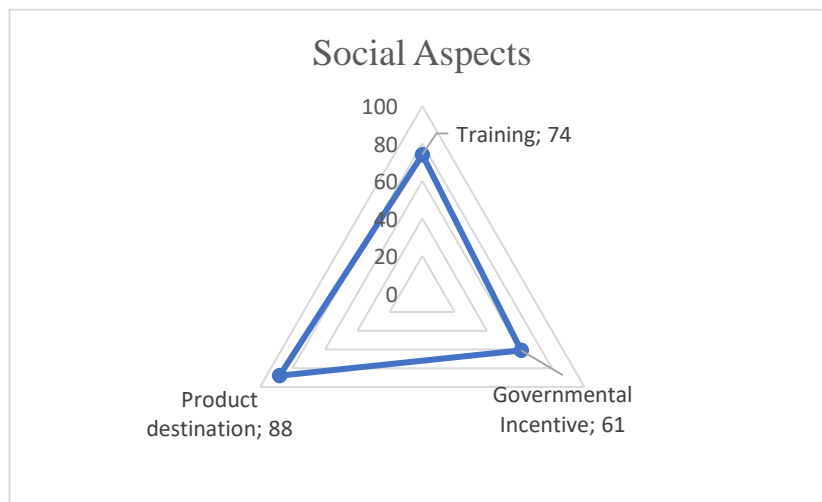
The prohibition of purchasing some items created a problem for the acquisitions through the public call because it reduced the list of items that could be purchased. However, the minimum purchase percentage for this procurement method remained the same, forcing units to buy items that sometimes have lower economic and financial advantages, such as loaves of bread, strawberries, and fruit jam.

5.5 THE INFLUENCE OF GOVERNMENT PROCUREMENT ON THE SUSTAINABLE PERFORMANCE OF FAMILY FARMING THROUGH THE SUSTAINABILITY BAROMETER

The sustainability of family farmers in the municipality of Cascavel participating in the PAA was analyzed based on social, economic, and environmental aspects. Figure 13 demonstrates the results of the social aspects.

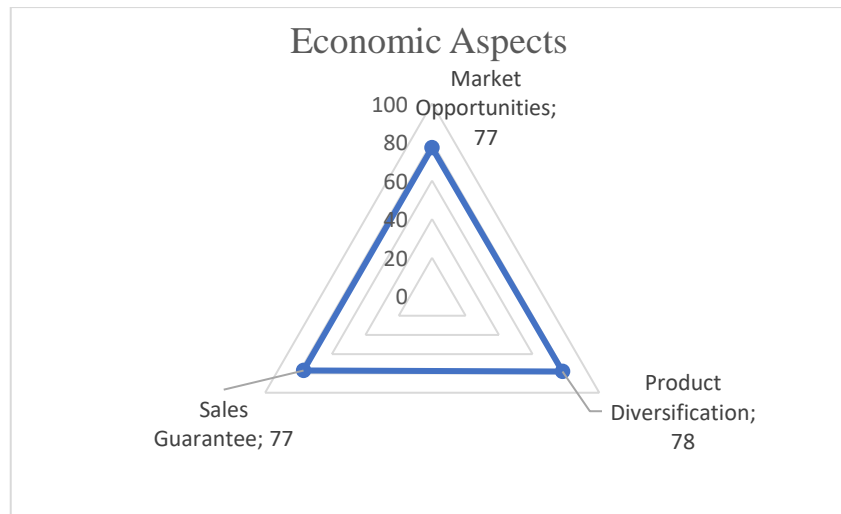
Figure 13

Social Aspects of PAA Participating Farmers



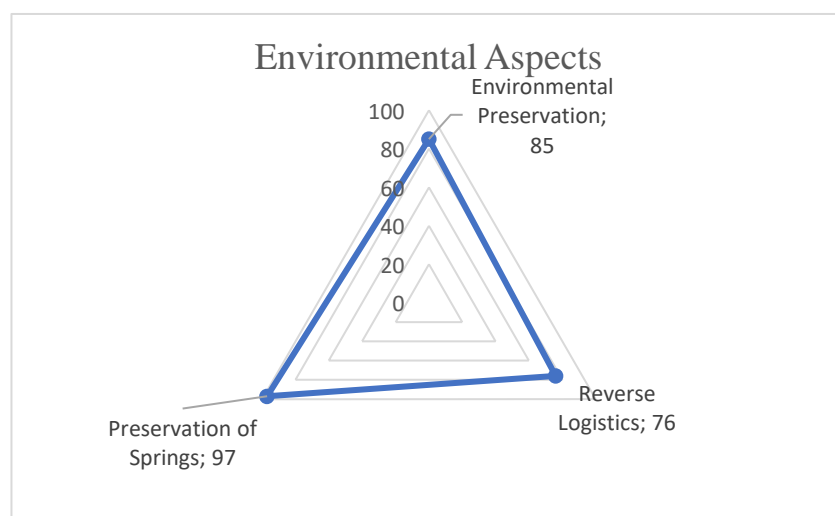
Source: research data (2022).

Based on the data, the farmers' perception of the training and technical assistance provided by EMATER, the cooperative, the union, and the municipality is identified. In addition, it mentions the incentive from the Federal, State, and Municipal Government for the permanence of the small producer in the field and the degree of recognition of the destination of the foodstuffs produced. Adding up the averages of the answers (74.3), it fits the 61-80 scale, potentially sustainable. The results are similar to Souza's (2016) findings in the evaluation of family farmers in the municipality of Toledo, in Paraná. Figure 14 illustrates the economic aspects.

Figure 14*Economic Aspects of PAA Participating Farmers*

Source: research data (2022).

Transcribing the results on the Sustainability Barometer scale, all the economic aspects analyzed had ratings in the 61-80 quadrant, labeled as potentially sustainable (77.3). The emergence of new market opportunities to sell their products and the assurance of selling the products to government agencies reached the index of 77; the degree of production diversification aimed at the 78 mark. Figure 15 illustrates the environmental aspects.

Figure 15*Environmental Aspects of PAA Participating Farmers*

Source: research data (2022).

In the environmental aspect, there was a disparity between the answers since environmental preservation obtained an index of 85; concern with the reverse logistics of the

packaging of the products used obtained an enumerator 76; conservation of water sources and springs received a score of 97. Thus, the environmental aspects (86) were classified in the 81-100 quadrant, fitting as sustainable.

Chart 13 shows the Sustainability Barometer questions and average responses, analyzing them individually, highlighting the two highest and lowest indexes.

Chart 13

Items Evaluated in the Sustainability Barometer Model with Average of Responses

Dimension	Question	Avg. (0 to 100)
Social	1- How are the training and technical assistance provided by EMATER, cooperative, union, city hall, other?	74.00
	2- In your opinion, how is the incentive from the Federal, State, and Municipal Government for the permanence of the small producer in the field?	61.00
	3- Do you consider important the destination of the commercialized products (to school meals, community restaurants, etc.)?	88.00
Economic	4- In your evaluation have new market opportunities arisen to sell your products in the last 5 years (fairs, supermarkets, PAA, etc.)?	77.00
	5- During the year, considering all the production of the property, how diversified is your production?	78.00
	6- How do you evaluate the guarantee of sale of the production to Government agencies?	77.00
Environmental	7- Are you concerned about environmental preservation?	85.00
	8- Are you concerned with the reverse logistics of the packaging of the products you use?	76.00
	9- Do you conserve water springs and water sources?	97.00

Source: research data (2022).

