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ANÁLISE DA CADEIA DE VALOR DO TABACO - O CASO DOS PRODUTORES DA REGIÃO SUDOESTE DO ESTADO DO PARANÁ

TOBACCO VALUE CHAIN ANALYSIS – THE CASE OF PRODUCERS IN THE SOUTHWEST REGION OF THE STATE OF PARANÁ

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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 Dr. Claudio Antonio Rojo

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ANDREA MARIZE WESCHENFELDER PAEZE

Análise da cadeia de valor do tabaco - o caso dos produtores da região Sudoeste do estado do Paraná

Dissertação apresentada ao Programa de Pós-Graduação em Administração em cumprimento parcial aos requisitos para obtenção do título de Mestra em Administração, área de concentração Competitividade e Sustentabilidade, linha de pesquisa Estratégia e Competitividade, APROVADO(A) pela seguinte banca examinadora:

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Cascavel, 30 de junho de 2022

To my children, Helen and Franki, my inspiration to be better every day. I love you!

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RESUMO

Paeze, A. M.W. (2022). Análise da cadeia de valor do tabaco: o caso dos produtores da região Sudoeste do Estado do Paraná. 2022. 87f. Dissertação (Programa de Pós-Graduação em Administração (PPGA) – Mestrado Profissional) - Universidade Estadual do Oeste do Paraná, Cascavel

O objetivo do estudo é analisar a cadeia de valor do tabaco da região Sudoeste do Estado do Paraná. O método proposto para a pesquisa foi dividido em duas partes: uma primeira etapa de natureza exploratória qualitativa e uma segunda etapa de natureza descritiva. As informações sobre os parâmetros populacionais foram obtidas realizando um censo que envolveu a enumeração completa dos elementos da pesquisa, sendo composta por duzentos e quarenta e cinco produtores de tabaco, distribuídos nos vinte oito municípios da região Sudoeste do Estado do Paraná. Com os dados obtidos nas entrevistas de roteiro semiestruturado e questionários aplicados individualmente nas propriedades, elaborou-se uma análise específica das características da cadeia de valor do tabaco contida nesse território. Os resultados do estudo identificaram como está estruturada a competitividade da cadeia de valor do tabaco na região da pesquisa. As informações resultantes facilitam o entendimento dos fatores intervenientes na cadeia do tabaco e identificam perspectivas para melhorar o desempenho na integração entre a questão sustentabilidade e a economia a fim de perpetuar a produção na região. Conclui-se que, correlacionando as variáveis de competitividade e os intervenientes da cadeia do tabaco, é possível refletir sobre as perspectivas quanto ao futuro da cadeia em questão e buscar compreender o papel do tabaco nas unidades de produção, bem como sua importância na renda familiar.

Palavras-chave: Competitividade. Stakeholders. Cadeia de valor. Tabaco. Produtores.

ABSTRACT

Paeze, A.M.W. (2022). Analysis of the tobacco value chain: the case of producers in the Southwestern region of the state of Paraná. 2022. 77p. Dissertation (Postgraduate Program in Administration (PPGA) - Professional Master's Degree – Western Paraná State University, Cascavel/PR, Brazil.

This study aims to analyze tobacco's value in the Southwest region of Paraná State. The research method was divided into two stages: the first stage was of qualitative exploratory nature and the second stage was descriptive. The information about the populational parameters was obtained through a census involving the complete enumeration of the research elements. It was composed of two hundred forty-five tobacco producers distributed in the twenty-eight cities of the Southwest region of Paraná State. With the data obtained in the semi-structured script and questionnaires, a specific analysis of the characteristics of the value chain of tobacco contained in this territory was elaborated. The study results have identified how the competitivity of the tobacco value chain in the research region is structured. The resultant information has facilitated the understanding of intervening factors in the tobacco chain and identified perspectives to improve the integration performance between sustainability matters and the economy to perpetuate the region's production. It was concluded that by correlating the competitivity variables and the stakeholders of the tobacco chain, it is possible to reflect upon the perspectives for the future of the chain in question and seek to understand the role of tobacco in the production units and its importance in the household income.

Keywords: Competitivity. Stakeholders. Value chain. Tobacco. Tobacco producers.

LIST OF FIGURES

Figure 1 Value Chain	21
Figure 2 Tobacco Supply Chain	24
Figure 3 Gender of tobacco producers in the Southwest region of the state of Paraná	36
Figure 4 Race or color of tobacco farmers in the Southwestern region of the state of Paraná	36
Figure 5 Age of tobacco producers in the Southwest region of the state of Paraná	37
Figure 6 Education of tobacco producers in the Southwest region of the state of Paraná	37
Figure 7 Owned or leased properties	38
Figure 8 Paid-off and financed properties	38
Figure 9 Tobacco production area	39
Figure 10 Property Residents	39
Figure 11 Residents involved in tobacco activity	40
Figure 12 Women in tobacco activity	40
Figure 13 Employees in tobacco activity	41
Figure 14 Main crop on the farm	41
Figure 15 Second main crop on the farm	42
Figure 16 Third main crop on the farm	42
Figure 17 Sources of income of the farm residents	43
Figure 18 Type of residence construction	44
Figure 19 Energy source in the residences	44
Figure 20 Source of drinking water consumed in the residences	45
Figure 21 Internet access at residences	45
Figure 22 Forms of communication and entertainment in the residences	46
Figure 23 Forms of paving of access roads to the residences	46
Figure 24 Main means of transporting of the residents	47
Figure 25 Public recyclable waste collection service	47
Figure 26 Forms of disposing of organic waste at the properties	48
Figure 27 Type of medical care used by producers	48
Figure 28 Rural housing program	49
Figure 29 Financing of assets on properties	49
Figure 30 Financing for tobacco production	50
Figure 31 Environmental sustainability activities on the properties	50
Figure 32 Tobacco activity improvement	51

Figure 33 Working method in soil preparation for planting	51
Figure 34 Working method for planting	52
Figure 35 Working method for tobacco harvesting	52
Figure 36 Types of warehouses for handling tobacco	53
Figure 37 Association to AFUBRA	53
Figure 38 Association to unions	54
Figure 39 Integrated Tobacco Production System	54
Figure 40 Sales to the Integrated Tobacco Production System	55
Figure 41 Relevant factors for continuing in business	55
Figure 42 Relevant factors for not continuing in business	56
Figure 43 Level of satisfaction of producers with quality of life in the business	56
Figure 44 Prospects of permanence of the producers in the tobacco business	57

LIST OF TABLES

Table 1 Evolution of tobacco production in Brazil	28
Table 2 Brazilian tobacco importing countries	29
Table 3 Burnt/Fueled Tobacco Products	30
Table 4 Smokeless tobacco products	31
Table 5 Heated/steamed tobacco products	31
Table 6 Average production profitability	57

LIST OF ACRONYMS AND ABBREVIATIONS

AFUBRA:	Tobacco Growers' Association of Brazil
ANEEL:	Brazilian National Electric Energy Agency
ANVISA:	Brazilian Health Regulatory Agency
ARIAS:	Association of Agricultural Input Dealers in the Southwest of Paraná
BAT:	British American Tobacco
BNDES:	Brazilian Development Bank
CAR:	Environmental Rural Registry
CDE:	Energy Development Account
CNA:	Brazilian Agriculture and Livestock Confederation
CONTAG:	National Confederation of Agricultural Workers
FETAG/RS:	Federation of Agricultural Workers of Rio Grande do Sul
FETRAF:	Federation of Workers in Family Farming
FIEP:	Paraná State Industry Federation
GDP:	Gross Domestic Product
IBGE:	Brazilian Institute of Geography and Statistics
IPI:	Tax on Industrialized Products
ITPS:	Integrated Tobacco Production System
JTI:	Japan Tobacco International
MAPA:	Ministry of Agriculture, Livestock and Supply
MH:	Ministry of Health
MPA:	Movement of Small Farmers
OGU:	General Union Budget
PMI:	Philip Morris International
PRONAF:	National Program for the Strengthening of Family Farming
SEAD:	Secretariat of Administration
SEAB:	Paraná State Department of Agriculture and Supply
SINIMA:	National Environmental Information System
SINDITABACO:	Union Interstate Tobacco Industry
SNVS:	Brazilian Health Regulatory System
SUS:	Unified Health System
WHO:	World Health Organization

TABLE OF CONTENTS

1	INTRODUCTION	14
1.1	RESEARCH PROBLEM	16
1.2	RESEARCH QUESTION	16
1.3	OBJECTIVES	17
1.3.1	General	17
1.3.2	Specific	17
1.4	JUSTIFICATION AND CONTRIBUTION OF TECHNICAL PRODUCTION	17
1.5	DISSERTATION STRUCTURE	19
2	THEORETICAL AND PRACTICAL REFERENCES	20
2.1	VALUE CHAIN	20
2.2	TOBACCO IN THE PRODUCER'S VALUE CHAIN	22
2.3	SUPPLY CHAIN	23
2.4	COMPETITIVENESS OF THE TOBACCO INDUSTRY	25
2.5	MARKET FOR TOBACCO AND ITS DERIVATIVES	29
2.6	TOBACCO AS ALTERNATIVE SOURCES	31
3	RESEARCH METHOD AND TECHNIQUES	33
3.1	RESEARCH DESIGN	33
3.1.1	Exploratory and Qualitative Research	33
3.1.2	Descriptive Research	33
3.2	DATA COLLECTION PROCEDURES	34
3.3	DATA ANALYSIS PROCEDURES	35
3.3.1	Identification of producers and farms	35
3.3.2	Main profitable activities on the farms	41
3.3.3	Socioeconomic aspects of producers and properties	43
3.3.4	Analysis of the intervening structure	48
3.3.5	Entity data	53
3.3.6	Perspectives with the activity	55
3.4	PROCEDURES FOR INTERPRETATION OF RESULTS	58
4	FINAL CONSIDERATIONS	70
REFE	RENCES	74

1 INTRODUCTION

The world population will grow to 10 billion people by the year 2050 in an accelerating economic scenario driven by demand and the development of agricultural technologies. This increase develops as agricultural technology evolves (SKOWRONSKA and FILIPEK, 2013).

Brazil leads the world trade ranking for important agricultural and livestock products: coffee, sugar, orange juice, soybeans, chicken meat, beef, tobacco, and cellulose. The sector's efficiency is reflected in its economic performance: the agribusiness GDP (Gross Domestic Product) reached a share of 27.4% of the national GDP (IBGE, 2021).

Given the competitive scenario of agribusiness, Brazil has led, since the 1990s, the exports of tobacco (*nicotiana tabacum*), already characterized as one of the largest Brazilian commodities. Brazil is the world's second largest producer of tobacco. Its harvest in 2019/2020 moved R\$ 5,600 billion of active *reais*, with 633,000 tons of dry tobacco produced, in a total area of 290,397 hectares planted and 146,430 producing families (AFUBRA, 2020).

In 2020, Brazil was positioned as the largest exporter of tobacco in the world, with 90% of the production concentrated in the southern region of the country. The tobacco production chain is articulated by five large multinational companies that operate in the processing and commercialization of tobacco in Brazil: BAT (Souza Cruz), Phillip Morris International, Alliance One, Universal Leaf Tobacco, and JTI Associated Companies. The tobacco chain comprises several agents with direct participation in production processes: industries and traders that supply inputs, farmers, processing companies, cigarette manufacturers, exporters, and traders of tobacco products to consumers (AFUBRA, 2020).

Over the years, tobacco has proven to be the crop that provides the highest gross income on properties. It occupies family labor because its production is almost exclusively done on small farms. The socioeconomic importance of tobacco farming favors a greater acceptance of the activity and minimizes the opponents of productive integration (MENGEL & AQUINO, 2017). The economic and social importance of tobacco for thousands of families in Southern Brazil and tobacco-growing territories does not imply, however, the absence of criticism of this crop (HILSINGER, 2016).

The increased concern with public health worldwide has caused, as a consequence, the progressive development of regulations around tobacco and its derivatives (ZOROVICH *et al.*, 2017). Even in an impeditive environment, tobacco corporations seek to intensify their domains through articulated strategies, maintaining and creating new spaces even in the face of popular anti-smoking pressure and measures restricting consumption. Thus, the tobacco industry has

managed to deal with the difficulties generated by policies to combat smoking (WEISS & SANTOS, 2015).

Given the critical scenario in the industry, tobacco corporations have started investing in research and development, engaging farming systems in environmental sustainability programs in order to target traceability operations in their production chain to provide cohesive information regarding the production of primary goods (SHOBRI, SAKIP, and OMAR, 2016).

The concept of production chain was developed as an instrument for a systemic view of the players, in which the flows of materials, capital and information are represented by a system that supplies the needs of the final consumer (CASTRO, 2002). The market and nonmarket links interconnect the agents that make up the productive chain forming the basis of the organizational and institutional structure; this produces value in the form of products and services to the final consumer (CARVALHO JUNIOR, 1995). The production chains are the sum of all the production and commercialization operations that form the basis of the final product (BATALHA, 1997).

Historically, agriculture in Paraná is one of the main economic activities of the state. The use of advanced agronomic techniques puts this state in the limelight regarding productivity (SEAD, 2020). Data from the Ministry of Agriculture confirmed the success of Paraná's agribusiness, which participates with 33.9% of the country's GDP, corresponding to R\$ 142.2 billion. Paraná's agricultural and livestock GDP increased 15% between 2019 and 2020; the state consolidated itself as the second that generates the most wealth in the countryside throughout Brazil (IBGE, 2021).

Tobacco production is the economic base for several Paraná producers; the tobacco production chain contributes to the development of the state. The Tobacco Growers' Association of Brazil (AFUBRA) presented data from the 2019/2020 harvest, which moved R\$1,507 billion in assets, with 174,181 tons of dry tobacco produced in a total area of 74,538 hectares planted and 29,160 producing families.

The tobacco production in the southwest region of the state of Paraná was presented in a study for decision-making in the reconversion of tobacco growing in alternative income, compatible with that achieved with tobacco, such as dairy production and poultry integration (PERONDI *et al.*, 2009). The study showed that income is not the only parameter to be considered among families who would like to change activity; obtaining a better quality of life was one of the factors considered necessary by the families surveyed.

In the existing literature, there is a scarcity of studies that address the current socioeconomic condition of producers located in its area of jurisdiction and that relate to the

changes that occur in the tobacco production chain and, especially, in the development of small farmers involved in tobacco cultivation in the Southwest region of the state of Paraná. This study seeks to understand the role of tobacco in the production units and its importance in family income. For the accomplishment, producers of that region were selected. Therefore, the present work aims to analyze the tobacco value chain in the Southwest region of the state of Paraná.

