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Articles

Analysis of the industrialization and commercialization of Erva-mate in the northwestern region of Rio Grande do Sul state

Análise da industrialização e comercialização de Erva-mate na região noroeste do Rio Grande do Sul

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ABSTRACT

Non-timber forest products (NTFPs), extracted in Brazil, are responsible for a significant portion of rural household income. Erva-mate is one of the most important NTFPs in the country and has a strong productive presence in the state of Rio Grande do Sul, particularly in small rural properties. Despite its importance, the sector lacks studies on the producer demands, market trends, production data, and market potential. Therefore, this study aims to characterize the industrialization and the commercialization aspects of erva-mate in the northwestern region of Rio Grande do Sul state. The research methodology involved the application of in-person questionnaires. A total of 12 erva-mate processing companies from 7 municipalities were interviewed. The main findings indicate that 75% of these companies have been in operation for over 10 years, with an average production of 1,005 kg per day; however, they maintain approximately 46% of their productive capacity idle. The greatest challenge reported by traders is obtaining raw materials and hiring labor. Additionally, most owners have no knowledge of initiatives aimed at promoting the erva-mate cultivation. More than 80% of the industries interviewed stated that they would purchase high-quality raw material if it was produced in the region and that they would be willing to establish partnerships to develop the sector. Given these results, it is evident that the erva-mate market in the region has potential for expansion. However, the lack of incentives for local silviculture research has limited the market growth.

Keywords: *Ilex paraguariensis*; Forestry; Erva-mate sector; Northwestern Rio-Grandense

RESUMO

Os produtos florestais não madeireiros (PFNM) extraídos no Brasil são responsáveis por grande parte da renda familiar rural. A erva-mate é um dos PFNM mais importantes do país e com grande destaque produtivo no estado do Rio Grande do Sul, principalmente em pequenas propriedades rurais. Mesmo com sua importância, o setor carece de estudos sobre demandas de produtores, mercado, levantamento de informações sobre produção e potencialidades de mercado. Deste modo, o presente estudo visa caracterizar os aspectos da industrialização e da comercialização de erva-mate na Região Noroeste do Rio Grande do Sul. A presente pesquisa teve como metodologia a aplicação de questionários, *in loco*. Foram entrevistadas 12 ervateiras localizadas em 7 municípios. Como principais resultados verificou-se que 75% das ervateiras estão em atividade a mais de 10 anos, com uma produção média de 1005 kg/dia, porém, mantêm cerca de 46% da capacidade produtiva ociosa. Como maior dificuldade citada pelos comerciantes destaca-se a obtenção de matéria-prima e contratação de mão de obra. A maioria dos proprietários não possui qualquer conhecimento sobre iniciativas que visem o fomento da cultura. Mais de 80% das indústrias entrevistadas afirmam que comprariam matéria-prima de qualidade se fosse produzida na região e que estariam dispostos a realizar parcerias visando desenvolver o setor. Frente a esses resultados, percebe-se que o mercado ervateiro da região está aberto a expansão e que a falta de incentivo à pesquisa da silvicultura local tem limitado a expansão do mercado da erva-mate.

Palavras-chave: *Ilex paraguariensis*; Silvicultura; Setor ervateiro; Noroeste Rio-Grandense

1 INTRODUCTION

Brazil has the second largest forest area in the world, totaling 496 million hectares. In addition to the observed potential in the timber sector, with 9.6 million hectares of planted forests, Brazil stands out as one of the leading countries in the productive capacity of non-timber forest products (NTFPs), which generated around half a billion dollars in 2021 (SFB, 2024).

NTFPs extracted in Brazil include food products, waxes, oilseeds, resins, and other forestry products (Ronchi; Bonfim; Coutinho, 2022). Erva-mate (Ilex paraguariensis A. St. Hil) is one of the species with the greatest potential and represents one of the country's most important NTFPs, accounting for USD 97.5 million in exported products in 2021 (SFB, 2024). According to Berté (2011), yerba mate can be used in the production of pharmaceuticals, tinctures, dyes, cosmetics, food products, beverages, among others, and has a high demand for industrialization and commercialization both in national and international markets. In Rio Grande do Sul, yerba mate is the main NTFP in terms of revenue generated, serving as an economic pillar by creating jobs and boosting family labor (Antoniazzi *et al*., 2018).

The northwestern region of Rio Grande do Sul was originally inhabited by indigenous peoples, including the Kaingangs and the Guaranis, and inherited the consumption habits of yerba mate, which became widely popular throughout the state. Today, the region is predominantly composed of small rural properties, which are distributed across undulating terrain with variable soil depth. According to Balzon *et al*. (2004), small rural properties are the primary sites for cultivating yerba mate, providing an important source of income for producers. In this context, Fiedler *et al*. (2008) highlight the significant social, economic, and environmental importance of NTFPs in general, as their production mainly occurs on small properties. Therefore, greater attention should be given to public policies and scientific development aimed at making tools available that support the continuity of production activities without compromising their socio-economic and environmental viability and sustainability.