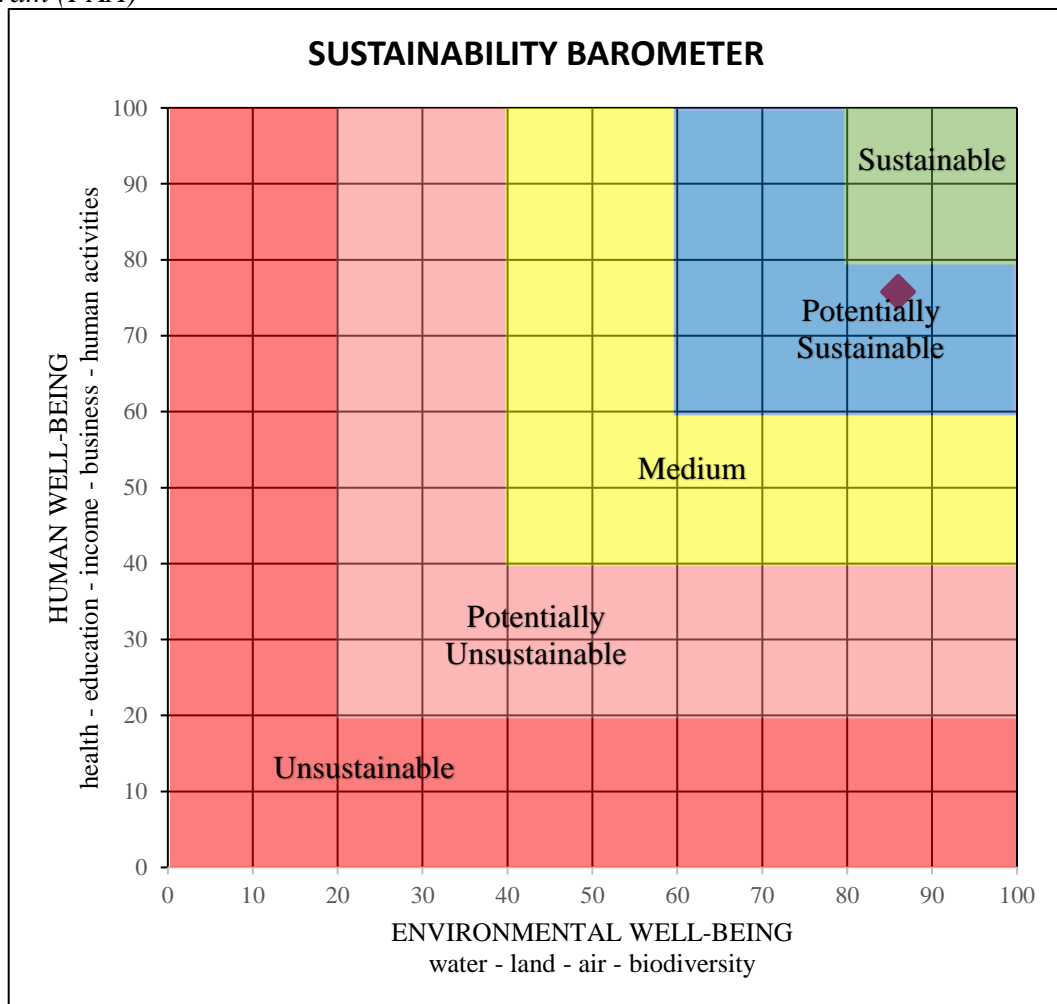
The overall average can be considered high, but there are possibilities for improvement and action, especially by public agencies and entities related to family farmers in Cascavel. This fact is demonstrated by the average of questions 1 and 2, which evaluated, respectively, the training and technical assistance provided by EMATER, cooperatives, unions, and city hall (74.00) and the incentive from the Federal, State, and Municipal governments to keep the small farmer in the field (61.00). On the other hand, the farmers' potential for sustainability is focused on environmental issues and awareness about the destination of the products. The concern with environmental issues, previously evidenced in the VAPERCOM model, was confirmed in the Sustainability Barometer in the averages of questions 9 and 7, which verified whether farmers conserve springs and water sources (97.00) and the level of concern with environmental

preservation (85.00). Furthermore, farmers highlighted the destination of commercialized products as important (88.00).

Compiling the data from the detailed findings, it is possible to identify the level of sustainability of family farming participating in the PAA in Cascavel, and it can be classified, according to Figure 2, on a scale from unsustainable to sustainable, according to the results of the dimensions. Figure 16 demonstrates the results found in the Sustainability Barometer. Thus, we can identify the Human Dimension with a result of 75.8 (potentially sustainable) and the Environmental Dimension with a result of 86 (sustainable), indicating the position in the condition of potentially sustainable.

Figure 16

Sustainability Barometer of Family Farming in Cascavel Participant in the Food Acquisition Program (PAA)



Source: research data (2022).

Taking into account the result of the level of sustainability of family farming as potentially sustainable, it is believed that actions aimed at regional sustainable development are

being carried out, especially in the Environmental aspect, since it showed the highest score. However, there are possibilities of action in the Human Well-Being dimension so that the social actors involved in the PAA dynamics can put the meaning of the development of strengthening programs on the agenda.

Therefore, it can be inferred that projects should be developed to improve factors related to Human Well-Being to achieve a sustainable performance on the part of family farmers in Cascavel participants of the PAA. Considering that, in this dimension, the social aspects were the ones that presented the lowest averages among the others, the factors "governmental incentive" (61) and "training" (74) stand out.

In a possible scenario in which the factors "governmental incentive" and "training" obtained the minimum value to be considered sustainable (81), the Social Aspects would obtain results considered sustainable (83.3). Furthermore, the profile questionnaire identified that the PAA is not the main means of marketing family farming products. However, they depend on other sales channels strongly influenced by public policies, such as PNAE and Fairs, which, added to PAA, represent 80% of the ways of selling the products. Thus, one can infer that there is a strong influence of government purchases on the sustainable performance of family farming in Cascavel.

5.6 TRIANGULATION AND DISCUSSION OF RESULTS

Based on the triangulation of the results obtained through the methods used, the sustainability of family farming participating in the PAA can be analyzed by economic, environmental, and social biases.

From the environmental point of view, farmers tend to have a high possibility of becoming ecological consumers, in addition to frequent concern with the life cycle of products and high environmental perception. The positive highlights of the VAPERCOM model highlight the concern with the energy consumption of equipment and the destination of the post-consumption product, such as the reuse of packaging. On the other hand, they are unconcerned about the verification of manufacturers' environmental actions and the origin of a product's resources. The Environmental Well-Being dimension of the Sustainability Barometer showed that the respondents are sustainable, and their concern with the conservation of water sources and springs stands out. In general, it can be deduced that the respondents are environmentally sustainable.

In the social aspect, the barometer indicated the sustainable potential, highlighting the possibilities for improvement in training actions by external agencies and the Government's

incentive for farmers to remain in the field. As a positive aspect, there was deep concern on the part of farmers about the finality of the commercialized products. Complementarily, the PWB scale showed a high level of well-being, with the intrinsic factors of farmers being positively highlighted, such as personal growth and purpose in life, with possibilities of actions for the development of extrinsic factors, such as autonomy and positive relations with others. Thus, it is inferred that psychosocial aspects have the potential for sustainability.

From an economic perspective, the volume of purchases by the Brazilian Army through the PAA has increased in recent years. There is a good relationship between the cooperatives and the delivery locations, with the quality of the products delivered being highlighted. Although the PAA represents the vital mode of commercialization for only 5% of respondents, public channels are essential for 80%. The Sustainability Barometer indicated sustainable potential, with the emergence in recent years of good marketing opportunities (PAA, Fairs, PNAE, and others); there is diversification in the products offered, with an average of four types of products per producing family; the guarantee of sale to public agencies is good. In summary, it is concluded that the sustainability of family farming and psychosocial well-being are substantially influenced by government procurement policies, being necessary for the elaboration of projects for the development of the potentials listed, aiming at local, sustainable development.

