



Views on the sociobiodiversity of the Pampa: dialogue of narratives

Visões sobre a sociobiodiversidade do Pampa: diálogo de narrativas

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ABSTRACT

Agribusiness has suppressed Pampas' socio-biodiversity in an increasingly aggressive way, either by inserting commodities or by changing the individual-field relationship. The present work sought, through a systematic review and semi-structured interviews, to compare the academic and local understandings in relation to the socio-biodiversity present in the Pampa. The databases of Scielo, Capes, Calibri, Redalyc and ScienceDirect were used for the systematic review, applying exclusion criteria. The semi-structured interviews were based on the guiding themes Biogeography and links with ecoagriculture, applied to 202 farmers in two municipalities in Rio Grande do Sul – Brazil. The final corpus analyzed consists of 115 articles, it was possible to relate the works into four sub-themes, terrestrial sociobiodiversity, marine sociobiodiversity, health and education. The interviews showed the importance of conserving the Pampas socio-biodiversity, both for the ecosystem services provided and for the cultural services. There is an urgent need for studies that understand the potential of the Pampa, so that it is possible to envision new forms of agriculture that harmoniously interact with production, conservation and knowledge.

Keywords: agroecology, systematic review, transdisciplinary.

RESUMO

O agronegócio tem suprimido a sociobiodiversidade do Pampa de forma cada vez mais agressiva, seja pela inserção de commodities, seja pela alteração da relação indivíduo-campo. O presente trabalho buscou, por meio de uma revisão sistemática e de entrevistas semiestruturadas, comparar os entendimentos acadêmicos e locais em relação à sociobiodiversidade presente no Pampa. Para a revisão sistemática, foram utilizadas as bases de dados Scielo, Capes, Calibri, Redalyc e ScienceDirect, aplicando-se critérios de exclusão. As entrevistas semiestruturadas foram baseadas nos temas norteadores Biogeografia e vínculos com a ecoagricultura, aplicadas a 202



agricultores de dois municípios do Rio Grande do Sul - Brasil. O corpus final analisado é composto por 115 artigos, sendo possível relacionar os trabalhos em quatro subtemas: sociobiodiversidade terrestre, sociobiodiversidade marinha, saúde e educação. As entrevistas mostraram a importância da conservação da sociobiodiversidade dos Pampas, tanto pelos serviços ecossistêmicos prestados quanto pelos serviços culturais. Há uma necessidade urgente de estudos que compreendam o potencial do Pampa, de modo que seja possível vislumbrar novas formas de agricultura que interajam harmoniosamente com a produção, a conservação e o conhecimento.

Palavras-chave: agroecologia, revisão sistemática, transdisciplinar.

1 INTRODUCTION

The immense variety of living organisms present in the ecological fabric of a space is called biodiversity (Severo 2012; Wilson 1997). In Brazil, it is estimated that it is possible to find between 169 and 212 thousand species, with more than 32 thousand species of plants and fungi, the vast majority of which are endemic to the country (Lewinsohn e Prado 2005). This great biodiversity makes Brazil a world highlight (Brito 2020), since, together with 20 other countries, they have 70% of the planet's biodiversity, representing only 10% of the earth's surface (Brasil 2019). As a country rich in natural resources, Brazil separates its biodiversity into six biomes. The term, derived from the Greek, was coined by Clements and Shelford in 1939, defining that biome is the interrelation of a specific type of vegetation with the macro, meso and micro fauna by which all are affected by the same defined climatic condition (Severe 2012).

Sharing between three countries of the South American cone, the Pampa Biome covers more than 750,000 km² between Argentina, Brazil and Uruguay. Originating in the language of the native communities of South America, the Pampa practically occupies the entire Uruguayan territory; in Argentina, however, it represents 20% of the land (Dinerstein et al. 1995; Gabriel et al. 2021). In Brazil, the Pampa is present in 193,000 km² in the state of Rio Grande do Sul, representing 68% of the region's native vegetation (Hasenack et al. 2023). Characterized by its plains, the Pampa has diverse ecosystems composed of forests and woodlands, parks similar to savannahs, complex rocky outcrops, dunes and different types of wetlands and water bodies (MapBiomias 2022). The vegetation is composed of grasses, creeping plants, shrubs and some trees (Kuplich 2018). The rich biodiversity of the Pampas is undeniable, and it is estimated that in the Brazilian portion alone, there are about 3 thousand species of vascular plants, 400 species of birds and 90 species of mammals (Andrade et al. 2023). In addition, it houses the Guarani



aquifer, one of the most important water resources for the region and global natural heritage (Severo et al. 2020).