1.1 RESEARCH PROBLEM

According to the activity reports, there are two main problems in the tobacco value chain: first, its poor level of efficiency given the constant concerns of government agencies regarding the harm caused by smoking; second, the search for alternatives to producers that can boost the diversification of productive activities, on small properties, replacing tobacco cultivation with other crops (AFUBRA, 2020).

Through articulated strategies even in an impeding environment, tobacco corporations seek to intensify their domination, maintenance, and creation of new spaces, even though, in the face of popular anti-smoking pressure and measures restricting consumption, the sector is managing to deal with the difficulties generated. Additionally, it is observed that there is a weak power of self-financing and difficulty in access to financing in the tobacco production activity, which somehow limits the investment capacity in the sector.

The agricultural activity of tobacco, especially on small farms, presents a set of deficiencies in its planting, processing, and marketing components, causing most farmers not to invest in their production with a business vision to seek to improve their income and generate wealth significantly. This lack of investment is also a result of the low level of training and poor economic knowledge and financial education techniques on the part of producers.

The gap this research intends to fill is presented on the need to analyze the tobacco value chain in the southwest region of the state of Paraná to facilitate an understanding of the current competitiveness of the activity. In addition, it aims to consider the importance of the activity for the local economy aggregated to the producing families. One can also perceive the need to investigate the intervening factors in developing this chain.

1.2 RESEARCH QUESTION

For the preparation of this dissertation, the following starting question was adopted:

How is the tobacco value chain structured in the Southwest region of the state of Paraná?

1.3 OBJECTIVES

1.3.1 General

Analyze the tobacco value chain in the Southwest region of the state of Paraná.

1.3.2 Specific

- a) To present an overview of the socioeconomic aspects of tobacco cultivation in the Southwestern region of the state of Paraná;
- b) To know the intervening factors in the development of the tobacco value chain in the Southwestern region of the state of Paraná;
- c) To identify how the competitiveness of the tobacco value chain is structured in the Southwest region of the state of Paraná.

1.4 JUSTIFICATION AND CONTRIBUTION OF TECHNICAL PRODUCTION

The plant *nicotiana tabacum* (tobacco) has its origin thought to be in the Valleys of the Bolivian Andes, brought by indigenous migrations to the Brazilian territory. The insertion and cultivation of the plant in the three Brazilian southern states (Rio Grande do Sul, Santa Catarina, and Paraná) were spread by German immigrants due to the excellent availability of labor in those regions (DUTRA & HILSINGER, 2013).

From 1918 onwards, Brazilian tobacco growing became an essential socio-economic activity for the South Brazilian region. The states of Rio Grande do Sul, Santa Catarina, and Paraná represent about 90% of Brazilian tobacco production, and the rest is grown in the states of Alagoas, Paraíba, Bahia, Ceará, and São Paulo. The concentration of production is justified by the tradition of European peoples with the culture of tobacco, climatic conditions, favorable soils, and the economic income that the crop provides in small properties.

The interest in addressing this issue is due to the relevance of the tobacco sector for the economy of the country's southern region. The Brazilian tobacco grower is an individual who generally owns little land or small property, often a tenant or sharecropper (an individual who does not own land). Within this principle, and according to AFUBRA data, the tobacco grower owns, on average, only 15.3 hectares of land. This condition no longer allows, for example, soybean cultivation, which necessarily requires mechanization and a more significant extension of land.

The Federal and State governments are searching for other activities that can substitute and reduce the tobacco crop. For this, it is necessary to know the profile of the tobacco grower and then be able to elaborate strategies to change the activity's life cycle or even its substitution. However, the process is slow since implementing a new activity takes time and demands resources, technical assistance, and persistence to achieve satisfactory economic results.

Paraná was one of the first states to initiate movements in the fight for diversification, reduction, or complete substitution of tobacco planting for other activities. However, despite the efforts of various entities linked to public health in the fight against smoking, there is continuous growth in the area of tobacco plantations in Paraná. Paraná's tobacco production ranks 3rd in the national ranking, and its growth rate has been continuous during the last 10 years (SEAD, 2020).

In the Southwest region of Paraná, the incentive to crop diversification and financial aid for producers seeking income alternatives have not been topics of interest to the public authorities, bringing the full responsibility to the producer, who reestablishes tobacco integration, considering the high investments required on the property to diversify production (AFUBRA, 2019).

Agriculture in the Paraná region addressed in this study is considered the main economic generator in all 42 cities of that region; according to data from the Environmental Rural Registry (CAR) of the National Environmental Information System (SINIMA), 59,114 rural properties are registered (FIEP, 2019). In the year 2021, the Southwest region centralized its cultivation in 28 cities, with an estimation of 245 tobacco producers (AFUBRA, 2022). The mechanization of the field, aging, rural exodus and the issue of labor charges are pointed out as factors that discourage the continuity of tobacco production, making it difficult to find the labor for the production chain (IBGE, 2020).

The choice of tobacco for this study is justified by its economic and social importance for producers in the region where the product has still been the crop that provides the highest gross income to the properties. This is because the producer does not envision, in the short term, sustainable conditions for diversification or replacement by other crops (AFUBRA, 2019). The properties are characterized by intensive family labor in tobacco cultivation. The employment of family members generates a factor of competitiveness and sustainability of small properties. Agricultural research, production planning, personalized technical assistance, and guaranteed product purchase guarantee the small grower a higher income than other products. Because of these advantages, most small producers prefer to continue in this activity.

The value chain analysis intends to identify how the competitiveness of the tobacco value chain is structured in the research region, seeking to facilitate the understanding of the factors intervening in the tobacco chain and to identify perspectives for improving performance in the integration between the sustainability issue and the economy, in order to perpetuate production in the region.

Thus, given the above, this study is relevant because it allows us to reflect on the perspectives regarding the future of the chain in question.

1.5 DISSERTATION STRUCTURE

The present research is structured as follows: in the first chapter, an introduction to the work is made in order to contemplate the problem and the research question, the general and specific objectives, the theoretical and practical justification for conducting this research, in addition to the structuring of the work. In the second chapter of the work, the theoretical framework is approached, subdivided into six parts which deal with the analysis of the value chain, the tobacco in the producer value chain, the study of the supply chain, the competitiveness of the tobacco sector, the market of tobacco and its derivatives, and the alternative sources of tobacco. The third chapter of the paper concerns the methodological aspects employed in carrying out the study.

Chapter four analyzes and interprets the research results; this chapter is subdivided into three parts, which correspond to each specific research objective. The fifth chapter discusses the work's final considerations. Following this, the bibliographical references are presented, and the Appendix contains the questionnaire applied in the research.

2 THEORETICAL AND PRACTICAL REFERENCES

This chapter presents the theoretical framework about:

2.1 VALUE CHAIN

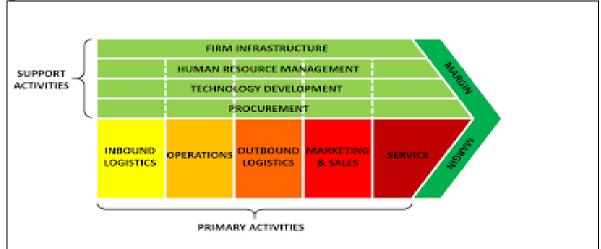
Adaptations to the market demand constant changes and transformations from organizations. The intrinsic activities of the organization create a value chain when something is added to the product or service (DALL VESCO *et al.*, 2014). Each organization has a specific value chain, a sequence of activities that create its goods or services. The activities are related through links, which can be defined as the relationships between how one value activity is performed and the cost or performance of another (PORTER, 1989).

Companies perform activities to design, produce, market, deliver, and sustain their product, which can be demonstrated through their value chain (PORTER, 1989). Companies must increasingly know the entire chain of their product since they seek to add maximum value to the customer. Activities are the pillars of competitive advantage building, being consumers of resources on the one hand and creators of value on the other (PORTER, 1991).

The value chain can be understood as a business performance set that adds value to the organization's products (GADELHA *et al.*, 2019). Creating value is important for a company to gain a competitive advantage and make better strategic choices. To map the value chain of a product, one must identify the value activities that are part of its production process, from raw material acquisition to the delivery of its final product to the customer.

The value chain demonstrates the flow of processes and represents a system of organizational values and information, in which the values represent the amount that consumers are willing to pay for what the company offers them. The value chain can represent the history of the organization, the strategies, the methods of implementing the strategies, and the basic economics of the activities (VARGAS *et al.*, 2013). Business success also depends on the organization's ability to manage, efficiently and effectively, its internal activities and articulate itself externally as one of the agents that make up a given activity segment (PORTER, 1989).

The value chain is composed of leading activities and supporting activities. The main (or primary) activities refer to those involved in the physical creation of the product, its sales process, distribution, and after-sales. Support activities are those that provide support to the main activities and the activities themselves.



Source: Porter (1991)

The organization's activities must be identified, synchronized, and integrated into the value chain because they can generate information of vital importance for obtaining competitiveness, which depends exclusively on the use and application made by managers (TORRES *et al.*, 2013).

A value chain diagram allows a definition of the impacts that organizations, projects, or processes intend to achieve (what results are intended to be achieved), establish which products or services you want to deliver and what the actions are, as well as inputs required to generate the established products or services (VILHENA *et al.*, 2006).

The value chain brings advantages: greater ease of detecting threats and opportunities, strong and weak processes, and opportunities for improvement and enhancement. In fact, identifying opportunities for cost reduction and better use of existing resources is essential to achieve greater efficiency in organizations (TORRES *et al.*, 2013). The value chain presents the sets of activities performed to generate value for the beneficiaries, enabling the perception of obstacles and waste and eliminating or reducing activities and processes that do not add value.

The value chain in agriculture has already been the object of study under the analysis of the agroindustrial tobacco chain in the southern region of Brazil and the formal institutions involved (WEISS & SANTOS, 2015); on the strategic alignment in the production chain of tobacco analyzing the dynamics of the agroindustrial chain from the perspective of a strategic alliance between two trading companies (ROSALEM & MACHADO, 2008); on the analysis of the value chain in the horticultural production of tomatoes as a fundamental tool for sustainable development and poverty reduction (COSTA, 2018); on the activity of production and marketing of baskets of organic horticultural products (VIEIRA, 2016); on cost analysis

from the value chain of milk and its derivatives for the introduction of a costing system (COSTA *et al.*, 2015). Since the value chain in agriculture is a recent theme, there are few studies on this subject; about the tobacco value chain in the southwest region of the state of Paraná, studies and publications of this kind have not yet been found.

2.2 TOBACCO IN THE PRODUCER'S VALUE CHAIN

Tobacco production has a vital function in territorial development, understanding that it addresses not only "a process of production, distribution, exchange, and consumption, but also a process referring to conduct, habits, and values, individual and collective - conditioned by power relations in which individuals, groups, and social classes find themselves in a concrete geographical space" (THEIS, 2008, our translation).

Brazil's position as the second largest tobacco producer is due to factors such as the low internal costs of its production (family farming) and non-mechanized farming, which provides better quality to the product through manual care (MINISTÉRIO DA SAÚDE, 2000). On average, three to four members of each family work in tobacco farming, an average of 520,000 people working in this activity, mainly during the planting, harvesting, classification, and drying periods. The integration between producers and companies takes place through contracts, through which the industry supplies technical assistance and inputs, guarantees financing, pays for the transportation of the production, and purchases the entire contracted harvest.

Tobacco is responsible for moving 1.03% of the world GDP; consequently, it contributes to a more significant development of the producing countries due to the taxation and commercialization of tobacco and its derivatives. This result originates from the sales of the sector and the workers' productivity since the process is highly challenging to mechanize, making the presence of skilled labor essential, with consequent development of local economies (AFUBRA, 2019). The reduction in planted area in recent years, compared to the slight increase in productivity per hectare and also a trend towards mechanization, so there is a natural disposition to go towards large properties or flatter land.

Since 1991, large tobacco industries have had access to credit lines from the BNDES for tobacco production. After 2002, when the first resolution by the Brazilian central bank was implemented, restricting access to PRONAF for tobacco production, there was a substantial

increase in access to BNDES resources for tobacco production. Between 2002 and 2010, access grew by 93%, from 8 million to 116 million. After 2010, the BNDES's disbursement to the tobacco chain appears to have added to the disbursement to the food and beverage chains in sector reports (BNDES, 2021).

Over the past few years, the consumption of tobacco and its derivatives has been showing significant signs of worldwide decline; in 2015, it registered a drop of 4.4%. In addition, its derivatives, on average, showed a drop of 1.3% from 2012 to 2015, which shows the difficulty of growth of the sector as a whole in this period. Due to the critical period in the sector, the industry began to invest in research and development to get back on its feet, maintaining an average annual growth of 2% (ZOROVICH & CINTRA, 2017).

In recent decades, several control measures against tobacco have been formulated and implemented worldwide to reduce its effects on human health and the environment. In Brazil, some of these measures are the competence of the National Health Surveillance System (SNVS), such as the regulation of tobacco products, the inspection of smoke-free environments, and the inspection of prohibition of advertising, sponsorship, and publicity of tobacco products. The SNVS is an instrument available to Brazil's Unified Health System (SUS) to achieve its objective of preventing and promoting health. This system encompasses the Brazilian Health Regulatory Agency (ANVISA), the State and District Health Surveillance agencies, and the Municipal Health Surveillance agencies, with shared responsibilities (MINISTÉRIO DA SAÚDE, 2021).

2.3 SUPPLY CHAIN

In industrial organizations, competition is no longer between individual companies but between supply chains. The organization's strategic management must analyze supply chains to identify the sources of sustainable competitive advantage (FEIZ & CORDON, 2012).

The supply chain is the management and coordination of information flows and materials between the source and users as an integrated system, interconnecting each phase in the optimization in which products and materials move towards the consumer, reducing costs, promoting the assets held in the logistics flow, and seeking to maximize customer service (CHRISTOPHER, 1997). The supply chain includes manufacturers and suppliers, carriers, warehouses, retailers, and customers, so it comprises five cycles: supplier, manufacturer, distributor, retailer, and customer.

Supply chain management is defined as the integration of all processes in the chain up to the final consumer using suppliers that provide products, services, and information that add value to their clients, requiring the sharing of information by all the constituent companies. This will allow the recognition of the systemic and strategic implications of the activities involved in the flows (COOPER *et al.*, 1997).

