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Agribusiness Adherence To The Sustainable Development Goals

Bianca Bigolin Liszbinski
Professora Da Universidade Federal De Santa Maria, No Departamento De Administração E No Programa De Pós-Graduação Em Agronegócios Do Campus De Palmeira Das Missões/Rs. Doutora Em Desenvolvimento Regional Pela Universidade Regional Do Noroeste Do Estado Do Rio Grande Do Sul.

Tiago Zardin Patias
Professor Da Universidade Federal De Santa Maria, No Departamento De Administração E No Programa De Pós-Graduação Em Agronegócios Do Campus De Palmeira Das Missões/Rs. Doutor Em Administração Pela Universidade Federal De Santa Maria. Pesquisador Conta Com Com Apoio Da Coordenação De Aperfeiçoamento De Pessoal De Nível Superior (Capes).

Maria Margarete Baccin Brizolla
Professora Da Universidade Federal De Ciências Da Saúde De Porto Alegre. Doutora Em Ciências Contábeis E Administração Pela Universidade Regional De Blumenau.

Beatriz Klimeck
Professora Do Instituto Federal Farroupilha No Campus De Júlio De Castilhos/Rs. Mestre Em Agronegócios Pela Universidade Federal De Santa Maria.

Daniela Staudt
Mestranda Em Agronegócios Pela Universidade Federal De Santa Maria.

Abstract
Food production and supply are fundamental to the world, as are the sustainable development goals (SDGs) created from the UN 2030 Agenda. Given this assumption, this investigation aims to identify the adherence of food agribusinesses in the State of Rio Grande do Sul to the SDGs by measuring indicators related to these objectives and that are aligned with the Food and Agriculture Business Principles (FABP). The FABP results from the construction of the Global Compact Network Brazil and aims to contribute to achieving the SDGs. This is a quantitative and descriptive research in the food agroindustries of the State of Rio Grande do Sul, in a sample of 254 establishments. Data analysis was performed using univariate and bivariate techniques. The results point to a mean adherence of 83.5% of food agribusinesses in RS to the SDGs. This significant number shows how much this segment contributes to sustainable development. Some principles stand out, and others point to some elements where it is possible to advance, either through the initiative of agribusiness or promotion by public entities or the third sector.

Keywords: *Sustainable development goals. Agroindustries. Food and agriculture.*

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I. Introduction

The sustainable development goals (SDGs) created from the 2030 Agenda (ONU, 2015) are concerned with providing well-being to the entire world population through different goals and with the participation of different stakeholders, going towards a more sustainable and resilient world (GEORGESON; MASLIN, 2018). Due to the legitimacy attributed to the SDGs (CHASEK *et al*., 2016), full adherence to this request is expected, including in this sense, a wide spectrum of agents, such as local or multinational companies, local governments, regional and international organizations, and civil society organizations (MOMBEUIL; DIUNUGALA, 2021).

Addressed as integrated and indivisible (ONU, 2015), the set of SDGs interacts with each other, complementing each other, endorsing their multidisciplinarity that seeks to meet in an integrative way environmental, social, and economic concerns given sustainable development (OMER; NOGUCHI, 2020). Considering these characteristics, it becomes a great challenge for companies to act to prioritize certain SDGs for

their implementation. Because the 2030 Agenda is a voluntary adoption methodology, in many cases, most private sector agents focus on those objectives that relate directly to their core businesses, associating this option, especially with profit (SCHEYVENS; BANKS; HUGHES, 2016).

In order to understand the possible contribution of a particular company or sector in the implementation of the SDGs, several studies have sought to frame goals for specific cases or even to analyze the applicability of an isolated SDG for a particular company or sector. As an example, one can mention analyses applied to the construction industry (JOHNSSON *et al*., 2020), agricultural and food production (MOVILLA-PATEIRO *et al*., 2020), the tourism sector (SOUZA, 2020), and higher education institutions (GRIEBELER, 2019).