Although extensive at the regional level, the Pampa covers only 2.3% of the national territory and for many years it was considered the most unknown and neglected biome in Brazil (Chomenko 2017; IBGE 2019). It was only in 2004 that a federal resolution disaggregated the Pampa from the Atlantic Forest Biome, giving it a new role (IBGE 2004). With undeniable aptitude for livestock production, especially cattle, sheep, goats and horses, the Pampa began to have this type of exploitation in the year 1630 by the Jesuits (Possamai 2006), since the grasses that make up the vegetation present ideal characteristics for food, having enough nutrients for the physiological development of the animals (Severo 2020).

The productivism view that biodiversity is just a heap of resources at the service of human beings, has transformed the Pampa into an agricultural frontier that has been aggressively exploited (Cavalheiro 2015; Netto 2017). Currently, the region suffers from the offensive of soybean, rice and forestry crops - Pinus and Eucalyptus, in addition, the insertion of exotic species, such as the annoni grass (*Eragrostis plano*), threatens the natural flora (Dias et al. 2020). Soybean farming in the state of Rio Grande do Sul expands every year, in 2007 the area planted with the legume was 3.8 million hectares, rising to 5.4 million in 2016 (EMATER/RS 2016; IBGE 2023). With data released in October 2022, the State Secretariat for Agriculture, Livestock, Sustainable Production and Irrigation (SEAPDR 2022), estimates that for the 2022/2023 harvest, the soy planted area should reach 6.5 million hectares.

In view of the above, soybean monoculture has been an important impact factor in the Pampa, since its intensive cultivation requires a high demand for energy, water and soil resources and is always linked to technological packages that instill pesticides and synthetic fertilization. This dynamic, of a business Fordist character, generates a product that is not very differentiated, being essential to increase the scale, causing deforestation and rural exodus (Ferreira 2016; Litre 2010; Netto 2017).

Forestry has also been putting pressure on the Biome, especially after 2004, when government projects were launched in an attempt to promote the cellulose chain (Dias et al. 2020). Data show that since the state incentives, the biome has lost more than 200 thousand hectares for the planting of exotic trees (FUNDAÇÃO ESTADUAL DE PROTEÇÃO AMBIENTAL 2013). The impact of adding forestry species to monocultures in the Pampa causes



a reduction in biodiversity and water availability and induces soil salinization processes (Litre 2010). Thus, with the advance of soybean cultivation and forestry, there was greater pressure from livestock on the remaining native fields in the territory. In an attempt to get around this situation, in the mid-1950s, annoni grass was introduced, with the proposal of a forage resource. At the time of its introduction, the species was unknown and, over time, its enormous invasive potential on the Pampa was observed (Kuplich 2018) as well as its ability to cause damage to cattle in advanced phenological stages due to the fibrous characteristic of its leaf blades. In this sense, the solution was not very effective, resulting in loss of forage quality and low productivity (Nabinger et al. 2009).

In view of the above, all these anthropic advances on the Pampa are increasingly putting it at risk, especially in regions with environmental weaknesses, thus threatening the ecosystem services provided, the food security of a people and sociocultural identities. (Ledur et al. 2017). The term sociobiodiversity seeks to express in a single word marine and terrestrial biodiversity, the various agrarian systems, human multiculturalism and their ecological knowledge, and proposes to work on sustainability concepts in a multidimensional way, involving social, economic and ecological aspects. (Gutiérrez 2023).

From this viewpoint set out above, to summarize all the Pampa's socio-biodiversity in terms of resources, is to impoverish all the biodiversity and local ancestry, given the erasure of the gaucho/pampa culture and the ecosystem services that the biome provides to human and non-human animals, such as capture and atmospheric carbon retention, rainwater filtration, aquifer recharge, providing refuge and food for fauna, maintaining the landscape, hosting popular knowledge, protecting seeds and promoting resistance to extreme weather events (Cavalheiro e Araújo, 2015; Litre 2010; Parera e Carriquiry, 2014). Although it is not possible to establish a perfect formula for sustainability, which can be applied in any context, Agroecology presents itself as a transversal science, capable of penetrating and understanding the ills of a territory, since it proposes solutions that can be effective in conservation of biodiversity while respecting sociocultural subjectivities (Cavalheiro 2021; Netto 2017). For the Pampa Biome, Agroecology seeks to break with the bias of agrarian capitalism, which has been degrading natural landscapes for the allocation of commodities and eroding local culture (Suertegaray e Silva 2009) and, by recognizing the importance of linking knowledge, it aims to value the socio-biodiversity of the territory.