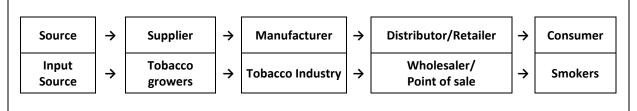
The tobacco supply chain is very complex, relevant, and socially challenged by Brazilian entities. This occurs because, besides involving activities (tobacco farming, retail, industry) in the three different economic sectors, it reaches the final consumer with a product that is widely challenged due to the health problems it has caused to its users (ETGES & FERREIRA, 2006).

The tobacco supply chain aggregates the models and activities to increase the attributions of socio-environmental responsibilities so that it can obtain additional elements to improve the management process, considering that the production and trade activities promote impacts on society and the environment. The supply chain needs to have its members acting consistently and responsibly because the negative performance of just one of these links can compromise the image and credibility of the system as a whole (SANTOS, FERRARI & GIACOMINO, 2008).

The tobacco industry is the set of organizations responsible for transforming raw tobacco into a product consumed by smokers, notably the cigarette. Besides promoting the mixture of types of tobacco, it adds elements such as filters, paper, packaging, labels, and other marketing supports, such as promotional systems. There is also the industry that processes the tobacco leaf; it would be the first tier supplier, which has an intermediary role in the supply chain (SANTOS, FERRARI & GIACOMINO, 2008).

According to Poirier & Reiter (1996), the tobacco supply chain was expressed through five links: input sources, tobacco farmers, tobacco industry, wholesalers at points of sale, and smokers.

Figure 2 Tobacco Supply Chain



Source: adapted from Poirier & Reiter (1996).

The figure presents the five links: the sources, which would be the organizations that offer the initial inputs of the production cycle; the suppliers, who would be in charge of processing the inputs to constitute them into raw materials for industrialization; the manufacturers, who would be in charge of transforming the raw materials into final products the distributors/retailers, who would be responsible for delivering the goods to consumers; and, finally, the consumers, who would evaluate and make the products marketable, and, in the goods disposal procedure, could generate inputs to feed back the production process.

2.4 COMPETITIVENESS OF THE TOBACCO INDUSTRY

Tobacco stands out in the Brazilian agro-industrial complexes for its importance as an export sector and employer for cigarette manufacturing and leaf processing. The tobacco processing industry in Brazil consists of two segments. The first is called industrial tobacco processing, which is dedicated to selling tobacco in leaves to manufacturers of cigarettes and other tobacco products, a strongly exporting segment. The second is the manufacturing of tobacco products, cigarettes, and other tobacco articles (FREITAS *et al.*, 2018).

Discussions about the effect on the health of consumers and workers and the impacts on the environment have reduced consumption throughout the tobacco chain at international levels. These political and social movements have had an impact on the way the production and distribution of tobacco are carried out. However, the industrial sector is structurally internationalized and has been constituted predominantly by global players, which has allowed a reformulation of this sector (FREITAS *et al.*, 2018).

The prominent organizations that claim to be mediators for the tobacco field are the Union Interstate Tobacco Industry (SINDITABACO), the Tobacco Growers' Association of Brazil (AFUBRA), the National Confederation of Agricultural Workers (CONTAG) through its state federations, the Federation of Workers in Family Farming (FETRAF), the Movement of Small Farmers (MPA), and the Brazilian Agriculture and Livestock Confederation (CNA). The federal government attempts to control production through the Ministry of Agrarian Development and the Ministry of Health (MENGEL, 2011).

The tobacco production chain is articulated by five large multinational companies that operate in the process of processing and commercialization of tobacco in Brazil: BAT (Souza Cruz), Phillip Morris International, Alliance One, Universal Leaf Tobacco, and JTI Associated Companies. The chain comprises several agents directly participating in the production processes: industries and traders that supply inputs, farmers, processing companies, cigaretteproducing industries, exporters, and traders of consumer tobacco products (AFUBRA, 2019).

BAT, British American Tobacco (Souza Cruz), began to be part of the history of tobacco in Brazil in 1903, joining the Integrated Tobacco Production program of the Ministry of Agriculture, Livestock and Supply (MAPA) from its creation. In the 2020/2021 harvest, the company expanded the project, encompassing its entire base of producers in the three southern states of the country. As a result of the program, which encourages more sustainable practices in cultivation and extra care with tobacco quality, thousands of Brazilian farmers have improved their efficiency and, consequently, the profitability and competitiveness of their products in the domestic and international markets have increased. The tobacco certification process occurs during soil preparation, cultivation, harvest, processing, and sale to the market. The three states in the Southern region have 304 certified producers responsible for the production of 1,812 tons of tobacco. The company supplies directly more than 300,000 points of sale with its products, spread over 5,500 Brazilian municipalities, directly employing 6,600 people (BAT Brazil, 2020).

Philip Morris International (PMI) is a Swiss-American cigarette and tobacco manufacturing company; with products sold in more than 180 countries, it is the global leader in the tobacco market. In Brazil, it has operated for more than 45 years and ranks second in the sector, offering a quality portfolio for adult smokers, with highlights including the Marlboro, L&M, and Chesterfield brands. The Brazilian affiliate ended the last year directly employing 1,949 employees, who work in several units throughout the country, including its manufacturing plant, offices, tobacco buying stations, distribution centers, and sales branches (GRI/PMI, 2020).

Alliance One International came about through the merger of DIMON Incorporated and Standard Commercial Corporation. The company purchases tobacco grown in more than 35 countries and serves manufacturers of cigarettes and other consumer tobacco products in more than 90 countries. With operations on five continents, Alliance One operates one of the world's largest networks of growers, buyers, processing facilities, and distribution operations. Its global headquarters is located in Morrisville, North Carolina, and the company is characterized as an agricultural company that delivers value-added products and services to businesses and customers (AOI, 2020).

JTI Associated Companies began operating in Brazil in 2009, engaged in tobacco production, purchase, and processing. Its infrastructure in Brazil consists of a leaf processing plant, a cigarette factory in Rio Grande do Sul state, leaf-buying units, an applied research center, distribution centers, and offices in twelve Brazilian states and the Federal District. The highlight of JTI's operations in Brazil is the integrated work of the Tobacco Leaf, Cigarette Factory, and Market, which is unique worldwide. They hire over two thousand employees, half of whom work during the harvest season. It has commercial partnerships with more than 11,000 growers, who receive full support and technical assistance for the responsible production of high-quality tobacco (JTI, 2020).

Universal Leaf Tobaccos is a leading leaf tobacco merchant and processor based on the volume handled by its subsidiaries and affiliates, which have operations in agro-products. Founded in 1918, it is headquartered in Richmond, Virginia, USA, and does business in over 30 countries, employing over 24,000 permanent and seasonal workers. The business includes selecting, purchasing, transporting, processing, packaging, storing, and financing leaf tobacco in developing countries for sale. Universal does not manufacture cigarettes or other consumer products, so the company's revenues are derived from selling processed tobacco, commissions, and specific services. The Brazilian subsidiary of Universal Leaf Tobacco calls itself one of the group's largest tobacco exporters. Its operations are in the select group of companies responsible for more than 50% of sales. Universal Leaf Tobacco has an integrated production system in which it finances inputs and offers technical assistance to growers who, in exchange, sell their entire production directly to the company. The company's headquarters in the country is located in the city of Santa Cruz do Sul (RS), which has branches in the states of Santa Catarina, in the cities of Panduva and Ituporanga, and Paraná, in the cities of Rio Negro and Imbituva (ULT, 2020).

The growth in the production and export of Brazilian tobacco is due to low production costs, the integrated system, and the quality of Virginia tobacco produced in Brazil (SINDITABACO, 2014). Tobacco production is competitive; thus, practically the entire production chain is structured in an integrated manner with the companies that buy the raw material, in which producers have easy access to seeds and inputs, in addition to technical assistance provided by the companies. With the integration, at the end of the harvest, the commercialization of the volume produced is already guaranteed by the industries (AFUBRA, 2019).

The Integrated Tobacco Production System (ITPS) establishes a contract between farmers and the tobacco industry, with the guaranteed purchase and technical assistance, corresponding to control that begins in the planting and extends to the delivery of the product. Thus, the agricultural technician acts as a mediator in the relationship between the company and the tobacco grower, guiding the various stages of cultivation (Riquinho & Hennington, 2016). It is based on a technical-commercial partnership with tobacco growers, who have the contracting of their tobacco crop with the guarantee of purchase of the entire volume produced, in which the company provides specialized technical assistance for the production of the crop and the economic, social, and environmental planning of the property (SOUZA CRUZ, 2019).

The profitability of tobacco farming is a competitive attraction for producers, especially those with small properties, since tobacco is more profitable than other crops (FETAG-RS, 2020). An example is a comparison between tobacco and corn: in one hectare, one can harvest 100 sacks of corn, with an average gross gain of R\$ 5,000; in the same area, occupied by tobacco, one can harvest 150 arrobas and receive up to R\$ 15,000.

Table 01 presents the evolution of tobacco production in Brazil in the last twenty years for every five years, according to data extracted from AFUBRA.

Year	Producer families	Hectar	res planted	Production (ton)	Value R\$
2000	134,840	257,660	539,0401,	078,08,000.00	
2005	193,310	417,420	769,6603,	194,089,000.00	
2010	186,810	372,930	832,8304,	105,851,900.00	
2015	153,730	308,260	697,6504,	976,704,200.00	
2020	149,430	290,397	633,0215,	609,341,172.32	

Table 1 Evolution of tobacco production in Brazil

Source: AFUBRA (2021).

Pressured by foreign competition, falling consumption, and anti-smoking legislation, many tobacco growers and municipalities have sought alternatives to reduce their economic dependence on the crop and seek competitiveness in the sector. Investments in new crops, animal husbandry, and agribusinesses have been encouraged by public authorities in several regions as a form of economic security (SINDITABACO, 2018).

The international competition in tobacco production is a challenge for Brazil. African countries are increasing their production and competing directly with Brazil in the international market, and unfavorable exchange rate conditions for exports are also taking away competitiveness from the Brazilian product (SINDITABACO, 2018).

Belgium and China stand out as the two largest importers of Brazilian tobacco. Besides being the world's largest tobacco producer, China stands out as the second largest importer of tobacco from Brazil and the largest consumer of cigarettes, according to data from the Brazilian Tobacco Yearbook (2018).

Position	Country	US\$ (million)	
1°	Belgium	597	
2°	China	454	
3°	USA	410	
4°	Netherlands	189	
5°	Russia	165	
6°	Germany	160	
7°	Indonesia	106	
8°	Poland	74	

 Table 2 Brazilian tobacco importing countries

Source: AFUBRA (2019)

In Brazil, the three most commonly used types of tobacco are Virginia (or kiln-cured), Burley, and Oriental. The climate of the region favors the quality of the tobacco and its physicalchemical properties, determined by an average daily temperature between 20 and 30°C for the development of the plant. Tobacco is cultivated in a wide range of climates; however, it needs 90 to 120 days without frost, covering from the transplanting phase to the end of harvest. The crop is sensitive to waterlogging and requires well-aerated and drained soils (AFUBRA, 2019).

2.5 MARKET FOR TOBACCO AND ITS DERIVATIVES

Tobacco is a condensed industry, in which 99% of its revenue comes from only five derivatives, namely cigarettes, natural tobacco, cigars, cigarillos, and smokeless tobacco (ZOROVICH *et al.*, 2017). It is consumed worldwide in different ways; thus, its demand is closely linked not only with the income condition of consumers but also with the cultural and symbolic practices and daily customs, specific to different social groups present in different regions and places of the world (SILVEIRA & DORNELLES, 2010).

The trend in the market for tobacco and tobacco products is downward due to increased awareness policies, taxes, and marketing restrictions. The number of cigarettes consumed worldwide is around 5.5 trillion units per year (WHO, 2016), with 40% of this consumption concentrated in China - which is of more significant concern to the industry, as earnings may decrease as awareness in the Chinese population increases.

According to data from the *Receita Federal* (Brazil's federal revenue service), cigarette production did not vary much, and the average number of packs produced was maintained between 2000 and 2011. After 2012, successive drops were recorded, representing

a 40% decline in production in 2015, compared to the average for the period mentioned. In 2015, new Tax on Industrialized Products (IPI) rates came into effect, directly impacting the price increase as a positive result of Article 6 of the WHO Framework Convention on Tobacco Control. According to data from the *Receita Federal*, the volume produced in 2015 represented a drop of 75% compared to 2000; however, after 2017, significant exports to Argentina were identified, which increased the number of cigarettes exported.

The Brazilian Ministry of Health classifies tobacco products into three categories: burning/fueled tobacco, smokeless, and heated/vaporized tobacco products.

Table 3 presents consumed tobacco products in burnt and combustible form according to the Ministry of Health's classification.

Product	Description
Cigarette	Cigarettes are the best-known product in Brazil and can be manufactured in four ways: tobacco wrapped in paper; homogenized or reconstituted tobacco; a mixture of cellulose and tobacco; another wrapping that is not exclusively tobacco leaf.
Cigar	The cigar is composed of whole tobacco leaves, chopped, shredded, or broken, rolled into a cylinder, with a wrapper made of tobacco leaf or reconstituted tobacco.
Cigarillos	The cigarillo is characterized by weighting less than 1,360g/1,000 cigarillos. It is composed of chopped, shredded, powdered, or broken tobacco leaves, forming a cylinder, and its wrapper consists of tobacco leaves or reconstituted tobacco.
Roll-your-own	Roll-your-own tobacco is composed of shredded tobacco leaves and may or may not be processed by the industry, allowing users to roll their own cigarettes.
Rope Tobacco	Rope tobacco is made from stripped, intertwined, and rolled tobacco leaves that have been cured in the sun.
Pipe	The pipe requires a smoke intended for its use, called pipe smoke.
Straw Cigarette	Straw cigarette is also one of the products without a filter. Its composition is simple: chopped tobacco rolled in corn straw.
Bidi	Bidi has no filter and is made from a small portion of chopped tobacco wrapped in tendu or temburni leaves, plants native to Asia.
Blunt	Blunt is considered a tobacco derivative because it is present in its composition. Unlike the other products presented, it is a wrapper used to put tobacco inside (for example, shredded tobacco) to be smoked.

Source: Ministry of Health, 2016.

Table 04 presents the products produced using tobacco, which, following the classification of the Ministry of Health, are non-smoking.