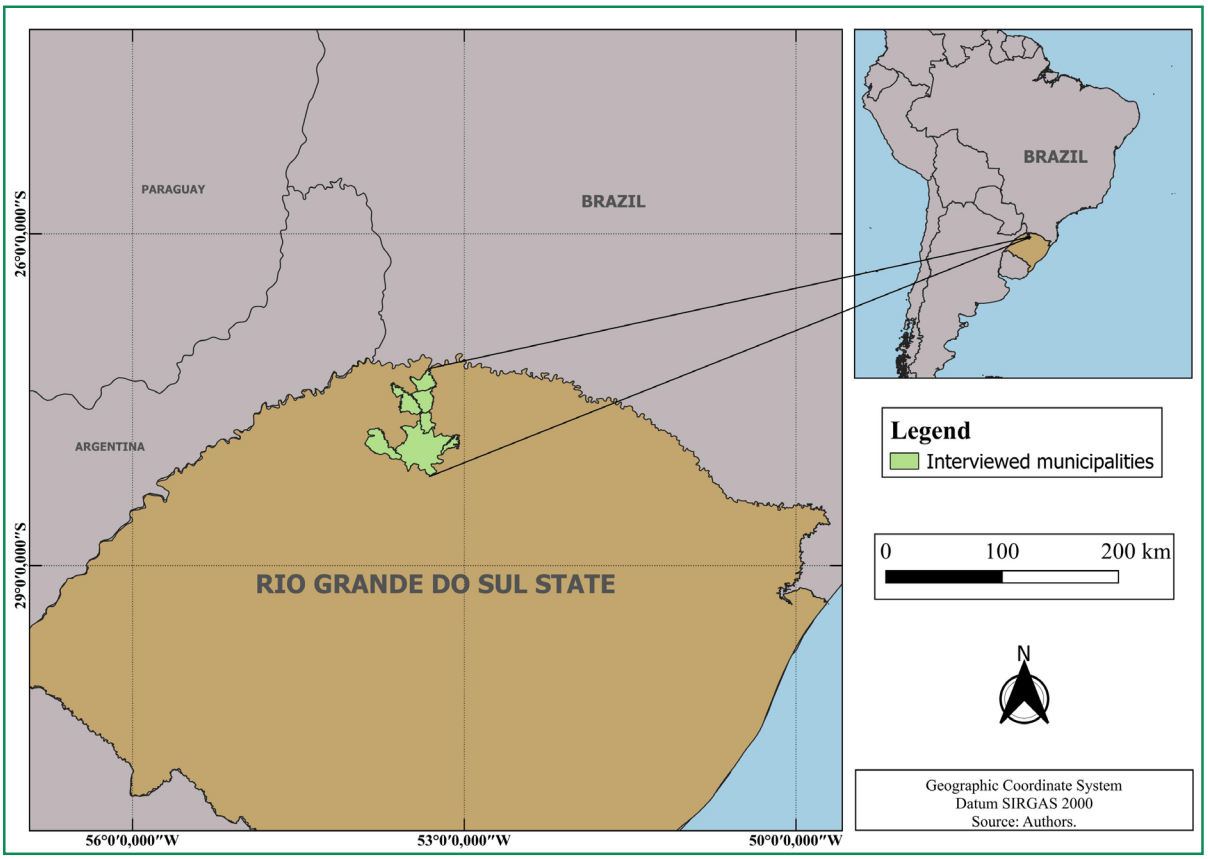
Thus, the present study aimed to evaluate some aspects related to the industrialization and commercialization of yerba mate in the northwestern region of Rio Grande do Sul, with the goal of contributing to the development and structuring of the yerba mate value chain in the state.

2 MATERIALS AND METHODS

2.1 Characterization of the study area

This research was conducted in 2022 across 12 yerba mate industries located in seven municipalities in the northwestern region of Rio Grande do Sul state: Seberi, Frederico Westphalen, Erval Seco, Novo Barreiro, Palmeira das Missões, Boa Vista das Missões and Santo Augusto (Figure 1). The Northwestern Mesoregion of Rio Grande do Sul is one of the five in the state and comprises a total of 216 municipalities, encompassing the regions of Planalto Médio, Alto Uruguai, Médio Alto Uruguai, Missões, Noroeste Colonial, and part of the Centro-Serra region.

Figure 1 – Location of the surveyed municipalities



Source: Authors (2024)

2.2 Data Collection

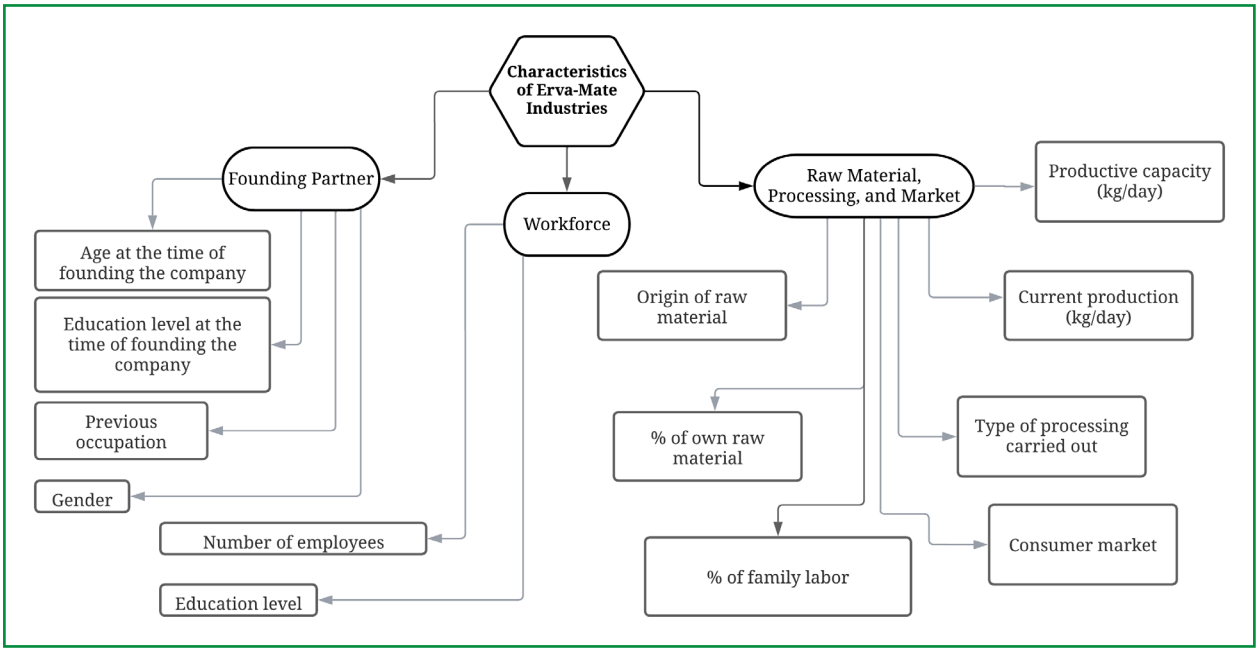
Data collection in the erva-mate industries of the region and contact with the owners were carried out through email requests sent to the municipal offices of EMATER and also via social media. The data were collected by determining the number of erva-mate processing industries in the region, aiming to obtain a figure that would enable a comprehensive analysis of the market situation.