Within the above, the present work aims to carry out a systematic review, in order to elucidate the current concepts and objects of study within the theme of sociobiodiversity of the Brazilian, Argentinean and Uruguayan Pampa Biome, linking these conceptions to a case study that aimed to characterize the profile and perceptions of farmers and ranchers in the municipalities of Santana do Livramento and São Luiz Gonzaga – Rio Grande do Sul/Brazil on the use of local socio-biodiversity, especially on native botanical species.

2 MATERIALS AND METHODS

The study followed a methodological arrangement consisting of two parts, a systematic review, and semi-structured interviews. For the systematic review, the concepts of Urrútia and Bonfill (2010) were used, searching for articles, called units of analysis (UA), by the following algorithms (socioecological AND argentina), (socioecological AND uruguay) and (socioecological AND brazil) in the Scielo, Capes, Calibri, Redalyc and ScienceDirect databases. After performing the search, duplicate results, those outside the article standard, references to patents, citations and those included outside the study period, between the years 2013 to 2023, were excluded. After applying the exclusion and inclusion criteria, articles on sociobiodiversity in the pampeana region of Brazil, Uruguay and Argentina, a textual corpus was created aiming at the interpretation of the results of the speeches from the elaboration of the descending hierarchical classification (CHD) and consequently the factorial analysis of correspondence (AFC) through of the IramuteQ software (version 0.7 Alpha 2).

As for the semi-structured interviews, based on the guiding theme of local knowledge about biodiversity, a sequence of pre-established and scripted questions was used, however, with space for free answers (Marconi e Lakatos, 1996). Thus, 202 semi-structured interviews were carried out during the period 2020 and 2022 through the Google Forms platform. For the selection of interviewees, the technique of following actors was used, where, for each interviewee, another interviewee was indicated. Participants were farmers and ranchers from the municipalities of Santana do Livramento (SL) and São Luiz Gonzaga (SLG), both in Rio Grande do Sul (Brazil). The form was formed by two blocks of questions, the first one, characterizing the profile of the interviewees, with the objective of characterizing the activity and area of the productive unit. The second block sought to raise awareness and knowledge about the



biodiversity of the Pampa. The systematization and analyzes of the speeches were carried out using Excel and Iramuteq programs.