•	ble tobacco; one of the tobacco products that does not generate smoke e it is inhaled.
	a different name, snus, which is very common in Sweden, consists of powdered tobacco for oral use.
Chewing Tobacco Chewin or suck	ng tobacco is one of the smokeless tobacco products used to be chewed ed.

Table 4 Smokeless tobacco products

Source: Ministry of Health, 2016.

Table 05 presents the products produced using tobacco, which, following the classification of the Ministry of Health, are used as vaporizers.

Product	Description			
Water Pipes	Narghile, water pipe, shisha, or hookah: the same device has several names, and all refer to the equipment used with the tobacco for shisha - another tobacco product. The shisha pipe contains a bowl, which stores the tobacco. The tobacco can come in contact with the burning charcoal and thus burn organic matter. Hence, the classification of shisha tobacco as a heated/steamed tobacco product may not cover all possible emissions during use.			
Electronic devices	Electronic smoking devices are also known as electronic hookahs, electronic cigarettes, e-cigarettes, e-ciggy, e-cigar, and others, which can take different forms but with the common goal of simulating the use of tobacco products such as cigarettes, cigarillos, cigars, pipes, and the like. These electronic devices vaporize a cartridge or container that contains tobacco leaf extract. They can also use the liquid purchased individually, containing nicotine or not.			

Table 5 Heated/steamed tobacco products

Source: Ministry of Health, 2016.

2.6 TOBACCO AS ALTERNATIVE SOURCES

Many studies reveal the detrimental health effects of excessive tobacco use. However, some indigenous cultures use snuff tobacco medicinally and in spiritual rituals. Snuff is a fine powder made from tobacco and a compound of tree bark, herbs, and other plants. The substance is considered a sacred medicine, and when used correctly, with supervision, it does not cause addiction, as it promotes healing of diseases, such as sinusitis, and spiritual healing (SOARES & SANTOS, 2015).

The studies by Soares and Santos (2015) describe snuff as medicine made from tobacco, which occupies a special place in shamanism among indigenous groups of the middle Purus (Amazon). In the text, the authors point out that snuff also fulfills, in some cases, the role of antivenom, neutralizing and placating the desire and anger of those who seek the natural principles of *timbó* or *tingui* for death and transformation into the non-human other.

Tobacco can also be sold in the form of essential oils. Brazil has a prominent place in producing these oils, alongside India, China, and Indonesia, considered the four major producers worldwide. Brazil's position is due to the essential oils from citrus fruits, which are byproducts of the juice industry. Among the industries producing essential oils in Brazil, a significant player is Ioto International, whose activities began in 1999 and which produces only flavorings for tobacco, always aiming at the export market. It is a small company and the only one in Latin America specialized in flavorings for tobacco, with a sales volume of 900 t in 2007, expected to reach 1000 t in 2009, considering only additives for tobacco (BIZZO *et al.*, 2009).

Tobacco is also used in pesticides in the form of nicotine tartrate. Insecticides of botanical origin have proven to be a good alternative in controlling insects and pests. Tobacco extract has been a great example of a botanical insecticide used to combat such organisms. Although there are not many studies on nicotine, the efficiency of nicotine has shown quite expressive results since this substance has a direct effect, causing hyperexcitation in the nervous system of the insect and, consequently, its death (SILVA *et al.*, 2017).

3 RESEARCH METHOD AND TECHNIQUES

For the proposed research, the method was divided into two stages: the first of a qualitative exploratory nature and the second of a descriptive nature, as presented below.

3.1 RESEARCH DESIGN

3.1.1 Exploratory and Qualitative Research

The exploratory research aims to provide greater familiarity with the object of study since the researcher does not have enough knowledge to properly formulate a problem or develop a hypothesis. Thus, it is necessary to investigate the nature of the problem and identify possible variables (MALHOTRA, 2012).

Qualitative research is used to analyze respondents' attitudes, motivations, opinions, and feelings; it is concerned with generalization, being related to the aspect of objectivity to be measurable. It uses the resource of graphic representations in the form of tables, charts, and graphs, adopting the application of instruments such as questionnaires with closed-ended questions (MALHOTRA, 2012).

In this stage, qualitative exploratory research was carried out to investigate the public of interest in the study and built the bases for the collection instrument, designed to identify and describe the socioeconomic level of tobacco producers. Two research focuses were implemented in this phase: (1) Definition of a criterion for social categorization, which provides the proper support to the results intended in the research; (2) Definition of indicators to specifically demonstrate the peculiarities of the tobacco farmers in the Southwest region of the state of Paraná.

3.1.2 Descriptive Research

Descriptive research analyzes, observes, records, and correlates variables. It seeks to answer the questions such as who, what, when, where, and how. Descriptive research methods include personal and telephone interviews, personal or mailed or e-mailed questionnaires and observation. It is used when the researcher needs to describe the characteristics of groups, for example, to obtain a profile of consumers through their distribution concerning gender, age group, educational level, preferences, and location (MALHOTRA, 2012). Surveys seek information about the characteristics or parameters of a population. Information about population parameters is obtained by conducting a census or a sample. A census involves a complete enumeration of the elements of a population and allows the population parameters to be calculated directly after enumerating, and is feasible when the population is small or when the variance of the characteristic of interest is significant (MALHOTRA, 2012).

To conduct the descriptive stage of the research, a questionnaire was developed from the exploratory stage of the research, and the following procedures were used: (1) the population considered for this study was composed of 245 tobacco producers, distributed in 28 municipalities in the Southwest region of the state of Paraná. A census was carried out for that purpose since it is the complete enumeration of tobacco producers in the state's Southwest region, with the analysis of the characteristic variance of the tobacco value chain contained in this territory. (2) The data collection of this research stage was performed based on personal interviews, carried out by the researcher and supporters at the residence of the producers that would constitute the census, from December 01, 2021, to March 17, 2022.

3.2 DATA COLLECTION PROCEDURES

Methodological procedures used:

Research in secondary data sources – search in sources of other studies' data on socioeconomic status in Brazil. It aims to better understand the economic and social environment in which the study was carried out, a study of specialized statistical data available in sources such as IBGE, SEAB, AFUBRA, SINDITABACO, and other state and municipal bodies such as class institutions and municipal governments was carried out.

Social characterization criteria used in the research - definition of social stratification criteria for the region consistent with the country's current economic and social reality.

Meetings with representatives of entities and companies of the sector – several meetings were held between the researcher and representatives of the sector to be studied (SINDITABACO, AFUBRA, and AMOSP) to gather relevant information about the sector.

Meeting with field instructors/technicians – the contribution of agricultural technicians who work in the regions covered by the research was sought both in terms of logistical support to the researcher and in disseminating the research to rural producers.

Interview with tobacco farmers – application of questionnaires carried out by the researcher and supporters at the producers' homes or online application (considering the COVID-19 pandemic).

3.3 DATA ANALYSIS PROCEDURES

Sorting the data constitutes the first stage of data analysis and includes the phases of data validation, editing, and coding. Tabulation involves arranging the data so that their meaning can be assessed. The data are placed into appropriate categories relevant to the research objectives (ANTÔNIO, 2011).

Tabulation can be done manually, mechanically, or electronically and comprises a frequency table and graphical presentation. Tabulation involves arranging the data so their meaning can be assessed; the data are placed into appropriate categories relevant to the research objectives. The graphical presentation involves the use of graphs to present the research results. The interpretation of the data stems from the analyses performed from the tabulation (ANTÔNIO, 2011).

For the research data analysis, a master file was structured, from which the data were processed, using specific software for applied scientific research. Tables and graphics with descriptive analysis were used as analysis procedures.

The questionnaire presented five sets of questions; the objective was to characterize the growers, their work, their production units, and their relationship with the tobacco industry. The following data were presented: identification of producers and properties, main profitable activities on the properties, socioeconomic aspects of producers and properties, analysis of the intervening structure, data from entities, perspectives with the activity, and profitability.

Based on the information collected in the census, the answer to the study's objective was obtained, which was to analyze the tobacco value chain in the Southwest region of the state of Paraná. The results were presented in percentage form and by means of graphs.

3.3.1 Identification of producers and farms

The identification of producers is presented through percentages on gender, age, race or color, and education. The properties are identified based on the type of tenure, noting whether

they are paid or financed, with measurement of the productive area of tobacco, the number of people living and involved in the cultivation of the properties, and their main crops other than tobacco.

According to the result shown in figure 03, the results show that most producers are male, corresponding to 94.69%, 12 female producers, representing 4.9%, and one person of another gender not described, representing 0.49%.

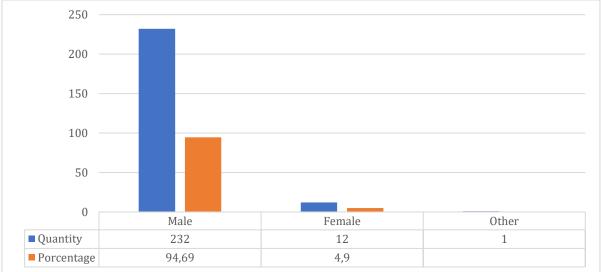


Figure 3 Gender of tobacco producers in the Southwest region of the state of Paraná

Source: census conducted by the author, Jan/Mar 2022.

In figure 04, regarding the identification of producers about race and color, it was observed that 85.71% consider themselves white, 13.88% consider themselves *pardos* (mixed ethnicity), and 0.41% identify themselves as black.

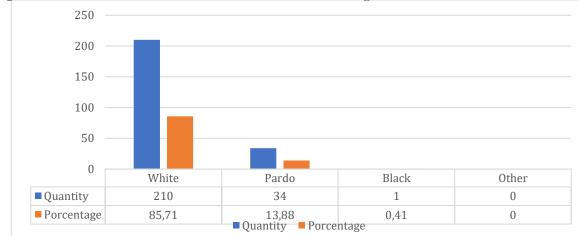


Figure 4 Race or color of tobacco farmers in the Southwestern region of the state of Paraná

Source: census conducted by the author, Jan/Mar 2022.

As shown in figure 05, the distribution of producers by age was composed of four age groups: 18 to 30 years, 31 to 45 years, 46 to 60 years, and over 60 years. It was found that 18 to 30 years old represents 7.76%, 31 to 45 years old corresponds to 27.76%, 53.88% are between 45 and 60 years old, and 10.61% are over 60 years old.

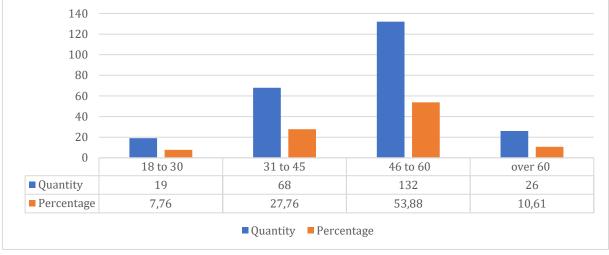
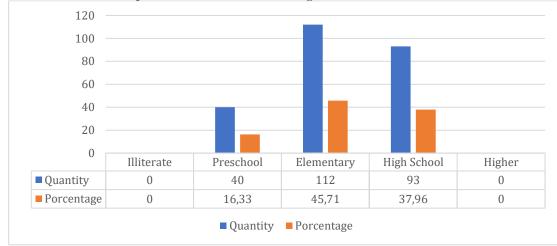


Figure 5 Age of tobacco producers in the Southwest region of the state of Paraná

Source: census conducted by the author, Jan/Mar 2022.

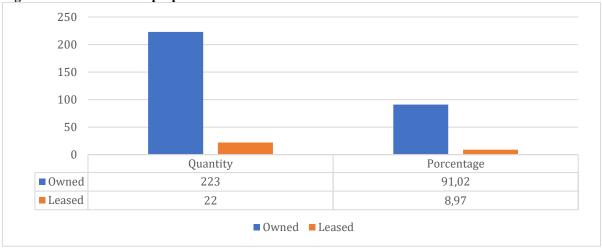
According to figure 06, there is no illiteracy percentage among the producers, and no higher education level was identified. 16.33% have preschool education, corresponding to the four initial years of literacy; 45.71% have elementary education, corresponding to the eight initial years of school; and the producers with high school education correspond to 37.96% of the data.

Figure 6 Education of tobacco producers in the Southwest region of the state of Paraná



Source: census conducted by the author, Jan/Mar 2022.

Regarding the identification of the properties of producers in tobacco cultivation, the census presented corresponding data on the form of ownership of the properties. Observing figure 07, regarding the quantity of owned properties (by the owner) and leased properties (for residence and cultivation), the results show that 91.02% are owned properties, and 8.97% are leased properties.





Source: census conducted by the author, Jan/Mar 2022.

Considering the data related to the identification of the properties, the number of owned properties totals 223 owned properties belonging to tobacco producers in the Southwest region of Paraná, as shown in graph 07. The owned properties can be assets paid off or financed by financial institutions.

According to figure 08, 98.37% of these properties have no financing and are listed as settled, and only 1.63% of these properties have some form of linkage with financial institutions or are financed.

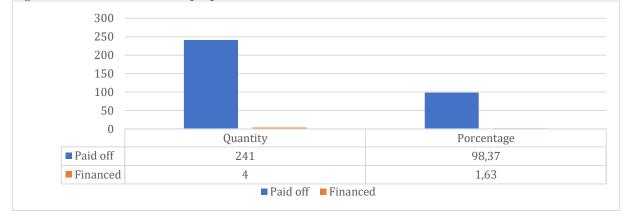
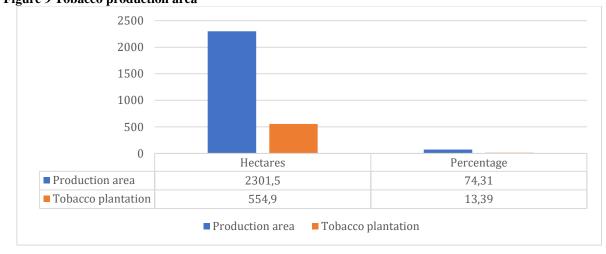


Figure 8 Paid-off and financed properties

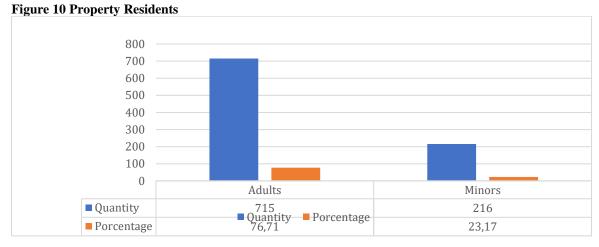
Source: census conducted by the author, Jan/Mar 2022

Still, regarding the identification of the properties of producers in the cultivation of tobacco, the census data also presented data corresponding to the total area of the properties of these producers in 3096.86 hectares (ha). This information was subdivided to identify, of this total of hectares, which percentage is productive and which is destined for tobacco cultivation, showing that 12.30% of the areas of the properties have other purposes, such as housing, water sources, native forest, and reserves. Figure 09 describes that 74.31% of the properties are productive areas and that, of this productive area, 13.39% is destined for tobacco cultivation. **Figure 9 Tobacco production area**



Source: census conducted by the author, Jan/Mar 2022.