Thus, the study consisted of applying a questionnaire based on the methodology adapted from the Research Network on Local Productive and Innovative Arrangements and Systems of the Federal University of Rio de Janeiro, available on the REDESIST online platform (2022). The questionnaire is divided into four sections: "I – Company Identification; II – Production, Market, and Employment; III – Innovation, Cooperation, and Learning; IV – Public Policies and Forms of Financing."

2.3 Structure of the Data Analysis

Based on the data collected through the questionnaire, the study was conducted by segmenting the information into different levels of analysis: characteristics of the erva-mate industries (Figure 2), Opinion Survey, and Municipal and Regional Perspective. The division into levels and sub-levels of analysis aims to facilitate the compilation and interpretation of the data, allowing the aspects of the collected information to be organized in a way that enables a better understanding of the overall study context.

Figure 2 – Structure of the data collection at the level of erva-mate industries



Source: Authors (2024)

2.4 Data Analysis and Processing

The collected data were subjected to descriptive statistical analysis. The analyses were conducted using Excel for organizing and compiling the information, and Microsoft Power BI was used for data visualization and analysis, allowing for the creation of an interactive dashboard summarizing the collected data. This dashboard may support future studies related to the region and the erva-mate value chain.

3 RESULTS AND DISCUSSIONS

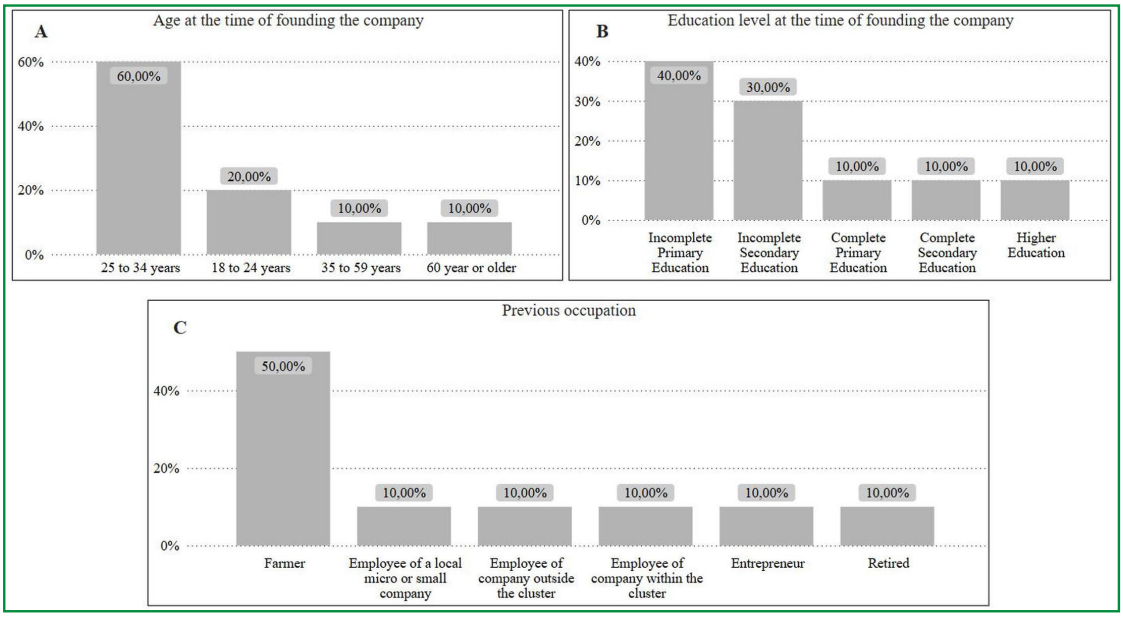
3.1 General Overview

A total of 12 erva-mate industries were surveyed, with an average operating time of 25 years. Among them, 75% have been in operation for more than 10 years, with the oldest one founded in 1970. All the erva-mate industries are classified as microenterprises according to the Brazilian Micro and Small Business Support Service (SEBRAE, 2024), with the number of employees ranging from 1 to 17, and an overall average of 8 employees.

3.2 Characteristics of the Erva-Mate Industries

Most erva-mate industries were founded by one or two founding partners (Figure 3A), with 91.7% being men, and an average age of 30 at the time of founding. Regarding the education level, 40.0% of respondents had not completed elementary school (Figure 3B). All interviewed founders reported not having entrepreneurial parents, and 50.0% were farmers prior to founding the company (Figure 3C).