3 RESULTS AND DISCUSSION

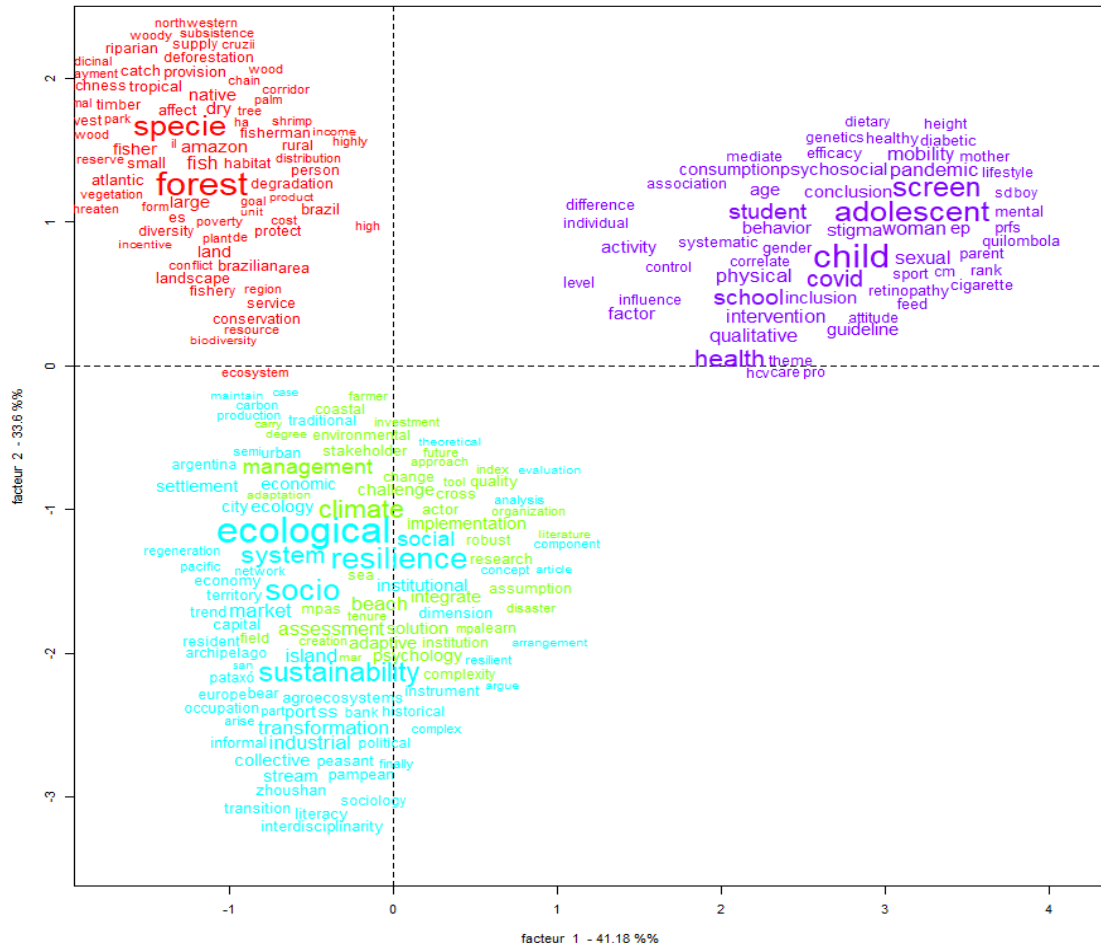
3.1 SYSTEMATIC REVIEW

From the systematized search, 460 AU were found, as follows: Scielo – 8 results, Redalib – 102 results and ScienceDirect – 350 results. The algorithms did not bring any results in the Capes and Colibri sites. Based on the exclusion criteria, 115 articles were included. Within the scope of the guiding axis studied, sociobiodiversity, the results were grouped into four groups, namely: group 1 – Land environment, group 2 – Marine environment, group 3 – Health and group 4 – Education. Thus, the articles were separated into related areas, where 50 articles were attached to group 1 - Sociobiodiversity in a terrestrial environment, 22 in group 2 - Sociobiodiversity in a marine environment, 32 in group 3 - Sociobiodiversity and Health and 3 in group 4 - Sociobiodiversity and Education. Each group generated a textual corpus for analysis and then the descending hierarchical classification (CHD) and factorial correspondence analysis (AFC) were processed in Iramuteq.

The descending hierarchical classification (CHD) proposed by Reinert (1990) aims to obtain, among the different corpus, the similarities and differences between the words used in the speeches and classify them into classes. Correspondence factor analysis (CFA) is derived from the CHD, through which, in a Cartesian plane, it is possible to observe the different words associated with each class of the CHD (Trigueiro et al. 2016). This type of analysis demonstrates the frequencies and chi-square correlation values of each word within the analyzed groups and, the plotting of the Cartesian plane, allows analysis of proximity, opposition and tendency of the terms of each segment of the corpus (Queiroz Filho, 2015; Salviati, 2017). The CFA corroborates the division into four distinct discourses on sociobiodiversity, however, it points to a relationship between groups 1 and 3, as they are mostly positioned in the lower left quadrant (negative X) and the connection with group 4, which is positioned in the upper left side. Group 3 is arranged in the upper right quadrant (positive X and Y), separated from the other groups. The resulting plan has 74.78% of the model explained in the X (41.18%) and Y (33.6%) axes, as exemplified in Figure 1. You can see that, at the intersection of the X and Y axes, the most common within the four groups, which stand out: Ecosystem, Health, Climate, Sustainability and Resilience.



Figure 1. Correspondence Factor Analysis (CFA) of the corpus.