6 FINAL CONSIDERATIONS

When performing the methodological procedures and analysis of the data collected to **identify the profile of family farmers in Cascavel-PR, participants in sustainable procurement policies of a government agency, and compare local data with national data from the 2017 Census of Agriculture** (specific objective a), a macro analysis of the results obtained in the different tools used in this study was performed. Therefore, it was identified that both young and old are performing activities in family farming in Cascavel, a key issue for regional sustainability. Moreover, there is homogeneity in the profile of farmers, highlighted by the existence of women representing farming families and relatively positive schooling levels. Furthermore, it can be inferred that most family farmers in Cascavel, Paraná, who participate in the Food Acquisition Program (PAA) have monthly incomes above R\$ 3,000.00, are linked to the National Program for the Strengthening of Family Farming (PRONAF), and have diversified ways of marketing their products. Compared to the national data from the 2017 Census of Agriculture, consonances were found in the proportion between genders, rural activities, and homogeneous age distribution. However, regarding the level of schooling, there was a highlight for the city of Cascavel (PR) and the state of Paraná because the city developed systems that ensure the schooling of the rural population.

As for the environmental dimension of the sustainable tripod, when **verifying the level of environmental perception of farming families** (specific objective b), the results obtained through the VAPERCOM method identified that family farmers participating in the PAA have a high possibility of becoming ecological consumers, frequent concern with the life cycle of products, and high environmental perception, showing that the existing relationship between these human beings and nature is favorable, therefore, duly satisfactory. Concomitantly, the result of the Sustainability Barometer in the environmental well-being bias corroborates the findings in the VAPERCOM method since it indicated that the results found represent sustainability in this theme.

From a social perspective, when **analyzing the psychological well-being of farming families** (specific objective c), it is concluded that family farmers have a high level of psychological well-being, with an average of 4.99 on a scale of 0 to 6 points. Performing a social counterpoint through the Sustainability Barometer, the results point to a potentially sustainable scenario, with an index of 74.3 on a scale of 0 to 100 points. Thus, it is noteworthy

that when external issues to farmers were evaluated, such as support from government agencies and trade unions, the indices were lower than the evaluation of personal factors.

In this context, the main positive highlights of the PWB scale evaluation were personal growth and purpose in life, evidencing the individualized sense of existence. This evidence may be related to the very execution of the labor activities characteristic of the field because, through them, farmers can perceive their share of action daily in society, generating pride and self-recognition. Moreover, the evaluation of the consideration about the destination of their products from the Sustainability Barometer obtained an 88 (sustainable) index.

Still, on the correlations between the dimensions of psychological well-being, it is noteworthy that the autonomy dimension was the only one not to have a statistical correlation with the other variables, which may be related to signs of dependence that family farmers have on family members and friends since it was the dimension that obtained the lowest average among the others. Thus, we identify difficulties in self-determination, the ability to evaluate, think, and act in relation to experiences, according to personal criteria, and resistance to social pressures. This factor may be related to rural activity, which historically and physiologically requires activities performed by pairs or more people.

Furthermore, when **analyzing the relationship between local food purchases by the Brazilian Army and the sustainability of family farming** (specific objective d) regarding the development of the PAA, it is possible to highlight a good relationship between the farmer suppliers and the PAA's delivery centers. Regarding the development of the PAA by the Brazilian Army in Cascavel-PR, one notices that the processes were initiated a few years ago, and currently, there are many benefits for both parties involved in the acquisitions. It is noteworthy that improvements can still be made to save the state's financial resources, especially in the preparation of the Public Call processes, such as removing items where the financial advantage is not more than 30% of the bid's value.

When **measuring the influence of government purchases on the sustainable performance of family farming** (specific objective e), the high sustainable level obtained in the Sustainability Barometer can be explained by the fact that farmers do not have the PAA as the main channel for marketing their products. Moreover, they have a high level of diversification of their products, participating in fairs, PNAE, and other forms of trade. Thus, especially in the human welfare item, which considers economic factors, public agents have some possibilities for improvement.

Therefore, by addressing all the specific objectives listed, it is concluded that family farmers in Cascavel participating in the PAA are environmentally sustainable and have potential

sustainability in psychosocial and economic aspects. To this end, the methods VAPERCOM (environmental perception), PWB Scale, Sustainability Barometer, and document analysis were used. Thus, by **analyzing the influence of government procurement policies in relation to aspects of sustainability and psychosocial well-being in family farming in Cascavel-PR**, it can be concluded that government procurement policies substantially influence these phenomena, and it is essential to develop projects for the development of the potentials listed, aiming at local, sustainable development.

Among the limitations of this study was the low number of respondents, which made it impossible to project results that were closer to reality. In addition, the time cycle of data collection required celerity for the unfolding of methodological procedures. Another limitation was the very delimitation of the study, to be carried out with farmers participating in the PAA based in Cascavel since, as already mentioned, cooperatives were participating in the public call processes that had their headquarters, and therefore their members residing in other cities in the state of Paraná.

As a suggestion for the development of future research on this topic, studies can be conducted to evaluate family farming in a generalist way, expanding the scope of the research to include family farmers who do not participate in government purchases. In addition, there is the possibility of replicating the compilation of the methods used in other segments that are fundamental to society, such as teachers, health workers, and political professionals, to evaluate aspects of sustainability of these social actors, generating basic data for the development of intervention policies that, indirectly, will result in social transformation.

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APPENDIX A – INFORMED CONSENT FORM

We are conducting a study in order to better understand aspects related to the well-being of family farmers in Cascavel (PR). The research results will hopefully help us better understand this phenomenon, assisting the elaboration of practices aimed at local development. To this end, we are applying a questionnaire that takes approximately twenty-five minutes to be answered. This research is being developed by Pedro Lachovicz Neto, under the supervision of Professor Dr. Sandra Mara Stocker Lago, from the Postgraduate Program in Administration at UNIOESTE. More information can be obtained by e-mail pedrolachoviczneto@gmail.com or by phone (45) 99817-7548. Participation in the research is totally voluntary.

By the present Informed Consent Form, I, _____, carrier of ID no.: _____, declare that I have been informed of the objectives and justification of the present research, and I agree to participate in it. I have also been informed: a) of the freedom to participate or not in the research, as well as of my right to withdraw my consent, at any time, and to no longer participate in the study, without any harm to me; b) of the guarantee of receiving an answer to any questions about the procedures and other issues related to the research; c) of the assurance that I will not be identified and that the information recorded will remain confidential; d) that the information obtained with the questionnaires will be filed, without personal identification, with the researcher's database, being available for future analysis.

Date: ____/____/____

Signature of participant: _____

Signature of the responsible researcher: _____

APPENDIX B – SOCIODEMOGRAPHIC SURVEY

Name										
Gender	Male			Female			Undefined			
Age	-20	20-30	31-40	41-50	51-60	60+				
Education	Incomplete elementary	Elementary School Complete	Incomplete High School	High School Complete	Higher Education Incomplete					
	Higher Education Complete	Post-graduation	Master's Degree	Doctor's Degree	Post-doctorate					
Family members (including yourself) who work on the property	2	3	4	5	6					
	7	8	9	10	11+					
Monthly profit range of the property	0 to R\$ 3,000	R\$ 3,001 to R\$ 5,000	R\$ 5,001 to R\$ 8,000	R\$ 8,000 to R\$ 10,000	R\$ 10,000+					
Main activity	Grains	Milk	Meat	Horticultural products	Others					
Main form of commercialization of the products	PAA	PNAE	Fairs	Supermarket	Others					
Are you a PRONAF user?	Yes				No					
How long have you participated in PAA?	Less than 1 year	1 to 3 years	3 to 5 years	5 years +						
Are the prices paid for the products satisfactory?	Yes				No					
What are the obstacles/difficulties encountered in the Program?	Transportation	Raw Material Procurement	Product Quality	Late Payment						
	Delivery Deadlines	Delivery Barriers	Requested Quantity	Other						

APPENDIX C – VAPERCOM

Dimension	Number	Statement	Never	Very few times	Sometimes	Often	Always
			1	2	3	4	5
Environmental Perception	1	Before discarding something, you think about reusing it.					
	2	Do you separate the garbage that can be recycled (paper, plastic, aluminum, glass, and metals) and dispose of them for collection?					
	3	Do you turn off the lights, turn off the TV, stereo, fan/air conditioner when you leave the room?					
	4	Do you try not to leave the faucet running when brushing your teeth and/or shaving?					
Eco-consumption	5	Do you consider the environmental variable when buying a product?					
	6	When buying, do you try to know if the manufacturer practices environmental actions?					
	7	Before purchasing, do you check the labels and packaging to identify an eco-friendly product?					
	8	Do you try to buy products and/or packaging that are made from recycled material or have the potential to be recycled?					
	9	Do you check the energy consumption when you are buying a product?					
	10	Are you willing to pay extra for an environmentally friendly product?					