Figure 3 – Profile description of the founding partners of the surveyed erva-mate industries according to Age (A), Education Level (B), and Previous Occupation (C) at the time of founding

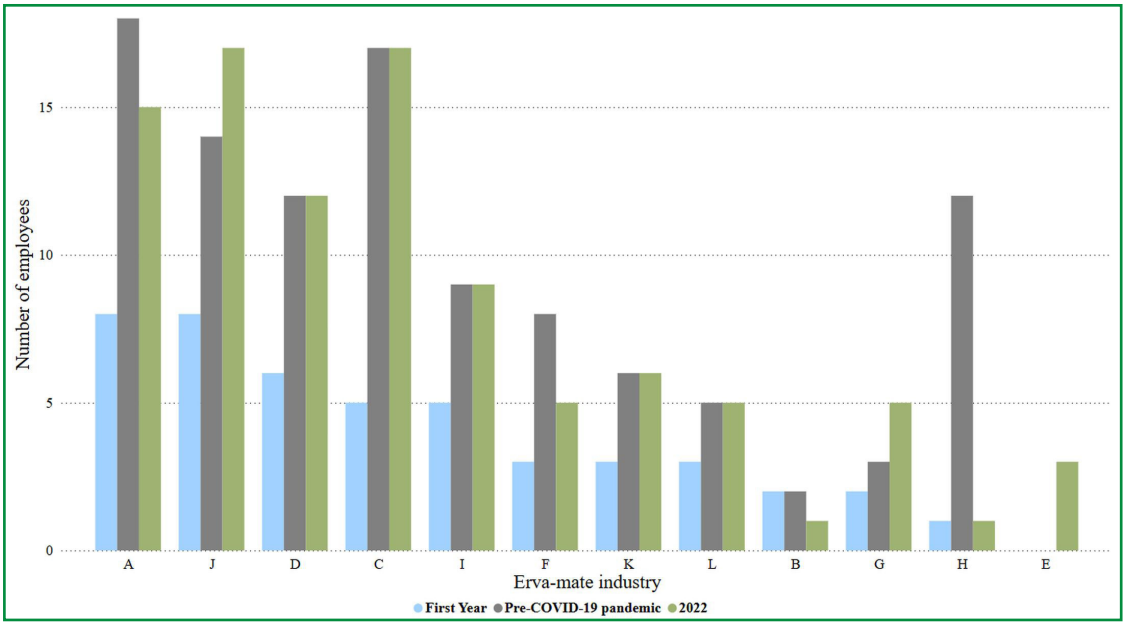


Source: Authors (2024)

3.2.1 Workforce

Currently, the surveyed erva-mate industries employ 96 workers directly. Compared to the first year of operation, 83.3% of the businesses experienced an increase in the number of employees, 8.3% maintained the same number, and 8.3% reported a reduction (Figure 4). When compared to the pre-COVID-19 pandemic period, 33.3% of the businesses reported a decrease in staff, 41.7% maintained the same number, and 25.0% saw an increase. One of the erva-mate industries reported a significant reduction in its workforce (91.6%) after the COVID-19 pandemic, reflecting the challenges faced in the marketing production during the pandemic period.

Figure 4 – Number of employees in the surveyed erva-mate industries during the first year of the company, the pre-COVID-19 pandemic period, and the year 2022

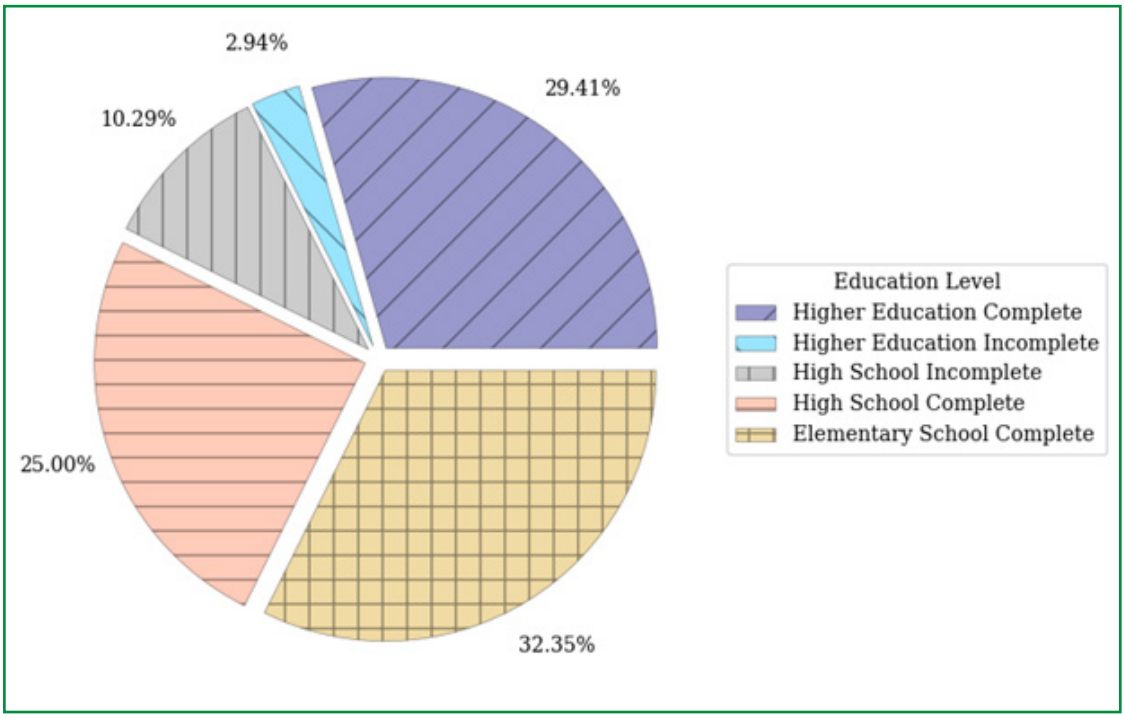


Source: Authors (2024)

Most employees had an education level between completed primary education and incomplete secondary education, with the workforce being predominantly composed of family labor (Figure 5). The information on the employees' education levels was provided by the interviewed erva-mate industries.

These results are consistent with the findings previously documented by Santos (2017), who focused his research on assessing generational succession in family farming in the region, highlighting aspects such as the educational level of local youth. The author's findings emphasized the predominance of young people with education levels ranging from incomplete to complete secondary education.