Source: The author (2023)

In the period covered by the study, there are 16 articles that address Brazilian socio-biodiversity, five are carried out in the Amazon biome, the same number for the Caatinga, three are in the Atlantic Forest and the same amount for the Cerrado. The Pantanal and Pampa biomes are not mentioned. When analyzing the most used terms, stands out in group 1, forest, used 125 times, followed by ecosystem, management and conservation, mentioned 89, 62 and 59 times, respectively. Among the most cited terms in group 2 are management - used 51 times, fish - 45, coast - 37 and fishing - 35. Of the articles carried out in Brazil, two of them are in the Amazon biome. The themes popular knowledge, protection of the coast and marine biodiversity and anthropic impacts on the coast, permeate thematic group 2. Within group 3, it is possible to notice the emphasis on the terms health, used 52 times, followed by children and climate, cited 39 and



38 times, respectively. The term Covid was used 25 times, being the tenth most cited term by the analyzed studies.

When the search engine focused on Argentina's socio-biodiversity, it was possible to find three articles that focused on the Pampa Biome. Regarding this region, Herrera et al. (2022) points out the difficulties of articulations between the public authorities, research groups and communities, for the creation and implementation of plans to confront deforestation in the biome. When conducting semi-structured interviews with residents of the region, he found that the central themes of the speeches revolved around biodiversity, terrestrial ecosystems, landscapes, anthropic pressures and environmental management.

Discussions that include marine socio-biodiversity as an integral part of the socio-biodiversity of a region are recent and have been growing. The theme began to enter the geopolitical agendas in 1994, after a United Nations Convention on the Law of the Sea, however, it was only possible to consolidate an agreement in 2023. The High Seas Treaty, developed by the United Nations (UN), aims to ensure the protection of 30% of the world's oceans, understanding that they provide essential ecosystem services, such as carbon dioxide absorption, being essential in mitigating climate change caused by carbon dioxide releases (UN 2023). In a pioneering way, the treaty condemns predatory activities, such as whaling, navigation and mining of the bottom of the sea. With plans that provide for the demarcation of marine spaces as preservation areas, the creation of a global fund for the protection of marine environments and monitoring of the genetic resources used (NEXO 2023).

The conversion of natural grasslands for anthropic use, whether for rural or urban purposes, equally affects marine environments, which are complex mosaics, characterized by high connectivity among themselves and with the surrounding landscapes (Fausch et al. 2002; Schlosser 1991; Tóth et al., 2019; Ward et al., 2002). Several studies prove the decline in water quality and the deterioration of biodiversity as disturbances from agriculture advance over watersheds (Allan 2004), highlighting the eutrophication of watercourses, dammings, changes in flow, invasion of exotic species and climate change (Joy et al., 2019). In the Pampa, fishing is carried out in an artisanal way, without industrial processes and in many cases with a family and subsistence character (Méndez, 2020), however, the effects of agriculture on the local marine biodiversity are already perceptible, the Pacú (*Piaractus mesopotamicus*) native to the region is practically extinct, with the products used in monocultures being one of the main factors, since



it was possible to find concentrations of Atrazine and Glyphosate in the animal (Brodeur et al. 2020).

The loss of natural areas in the Pampa to silvicultural crops such as *Pinus sp.* and *Eucalyptus sp.* it directly impacts water resources, whether due to the quality and quantity of water supplied, mobilization of salts and the leaching of fertilizers, commonly needed for cultivation (Scanlon et al. 2007). Valente (2013), sums up the evidence, by proving that the conversion of pastures into *Eucalyptus sp.* in Santa Maria - RS, was able to reduce the water quality indicators in the region, the same is reported by Netto (2017) in Argentine plains, which, due to the change in land use, suffered from salinization problems. Due to their root physiology, trees move water and sediments, depositing them under the soil surface, a behavior capable of interfering with terrestrial and marine biodiversity (Netto, 2017). The conditions of light, humidity, soil structure, food availability, in addition to the loss of local biodiversity, whether due to migratory changes or even extinction, are direct consequences of the replacement of native grasslands by exotic trees (Bencke, 2006).

Group 3 – Health seeks to relate how sociobiodiversity impacts collective health. The promotion of predatory agribusiness stands out with the constant changes in land use, mainly for the production of animal protein (Rabello, 2020). These types of activities generate the proliferation of polluting gases, which, in addition to direct damage such as respiratory problems, accelerate the processes of climate change, altering regional seasonality - water regimes, temperatures and humidity, which may favor the development of vectors and the proliferation of viruses, see *Aedes aegypti*, transmitter of yellow fever, dengue, Chikungunya and Zika (Almeida et al. 2021; Jones et al. 2008; Shope, 1991).