		No concern	Low concern	Medium concern	Frequent concern	Deep concern
		1	2	3	4	5
Stages of a Product Life Cycle Analysis	Regarding raw material, please indicate your concern:					
	11	Origin of the resources (if they are renewable)				
	12	Environmental impact in extraction and transport				
	Regarding the production process, please indicate your concern:					
	13	Generation of solid waste, liquid effluents, and atmospheric emissions				
	14	Fuel consumption storage and transportation and distribution				
	Regarding the use of the product, please indicate your concern:					
	15	Product life cycle				
	16	Potential contamination to the environment				
	Regarding post-use of the product, please indicate your concern:					
	17	Possibility of reusing and repurposing components				
	18	Recyclability				
Regarding product disposal, please indicate your concern:						
19	Hazard or toxicity					
20	Volume of the material (including packaging)					

APPENDIX D – PSYCHOLOGICAL WELL-BEING SCALE

The questions below refer to the way you deal with yourself and your life. There are no right or wrong answers, just mark the alternative that best describes how you currently feel about each statement.

Number	Statement	Totally Disagree	Partially Disagree	Somewhat Disagree	Somewhat Agree	Partially Agree	Totally Agree
		1	2	3	4	5	6
1	I am not afraid to express my opinions, even when they are contrary to the opinions of most people.						
2	In general, I feel confident and positive about myself.						
3	I feel that I have many gains from my friendships.						
4	I often worry about what others think of me.						
5	I am very good at managing the various responsibilities in my daily life.						
6	In my opinion, people of all ages are capable of continuing to grow and develop.						
7	Most of the time, I find my activities uninteresting and trivial.						
8	It seems to me that most people have more friends than I do.						
9	I have learned many things from life over time, which has made me a strong and capable person.						
10	I like to make plans for the future and work to make them come true.						
11	In general, I feel disappointed with what I have achieved in life.						

12	People would describe me as someone willing to share my time with others.						
13	People can hardly convince me to do things I do not want to do.						
14	I manage my time well, so I can do everything that needs to be done.						
15	I am an active person to execute the goal that I have set for myself.						
16	In general, I am proud of whom I am and the life I lead.						
17	Regarding friendships, I generally feel out of place.						
18	I often change my mind if my friends or family disagree with my decisions.						
19	I get frustrated when I try to plan my daily activities because I never get the things that I had planned done.						
20	For me, life is a continuous process of learning, changing, and growing.						
21	When I compare myself to friends and acquaintances, I feel good about who I am.						
22	I have trouble organizing my life in a way that is satisfactory to me.						
23	I like to see how my opinions have changed and matured over the years.						
24	I am satisfied when I think of what I have accomplished in life.						



APPENDIX E – SEMI-STRUCTURED INTERVIEW



INTERVIEW

Study with the purpose of better understanding aspects related to the sustainability of family farmers in Cascavel (PR). The research results will hopefully help us better understand this phenomenon, assisting the elaboration of practices aimed at local development.

1) Could you describe how the relationship between the Brazilian Army and the cooperatives participating in the PAA is? In this sense, is there any difference between these suppliers and the winners of traditional bidding contests?

2) Tell us a bit about the products coming from family agriculture. Is there any difference between the products of public calls and those coming from public biddings?

3) What is the main stimulus for acquiring family farming products: the legal requirement or the quality of the products?

4) In recent years, have the public call processes and the food bidding contests had any changes in their configuration (e.g. addition or decrease of food options)? If so, what is the main reason for this?

5) What benefits and difficulties does the requirement to purchase family farming products establish for the Brazilian Army, specifically for the Cascavel Garrison?

APPENDIX F – SUSTAINABILITY BAROMETER

Social aspects						
1	How is the training and technical assistance provided by EMATER, the cooperative, the union, the city hall, and others?	Bad	Poor	Fair	Good	Excellent
		0-20	21-40	41-60	61-80	81-100
2	In your vision, how is the incentive from the Federal, State, and Municipal Government to the permanence of the small producer in the field?	Bad	Poor	Fair	Good	Excellent
		0-20	21-40	41-60	61-80	81-100
3	The destination of the commercialized products is important (if for school meals, restaurants, etc.).	Not at all	Not much	Medium	Very much	Totally
		0-20	21-40	41-60	61-80	81-100
Economic Aspects						
4	In their evaluation, new market opportunities have arisen for selling the production in the last 5 years (fairs, supermarkets, PAA, etc.).	No opportunities	Few opportunities	Some opportunities	Good opportunities	Excellent opportunities
		0-20	21-40	41-60	61-80	81-100
5	During the year, considering all the production of the property, how diversified is your production?	1 product - non-diversified	2 products - not very diversified	3 products - medium diversification	4 products - diversified	5 products - totally diversified
		0-20	21-40	41-60	61-80	81-100
6	How do you evaluate the guarantee of sale of the production?	Bad	Poor	Fair	Good	Excellent
		0-20	21-40	41-60	61-80	81-100
Environmental aspects						
		Not at all	Not much	Medium	Very much	Totally
7	Are you concerned about environmental preservation?	0-20	21-40	41-60	61-80	81-100
8	Are you concerned with the reverse logistics of the packaging of the products you use?	0-20	21-40	41-60	61-80	81-100
9	Do you conserve water springs and water sources?	0-20	21-40	41-60	61-80	81-100

APPENDIX G – GOVERNMENT PROCUREMENT ANALYSIS (2019)