Bringing reflection to the field of food production and supply, we see how relevant it is for success in achieving the SDGs. More than ever, the set of SDGs has become imperative for sustainable food supply, making production companies, in addition to all those involved in the food supply chain, adhere to established conditions for food production (GOVINDAN, 2018).

In this food context, the agri-food industry is economically, politically, and socially significant worldwide. It is also one of the most regulated and protected sectors with implications for sustainability, such as meeting human needs, supporting employment and economic growth, and its impact on the natural environment (JOSHI; SINGH; SHARMA, 2020).

Thus, it is understood that implementing actions aimed at sustainability in agri-food production companies, such as business practices, is becoming the main key to measuring the expectations of stakeholders and society about this sector (SCHMUTZ *et al*., 2018). Moreover, the adoption of practices related to sustainable production and food security make agroindustries, in addition to becoming more competitive (VERDOUW *et al*., 2018), take an important step towards sustainable development (DEPETRIS-CHAUVIN et al., 2023).

Seeking to contribute to the path of sustainable development in the food and agriculture industry in Brazil, the Global Compact Network Brazil[1] has built guidelines that will guide the performance of companies for the UN 2030 Agenda, based on responsible socio-environmental practices, which consider the preservation of the natural, social, and cultural ecosystems of each region. These guidelines are translated into the Food and Agriculture Business Principles (FABP), which are in line with the SDGs and aim to guide, especially the private sector, to adopt and implement robust strategies focused on the sustainable development process. In fact, through the FABP, food-producing companies are instrumental in the search for a more sustainable and resilient production system, in addition to facilitating the monitoring and measurement of each variable linked to the respective principles (REDE BRASIL, 2016).

Considering the above, this article aims to identify the adherence of food agribusinesses in the State of Rio Grande do Sul to the SDGs by measuring indicators related to these objectives and that are aligned with the FABP. The perceptions obtained with this study seek to contribute to the understanding of those actions and practices developed by agroindustries that are focused on the progress of sustainable development, characterizing the commitment of this group of companies to the 2030 Agenda (ONU, 2015).

The study is justified by the increasingly ubiquitous concern regarding food production, whether in the social or environmental field (LERRO *et al*., 2018), by the increasingly demanding production methods and processes adopted, whether due to consumer demand or inspection agencies or by the presence of numerous cases of scandals in food production, whether at the national or international level, which causes a reduction in confidence in companies and the sector (GIDER; HAMM, 2019). Also, the economic and social relevance of the agroindustrial sector in the State of Rio Grande do Sul stands out, with most municipalities being dependent on agricultural activity, such as the supply of final products and raw materials for agroindustry (FEIX; LEUSIN JÚNIOR; BORGES, 2021).

This article is structured as follows: the second and third sections consist of a literature review on the SDGs and the SDGs applied to food production; the fourth section discusses the research methodology; the fifth section discusses the results of the research; the sixth concludes the research and presents implications and limitations of the study.

II. Sustainable Development Goals

In September 2015, after negotiations, heads of state and representatives of the 193 member countries of the UN General Assembly approved and committed to the document "Transforming Our World: The 2030

[1] The Global Compact Network Brazil was created in 2003, is linked to UNDP and its projects in the country are within the following platforms for action: water and sanitation, food and agriculture, energy and climate, human rights and labor, anti-corruption, engagement and communication and SDGs (the latter to engage companies in relation to the 2030 Agenda). Global Compact Network Brazil is a platform that brings together the business sector to act with measurable impact on the SDGs. Source: https://www.pactoglobal.org.br/no-brasil.

Agenda for Sustainable Development". The SDGs, the result of this document, are recognized as a renewal and expansion of global commitments to sustainable development (ROMA, 2019).

Effective from 2016 to 2030, the 2030 Agenda is an action plan for people, the planet, and prosperity to strengthen universal peace and freedom. It also recognizes that achieving no poverty in all its forms and dimensions is the greatest global challenge and an indispensable requirement for sustainable development (ONU, 2015).