Children's health is impacted by the devastation of socio-biodiversity in several ways, including food sovereignty. With the acceleration of globalization, ultra-processed foods based on soy and corn have been gaining ground to the detriment of in natura ones (Louzada et al., 2021). The standardization of eating habits has caused the consumption of plant species to drop from 10,000 to 170 in recent years, depriving the individual of discovering new flavors and cultures (EMBRAPA, 2019). With an inadequate nutritional profile, mostly with high energy density and excess total fat (Louzada 2015; Monteiro 2016), ultra-processed foods have been catalyzing obesity rates in children, as evidenced by the World Atlas of Obesity, which estimates one third of children with obesity in Brazil by 2035 (Anastacio 2019).



Understanding that the collective health of human beings has great interference from the environment is fundamental, thus, thinking about transdisciplinary collective actions that seek to reduce the loss of sociobiodiversity is fundamental. It is estimated that in the last 50 years, 75% of new diseases originated in animals (Gebreyes et al. 2020). The destruction of natural landscapes by anthropic action, whether for the most diverse purposes, forces contact between wildlife and humans and this relationship facilitates the proliferation of zoonoses, diseases transmitted from animals to humans (Rabello 2020; Volpato et al. 2020). It was like this with the Ebola Virus, Avian Influenza (H5N1) and the SARS-Cov-2 pandemic (Perrota, 2020).

Education is the central theme of group 4, which has the smallest number of files indexed, 11 in total. Among the most cited terms, environment is mentioned 23 times, followed by research – 17 times and education 16 times. Also noteworthy are the 13 mentions of the word resilience and 8 of the words development. In the corpus of group 4, it is the first time that the words gender, culture, family and future appear prominently, proving the transdisciplinary character that education has. It is significant that education appears in the discussion on socio-biodiversity, given that a change in mentality only occurs through emancipatory educational processes. Environmental education aims to teach and prepare critical human beings in the face of social injustices, management is actions to protect the integrity of physical and biotic environments, as well as social groups that depend on them (Campaner et al. 2009; Reigota 2009; Santos, 2004).

In the Pampa, environmental education must be based on valuing the territory, exalting local socio-biodiversity, focusing on combating destructive exogenous processes, such as soy, rice and forestry monocultures, combating land concentration and condemning degrading techniques, such as the fires (Schlee e Barros 2020). Environmental education encourages marginalized groups to interact with the environment, converting them into agents of change, in addition, it protects and propagates traditional knowledge, involving individuals from different generations (Toomey et al. 2017).

The temporal distribution is as follows: group 1, the highest concentration of works is found in 2019, with 9 articles published, followed by the years 2021 and 2018 tied with 8. For group 2, the years 2020 and 2021 were the most expressive, obtaining 4 articles in the research period, however, it is possible to perceive a cooling of the theme in the following years. The change in academic behavior is significant for group 3 (health), given the intense increase in



research in the years 2020, 2021 and 2022, where 7, 8 and 6 articles were published respectively, this is due to the interest in understanding and combating new pandemics resulting from zoonoses. Group 4, has the lowest number of absolute articles, 11 in total, has the highest concentration of publications in 2015 – 4 in total.

3.2 SEMI-STRUCTURED INTERVIEWS

Among the 202 forms applied, 42 were from the municipality of Santana do Livramento (SL) and 160 from São Luiz Gonzaga (SLG). Regarding the profile of the interviewees, the data registered that in SL the main economic activity of the interviewees was beef cattle, representing 58% of the properties analyzed, followed by sheep farming - 14%, dairy farming - 11%, soy farming - 9%, olericulture - 5.5% and forage - 2.5%. The results found in SL are in line with those of Aguiar (2011), who characterized the Southern Half of Rio Grande do Sul as extremely linked to primary activities, such as beef cattle raising and cattle, sheep and dairy farming. to a lesser extent soybean and rice crops. However, data from IBGE (2014) and Netto e Vargas (2019), demonstrate the change in land use in the region, with the extension of planted soybean area jumping from 4,700 hectares in 2004 to 29,100 ha in 2013.