	Product	Unit	Quantity purchased by PAA in 2021	PAA Value	Total PAA Value	Bidding Value	Total Bidding Value	Difference between the values in R\$	Difference between the amount paid in the PAA and the bidding process
A G R I C U L T U R A	Avocado <i>in natura</i>	Kg	550	R\$ 3,35	R\$ 1.842,50	R\$ 2,94	R\$ 1.617,00	-R\$ 225,50	12,24
	Chard <i>in natura</i>	Bunch	1200	R\$ 3,49	R\$ 4.188,00	R\$ 2,30	R\$ 2.760,00	-R\$ 1.428,00	34,10
	Butterhead lettuce	Unit	3750	R\$ 1,89	R\$ 7.087,50	R\$ 1,71	R\$ 6.412,50	-R\$ 675,00	9,52
	Garlic	Kg	1120	R\$ 22,91	R\$ 25.659,20	R\$ 18,77	R\$ 21.022,40	-R\$ 4.636,80	18,07
	Cavendish banana	Kg	4150	R\$ 3,07	R\$ 12.740,50	R\$ 1,50	R\$ 6.225,00	-R\$ 6.515,50	51,14
	Banana <i>prata</i>	Kg	4000	R\$ 3,08	R\$ 12.320,00	R\$ 2,23	R\$ 8.920,00	-R\$ 3.400,00	27,60
	Coconut-flavored butter cookies	500g	1700	R\$ 9,10	R\$ 15.470,00		R\$ -	R\$ -	-
	Chocolate-covered cookies	500g	4900	R\$ 9,12	R\$ 44.688,00		R\$ -	R\$ -	-
	Calabrese broccoli <i>in natura</i>	Unit	620	R\$ 3,98	R\$ 2.467,60	R\$ 2,55	R\$ 1.581,00	-R\$ 886,60	35,93
	Salted pork ribs	Kg	2240	R\$ 13,98	R\$ 31.315,20	R\$ 19,88	R\$ 44.531,20	R\$ 13.216,00	42,20
	Salted Pork feet	Kg	240	R\$ 6,47	R\$ 1.552,80		R\$ -	R\$ -	-
	Salted Pork Tail	Kg	240	R\$ 12,80	R\$ 3.072,00		R\$ -	R\$ -	-
	Salted pork loin	Kg	270	R\$ 14,87	R\$ 4.014,90	R\$ 13,30	R\$ 3.591,00	-R\$ 423,90	10,56
	Green onion, 120g	Bunch	360	R\$ 2,81	R\$ 1.011,60	R\$ 1,80	R\$ 648,00	-R\$ 363,60	35,94
	Green onion and parsley, 120g	Bunch	450	R\$ 2,81	R\$ 1.264,50	R\$ 1,95	R\$ 877,50	-R\$ 387,00	30,60
	Cauliflower <i>in natura</i>	Unit	650	R\$ 3,19	R\$ 2.073,50	R\$ 3,99	R\$ 2.593,50	R\$ 520,00	25,08
	Collard	Bunch	6560	R\$ 2,43	R\$ 20.926,40	R\$ 1,85	R\$ 12.136,00	-R\$ 8.790,40	42,01
	Pumpkin candy with coconut	400g	1100	R\$ 7,98	R\$ 2.673,00		R\$ -	R\$ -	-
	Blackberry Jam	700g	1050	R\$ 14,28	R\$ 8.379,00		R\$ -	R\$ -	-
	Banana and Orange Jam	700g	600	R\$ 12,99	R\$ 8.568,00		R\$ -	R\$ -	-
	Fig jam	700g	600	R\$ 15,49	R\$ 7.794,00		R\$ -	R\$ -	-
	Fruit jam, various flavors	400g	450	R\$ 7,98	R\$ 6.970,50	R\$ 2,39	R\$ 1.075,50	-R\$ 5.895,00	84,57
	Milk jam with plum	700g	1150	R\$ 13,39	R\$ 9.177,00		R\$ -	R\$ -	-
	Milk jam with blackberry	700g	1250	R\$ 13,39	R\$ 16.737,50		R\$ -	R\$ -	-
	Milk jam with strawberry	700g	1250	R\$ 13,39	R\$ 16.737,50		R\$ -	R\$ -	-
	Mandarin orange jam	700g	450	R\$ 13,12	R\$ 6.025,50		R\$ -	R\$ -	-
	Strawberry jam	700g	1150	R\$ 14,97	R\$ 17.215,50	R\$ 3,33	R\$ 3.823,75	-R\$ 13.391,75	77,79
	Strawberry <i>in natura</i>	Kg	100	R\$ 20,50	R\$ 2.050,00	R\$ 14,67	R\$ 1.466,67	-R\$ 583,33	28,46
	Isabella grape	Kg	675	R\$ 5,49	R\$ 3.705,75		R\$ -	R\$ -	-
	Niagara grape	Kg	675	R\$ 5,49	R\$ 3.705,75		R\$ -	R\$ -	-
	Pink niagara grape	Kg	675	R\$ 5,49	R\$ 3.705,75		R\$ -	R\$ -	-
	Mint <i>in natura</i>	Bunch	250	R\$ 2,15	R\$ 537,50		R\$ -	R\$ -	-
	Zucchini <i>in natura</i>	Kg	1050	R\$ 2,39	R\$ 2.509,50	R\$ 2,00	R\$ 2.100,00	-R\$ 409,50	16,32
	Pumpkin	Kg	900	R\$ 1,79	R\$ 1.611,00	R\$ 1,90	R\$ 1.710,00	R\$ 99,00	6,15
	Kabocha squash	Kg	800	R\$ 1,79	R\$ 1.432,00	R\$ 2,10	R\$ 1.680,00	R\$ 248,00	17,32
	Eggplant <i>in natura</i>	Kg	735	R\$ 2,79	R\$ 2.050,65	R\$ 2,95	R\$ 2.168,25	R\$ 117,60	5,73
	Beet <i>in natura</i>	Kg	1850	R\$ 2,47	R\$ 4.569,50	R\$ 2,50	R\$ 4.625,00	R\$ 55,50	1,21
	Carrot <i>in natura</i>	Kg	1850	R\$ 2,47	R\$ 4.569,50	R\$ 2,70	R\$ 4.995,00	R\$ 425,50	9,31
	Chayote <i>in natura</i>	Kg	620	R\$ 2,08	R\$ 1.289,60	R\$ 1,93	R\$ 1.196,60	-R\$ 93,00	7,21
	Clean cassava	Kg	5700	R\$ 2,99	R\$ 17.043,00	R\$ 3,40	R\$ 19.380,00	R\$ 2.337,00	13,71
	Moranga	Kg	800	R\$ 2,09	R\$ 1.672,00		R\$ -	R\$ -	-
	Cucumber <i>in natura</i>	Kg	1180	R\$ 2,67	R\$ 3.150,60	R\$ 2,05	R\$ 2.419,00	-R\$ 731,60	23,22
	Okra <i>in natura</i>	Kg	700	R\$ 3,59	R\$ 2.513,00		R\$ -	R\$ -	-
	Tuscan sausage	Kg	1600	R\$ 13,30	R\$ 21.280,00		R\$ -	R\$ -	-
	Smoked Pork Loin	Kg	1200	R\$ 12,65	R\$ 15.180,00		R\$ -	R\$ -	-
	Fusilli pasta	500g	1400	R\$ 3,61	R\$ 5.054,00		R\$ -	R\$ -	-
	Fettuccini pasta	500g	1400	R\$ 4,17	R\$ 5.838,00		R\$ -	R\$ -	-
Corn <i>in natura</i>	Kg	560	R\$ 5,23	R\$ 2.928,80		R\$ -	R\$ -	-	
Wholewheat bread	500g	550	R\$ 5,09	R\$ 2.799,50		R\$ -	R\$ -	-	
Bread loaf	500g	800	R\$ 5,09	R\$ 4.072,00	R\$ 4,19	R\$ 3.352,00	-R\$ 720,00	17,68	
Burger bun	480g	1850	R\$ 6,03	R\$ 11.155,50	R\$ 7,36	R\$ 13.616,00	R\$ 2.460,50	22,06	
Hot dog bun	Kg	1800	R\$ 9,98	R\$ 17.964,00	R\$ 7,19	R\$ 12.942,00	-R\$ 5.022,00	27,96	
Salami	Kg	1800	R\$ 20,97	R\$ 37.746,00		R\$ -	R\$ -	-	
COOPRACOR	Iceberg lettuce	Unit	3750	R\$ 3,09	R\$ 11.587,50	R\$ 2,33	R\$ 8.737,50	-R\$ 2.850,00	24,60
	Crispleaf lettuce	Unit	3750	R\$ 2,09	R\$ 7.837,50	R\$ 1,35	R\$ 5.062,50	-R\$ 2.775,00	35,41
	Mint <i>in natura</i>	Bunch	200	R\$ 2,09	R\$ 418,00		R\$ -	R\$ -	-
	Sweet potato <i>in natura</i>	Kg	1760	R\$ 2,37	R\$ 4.171,20	R\$ 1,90	R\$ 3.344,00	-R\$ 827,20	19,83
	Minas cheese	Kg	450	R\$ 21,27	R\$ 9.571,50	R\$ 29,79	R\$ 13.405,50	R\$ 3.834,00	40,06