The 2030 Agenda for Sustainable Development comprises 17 objectives, considered integrated and indivisible, which involve the economic, social, and environmental dimensions of sustainable development in a balanced way. The 17 SDGs were originally structured into 169 goals, constituting a broad and ambitious step towards universal sustainable development (FLEMING *et al*., 2017).

According to the UN (2015), the SDGs and their targets stimulate action in areas of crucial importance for humanity and the planet by 2030, namely:

a) people: determined to end poverty and hunger, ensuring that all human beings can fulfill their potential in dignity and equality;
b) planet: involves protecting the planet from degradation, through sustainable production and consumption, in order to guarantee the needs of present and future generations;
c) prosperity: it is understood that every human being can enjoy a prosperous and fulfilling life, and that economic progress is in harmony with social and technological issues;
d) peace: the objective is to promote peaceful, just, and inclusive societies, without fear and violence;
e) partnerships: for the implementation of the 2030 Agenda, the spirit of global solidarity is understood to be decisive, with an emphasis on the needs of the most vulnerable and with the participation of all countries, groups, and stakeholders.

Based on the set of SDGs explained in Chart 1 and their goals, we have the determination to end poverty and hunger, combat inequalities, build peaceful, just, and inclusive societies, protect human rights, promote gender equality, and guarantee the lasting protection of the planet and its natural resources, with the determination to create conditions for sustainable, inclusive, and sustained economic growth, shared prosperity, and decent work for all (ONU, 2015).

Chart 1 - Set of SDGs and their description

Objectives	Description
1. No poverty	End poverty in all its forms everywhere
2. Zero hunger and sustainable agriculture	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. Health and well-being	Ensure healthy lives and promote well-being for all at all ages
4. Quality education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Gender equality	Achieve gender equality and empower all women and girls
6. Clean water and sanitation	Ensure availability and sustainable management of water and sanitation for all
7. Clean and affordable energy	Ensure access to affordable, reliable, sustainable and modern energy for all
8. Decent work and economic growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Industry, innovation, and infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduced inequalities	Reduce inequality within and among countries
11. Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient and sustainable
12. Responsible consumption and production	Ensure sustainable consumption and production patterns
13. Action against global climate change	Take urgent action to combat climate change and its impacts
14. Life below water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Life on land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Peace, justice and strong institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Partnerships and means of implementation	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Source: UN (2015).

In the Brazilian context, from the moment it committed to act in a collaborative partnership to implement the SDGs, the country went through the process of building the nationalization of the Brazilian goals to the 2030 Agenda, shaping the country's priorities to ensure sustainable development by 2030 (PNUD, 2020). Of the 169 global goals, 167 were considered relevant, and of these, 128 had textual changes to adapt to the national reality. Also, it is observed that 8 new goals were created, totaling 175 national goals (IPEA, 2018).

In Brazil, the United Nations Development Program (UNDP) has been focusing efforts on cooperation around four key areas, out of the five that summarize the 2030 Agenda: a) people: seeking to reduce inequalities, overcome crises, and improve the quality of public services, focusing on the vulnerable population; b) planet: support for better management of natural resources, stimulating energy efficiency and coping with climate change, as well as strengthening the resilience of the most vulnerable populations and regions, including areas at risk of natural disasters; c) prosperity: stimulating inclusive economic growth by strengthening public-private partnerships, promoting and supporting micro and small enterprises, contributing to the reduced gender inequality in the private sector, promoting inclusive businesses and social impact; d) peace: encouraging transparency and combating corruption, strengthening the institutions of the judicial system, establishing dialogues to eliminate different forms of prejudice and discrimination, modernizing the state, and other measures that result in more human rights and a pacified society (PNUD, 2019).

Regarding the implementation of the SDGs at the Brazilian internal level, Donaires et al. (2018) indicate that Brazil, as a whole, cannot yet be seen as a self-organized system evolving towards sustainability. According to these authors, from the pattern of data released by the World Bank, in many cases absent, it is revealed that efforts are still irregular and that the systemic synergy around the achievement of the SDGs has not yet occurred. In short, efforts in the country seem to focus more on the social dimensions of sustainability (education, health, and no poverty). In contrast, the economic dimensions (industry, innovation, and investments) do not seem to show promising results, as well as the ecological dimensions (DONAIRES *et al*., 2018).