Figure 5 – Education level of the workforce in the surveyed erva-mate industries

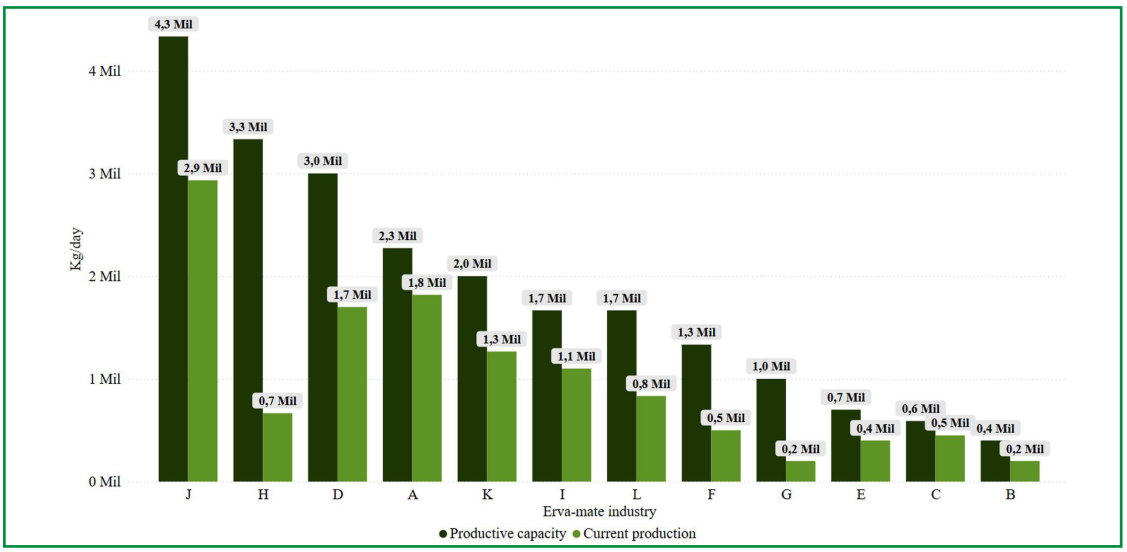


Source: Authors (2024)

3.2.2 Raw Material, Processing, and Market

Regarding the production capacity, 33.3% of the industries operate at less than 50.0% of their installed productive capacity (Figure 6), with an average production of 1,005 kg/day. As such, 46.0% of the total productive capacity (around 10,000 kg/day) remains idle, with the lack of raw material and reduced the commercialization of erva-mate being reported as the main factors contributing to the underutilization of installed capacity.

Figure 6 – Relationship between the productive capacity and the current production of the surveyed erva-mate industries



Source: Authors (2024)

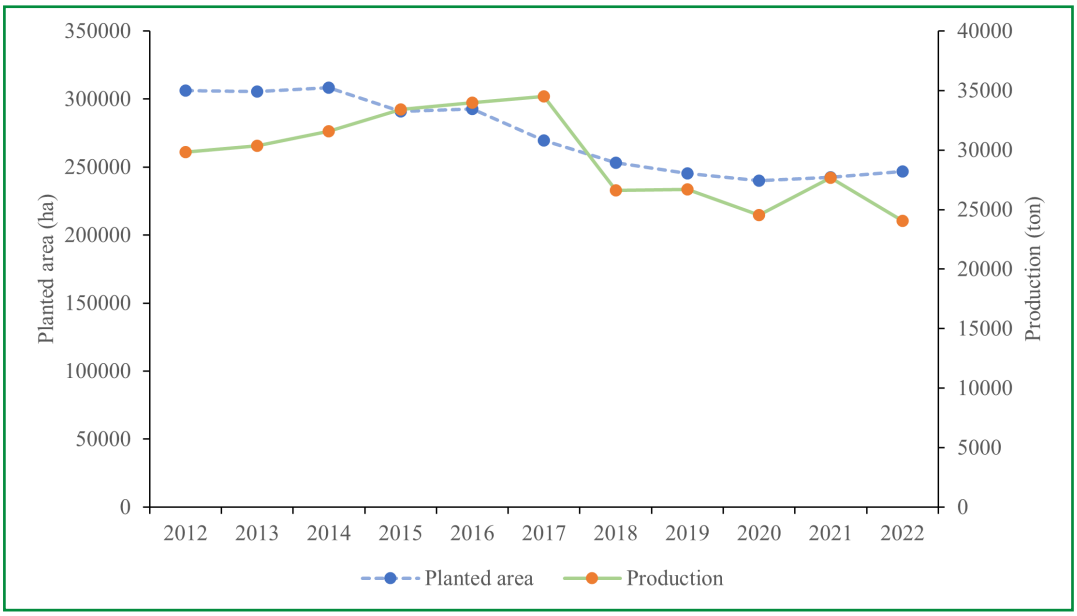
Among the enterprises analyzed, around 41.7% had their own erva-mate plantations; however, these accounted for only 25.0% or less of the total raw material consumed. All erva-mate industries reported sourcing erva-mate from the state of Paraná, originating from shaded plantations. As such, most of the surveyed erva-mate industries perform a partial processing of the product, carrying out the grinding, drying, and packaging stages. According to the 2022 report on the Production of Extractivism and Silviculture (PEVS), Paraná was the leading state in the erva-mate production, responsible for 85.7% of the country's total output (IBGE, 2022).

Regarding the acquisition of raw material from outside the state of Rio Grande do Sul, this scenario is primarily due to the decline in erva-mate cultivation area in the region (GLOBO, 2016). Between 2002 and 2020, the erva-mate production in Rio Grande do Sul state decreased by 41.0% (IBGE, 2022). In the recent years, the expansion of annual crops—especially soybeans—combined with the declining prices paid to producers, has led to the suppression of erva-mate plantations in the study region. According to Viana *et al*. (2021), there was a 47.6% increase in grain cultivation

areas in Rio Grande do Sul between 2006 and 2018. Thus, in regions with a stronger agricultural vocation, there is a tendency to convert forest crop areas into temporary crop fields.