APPENDIX H – GOVERNMENT PROCUREMENT ANALYSIS (2020)

	Product	Unit	Quantity purchased by PAA in 2021	PAA Value	Total PAA Value	Bidding Value	Total Bidding Value	Difference between the values in R\$	Difference between the amount paid in the PAA and the bidding process
A G R I V E L	Chard	Bunch	900	R\$ 3,80	R\$ 3.420,00	R\$ 2,95	R\$ 2.655,00	-R\$ 765,00	22,37
	Garlic	Kg	520	R\$ 24,16	R\$ 12.563,20	R\$ 16,12	R\$ 8.382,40	-R\$ 4.180,80	33,28
	Bacon	Kg	1600	R\$ 19,80	R\$ 31.680,00	R\$ 19,30	R\$ 30.880,00	-R\$ 800,00	2,53
	Chocolate, corn and carrot cakes (60g)	Unit	3000	R\$ 1,80	R\$ 5.400,00		R\$ -	R\$ -	-
	Homemade chocolate cookies	500g	1500	R\$ 11,80	R\$ 17.700,00	R\$ 8,80	R\$ 13.200,00	-R\$ 4.500,00	25,42
	Salted Pork Ribs	kg	1200	R\$ 15,30	R\$ 18.360,00		R\$ -	R\$ -	-
	Salted Pork feet	kg	800	R\$ 7,10	R\$ 5.680,00		R\$ -	R\$ -	-
	Salted Pork Tail	kg	800	R\$ 13,60	R\$ 10.880,00		R\$ -	R\$ -	-
	Salty Pork Loin	kg	1250	R\$ 16,20	R\$ 20.250,00		R\$ -	R\$ -	-
	Milk Jam	1 Kg	480	R\$ 17,20	R\$ 8.256,00		R\$ -	R\$ -	-
	Milk jam with strawberry jam	Unit	480	R\$ 15,30	R\$ 7.344,00		R\$ -	R\$ -	-
	Milk jam with plum jam	Unit	580	R\$ 15,30	R\$ 8.874,00		R\$ -	R\$ -	-
	Milk jam in tablet form	Pack	720	R\$ 22,00	R\$ 15.840,00		R\$ -	R\$ -	-
	Strawberry <i>in natura</i>	Kg	1100	R\$ 20,50	R\$ 22.550,00	R\$ 5,90	R\$ 6.490,00	-R\$ 16.060,00	71,22
	Niagara <i>in natura</i>	kg	430	R\$ 8,60	R\$ 3.698,00		R\$ -	R\$ -	-
	Pumpkin <i>in natura</i>	Kg	650	R\$ 1,90	R\$ 1.235,00		R\$ -	R\$ -	-
	Kabocha squash <i>in natura</i>	Kg	500	R\$ 1,90	R\$ 950,00	R\$ 1,30	R\$ 650,00	-R\$ 300,00	31,58
	Beet <i>in natura</i>	Kg	2050	R\$ 2,48	R\$ 3.895,00	R\$ 1,60	R\$ 3.280,00	-R\$ 615,00	15,79
	Carrot <i>in natura</i>	Kg	1250	R\$ 2,70	R\$ 3.100,00	R\$ 1,50	R\$ 1.875,00	-R\$ 1.225,00	39,52
	Chayote <i>in natura</i>	Kg	750	R\$ 2,38	R\$ 2.025,00	R\$ 2,10	R\$ 1.575,00	-R\$ 450,00	22,22
	Moganga pumpkin <i>in natura</i>	Kg	750	R\$ 1,90	R\$ 1.785,00	R\$ 1,40	R\$ 1.050,00	-R\$ 735,00	41,18
	Cucumber <i>in natura</i>	Kg	1150	R\$ 2,90	R\$ 2.185,00	R\$ 1,80	R\$ 2.070,00	-R\$ 115,00	5,26
	Okra <i>in natura</i>	Kg	340	R\$ 3,90	R\$ 986,00		R\$ -	R\$ -	-
	Tuscan sausage	Kg	2400	R\$ 14,58	R\$ 9.360,00	R\$ 12,50	R\$ 30.000,00	R\$ 20.640,00	220,51
	Smoked pork loin	Kg	1800	R\$ 16,20	R\$ 26.244,00		R\$ -	R\$ -	-
	Spaghetti pasta	500g	600	R\$ 4,49	R\$ 9.720,00		R\$ -	R\$ -	-
	Fettuccine pasta	500g	600	R\$ 4,49	R\$ 2.694,00		R\$ -	R\$ -	-
	Ditalini pasta	500g	100	R\$ 4,49	R\$ 449,00		R\$ -	R\$ -	-
	Fusilli pasta	500g	600	R\$ 4,19	R\$ 2.514,00		R\$ -	R\$ -	-
	Rigatoni pasta	500g	600	R\$ 4,19	R\$ 419,00		R\$ -	R\$ -	-
	Honey	1 Kg	600	R\$ 28,80	R\$ 17.280,00	R\$ 26,00	R\$ 15.600,00	-R\$ 1.680,00	9,72
	Egg	Carton	2592	R\$ 4,95	R\$ 12.830,40	R\$ 4,95	R\$ 12.830,40	R\$ -	-
	Whole wheat bread	500g	600	R\$ 5,19	R\$ 3.114,00	R\$ 3,30	R\$ 1.980,00	-R\$ 1.134,00	36,42
	Bread loaf	500g	644	R\$ 5,19	R\$ 3.342,36	R\$ 3,30	R\$ 2.125,20	-R\$ 1.217,16	36,42
	Burger bun	500g	900	R\$ 5,19	R\$ 4.671,00		R\$ -	R\$ -	-
	Minas cheese	Kg	790	R\$ 21,34	R\$ 16.858,60		R\$ -	R\$ -	-
	Mozzarella cheese	Kg	2150	R\$ 24,90	R\$ 53.535,00	R\$ 25,29	R\$ 54.373,50	R\$ 838,50	1,57
	Radish <i>in natura</i>	Bunch	340	R\$ 2,30	R\$ 782,00	R\$ 3,20	R\$ 1.088,00	R\$ 306,00	39,13
	Arugula <i>in natura</i>	Bunch	750	R\$ 2,30	R\$ 1.725,00	R\$ 1,94	R\$ 1.455,00	-R\$ 270,00	15,65
	Pork salami	Kg	3450	R\$ 21,90	R\$ 75.555,00		R\$ -	R\$ -	-
	Iceberg lettuce <i>in natura</i>	Unit	2050	R\$ 2,60	R\$ 5.330,00	R\$ 1,80	R\$ 3.690,00	-R\$ 1.640,00	30,77
	Crispleaf lettuce <i>in natura</i>	Unit	2050	R\$ 2,60	R\$ 5.330,00	R\$ 1,80	R\$ 3.690,00	-R\$ 1.640,00	30,77
	Butterhead lettuce <i>in natura</i>	Unit	2050	R\$ 2,30	R\$ 4.715,00	R\$ 1,70	R\$ 3.485,00	-R\$ 1.230,00	26,09
	Cavendish banana <i>in natura</i>	Kg	1450	R\$ 3,10	R\$ 4.495,00	R\$ 1,94	R\$ 2.813,00	-R\$ 1.682,00	37,42
Banana <i>prata in natura</i>	Kg	1450	R\$ 3,50	R\$ 5.075,00	R\$ 3,32	R\$ 4.814,00	-R\$ 261,00	5,14	
Biscoito amanteigado sabor coco	500g	1500	R\$ 11,48	R\$ 17.220,00		R\$ -	R\$ -	-	
Calabrese broccoli <i>in natura</i>	Bunch	1300	R\$ 3,00	R\$ 3.900,00	R\$ 4,44	R\$ 5.772,00	R\$ 1.872,00	48,00	
Green onion <i>in natura</i>	Bunch	640	R\$ 2,70	R\$ 1.728,00	R\$ 2,36	R\$ 1.510,40	-R\$ 217,60	12,59	
Green onion and parsley <i>in natura</i>	120g Bunch	640	R\$ 2,70	R\$ 1.728,00	R\$ 2,63	R\$ 1.683,20	-R\$ 44,80	2,59	
Cauliflower <i>in natura</i>	Bunch	750	R\$ 3,50	R\$ 2.625,00	R\$ 5,10	R\$ 3.825,00	R\$ 1.200,00	45,71	
Collard <i>in natura</i>	Bunch	4100	R\$ 2,50	R\$ 10.250,00	R\$ 1,95	R\$ 7.995,00	-R\$ 2.255,00	22,00	
Jar of fruit jam	700g	380	R\$ 13,00	R\$ 4.940,00		R\$ -	R\$ -	-	
Creamy fig jam	700g	280	R\$ 15,50	R\$ 4.340,00		R\$ -	R\$ -	-	
Sugar-coated peanuts	220g	720	R\$ 3,35	R\$ 2.412,00		R\$ -	R\$ -	-	
Chocolate-coated peanuts	220g	520	R\$ 3,75	R\$ 1.950,00		R\$ -	R\$ -	-	
Mint <i>in natura</i>	Bunch	170	R\$ 2,50	R\$ 425,00		R\$ -	R\$ -	-	
Mint <i>in natura</i>	Kg	650	R\$ 2,40	R\$ 1.560,00	R\$ 1,40	R\$ 910,00	-R\$ 650,00	41,67	
Zucchini <i>in natura</i>	Kg	1150	R\$ 2,50	R\$ 2.875,00	R\$ 1,30	R\$ 1.495,00	-R\$ 1.380,00	48,00	
Sweet potato	Kg	1950	R\$ 3,99	R\$ 7.780,50	R\$ 3,50	R\$ 6.825,00	-R\$ 955,50	12,28	
Cassava <i>in natura</i> (clean)	Kg	900	R\$ 5,99	R\$ 5.391,00		R\$ -	R\$ -	-	
Corn <i>in natura</i>	kg	1700	R\$ 10,87	R\$ 18.479,00	R\$ 15,16	R\$ 25.772,00	R\$ 7.293,00	39,47	
Hot dog bun	Kg	1100	R\$ 1,99	R\$ 2.189,00	R\$ 2,30	R\$ 2.530,00	R\$ 341,00	15,58	
IGUAÇU VALLEY	Cabbage <i>in natura</i>	700g	380	R\$ 14,60	R\$ 5.548,00		R\$ -	R\$ -	-
	Creamy mandarin orange jam	700g	280	R\$ 14,60	R\$ 4.088,00		R\$ -	R\$ -	-
	Banana and Orange Jam	700g	380	R\$ 15,30	R\$ 5.814,00		R\$ -	R\$ -	-
	Strawberry jam	700g	480	R\$ 18,00	R\$ 8.640,00		R\$ -	R\$ -	-