Concluding the data referring to the identification of producers' properties in tobacco cultivation, the census presented data corresponding to the number of people residing on the properties and the number of people involved in tobacco activity on each property. Figure 10 shows the number of persons residing on the properties; 76.71% are adults, and 23.17% are minors under 18.



Source: census conducted by the author, Jan/Mar 2022.

Considering the number of people residing on the properties, figure 11 shows that 51.93% of residents are directly involved in tobacco activity.

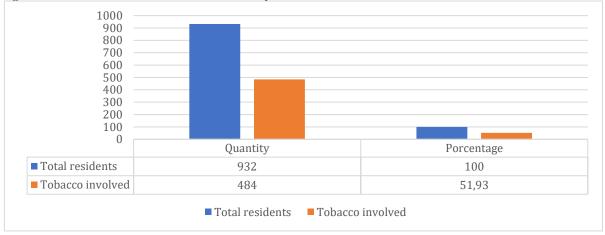
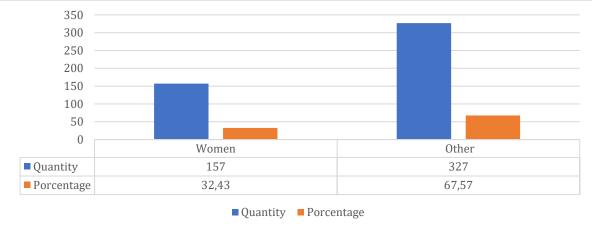


Figure 11 Residents involved in tobacco activity

Source: census conducted by the author, Jan/Mar 2022.

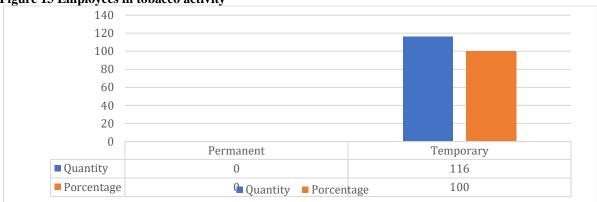
Figure 12 represents the people involved in tobacco activity on all the farms studied; the figure identifies that 32.42% are women.





Source: census conducted by the author, Jan/Mar 2022.

Figure 13 shows that this labor is 100% temporary, with no records of permanent employees on the properties in the study.



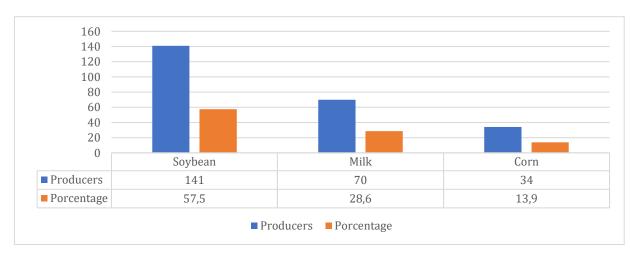


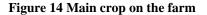
Source: census conducted by the author, Jan/Mar 2022.

3.3.2 Main profitable activities on the farms

The study referring to the identification of the properties indicates that other crops are grown on the properties in addition to tobacco.

Based on the census, the three main profitable activities on the properties besides tobacco were identified. Figure 14 demonstrates that, among the tobacco farmers analyzed in the census, for 57.5% of the farmers, the first main crop on the property is soybeans; for 28.6% of the farmers, it is milk production; for 13.9%, it is corn production.





Source: census conducted by the author, Jan/Mar 2022.

According to figure 15, for 39.6%, the second main crop is corn; for 13.1%, it is wheat production; 21.2% producers related soybean; 9.8% highlight milk production; 1.2% have bean production; 15.1% of producers do not have a second main activity.

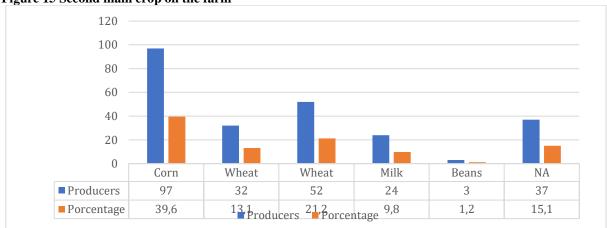


Figure 15 Second main crop on the farm

Source: census conducted by the author, Jan/Mar 2022.

The third main crop of the properties is presented in figure 16, and it can be observed that, for 38.8% of the producers, it is the production of corn; 4.1% produce wheat; beef cattle for 0.8% of the producers; 2% grow beans; 1.6% produce milk; 52.7% have no third main activity on the property.

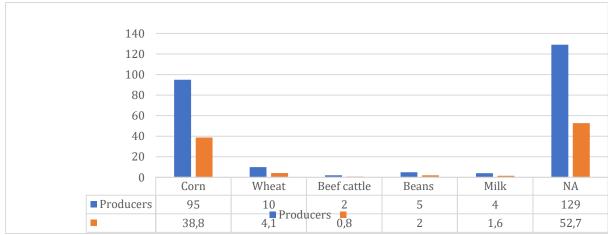


Figure 16 Third main crop on the farm

Source: census conducted by the author, Jan/Mar 2022.

The census also identified that other sources of income contribute to the subsistence of producing families. This income was identified by income generated through formal jobs of its members in other activities besides the farm and by social security and welfare assistance. Figure 17 shows that 17.5% of the properties have income from retirement; 4.5% have pensioners; 6.5% have residents assisted by social programs; 5.7% have a permanent job outside the farm.

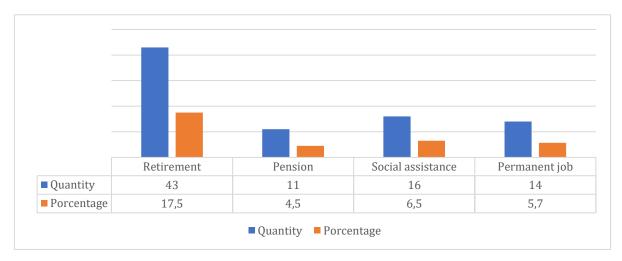


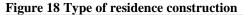
Figure 17 Sources of income of the farm residents

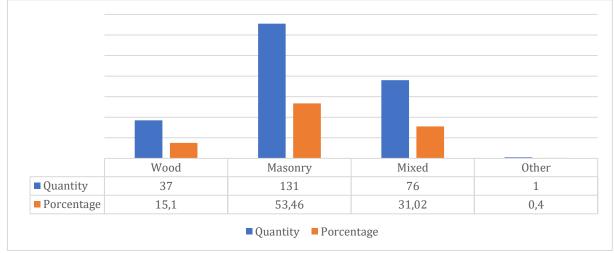
Source: census conducted by the author, Jan/Mar 2022.

3.3.3 Socioeconomic aspects of producers and properties

The census sought to identify the social stratification criteria for the region, consistent with the country's current economic and social reality. The identification of socio-economic aspects describes a panorama of the main conditions experienced on the properties and presents data from sources deduced by observation and data answered by the respondents.

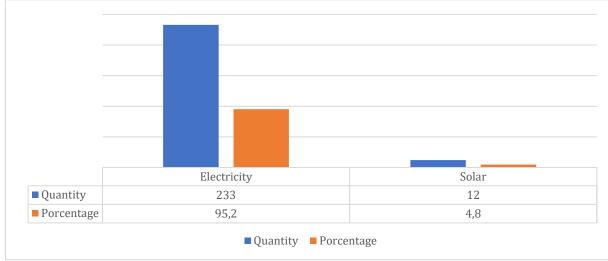
Figure 18 identifies the type of construction of the residences, describing the physical structure of the houses, so that masonry construction prevails, with 53.46%; 15.1% are wooden residences; 31% present mixed constructions (consisting of masonry and wood); finally, representing 0.4%, one residence has another form of construction.





Source: census conducted by the author, Jan/Mar 2022.

According to the census, figure 19 shows the source of energy consumed on the properties, consisting of 95.2% electricity and 4.8% solar energy.





Source: census conducted by the author, Jan/Mar 2022.

Figure 20 presents the source of the drinking water consumed in the residences, being 44.5% natural water source from the property; 15.9% is water coming from an artesian well drilled on the property; 39.6% of the residences are supplied by public water supply.

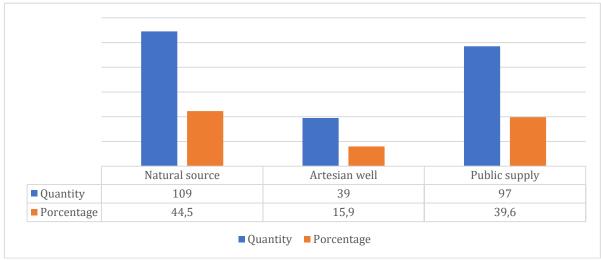
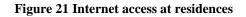
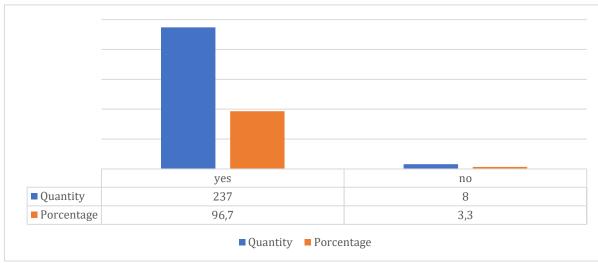


Figure 20 Source of drinking water consumed in the residences

The findings report that 96.7% of households have internet, as shown in figure 21. Furthermore, figure 22 presents data regarding the forms of communication and entertainment used in the residences, showing that 100% of the residences use TV, radio, and cell phones; 35.10% use computers.





Source: census conducted by the author, Jan/Mar 2022.

Source: census conducted by the author, Jan/Mar 2022.

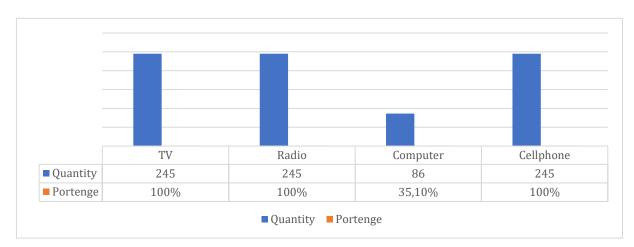
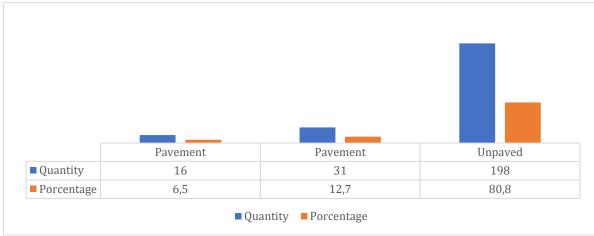


Figure 22 Forms of communication and entertainment in the residences

Source: census conducted by the author, Jan/Mar 2022.

The paving on the properties' access roads to the properties is identified in figure 23, with the observation that 6.5% have access through paved roads; 12.7% are rough stone roads; 80.8% remain unpaved roads (dirt roads).

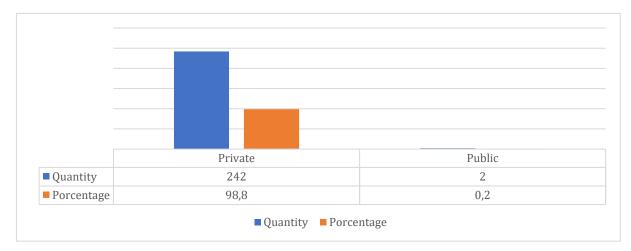
Figure 23 Forms of paving of access roads to the residences



Source: census conducted by the author, Jan/Mar 2022.

Figure 24 shows the main means of transportation used by the respondents, totaling 98.2% of producers who have their means of transportation and 0.2% who use public transportation.

Figure 24 Main means of transportation of the residents



Source: census conducted by the author, Jan/Mar 2022.

The census identified the destination of recyclable and organic waste produced in the residences. Figure 25 shows that 79% of the properties have the public selective collection service, and 21% do not have this service provision. Furthermore, figure 24 shows that 100% of the organic waste produced is disposed of at the property itself.

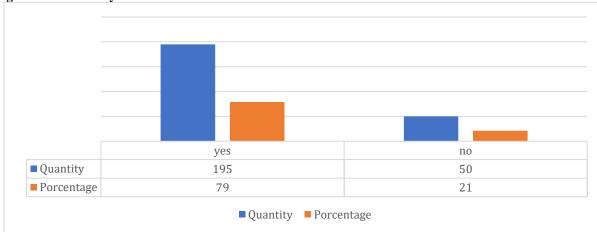


Figure 25 Public recyclable waste collection service

Source: census conducted by the author, Jan/Mar 2022.

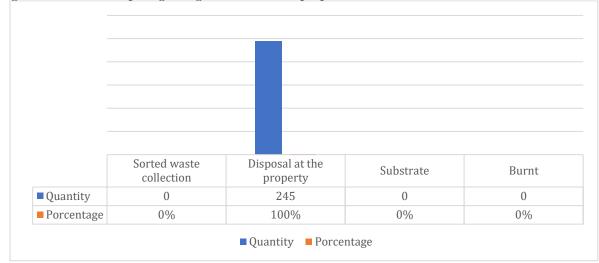
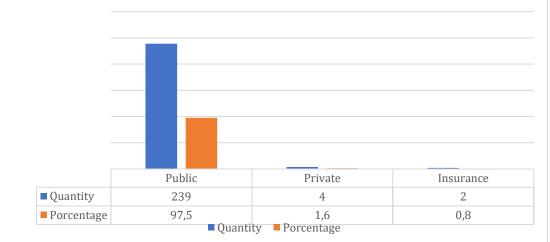


Figure 26 Forms of disposing of organic waste at the properties

Source: census conducted by the author, Jan/Mar 2022.

Figure 27 finishes the identification of the stratified items for the study by presenting the type of medical care used by the producers of the study, presenting that 97.5% of the producers use the single health system, 1.6% seek private care, and 0.8% have health insurance.