In comparative terms, Rio Grande do Sul produced 26,611 tons of erva-mate (R$ 34.4 million) in 2020 (SFB, 2024), while the soybean production in the same year reached 135.9 million tons (R$ 11.4 billion) (IBGE, 2022). The trends in planted area and erva-mate production in Rio Grande do Sul from 2012 to 2022 are shown in Figure 7.

Figure 7 – Trends in planted area and erva-mate production in Rio Grande do Sul from 2012 to 2022



Source: Adapted from IBGE (2022)

The adoption of annual crops requires producers to incorporate new technologies to maximize productivity. Similarly, the implementation of technologies in the erva-mate cultivation could lead to significant productivity gains. However, as noted by Goulart (2020), the adoption of advanced techniques for erva-mate cultivation, including full-sun planting, is still limited. As a result, many producers prefer to invest in new technologies for annual crops and end up removing their erva-mate plantations. Nevertheless, if they adopted technological innovations in the erva-mate cultivation, they could achieve a substantial increase in the crop productivity.

Regarding the consumer market, 8.3% of the erva-mate industries sell only to the regional market, 16.6% to the state market, 66.6% to the national market, and 8.3% sell to both national and international markets. Greff (2016) found that more than 90.0% of erva-mate sales produced in the Alto Vale do Taquari region, RS state, are destined for the state market. According to Vasconcellos (2012), the international erva-mate market is still underdeveloped, involving only Brazil and Argentina, and mostly trading processed erva-mate and its derivatives.

According to Zanin and Meyer (2018), even with the trade liberalization following the creation of the Southern Common Market (MERCOSUR) in the early 1990s, erva-mate remains a product primarily for domestic consumption, with a low proportion of foreign product in the total supply. The same authors state that there is great potential for export growth and market diversification, but this requires increased investment in the development of new products and their promotion both internationally and within Brazil, beyond the southern region.

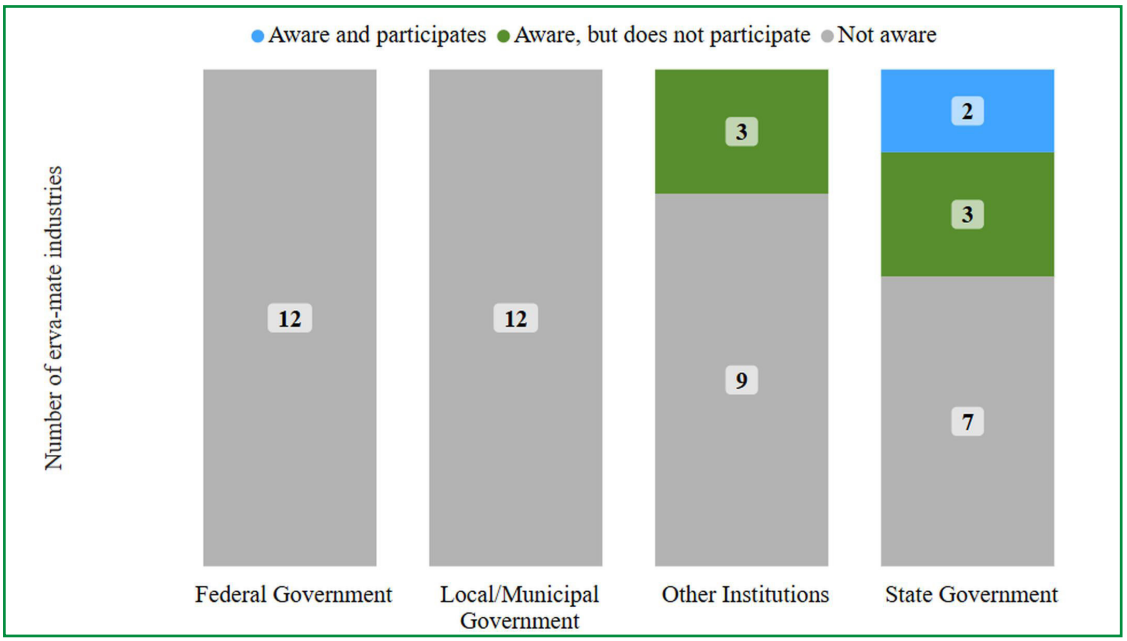
In this context, the results observed in the present study show that the main product sold is erva-mate for chimarrão and tereré, with little to no additives, and not directed toward other commercial uses. This indicates a low level of investment by the erva-mate forestry sector in the study region in developing new products, which results in a reduced export rate of erva-mate from the enterprises analyzed.

3.3 Characteristics of the Erva-Mate Industries

Regarding the knowledge of specific programs or initiatives for the sector, all erva-mate industries reported being unaware of any programs from the federal or municipal governments. Among the enterprises analyzed, 17.0% are aware of and participate in state-level policies, 25.0% are aware but do not participate, and another 25.0% are aware of policies from other institutions but also do not participate (Figure 8). Greff (2016), in his study of the erva-mate industrial cluster in Alto Vale do Taquari, RS, also observed low participation of erva-mate industries in public policies across

all levels of government. This highlights the lack of outreach and visibility of incentive programs for the erva-mate cultivation and underscores the need to expand public policies targeted at the sector.