Given this, the importance and necessary commitment of all stakeholders - government, civil society, companies, individuals, and educational institutions - in executing actions that meet the objectives and goals of the 2030 Agenda and that help the positive evolution of the SDG indicators in Brazil. To fully achieve the 2030 Agenda, much effort will still be necessary. Only a systemic approach, which involves all these agents together, can facilitate the achievement of more comprehensive and significant results (ONU, 2021), not leaving aside the country's socio-territorial capacities, especially in contexts of economic, pandemic, and social crises (STAVIZKI JUNIOR; ETGES, 2023).

III. Sustainable Development Goals In The Food Agribusiness

The global food industry plays a decisive role in achieving multiple SDGs, and it is considered one of the main responsible for global food security and holds great economic and social importance, especially in countries that are moving towards development (PANDEY *et al*., 2019). Given its production process, deep implications observed in the environment are also attributed to this industrial group, such as those arising from the emission of greenhouse gases and deforestation that threaten species and ecosystems (MARGONO *et al*., 2014; WILLET *et al*., 2019).

The negative effects on the planet, in turn, impact society's general social and economic results: human well-being, food security, social inclusion, and economic prosperity (HOEK *et al*., 2021). These factors illustrate how food, agriculture, and livestock (the main suppliers of raw materials for the food industry) connect with people and the planet, thus pressuring the food industry for a necessary transformation towards a more sustainable food system, which can greatly contribute to the achievement of several SDGs (FAO, 2018).

Regarding the agri-food industry, which is widely regulated and legally protected due to its impact on the natural environment (JOSHI; SINGH; SHARMA, 2020), it was required to address social and environmental issues, assuming a multifaceted and interconnected strategy necessary to ensure sustainable and equitable food security at local and global levels. To achieve this level, criteria or practices are identified for companies to implement and that can serve as an instrument to measure their sustainable performance, such as their engagement with multiple stakeholders in their business, the constant measurement of sustainability results, the commitment of resources by senior management, the integration of sustainability programs with the management system and a process of identifying specific SDG issues (PANDEY *et al*., 2019; DEPETRIS-CHAUVIN et al., 2023), with the assertive communication of their actions to stakeholders (GIDER; HAMM, 2019).

At the Brazilian level, regarding the alignment of the food production sector with the SDGs, the Global Compact Network Brazil[2], through the Food and Agriculture Thematic Group, prepared a document entitled "Food and Agriculture Business Principles as Guidelines for the Sustainable Development Goals." This guidebook aims to guide a measurable performance for food and agriculture companies on the Food and

[2] The Global Compact Network Brazil was created in 2003, is linked to UNDP and its projects in the country are within the following platforms for action: water and sanitation, food and agriculture, energy and climate, human rights and labor, anti-corruption, engagement and communication and SDGs (the latter to engage companies in relation to the 2030 Agenda). The Global Compact Network Brazil is a platform that brings together the business sector to act with measurable impact on the SDGs, both in the evolution of business models and in the implementation of partnership projects. Source: https://www.pactoglobal.org.br/no-brasil.

Agriculture Business Principles (FABP) in search of a more sustainable and resilient production system, noting that the themes and fronts of action highlighted are based on the context and experience of companies in Brazil. In short, the FABPs "are an adaptation of the Sustainable Development Goals (SDGs) for the Food and Agriculture sector, focusing on the specific activity of the private sector" (REDE BRASIL, 2016, p. 10).

Each of the six FABPs relates to certain themes and lines of action, offering a voluntary and solid structure so that companies can jointly seek a positive impact in this sector. With regard to FABP 1, it relates to SDGs 2, 3, and 12, presenting as a central foundation the idea that "companies must develop agricultural and food systems that optimize production and minimize waste, in order to provide nutrition and promote health" (REDE BRASIL, 2016, p. 17).