Source: census conducted by the author, Jan/Mar 2022.

3.3.4 Analysis of the intervening structure

The census showed factors that are not directly linked to the business strategy but have an influence on it because they intervene or interfere in the sustainability of the activity. Figure 28 shows what relationships with financial institutions tobacco producers have and shows that 91.8% of the properties in the study have no financing for their own homes through the rural housing program; furthermore, 8.1% of the properties are participants in the program.

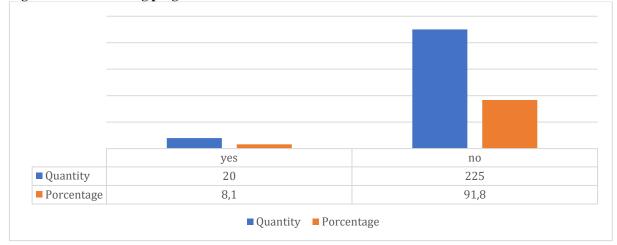


Figure 28 Rural housing program

Source: census conducted by the author, Jan/Mar 2022.

Na figura 29, apresentam-se as propriedades que possuem financiamentos junto às instituições para aquisição de outros bens ou equipamentos. Pode-se observar que 39,2% das propriedades possuem algum tipo de financiamento e 60,8% não possuem não utilizam essa modalidade.

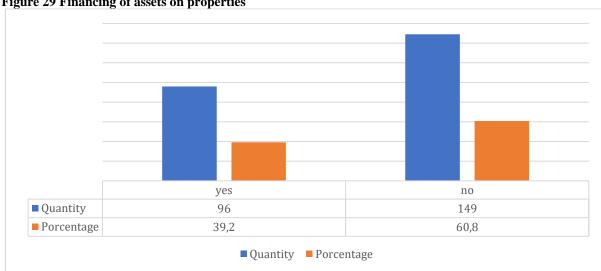


Figure 29 Financing of assets on properties

Source: census conducted by the author, Jan/Mar 2022.

Figure 30 shows that 100% of the properties do not have financing for tobacco production subsidies from financial institutions.

yes no Quantity 0 245 Porcentage 0% 100%

Figure 30 Financing for tobacco production

Source: census conducted by the author, Jan/Mar 2022.

According to figure 31, four relevant activities developed in the properties aim at sustainability and environmental commitment. Twenty-five properties invest in protecting springs, representing 10.2%; the preservation of the riparian forest exists in 90% of the properties, and 100% of them avoid burning and return empty containers of pesticides.

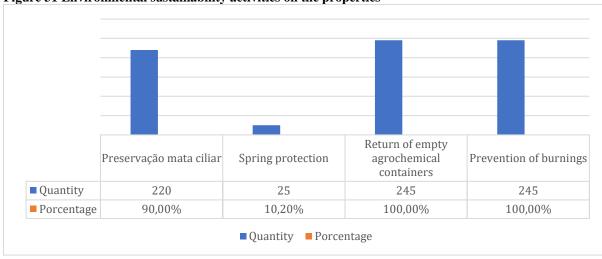


Figure 31 Environmental sustainability activities on the properties

The search for improvement in the tobacco activity, identified in figure 32, reveals that 98.7% of the producers seek training and qualification in the activity and receive technical assistance, and 100% of the producers carry out their activities respecting the safety norms at work.

Source: census conducted by the author, Jan/Mar 2022.

Figure 32 Tobacco activity improvement



Source: census conducted by the author, Jan/Mar 2022.

Figure 33 presents the methodology of the stages of the production process and storage, pointing out that 91.2% of the soil preparation for planting is mechanized, and 9.8% is done by animal traction.

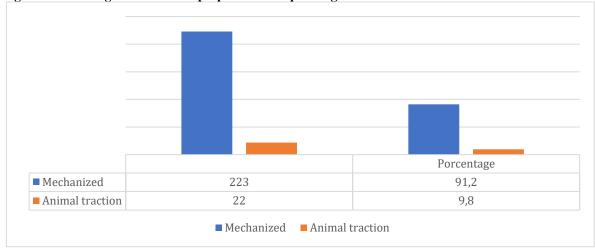
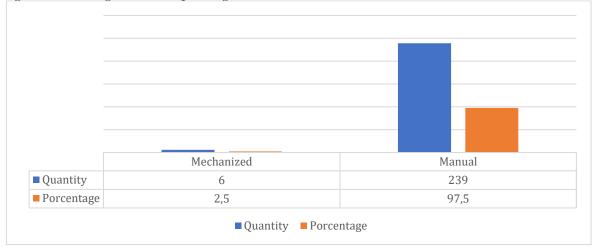


Figure 33 Working method in soil preparation for planting

Source: census conducted by the author, Jan/Mar 2022.

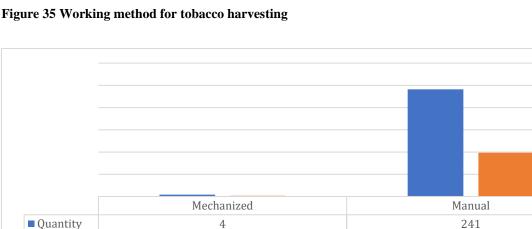
Figure 34 represents the form used on the property for soil planting, with 97.5% of manual planting and 2.5% of mechanized planting.

Figure 34 Working method for planting



Source: census conducted by the author, Jan/Mar 2022.

The method used to harvest tobacco is depicted in Figure 35. Mechanized harvest is represented by 1.7% of the production, while 98.3% is harvested manually.



1,7

Figure 35 Working method for tobacco harvesting

Source: census conducted by the author, Jan/Mar 2022.

Porcentage

The facilities for storing and handling tobacco are identified as standard warehouses and conventional warehouses. Figure 36 shows that 54.3% of the farms use the standard warehouse model, 97.5% use the conventional warehouse model, and 51.8% use both.

■ Quantity ■ Porcentage

98,3

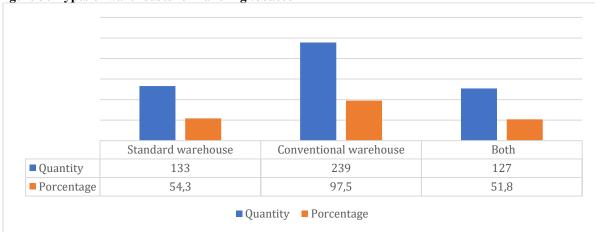


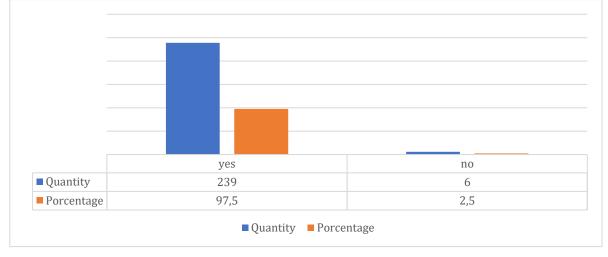
Figure 36 Types of warehouses for handling tobacco

Source: census conducted by the author, Jan/Mar 2022.

3.3.5 Entity data

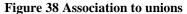
Tobacco activity is represented by entities such as associations and unions and establishes an integrated production system. Figure 37 shows that 97.5% of the producers are associated with AFUBRA.





Source: census conducted by the author, Jan/Mar 2022.

Figure 38 shows that 71.4% of the producers are unionized, and 28.5% do not belong to a union. It also shows that 84.5% of the union members belong to the rural workers union (RWU) and 15.5% belong to the rural employers union (REU).





Source: census conducted by the author, Jan/Mar 2022.

According to figure 39, among the farmers, 98.8% have contracts in the ITPS, accredited in integrated companies, and 1.2% have no integration with companies, absorbing production costs. The figure also shows that 90.9% of integrated producers belong to the BAT company, and 9.1% of producers belong to the Universal Leaf Tobacco Company (ULT).



Figure 39 Integrated Tobacco Production System

Source: census conducted by the author, Jan/Mar 2022.

As for the products marketed to the ITPS, the census shows, in figure 40, that there are three variances to be considered: 98.7% sell more than 80% of the production to the system; 1.3% of the farmers sell less than 50% of the production to the ITPS.



Figure 40 Sales to the Integrated Tobacco Production System

Source: census conducted by the author, Jan/Mar 2022.

3.3.6 Perspectives on the activity

The study presented data to analyze the producers' perspectives in the continuation of the activity so that motivational data with the activity and the relationship of the activity with the quality of life of its producers can be studied.

Alternatives were presented to the producers as motivational factors, such as profitability, integrated system, technical assistance, price, and property size. Of those, the producers chose three, which would be, in their preferences, the major factors to continue in the activity. Figure 41 shows that 97.1% of the producers remain in the activity due to ITPS, 90.2% related to technical assistance, and 69.8% said profitability was one of the three most relevant factors to continue in the activity.

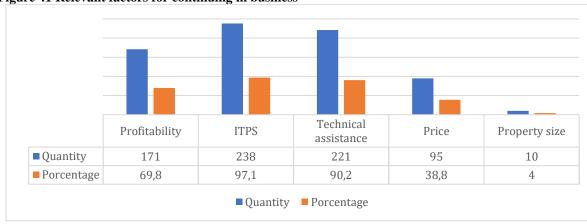
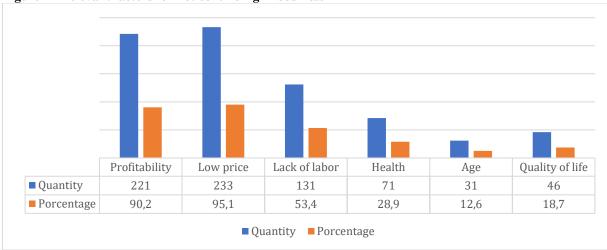


Figure 41 Relevant factors for continuing in business

Source: census conducted by the author, Jan/Mar 2022.

Alternatives that would lead the producer to quit the activity were also the focus of the study during the census. Thus, the responding producers analyzed the alternatives: profitability, low price, lack of labor, health, age group, and quality of life. Figure 42 shows that 95.1% of the producers would quit the activity for reasons related to the low price of the production, 90.2% said they would abandon the activity due to profitability factors, and 53.4% said the lack of labor for work was one of the three most relevant factors for not continuing in the activity.

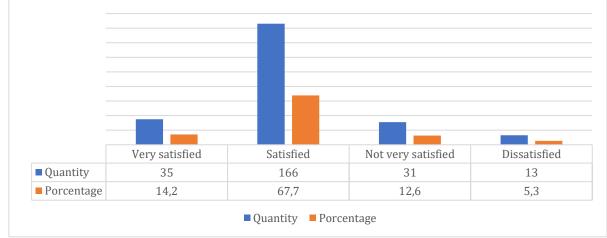




Source: census conducted by the author, Jan/Mar 2022.

Figure 43 presents data regarding how the respondent farmer considers his quality of life with tobacco farming. 67.7% of the producers are satisfied with their activity, 14.2% are very satisfied, 12.6% are not very satisfied, and 5.3% are dissatisfied.

Figure 43 Level of satisfaction of producers with quality of life in the business



Source: census conducted by the author, Jan/Mar 2022.

The time that the producers intend to stay in tobacco farming can be identified in figure 44, representing the period measured in years. The results show that 16.3% of the producers intend to work in the activity for one more harvest (one year), 43.8% show interest in staying in the activity for another five years, 25.7% will stay for 10 years, and 14.2% intend to be in the activity for more than 10 years.

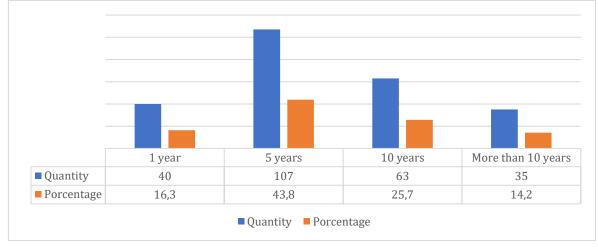


Figure 44 Prospects of permanence of the producers in the tobacco business

The profitability of the properties was identified through data on the cost of production with inputs and insurance per planted hectare. According to the data informed by producers regarding the 2021 harvest, which was commercialized in 2022, AFUBRA provided data regarding the last five years of tobacco production in the Southwest region of the state of Paraná. The number extracted from the study for the cost of production and the profitability of production is presented in table 06.

Harvest	Avg. Prod. cost/ha	Hectares planted	Total kg produced	Avg. Prod.
2018	R\$ 3,991.14	934 ha	2,185,394	2,199
2019	R\$ 2,868.48	1,187 ha	2,935,575	2,473
2020	R\$ 3,293.19	946 ha	2,233,790	2,361
2021	R\$ 2,972.18	686 ha	1,348,573	1,966
2022	R\$ 3,852.89	555 ha	1,411,900	2,543

Table 6 Average production profitability

Source: Research data

Source: census conducted by the author, Jan/Mar 2022.

3.4 PROCEDURES FOR INTERPRETATION OF RESULTS

The questionnaire presented five sets of questions, with the first set referring to the socioeconomic aspects of the producers involved in the activity of tobacco cultivation in the southwestern region of the state of Paraná. Initially, the identification of producers and properties was characterized, along with the main profitable activities performed in the properties. The second set identified other crops grown on the properties, noting all the sources of income that compose the total income of the properties. The third set referred to an analysis of the intervening structure of the properties, presenting issues related to land tenure, sustainability, and production (soil preparation, planting, harvesting) on the properties. The fourth set dealt with the integration with the tobacco industry. Finally, the fifth set presented the level of perspectives on the activity, dealing with the satisfaction of those involved and the property's profitability. For interpreting the data, descriptive statistical analysis was used.

The predominance of white (self-declared) producers, presented in Figure 02, with 85.7%, characterizes the form of colonization in the Southwest region of the state of Paraná. This characterization is affected by German and Italian descendants coming from the states of Rio Grande do Sul and Santa Catarina in the mid-1930s, when pioneers constituted numerous families for the labor force. Although 94.69% of the producers are male, understood in this study as the "owners" of the properties studied, the women who work in the activity, identified in figure 12, represent 32.42% of the operationalized labor force, another characteristic of the colonizing descent.

Concerning the age of tobacco producers, identified in figure 5, there is a higher index (53.88%) between the ages of 46 and 60 years, showing that the activity is ensured among a profile characterized as active in the manual labor force, farmers less adept to innovation, technologies, and who have a medium level of education in their majority, as shown in figure 06. 45.7% of those have attended only the first eight years, and 37.9% of the "owner" producers do not have higher education. Figure 5 also shows that between 18 and 30 years old is the lowest percentage of producers in the activity (7.7%), which concludes that, in the tobacco activity, the number of young people is decreasing considerably in contrast to other activities of the agro, which presents, in recent decades, a new generation arriving in the field with a much higher formal educational level, more familiarity with technologies, and also interested in knowing how technology can influence production.