Figure 8 – Awareness among erva-mate industries of specific programs or initiatives for the sector promoted by State, Federal, or Municipal governments or other institutions



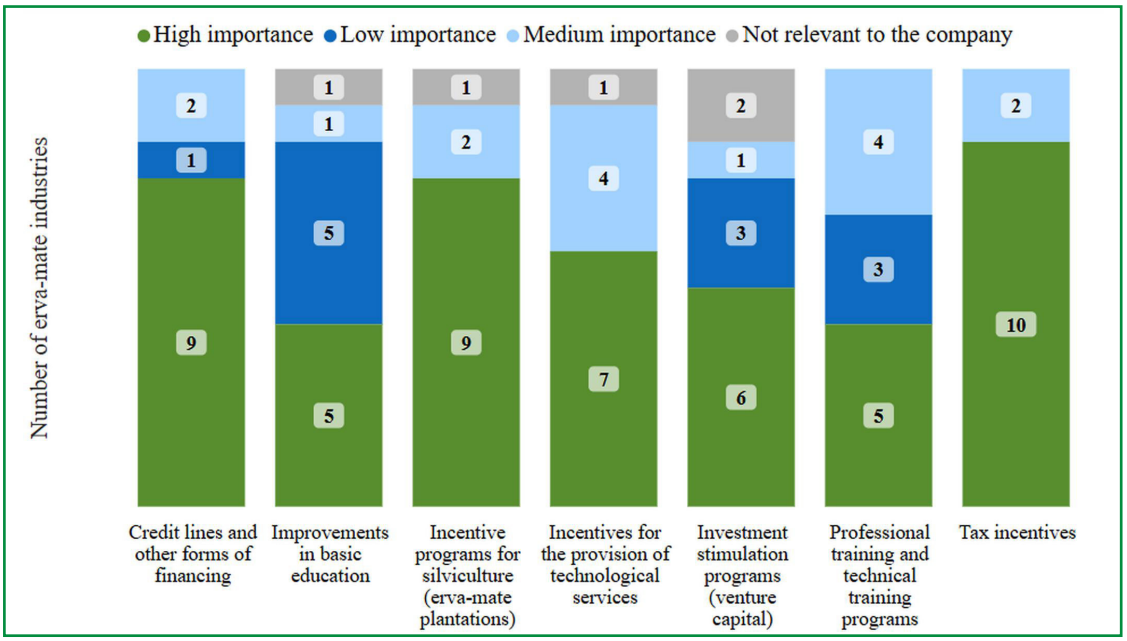
Source: Authors (2024)

Goulart *et al*. (2022), in their study on factors affecting the productivity of erva-mate in southern Brazil, reported that only 28.2% of the producers stated that they received Technical Assistance and Rural Extension (ATER), indicating a deficient level of ATER in the sector—a conclusion similar to that found in the present study. The lack of ATER emerges as one of the possible reasons for the low percentage of producers who maintain their own plantations. Inadequate guidance on erva-mate management, combined with poor selection of genetic and physiological quality, can compromise the success of independent cultivation (Winhelmann *et al*., 2022).

Regarding public policies that could help increase the competitive efficiency of erva-mate industries, 83.3% assign high importance to the need for tax incentives, and

75.0% consider credit lines and additional financing options to be of high importance (Figure 9). Additionally, 75.0% of respondents consider it highly important to develop and implement programs or initiatives aimed at promoting erva-mate silviculture. This is due to the lack of high-quality raw material available in the study region. Therefore, there is a clear need for actions focused on erva-mate cultivation in the region, which is essential for obtaining a high-quality final product.

Figure 9 – Degree of importance of public policies that could contribute to increasing the competitive efficiency of companies in the erva-mate sector



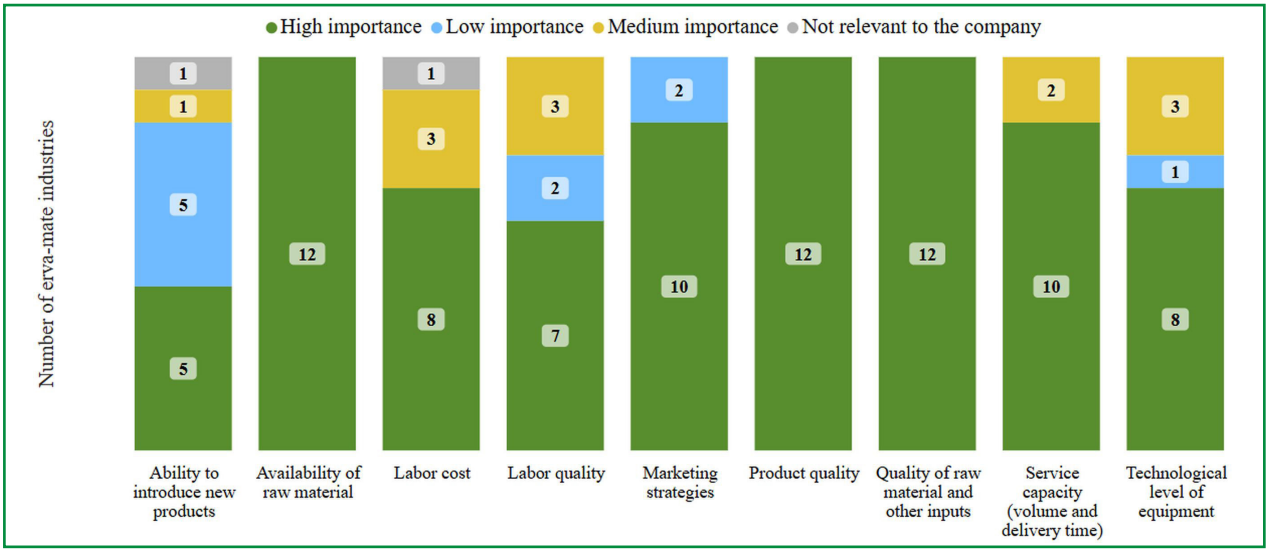
Source: Authors (2024)

To maintain competitive capacity in their main product line, 100% of respondents indicated high importance for the availability and quality of raw material as well as the quality of the final product (Figure 10). This result highlights the importance of developing public policies aimed at promoting the cultivation of erva-mate in the region.

Customer service capacity and marketing strategies were considered highly important by 83.3% of respondents (Figure 10). The adoption of appropriate marketing strategies is essential for reaching new markets, especially international trade (Zanin;

Meyer, 2018). This indicates the erva-mate sector's concern with formulating various marketing strategies, as most respondents reported difficulties in selling their products. Moreover, due to the large number of brands in the market and the fact that packaging is nearly identical across products, entrepreneurs have focused on colors and styles that could attract more the consumer's attention.