Piñeiro (2012) points out that SL began to feel the onslaught of monocultures later when compared to SLG, which already felt changes in the landscape around the 90s. This is noticeable when analyzing the profile of respondents in SLG. Although livestock has the largest share within rural activities, beef cattle – 24%, followed by dairy farming – 11% and pig farming – 6.5%, commodities occupy 33.5% of the properties, distributed in soy farming - 22%, corn - 10% and rice by 1.5%. There was record of tobacco production and horticulture in 2.5% of the areas and forage production in 1.5%. It is believed that the municipality's greater adherence to agribusiness took place from the 60's, when the region began to be intensely impacted by the advance of agrarian capitalism, camouflaged as a green revolution, this linked to public incentives and European colonization, altered the productive systems that were previously focused on polycultures for subsistence, converting them into monocultures, initially wheat and later soy. These changes had deleterious effects on local biodiversity, in addition to causing rural exodus, land concentration and cultural erosion, with the replacement of the figure of the gaucho cattle rancher (Brum 2008; Oliveira 2011; Tomasi e Araújo 2004).



As shown, in both locations the main activity is livestock, a result that corroborates the studies by Possamai (2006) and Severo (2020), where they extol the Pampa's suitability for extensive livestock. It is also noteworthy that extensive livestock in this region can be an ally in the conservation of the Biome's socio-biodiversity, since by using it, following its aptitudes, one would be creating conservation spaces through use, in addition, safeguarding -ia the identity of the cattle rancher (Ledur et al. 2017; Martins Costa et al. 2000; Martins Costa 2007; Netto 2017).

The land structure of the interviewees in the two municipalities was similar, with most of the analyzed properties having areas between 1 and 49 hectares, 50% of the interviewees own this extension of land in SL and 55% in SLG. Properties between 50 and 100 ha were a reality for 15% of rural properties in SL and 19% in SLG. In SL, 35% of the interviewed properties have areas larger than 100 hectares, in SLG, this number is 19%. These data are in line with those presented by the historical series of the Brazilian Institute of Geography and Statistics (IBGE), which from 1975 to 2006 found that the number of properties with up to 49 hectares has been reducing each year while those with more than 100 hectares have been increasing. The latest Senso Agropecuário (IBGE, 2017) found 364,193 properties in the state of Rio Grande do Sul, a reduction of 22.78% compared to the first measurements. It is important to point out that even though properties smaller than 50 hectares are numerically in greater quantity, those with more than 100 hectares cover 67.11% of the territory of Rio Grande do Sul (Ilha e Silva 2000). In contrast to the commodities commonly planted in large areas, small properties are responsible for food production, producing all the vegetables that reach the Brazilian table, in addition to 87% of cassava, 70% of beans, 38% of coffee. and 58% of milk, essential food for food security in urban areas (Aguiar 2011; IBGE 2006).

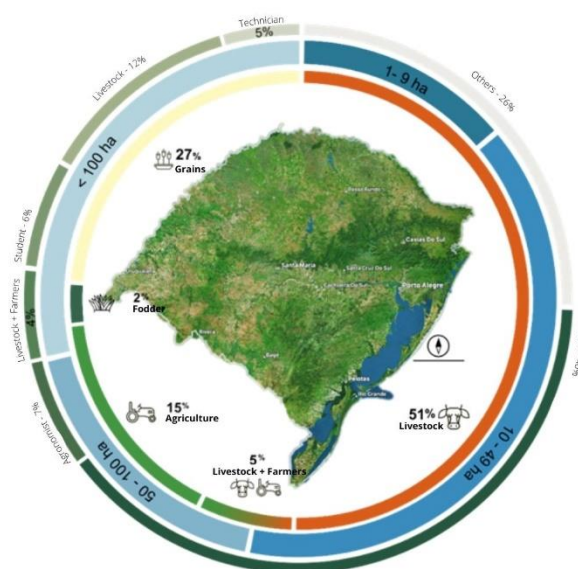
Intersecting gender with data obtained from interviews in the cities of SL and SLG, in the region, just over a quarter of the productive areas are headed by women – 54 properties. This data follows the national behavior and the state of Rio Grande do Sul, where 19% and 12% respectively of the properties are commanded by women (IBGE 2017). It is women from the most popular sectors, such as indigenous, mestizo and black women, who suffer most from the masculinization of territories, closely linked to employer agriculture (Barragán et al. 2016; Svampa 2019). The resistance to the advances of monocultures comes from women, according to Ferrera (2022), men are the most likely to replace the diversity of crops to produce soybeans on a large scale, while women understand more the negative externalities of the production



method - decreased quality soil, water and air, as well as the consequences caused to human health. Thus having a more intimate relationship with the territory. New policies involving female protagonism are great opportunities to promote gender equity in the countryside, putting narratives of well-being and the rights of nature in vogue, guidelines linked to peasant feminist movements (Ferrera 2022; Ordóñez et al. 2018; Svampa 2019).