Young persons have a great capacity to influence management and decision-making, allied to the issue of technological challenge, profitability, and sustainability. The prospects of

children staying in the agricultural activity depend mainly on the internal conditions of the families, both economic and social. Among these activities are the farm's economic viability, the qualification for entering new markets, the strategies for obtaining complementary incomes, the relationship between parents and children, the gender issue, and the professional choice.

Figure 7 shows that, in 8.9% of the properties, the planting area is leased, in which the producer rents the land for planting the tobacco crop or, still, makes an annual income with other seasonal crops in the same area of land. The relationship between the aggregate and the land owner (employer) is a partnership. Generally, the employer pays half of the tobacco costs and receives half of the production. The study presents the predominance of own properties, in which the land areas belong to the producing family; this is related in figure 08, with 98.37% of the properties that do not have financing from financial institutions, thus considered as paid-off properties.

Culturally, the acquisition of properties in the study region is carried out by direct negotiation, in which the buyer negotiates with the former owner the form of payment (annual installments or crop) and is registered through purchase and sale contracts. The National Land Credit Program (PCNF) was also identified as a form of rural credit financing used by producers to buy land; this program offers resources from the Agrarian Reform fund and can be used to structure the property, such as building improvements.

The properties in the study present, on average, a total area of 3096.86 hectares (ha), showing that 74.31% of the total area of the properties is productive and, of these, 12.3% are used for the production of tobacco. The census data shows (figure 09) a total of 2,301.5 hectares of productive areas, corresponding to 74.31% of the properties cultivated; of this cultivated area, 554 hectares are used for the cultivation of tobacco. The productive areas can be used with crop rotation so that the producer can have two or more annual harvests with diversified products using the same planting area.

There is international pressure for Brazil to force tobacco producers to diversify their properties' agricultural production, which is becoming increasingly important. This is because the country became a signatory of the 2005 Framework Convention on Tobacco Control, the first international public health treaty to combat smoking. The convention foresees, among several measures, the stimulus to the production of other crops so that the producers do not depend exclusively on tobacco as a source of income.

The subsistence of the properties requires the activity of diversified crops; thus, other crops are developed in the properties besides tobacco. Besides diversification, the practice of crop succession to tobacco was also observed. This is due not only to the increase in income

but also to the fact that succession provides the use of residual fertilizer, protection of the soil against erosion, and reduction of the incidence of pests and weeds.

The study sought to demonstrate the three main crops produced besides tobacco. Thus, soybean stands out, being reported by 57.5% of the producers as the first main crop of the property, followed by corn, shown in figure 15, as the second main crop for 39.6% of the producers. Moreover, corn also represents the third main activity developed in the properties for 38.8% of the respondents, presented in figure 16. These activities are essential for food security and for the complementation of family income, which end up demanding dedication and collective work of all family members. However, it is noteworthy that 15.1% of producers have no second main activity, and 52.7% have no third main activity; this strengthens the prevalence of tobacco with one or two other crops for the subsistence of the property.

Tobacco production and product diversification have conquered space and generated controversy about contemporary rural development challenges. The producers favor diversifying their properties but question the responsibility arising from the reduction in income since tobacco provides a higher income per hectare than rotational crops. Another obstacle to diversification is the farmers' access to agricultural credit. Those who grow tobacco are not entitled to financing to invest in the crop with credit lines at subsidized interest rates, as with PRONAF.

The data concerning the identification of the properties and the producers in tobacco cultivation, which correspond to the number of people residing in the properties and the number of people involved in tobacco activity, in each property, were presented in figure 10, which also shows the indices of adult and minor people residing in the property. Figure 11 shows the percentage of adult persons involved in tobacco activity; these data are complemented by the indices in figure 13, which presents a survey of the number of permanent and temporary employees on the property.

The data on the number of people residing on the properties show that 76.71% are adults and 23.17% are minors under 18. These data are a repercussion of questions about the exodus and aging of the rural population. Another factor contributing to the aging of the rural population is the exodus of rural youth to the urban environment. The rural population that enters the working age, in this case, the rural youth, faces difficulties in building their life project in the countryside and increasingly seeks better living conditions in urban centers.

The reduction in the number of children per family in recent years in Brazil is another determining factor for the low number of minors on the properties. This drop in the number of children was due to the demographic transition, i.e., the drop in fertility levels in Brazil acceleratedly over 30 years. According to data released by the Brazilian Institute of Geography and Statistics (IBGE), the country has an average of 1.94 children per woman, below the population replacement rate of 2.1 children per woman. Several factors contribute to the drop in fertility, mainly the expansion of urbanization because, in the rural environment, families had more children to assist in the work in the fields.

Considering the number of people residing on the properties, Figure 11 shows that 51.93% of this percentage of residents are directly involved in tobacco activity. The study reveals that only adults (over 18 years old) perform tobacco activity; this rate is mainly due to the requirements of the integrated production system companies.

It is necessary to remember that there is a disagreement between the conceptions of the legal provisions in force in Brazil, which prohibit the work of children and adolescents in tobacco cultivation. The parents, tobacco farmers, based on the traditional uses and customs used to socialize the new generations, believe that there is a duty to educate their children through work, whether in agricultural or domestic activities, as long as it does not prevent or hinder the continuity of their school studies. From the parents' perspective, work interconnects the child and the adolescent with the property and the local community, enabling them to value the environment in which they live.

In 2009, the integration contracts of the tobacco production chain, signed between tobacco agribusinesses and family farmers, inserted a social clause that obliges the farmer to comply with the Brazilian legislation regarding the "non-use of child labor," more specifically, the provisions of Article 7, item XXXIII of Brazil's Federal Constitution, on the norms foreseen in the of the Child and Adolescent Statute (Law 8,069/1990), as well as all complementary legislation related to child labor. This social clause resulted from a Term of Commitment signed by the tobacco agribusinesses, the *Sindicato da Indústria do Fumo* (Tobacco Industry Trade Union) in the Southern region of Brazil and the AFUBRA, under the guidance of the Ministry of Labor. Through this document, mechanisms were created to intimidate tobacco growers about the use of labor by children and adolescents under 18 years of age and encourage parents to keep their children enrolled and regularly attending school.

The census showed that the properties intensify the active labor used in tobacco cultivation since, in addition to family members, they hire temporary employees for seasonal periods in cultivation, planting, and harvesting. Figure 13 shows that this labor force is 100% temporary, with no records of permanent employees on the properties in the study. The reduction in the contingent of inhabitants in rural areas highlights the lack of housing resources

in the countryside, and the lack of qualified labor is one of the main objections of rural entrepreneurs.

The census also showed that other sources of income contribute to the subsistence of producing families. This income was identified by income generated by formal jobs of its members in other activities besides the property and by social security and welfare assistance. Figure 17 shows that 17.5% of the properties have residents with a source of income by retirement, 4.5% have pensioners, 6.5% have residents assisted by social programs, and 5.7% of the properties have residents with permanent jobs outside the property. In the search for a better monthly income, many families add fixed jobs for one of the members in the city and even on neighboring farms so that they work part-time or during the off-season, helping mainly in the harvest and planting of other crops. There is a greater demand for permanent jobs on properties with little or no crop diversification.

Moreover, the results presented socioeconomic aspects of producers and tobacco farms in the Southwest region of the state of Paraná, consistent with the country's current economic and social reality. Figures 19 and 20 describe an overview of two primary sources of basic needs: water and energy. All the properties in the census have access to energy sources in their homes; of these, 95.2% use electricity, and only 4.8% use solar energy.

Rural producers have a rural energy subsidy, which gives discounts on electricity taxes. This right is made effective by complying with some bureaucracies with ANEEL, the regulatory agency. Producers need to prove that they meet the rural class conditions by presenting the *Registro de Produtor Rural* (Rural Producer Certificate) issued by the *Sindicato dos Trabalhadores Rurais* (Rural Workers Union).

The rural subsidy is financed by the Energy Development Account (CDE). The payment of the CDE is made partly by the Union's General Budget (OGU) and primarily by electricity consumers, passed on in the electricity bill as part of the sectorial charges. In recent years, some adjustments have been made in order to streamline the expenditures made with the CDE; one of these measures was decree 9,624/2018, which determines the gradual reduction of incentives for the rural class (except irrigation and aquaculture) from 20% per year to a zero rate in 2023.

Because of the reduction in rural energy subsidies, alternative energy sources are gaining more space in the countryside, especially renewable ones, because of their low environmental impact, especially solar energy in the study region.

As for the source of drinking water and solar energy consumed in the households, presented in figure 20, it is evident that 44.5% are from natural sources from springs and wells,

39.6% use water from the public water supply, and only 15.9% use artesian wells. Public policies are institutionalized to preserve and conserve the quantity and quality of water on the properties where producers, municipalities, and concessionaires are involved. Actions also aim to preserve springs, reduce soil erosion, and increase or maintain forest cover. Expanding rural sanitation, which brings potable water to the countryside, has been a slow process in the region, as it requires private and public investments. Moreover, the low adherence to the drilling of artesian wells is attributed to the high cost and difficulties accessing infrastructure.

In the rural environment, the internet facilitates access to information and contact with new technologies. This internet advance in the countryside forces producers to keep up to date about equipment and communication methods. Digital inclusion in rural areas is necessary for development, as it has also reached the school environment, being part of the new form of education, especially in the post-pandemic world. Figure 21 shows that 96.7% of the households in the census have internet. Among the respondents who do not have internet access, factors such as lack of access and lack of adequate service provision in delivering a quality connection to properties were identified. Internet access also favors communication and entertainment in the households; figure 22 points out that 100% of the households use TV, radio, and cell phones, and 35.10% use computers.

Figure 18 contemplates a determinant factor of the quality of life under the panorama of comfort and safety of the residences and identifies the type of construction. 53.46% of the residences have a masonry structure; 31.02% are mixed houses composed, in its majority, of a living room and bedrooms in wood, and kitchen, sanitary facilities, and service areas in masonry; 15.1% are wooden houses, including external sanitary facilities; the index of 0.4% defines as others a residence in a shed.

Figure 23 presents an overview of the forms of paving on the access roads to the properties, which are used for human locomotion, school transportation, and production flow, considering passenger vehicles, buses, and agricultural machinery. Only 6.5% of the properties have access by paved roads determined from the city to the entrance of the properties; 12.7% of the properties have access by roads paved with irregular stones; a more expansive number, 80.8%, have access by unpaved roads. The rural access roads' maintenance and paving is the state government's responsibility, which is carried out with funds assigned to the municipal road and construction departments. These access roads are used by 98.2% of the producers with their vehicles, and only 0.2% use public transport. The use of public transportation in rural areas has been unfeasible due to the lack of demand characterized by older adults.

Another factor of socio-environmental character and quality of life identified in the census was presented in figures 25 and 26. The service of sorted-waste collection of recyclable waste was seen in 79% of the properties, and 21% do not have this service. Therefore, it is demonstrated that 100% of the organic waste produced is disposed of on the property itself. The municipal governments are responsible for the collection through an established calendar on properties with a recyclable waste collection.

Producers also report the collection of empty triple-washed pesticide containers as a requirement among tobacco production integrating companies. The companies require their integrated tobacco growers to build pesticide storage tanks for the storage of full and empty containers and provide "agrobags," which are appropriate containers for storage until the collection period. The farmers are responsible for the correct return in the selective collections organized by ARIAS - Association of Agricultural Input Dealers in the Southwest of Paraná; these collections have a specific calendar, established annually in advance.

The organic waste generated on the property is disposed of or reused on the properties, according to the census index in 100%. This disposal or reuse can be described as the use in domestic gardens, feeding domestic animals (cats and dogs) and livestock (pigs and chickens), and producing compost. Composting, a biological process, provides new uses for organic waste and reuse as fertilizer for plants and vegetables.

Figure 27 finalizes the identification of the stratified items for the census socioeconomic study, presenting the type of medical care used by the producers in the study. 97.5% of the producers use the Unified Health System (SUS), 1.6% seek private care, and 0.8% have health insurance. The municipalities that compose the Southwest region of the state of Paraná highlight the cities of Francisco Beltrão, Cascavel, and Pato Branco as references in medical and hospital care for the population. Access to health insurance is pointed out as important but costly, causing little adhesion. The producers also report that access is very restricted, and there is no specialized care in several cities, so it is preferable to keep an extra financial reserve for the occurrences than to pay for a plan. Thus, care via SUS is the most used, a relevant factor for being mostly small properties and scarce resources.

The players in the tobacco value chain are identified in the study as the factors that are not directly linked to the business strategy but exert influence on it since they intervene or interfere in the sustainability of the activity. The census sought first to direct the relationships with financial institutions that the producers effectively have. Figure 28 shows that 91.8% of the properties in the study have no financing for their residences through rural housing programs. It is also shown in figure 29 that 39.2% of the properties have financing for some other type of property (machinery, equipment), and, in figure 30, the result shows that the properties of the study have no financing for tobacco production subsidies with financial institutions.

Sustainability in the field, also known as rural sustainability, uses environmental preservation practices for day-to-day activities, as well as the adoption of new technologies and the application of sustainable methods in the routine of the properties. The census showed four relevant activities developed on the properties that aim at sustainability and environmental commitment. Figure 31 indicates that 100% of these properties avoid burning and return empty containers of pesticides; 90% preserve the riparian forest; twenty-five properties protect the springs.

Producers relate the Environmental Rural Registry (CAR) as an agent for environmental preservation in the study region. The CAR is a public electronic registry, mandatory for all rural properties, which aims to integrate environmental information regarding the situation of permanent preservation areas (APP), legal reserve areas, forests and native vegetation remnants, restricted use areas, and consolidated areas of rural properties and possessions in the country.

Another determining factor for the producers' performance in the sustainability of their properties is the requirements of the ITPS companies, which involve from environmental preservation practices in agricultural activities to the adoption of new technologies and the application of sustainable methods in the field routine. These companies promote awareness and education actions, aiming to engage all links in the production chain.