APPENDIX I – GOVERNMENT PROCUREMENT ANALYSIS (2021)

	Product	Unit	Quantity purchased by PAA in 2021	PAA Value	Total PAA Value	Bidding Value	Total Bidding Value	Difference between the values in R\$	Difference between the amount paid in the PAA and the bidding process
	Chard in natura	Kg	650	R\$ 3,99	R\$ 2.593,50	R\$ 2,95	R\$ 1.917,50	-R\$ 676,00	26,07
	Calabrese broccoli	Kg	950	R\$ 3,99	R\$ 3.790,50	R\$ 16,12	R\$ 15.314,00	R\$ 11.523,50	304,01
	Kabocha squash	Kg	220	R\$ 3,13	R\$ 688,60	R\$ 19,30	R\$ 4.246,00	R\$ 3.557,40	516,61
	Chayote in natura	Kg	900	R\$ 3,17	R\$ 2.853,00		R\$ -	R\$ -	-
	Moganga pumpkin in natura	Kg	300	R\$ 3,17	R\$ 951,00	R\$ 8,80	R\$ 2.640,00	R\$ 1.689,00	177,60
	Okra in natura	Kg	270	R\$ 4,47	R\$ 1.206,90		R\$ -	R\$ -	-
	Corn in natura, peeled	Kg	680	R\$ 6,48	R\$ 4.406,40		R\$ -	R\$ -	-
	Fruit pulp, frozen, 1 kg	Kg	400	R\$ 17,00	R\$ 6.800,00	R\$ 14,21	R\$ 5.684,00	-R\$ 1.116,00	16,41
	Chocolate cake, 60g, with toppings	Unit	553	R\$ 1,80	R\$ 995,40		R\$ -	R\$ -	-
	Corn cake, 60g, with toppings	Unit	553	R\$ 1,80	R\$ 995,40		R\$ -	R\$ -	-
	Carrot cake, 60g, with toppings	Unit	554	R\$ 1,80	R\$ 997,20		R\$ -	R\$ -	-
	Coconut cookie, 500g plastic package.	Unit	1200	R\$ 11,97	R\$ 14.364,00		R\$ -	R\$ -	-
	Chocolate and coconut cookies, 500g package.	Unit	720	R\$ 12,95	R\$ 9.324,00		R\$ -	R\$ -	-
	Cookie with syrup and coconut, 500g package.	Unit	720	R\$ 12,95	R\$ 9.324,00	R\$ 5,90	R\$ 4.248,00	-R\$ 5.076,00	54,44
	Polvilho cookie, without filling, 100g package, salty	Unit	840	R\$ 5,44	R\$ 4.569,60		R\$ -	R\$ -	-
	Homemade cookie, with chocolate coating, 500g package	Unit	1100	R\$ 12,95	R\$ 14.245,00		R\$ -	R\$ -	-
	Whole wheat sliced bread, 500g package	Unit	460	R\$ 6,27	R\$ 5.957,00	R\$ 1,30	R\$ 598,00	-R\$ 5.359,00	89,96
	Sliced bread, 500g package	Unit	900	R\$ 6,27	R\$ 5.643,00	R\$ 1,60	R\$ 1.440,00	-R\$ 4.203,00	74,48
	Traditional hamburger bun, Package with 6 units, 480g	Unit	1260	R\$ 5,45	R\$ 7.900,20	R\$ 1,50	R\$ 1.890,00	-R\$ 6.010,20	76,08
	Hot dog bun, 80g.	Kg	1460	R\$ 11,95	R\$ 7.957,00	R\$ 2,10	R\$ 3.066,00	-R\$ 4.891,00	61,47
	Cake, mixed with black, white and red dough. Weight 500g.	Unit	170	R\$ 23,95	R\$ 2.031,50		R\$ -	R\$ -	-
	Cake, cornmeal flavor. Weight 500g.	Unit	170	R\$ 8,67	R\$ 4.071,50		R\$ -	R\$ -	-
	Cake, tingling type, Weight 500g.	Unit	170	R\$ 23,95	R\$ 1.473,90		R\$ -	R\$ -	-
	Crumb cake, no filling, Weight 500g	Unit	370	R\$ 7,95	R\$ 2.941,50	R\$ 12,50	R\$ 4.625,00	R\$ 1.683,50	57,23
	Pork ribs in natura	Kg	1240	R\$ 19,90	R\$ 24.676,00		R\$ -	R\$ -	-
	Pork feet in natura	Kg	840	R\$ 11,00	R\$ 9.240,00		R\$ -	R\$ -	-
	Pork loin in natura	Kg	660	R\$ 21,90	R\$ 14.454,00		R\$ -	R\$ -	-
	Bacon piece, smoked	Kg	2250	R\$ 24,90	R\$ 56.025,00	R\$ 22,40	R\$ 50.400,00	-R\$ 5.625,00	10,04
	Tuscan sausage	Kg	330	R\$ 17,90	R\$ 5.907,00	R\$ 13,90	R\$ 4.587,00	-R\$ 1.320,00	22,35
	Egg, middle-sized	Carton	4500	R\$ 5,88	R\$ 26.460,00	R\$ 5,76	R\$ 25.938,00	-R\$ 522,00	1,97
	Salami	Kg	3060	R\$ 33,80	R\$ 103.428,00		R\$ -	R\$ -	-
	Milk jam, 700 g	Unit	420	R\$ 18,15	R\$ 7.623,00	R\$ 3,30	R\$ 1.386,00	-R\$ 6.237,00	81,82
	Mandarin orange jam, 700g.	Unit	280	R\$ 17,53	R\$ 4.557,80	R\$ 3,30	R\$ 858,00	-R\$ 3.699,80	81,18
	Strawberry and milk jam, 700g.	Unit	470	R\$ 21,52	R\$ 10.114,40		R\$ -	R\$ -	-
	Hazelnut jam, 700g.	Unit	460	R\$ 24,95	R\$ 11.477,00		R\$ -	R\$ -	-
	Peanut candy with condensed milk, weighing 50g.	Unit	420	R\$ 28,60	R\$ 12.012,00	R\$ 25,29	R\$ 10.621,80	-R\$ 1.390,20	11,57