Figure 2 shows the general profile of the productive units and their owners, that is, a summary of the first block of questions, which aimed to outline the profile of the interviewees. It is noteworthy that in the figure, all forms of livestock - beef cattle, dairy production, sheep and pig farming were united in the Livestock category. Major crops such as soy, corn and rice were grouped in the Grains category. All other forms of agriculture mentioned in the forms are represented in the Agriculture category. In the internal portion, the profession of the owners and the land structure stand out.

Figure 2. Characterization of property and owner profile in Santana do Livramento and São Luiz Gonzaga (RS).



Source: The author (2023)

The second block of questions referred to the interviewees' perception of the Pampa and their knowledge about the biome's native plants. The central word of the analysis is preservation, which is directly related to the terms fauna, biome and biodiversity. The following words are derived from the central term: important, which is segmented into medicinal, plant and air and environment, which is related to nature and balance. The frequency of terms in the interviewees'



speeches was preservation - 41 times, environment - 39 times, animal - 32 times, medicinal - 29 times and natural, balance, air and nature cited 23, 22, 19 and 11 times, respectively. The main highlighted species of frequent use were: carqueja (*Baccharis crispa*) and croup (*Aloysia gratissima*) in SL and macela (*Achyrocline satureioides*), carqueja, pitangueira (*Eugenia uniflora*) and cobra (*Tabernaemontana catharinensis*) in SLG.

With an exclusive biodiversity, the Pampa holds much more than ecosystem services. The biome is the guardian of an immense cultural heritage, built by years of interaction between nature and its inhabitants (Cruz e Guadagnin 2015). Its maintenance is also necessary to safeguard local peasant knowledge, since the territory lives in constant dispute from the industry and agro-industrialization processes, in practices that subjugate, inferiorize and make local systems unfeasible (Floriani et al. 2019; Netto 2017).

In this sense, local communities become subjects of conservation when they theorize about new production and conservation models (Oliveira Junior e Cabreira, 2012). The interactions built throughout coevolution break the paradigm that to protect biodiversity, we must keep it untouched and separate (Pereira 2013). In this way, transdisciplinary debates must be promoted, including local potentialities, drugs, food products, cosmetics, without forgetting the environmental complexities, conversations that allow the reconnection between local and scientific knowledge, the appreciation of sociobiodiversity and the redesign of productive models for a agroecological bias (Sandim 2021).

4 CONCLUSIONS

The constant assaults by agribusiness on the Pampa Biome have caused an ever deeper trail of destruction. The package of boss agriculture requires the exhaustion of natural resources, the constant insertion of synthetic inputs, the change in land use and the concentration of land. In this way, seriously threatening Pampa's socio-biodiversity, causing, in addition to environmental liabilities, a disconnection and erosion of the cultural co-developed between the subjects and the territory over the years. All this exposes the territory to greater susceptibility to climate change, low resilience, loss of food sovereignty and stimulates socio-environmental and land conflicts, in addition to causing an erasure of popular knowledge and intrinsic cultural traits of these peoples.



The main resistance actions against the advances of agribusiness come from family farming, as they still continue with the perception and appreciation of the botanical species present in the Pampa Biome. This recognition strengthens the bond between communities and nature, presenting itself as an opportunity to promote changes in current production patterns, positioning local biodiversity as a protagonist and ally of processes of productive redesign. However, there is a need for studies on the potential of this place's biodiversity, especially with an Agroecology bias, a science that proposes to seek solutions that interact environmental conservation with the sociocultural subjectivities present.

Public policies must be promoted that rethink the conservation of the socio-biodiversity of the Pampa Biome, that break with the current commodification of spaces and bodies. Actions that value knowledge and seek knowledge about the unexplored biodiversity of the biome, which allow contributions to the ecology of economic activities in the region.



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