The search for sustainability in the field can also be identified in the census, shown in Figure 32, in which the producers describe that they seek to improve and enhance tobacco activity, aiming at improvements in the activity. Thus, 98.7% of the farmers perform training and capacity building in the activity and invest in specialized technical assistance; 100% of the farmers perform their activities respecting the safety rules at work. The training of tobacco growers is reported as a joint action managed by SINDITABACOS and ITPS companies in partnership with the National Service of Rural Learning (SENAR), which provide complementary courses for the qualification of production, such as IT, rural management, tractor operation, safety, diversification within the rural property, in addition to the living conditions of the tobacco grower based on environmental and occupational safety issues.

Tobacco farming requires that the work be divided into several production stages, distributed throughout the year, considering seasonality. The stages that demand the most work are soil preparation, planting, and harvesting. The harvest is the longest stage and the one that

66

demands the most labor. It is performed in the summer, which makes the activity exhausting, and requires the adoption of uncomfortable postures. The work in tobacco growing is little mechanized, almost handmade, with simple tools. The census showed the percentage distributed between work mechanisms characterized in each activity stage.

In the soil preparation stage, 91.2% of soil preparation for planting is mechanized, and 9.8% is done by animal traction. In a report, producers describe that it is not always possible to incorporate machinery in tobacco production since it is grown in hilly terrain or on hillsides, sometimes steep. The tractor and agricultural equipment, such as plow and trailer, are the most used tools among producers in soil preparation, and the oxen joint is the most common animal traction. Figure 34 presents the form used on the property for soil planting, with 97.5% of manual planting and 2.5% of mechanized planting. The cycle ends with figure 35, which describes the harvesting methodology, which is mechanized and represented by 1.7% of the production, while 98.3% is harvested manually. The technical conditions of the tobacco activity, the low incorporation of mechanical technologies, and the terrain imply the intensive use of family labor.

After the tobacco is harvested in the field comes the process of curing the produce. Curing is a continuation of the ripening process, primarily involving nutrient transformation and moisture reduction; curing tobacco is more than just drying the leaves. Curing refers to tobacco leaves' numerous chemical and physical transformations after harvest. The environment in which curing occurs determines the nature of these transformations and substantially impacts the quality and price received for the cured tobacco. The curing environment refers primarily to temperature, relative humidity, and air exchange or ventilation. In many crops, natural conditions provide acceptable conditions without much need for management. However, in atypical conditions, such as dry or rainy periods, there is a need for humidity control inside the warehouse.

The warehouse is used for the storage and handling of tobacco and is identified as a standard warehouse (low ceiling structures with plastic roofing) and a conventional warehouse. In Figure 36, it can be seen that 54.3% of the properties use the standard warehouse model, 97.5% use the conventional warehouse model, and, in 51.8% of the properties, both models are used. Considering both, the producer will have greater flexibility of workforce and time in order to help in the management of climatic risks inherent in tobacco production.

No one structure is necessarily better since plastic-covered tillage-curing structures are the least expensive. However, they are precarious structures for storing cured tobacco for long periods because of weather hazards. If the grower cannot cull the tobacco as it cures, then a structure with an adequate roof, perhaps with partial or complete side protection, would be more appropriate than the plastic-covered tillage curing structure for storing tobacco not yet culled or cured.

Tobacco activity has representation based on entities such as associations and unions and establishes an integrated production system. The unions ensure the sector's sustainability and represent the tobacco industries' common interests. Figure 37 shows that 97.5% of the producers are associated with AFUBRA, while figure 38 shows that 71.4% of the producers are union members. Among these union members, 84.5% belong to the rural workers union, and 15.5% belong to the rural employer's union.

Tobacco companies' economic and financial success depends on ITPS, which BAT created based on knowledge of geography, climatology, history, and socioeconomics. Its initial purpose was to ensure a regular supply of raw materials. The system's establishment resulted from a well-articulated marketing strategy based on technoscientific and cultural knowledge and motives.

According to figure 39, among the responding producers, 98.8% are part of ITPS accredited in integrating companies, and 1.2% have no integration with companies, absorbing production costs. Figure 39 also shows that 90.9% of integrated producers belong to BAT companies, and 9.1% of producers belong to the company Universal Leaf Tobaccos.

As for the products marketed to the ITPS, the census shows, in figure 40, that there are two variances to consider: 98.7% market more than 80% of the production to the SIT and 1.3% of the producers market less than 50% of the production to the ITPS. This result is attributed to the commercialization of tobacco by the so-called "tobacco scammers," who buy directly from the grower and sell to tobacco companies, generally paying higher prices than the integrating companies.

Among the producers, the census analyzed determining factors for the continuation of the activity that were studied under the motivational perspectives with the activity and the perspectives in relation to the activity with the quality of life of its producers. The motivational factors analyzed are profitability, integrated system, technical assistance, price, and property size. Thus, the producers chose three, which would be, in their preferences, the most significant factors to continue in the activity. Figure 41 shows that 97.1% of the producers remain in the activity due to the integrated system of production, 90.2% list technical assistance as the most significant factor, and 69.8% say that profitability is one of the three most relevant factors to continue in the business.

However, Figure 44 shows a considerable range of 43.7% of producers who have prospects of remaining in the activity for another five years; considering a medium term of 10 years, it is reduced to 25.8% of producers with prospects of remaining in the tobacco business. The low adherence of young people to the activity leads to the prospect of a considerable reduction in the workforce, which contributes to a decrease in production if more accessible technological mechanisms of production are not adapted.

ITPS has become a reference in family agribusiness in the country and is currently used by several other productive sectors in Brazil and worldwide. This system of partnership with tobacco growers consists of the supply of seeds and inputs necessary for the installation and development of the crop, as well as free technical assistance in all phases of the culture until commercialization. Hence, the producer's relationship with the agricultural advisor is reported as a determining factor of the activity, a link of trust and improved productivity.

The advantage of the integrated system is the approximation of the integrating companies with the rural communities, enabling partnerships and investments of an environmental and social nature, besides contributing to the reduction of the rural exodus and the diversification of the rural property with other activities, for example, corn and beans after tobacco. The perspectives for the future point to the continuous improvement of this system, making tobacco production even more sustainable (BAT, 2020).

Profitability is the third motivational factor in the permanence of producers in the tobacco activity; it is related to the profit obtained with the production over the cultivated plantation areas, so it is a proven profitable activity, especially with small properties. Table 06 proves the development of the activity whose profitability has been increasing, considering the last five harvests, which is a response to new technologies developed to obtain more quality, productivity, and profitability in the tobacco segment.

On the other hand, the census also presented relevant factors for the producer not to continue in the tobacco business. The alternatives that would lead the producer to abandon the activity were the following: profitability, low price, lack of labor, health, age, and quality of life. Figure 40 shows that 95.1% of the producers would quit the activity for reasons related to the low production price in case there is a decrease in the new harvest or a high increase in the prices of inputs.

Of the producers, 90.2% said they would abandon the activity due to profitability factors, considering introducing new technologies to increase production. 53.4% say that the lack of labor is one of the three most relevant factors for not continuing in the activity; they fear

the growth of this shortage linked to the rural exodus. Considering that the activity is manual, it does not arouse the interest of young people leaving the countryside.

Given the behavior of the last harvests, shown in table 06, it is noted that the producer, on average, is satisfied with the quality of life of the activity. Figure 43 shows that 67.7% of producers are satisfied, which drives producers' activity and permanence in tobacco cultivation. It is noted that this culture is consolidated in the Southwest region of the state of Paraná. Once installed in small properties, the activity presents satisfactory economic results compared to other activities developed in the properties. Besides, the activity brings general satisfaction with the results among the producers integrated into the culture.

4 FINAL CONSIDERATIONS

Following the sequence proposed in the specific objectives of the work in the first stage, exploratory qualitative research was conducted to define a criterion for social categorization and the definition of indicators to demonstrate precisely the peculiarities of the tobacco producers in the Southwest region of the state of Paraná. The second stage was the census with the 245 tobacco farmers distributed in the 28 municipalities of the Southwest region of the state of Paraná; the results obtained were presented in items 3.3 and 3.4 of the study.

It can be concluded that the proposed specific objectives were entirely met. The census attributed a greater number of questions in its interview form to the first objective since it was necessary to investigate the public of interest of the study to build the bases aimed at identifying and describing the socioeconomic level of tobacco producers. The second and third objectives used descriptive analysis correlating the variables that allowed reflection on the perspectives regarding the future of the chain in question and sought to understand the role of tobacco in the production units, besides its importance in family income.

By reaching each of the specific objectives, the general objective (to analyze the tobacco value chain in the Southwest region of the state of Paraná) was also reached, as it facilitated the understanding of the activity and its importance to the local economy aggregated to the producing families.

As for the research question (How is the tobacco value chain structured in the Southwestern region of the state of Paraná?), the census identified the competitive and intervening factors in the development of the tobacco value chain.

As for objective one, which deals with the panorama of socioeconomic aspects of tobacco growing in the state region, this was presented in the first part of the census, described in chapter 3 and interpreted in item 3.4, and was characterized by the identification of producers and the identification of the properties, about the main profitable activities performed on the properties, which identified crops developed in these locations.

The stratified data pointed out relevant factors, such as the predominance of white people coming from the colonizing descendants, in labor used in the tobacco activity in the properties. Tobacco farming proved to be a manual activity involving the whole family's labor, even though the relevance among the producers is male. The age bracket of tobacco growers shows a higher rate between 46 and 60 years old and does not indicate a proportional succession in the families, so that, in 10 years from this study's realization, according to the perspectives

reported. If innovations and technologies are not incorporated, the activity will no longer be carried out by the young generations, currently between 18 to 30.

The quality of life in the study's properties was evidenced in the high index of accessibility to public health, basic sanitation, electricity, garbage collection, internet access, road paving, education, and transportation. These characteristics were crucial for the tobaccoproducing families in the 28 municipalities of the study to be guaranteed decent housing, health, education, technology, and entertainment.

Regarding objective two, in relation to the intervening factors in the development of the tobacco value chain in the southwestern region of the state of Paraná, it is noteworthy that the predominance of properties studied is of their own property so that the producer's family owns the land areas. The study also concluded that the prevalence of properties that do not have financing from financial institutions; also, low rates of financing for housing, equipment, and cost of production were identified, characterizing the lack of financial subsidies via the federal government, characteristic of the activity.

Considering the average of the properties used for tobacco planting and crop rotation (total area of 3,096.86 ha), the census showed that the farmer can have two or more annual harvests with diversified products using the same area for tobacco planting. It can be said that the properties seek to manage their sustainability, also identified in the low rate of producers who work in other formal jobs, i.e., tobacco growers seek their livelihood by exploring activities on the property itself. To be the "owner" of the property, without having any financing, and to perform crop rotation are factors that intervene in the subsistence of the activity and determine the permanence of the families in tobacco growing.

The representative entities are intervening in the tobacco activity and seeking sustainability in the field, conducting training and capacity building in the activity, and investing in specialized technical assistance through complementary courses for the qualification of production. The producers presented these entities as being active in the region: SINDITABACOS, AFUBRA, rural unions, and SENAR.

Another factor that intervenes in tobacco activity is rural sustainability, which uses environmental preservation practices for day-to-day activities and new technologies and application of sustainable methods in the routine of the properties. The properties studied identified several sustainable practices and environmental commitments. The return of empty containers of pesticides and the non-conduct of burning are fully met in the study properties.

Regarding objective three, which seeks to present the structure of competitiveness of the tobacco value chain, one can conclude that the articulation in the commercialization of tobacco, characterized by the integrated production system, is a positive factor for the activity. Tobacco growers believe that the guaranteed purchase and technical assistance, corresponding to control that begins at planting and extends through the delivery of the product, with the agricultural technician mediating the relationship between the company and the tobacco grower, are determining factors for the tobacco value chain. However, they understand that this integrated system centralizes the power of decisions for the tobacco companies, which operate in small numbers, because, at the end of the harvest, the commercialization of the volume produced is already guaranteed by the industries. Competitiveness would increase if other trading companies were active in the region.

In the study region, the predominance of BAT in tobacco activity is a factor linked to the decline of the crop and the tobacco industries in recent decades; the company has operated in the region for over 60 years and is the only one to remain. Nevertheless, the study pointed out the resumption of Universal Leaf Tobacco in the last two harvests.

Tobacco is more profitable than other crops. The profitability of tobacco farming is a competitive attraction for producers, especially for those with small properties, and the employability of family members generates a factor of competitiveness and sustainability of small properties. The study concludes that family labor is used to the maximum, except in periods of planting and harvest, when it is necessary to hire outsourced workers.

As motivational factors determining the continuation of tobacco activity, producers point to profitability, the integrated system, and technical assistance. They also list factors, such as low prices and lack of labor for production, as the main factors that would lead to the abandonment of the activity. Thus, we conclude that a competitive factor in the tobacco value chain is firmly based on the integrated companies and the profitability of the property. Another competitive factor is the non-implementation of a mechanized production system to make the activity less manual since, in the medium term, there will be no more labor available for the activity in the region.

The integrating companies commercialize their production with industries, especially cigarette manufacturers, a factor that can contribute to the competitiveness of tobacco. Indexes such as the reduction in consumption and legal requirements may affect commercialization. Furthermore, the substitution of traditional tobacco for artificial products and the intense requirements of the Ministry of Health in limiting consumption may determine the law of supply and demand for the product. The fact that tobacco has few alternatives for its use (98% as cigarettes or derivatives) can affect the value chain, affecting the entire production chain.

Finally, the tobacco crop showed growth in planting areas and productivity in the last harvest; this rate is based on several factors that go through the organization of the sector, especially the personalized technical assistance and the production integration system. These variables have driven the activity, and for this reason, it is concluded that if tobacco cultivation remains profitable for the next 10 years, the activity will perpetuate in the region. If there is a technological innovation in the work methodologies, the activity will grow and develop in the study region, especially considering the favorable climatic conditions and the number of small properties.

The scientific contribution of this research is effective in presenting an analysis that involves the complete enumeration of the elements of the population studied, resulting in integral data for the smoking entities to perform technical and sustainability analysis in the activity. In the census proposal, no similar work was found in the Southwest region of the state of Paraná.

In relation to the limitations of the research, there are the characteristics of the population studied, due to the research being a case study, which has particularities of the object chosen to be studied. Another limiting factor is the number of producers who are not linked to the association, of which there is no dimensioning; therefore, it is not reachable.

As suggestions for future research, the influence of new tobacco companies can interfere with the current scenario, and the promotion of agricultural credit lines, as a government policy, can directly encourage producers to seek investments and technologies for the sector. It is also suggested that the census be carried out at the end of a five-year period to validate the perspectives described in the research.

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