	Brigadeiro, 30g.	Unit	1300	R\$ 0,79	R\$ 1.027,00		R\$ -	R\$ -	-
	Sugar-coated peanuts, 200g.	Unit	820	R\$ 5,45	R\$ 4.469,00	R\$ 1,94	R\$ 1.590,80	-R\$ 2.878,20	64,40
	Peanuts coated with sugar and coffee, 200g	Unit	320	R\$ 5,45	R\$ 1.744,00		R\$ -	R\$ -	-
	Peanuts coated with sugar and coconut, 200g	Unit	320	R\$ 5,45	R\$ 1.744,00	R\$ 1,80	R\$ 576,00	-R\$ 1.168,00	66,97
	Peanuts coated with sugar and chocolate, 200g.	Unit	1020	R\$ 5,45	R\$ 5.559,00	R\$ 1,80	R\$ 1.836,00	-R\$ 3.723,00	66,97
	Honey in natura, 500ml	Unit	260	R\$ 17,90	R\$ 4.654,00	R\$ 13,00	R\$ 3.380,00	-R\$ 1.274,00	27,37
	Honey in natura, 1 kg	Unit	262	R\$ 34,00	R\$ 8.908,00		R\$ -	R\$ -	-
	Fruit popsicle, 45g	Unit	1700	R\$ 0,90	R\$ 1.530,00	R\$ 3,32	R\$ 5.644,00	R\$ 4.114,00	268,89
	Pasteurized milk popsicles, flavors (cream, condensed milk, green corn, coconut, chocolate, papaya, kiwi, banana, acerola)	Unit	1850	R\$ 1,50	R\$ 2.775,00		R\$ -	R\$ -	-
	Frozen green banana biomass, packed with 1 Kg	Unit	25	R\$ 20,00	R\$ 500,00	R\$ 4,44	R\$ 111,00	-R\$ 389,00	77,80
	Dried banana, 500g	Unit	124	R\$ 10,00	R\$ 1.240,00	R\$ 2,36	R\$ 292,64	-R\$ 947,36	76,40
	Dried banana with chocolate, 500g	Unit	124	R\$ 15,00	R\$ 1.860,00	R\$ 2,63	R\$ 326,12	-R\$ 1.533,88	82,47
	Banana candy (banana and sugar), 500g.	Unit	124	R\$ 10,00	R\$ 1.240,00	R\$ 5,10	R\$ 632,40	-R\$ 607,60	49,00
	Salted banana chips, chimichurri flavor, 70g.	Unit	170	R\$ 2,87	R\$ 487,90	R\$ 1,95	R\$ 331,50	-R\$ 156,40	32,06
	Banana chips, salty, lemon pepper flavor, 70 g.	Unit	170	R\$ 2,87	R\$ 487,90		R\$ -	R\$ -	-
	Banana chips, sweet, sugar and cinnamon flavor, 70 g.	Unit	170	R\$ 2,87	R\$ 487,90		R\$ -	R\$ -	-
	Yogurt, pasteurized, whole, with fruit pulp, coconut flavor, 1 liter	L	700	R\$ 5,15	R\$ 3.605,00		R\$ -	R\$ -	-
	Yogurt, pasteurized, whole, with fruit pulp, strawberry flavor, 1 liter	L	700	R\$ 5,15	R\$ 3.605,00		R\$ -	R\$ -	-
	Yogurt, pasteurized, whole, with fruit pulp, peach flavor, 1 liter	L	700	R\$ 5,15	R\$ 3.605,00		R\$ -	R\$ -	-
	Milk, pasteurized, whole, 1 liter	L	1200	R\$ 3,98	R\$ 4.776,00	R\$ 1,40	R\$ 1.680,00	-R\$ 3.096,00	64,82
	Minas cheese, pasteurized, colonial, packed.	Kg	640	R\$ 30,00	R\$ 19.200,00		R\$ -	R\$ -	-
	Minas cheese, colonial, packed.	Kg	510	R\$ 30,00	R\$ 15.300,00		R\$ -	R\$ -	-
	Coalho cheese, on the skewer, colonial, 500g	Unit	410	R\$ 20,00	R\$ 8.200,00		R\$ -	R\$ -	-
	Homemade ricotta cheese	Kg	90	R\$ 18,80	R\$ 1.692,00	R\$ 15,16	R\$ 1.364,40	-R\$ 327,60	19,36
	Homemade ricotta cheese, ricotta pâté type, with added spices and natural seasonings (natural ricotta cheese, natural yogurt, tomatoes, carrots, olives and seasonings)	Kg	30	R\$ 27,00	R\$ 810,00		R\$ -	R\$ -	-
	Spaghetti pasta, 500g.	Unit	110	R\$ 5,15	R\$ 566,50		R\$ -	R\$ -	-
	Ditalini pasta, 500g.	Unit	110	R\$ 5,15	R\$ 566,50		R\$ -	R\$ -	-
	Fusilli pasta, 500g.	Unit	610	R\$ 5,20	R\$ 3.172,00		R\$ -	R\$ -	-
	Rigatoni pasta, 500g.	Unit	110	R\$ 5,15	R\$ 566,50		R\$ -	R\$ -	-
	Whole grain ditalini pasta, 500g.	Unit	60	R\$ 6,20	R\$ 372,00		R\$ -	R\$ -	-
	Whole grain fusilli pasta, 500g.	Unit	110	R\$ 7,20	R\$ 792,00		R\$ -	R\$ -	-
	Whole grain fusilli pasta, enriched with carrot, 500g.	Unit	110	R\$ 7,20	R\$ 792,00		R\$ -	R\$ -	-
	Whole grain fusilli pasta, enriched with beet, kabocha and c	Unit	110	R\$ 7,20	R\$ 792,00		R\$ -	R\$ -	-
	Whole grain pasta, spaghetti or fettuccini, 500g.	Unit	110	R\$ 6,86	R\$ 754,60		R\$ -	R\$ -	-

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ANNEX A – COAT OF ARMS OF THE STATE OF PARANÁ