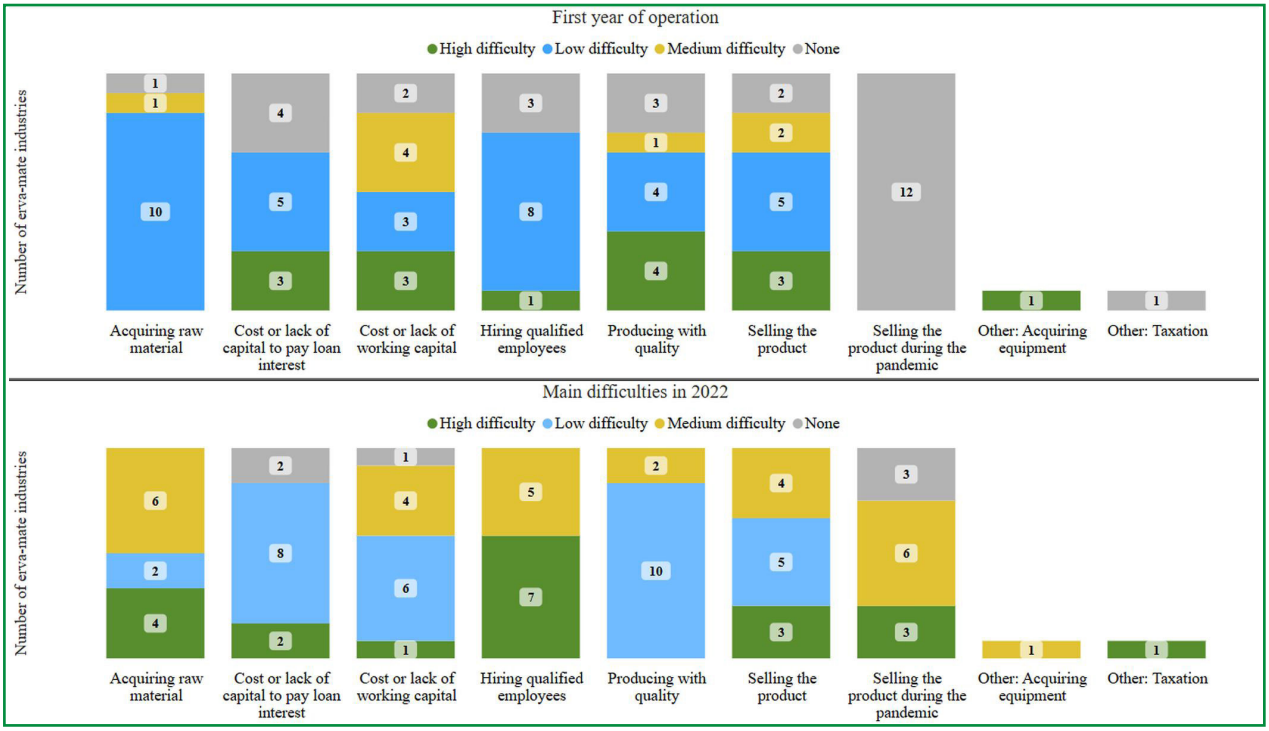
Figure 10 – Degree of importance of the main obstacles limiting the companies' access to external sources of financing



Source: Authors (2024)

On the other hand, the ability to introduce new products was mostly rated as of low importance or not relevant to the company (50.0%) (Figure 10), indicating that, in general, erva-mate industries do not aim to commercialize other derivatives of *Ilex paraguariensis* beyond erva-mate for *chimarrão* and *tereré*. This result may partly explain the challenges in the product commercialization, as 25.0% and 33.3% of respondents reported high and medium difficulty in selling their production, respectively (Figure 11). In the industrial context, Barros (2007) highlights that low brand loyalty, coupled with a large number of suppliers, leads the erva-mate consumers to not commit to a specific company, thereby reducing the companies' bargaining power and increasing the commercialization difficulties.

Figure 11 – Degree of difficulty of the main operational challenges faced by the company in its first year compared to 2022



Source: Authors (2024)

Comparing the operational challenges faced during the first year of activity with the current period, there is an increase in the difficulty of hiring qualified employees. Additionally, there has been a rise in the difficulty of acquiring raw material. Considering that most of the erva-mate industries have been in the market for over 30 years, it is likely that at the time of their founding there was greater availability of erva-mate in the region. Over time, however, the increasing value of soybean production has made replacing erva-mate plantations with soybean crops a financially attractive alternative.

4 CONCLUSIONS

The northwestern region of Rio Grande do Sul state presents potential for the development and the expansion of the erva-mate production. However, a significant portion of the erva-mate processed in the region comes from outside the state, with most being cultivated in Paraná state.

It was found that most producers are unaware of public policies specifically aimed at the erva-mate sector to support the local production, which is one of the factors hindering the sector's development in the region. Thus, there is a need to create and to implement public policies tailored to the needs of the erva-mate industries, as well as to promote the silviculture of erva-mate in the region to ensure the sector's maintenance and expansion.

The erva-mate industries in the region show low innovation capacity, although there is interest in innovation and in technological development. Moreover, the sector is currently facing greater difficulty in hiring qualified employees and acquiring raw materials compared to the time of its establishment. Finally, a low volume of exports was observed, which underscores the need for training and strategic partnerships to access new markets.

It is recommended that studies on the erva-mate sector in the northwestern region of Rio Grande do Sul state continue, covering the entire regional industry to provide a broader perspective of the sector and include all stakeholders in the erva-mate value chain. In addition, there is a need for further research focused on improving local products through scientific and technological development, aiming to advance the different links in the production chain.

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