FABP 2 (being environmentally responsible) relates to SDGs 2, 6, 7, 12, 13, 14, and 15, with the central foundation being the idea that companies must foster the sustainability of food systems to meet the global management needs of agriculture, livestock, fisheries, and forestry responsibly. They must also protect and improve the environment, using natural resources efficiently and optimally (REDE BRASIL, 2016).

FABP 3 (ensuring economic viability and sharing values) correlates with SDGs 8, 9, and 12, essentially presenting the idea that companies should create, deliver, and share values throughout the entire food chain where they are inserted, from farmers to final consumers (REDE BRASIL, 2016).

FABP 4 (respect human rights, create decent work, and help rural communities thrive) aims for companies to respect farmers, workers, and consumers, improving these people's lives and making these communities attractive to live and work in. It relates to SDGs 1, 2, 4, 5, 9, 10, and 11 (REDE BRASIL, 2016).

Regarding FABP 5 (encouraging good governance and responsibility), it relates to SDG 16 based on four themes: 1) corporate governance, which refers to the system by which companies are directed; 2) transparency and business ethics, which is summarized in business performance guided by transparency and ethics, reflecting the values of the organization in all its relations; 3) institutional relations, which addresses the relationship with institutions, government agencies, and civil society groups; 4) regulation and compliance, which addresses the set of practices to adapt to the laws and regulations to which the company is subject (REDE BRASIL, 2016).

Finally, FABP 6 (promoting access to and transfer of knowledge, skills, and technology) - related to SDGs 1, 2, 9, and 17 - was structured with companies in mind to promote access to information, knowledge, and skills for more sustainable food systems, investing in the capacity development of small farmers and small and medium-sized enterprises (REDE BRASIL, 2016).

Considering the above, we understand the effort and approach brought by the FABP to the business activities of the food production sector in the Brazilian context, offering an instrument that directs them to achieve the SDGs comprehensively. Also, it generates mechanisms for monitoring and managing SDG indicators as recommended by Liu (2020), in addition to being an alternative that offers more sustainable actions to meet the demands of food production, considered a permanent challenge for humanity (NICHOLLS *et al*., 2020).

IV. Methodological Procedures

Based on the general objective of this article, which is to analyze the adherence of food agribusinesses to the SDGs, it was decided to develop it quantitatively and descriptively. The population involved in this study comprises the food agribusinesses of the State of Rio Grande do Sul. Feix and Leusin (2019), through the State Department for Planning, Budget, and Management, understand agribusiness as the industry for processing agricultural raw materials, specifying agriculture as the combination of agricultural, livestock, forestry and plant exploitation, and fishing activities. These activities cover: a) agriculture: cultivation of cereals, sugarcane, soybeans, fruits, coffee, and other products from temporary and permanent crops; b) livestock: breeding of cattle, pigs, poultry, and other animals and production of derived products on the rural property; c) forestry and forest exploitation - production of firewood, logging, pulpwood, and other forestry products; d) fishing: production of fresh fish.

Considering the sectoral scope of this type of industry, it was decided to include only food agribusinesses registered with the State's control and inspection bodies in this study. Thus, those agroindustries that are officially registered with the Department of Agriculture, Livestock, and Rural Development (SEAPDR), with the Division of Family Agriculture and Agribusiness (DAFA), and Division of Inspection of Products of Animal Origin (DIPOA) are considered the population. Within the scope of RS, these sectors act to grant permission for activities, various inspections, and programs to promote the activities of this sector, currently having 3,611 agribusinesses under their supervision.

From this population, a non-probabilistic convenience sampling was adopted in the study, a methodology commonly used in social sciences (LOPES, 2018), reaching a total of 254 agroindustries participating in the sample. The approach to the study population was electronically (online questionnaire) due to the difficulty of direct contact during the data collection period due to the COVID-19 pandemic, which brought restrictions on the occurrence of events and fairs with the participation of agribusinesses or on-site visits to these companies.

The data collected originated from a questionnaire prepared and based on the FABP (REDE BRASIL, 2016) following the SDGs (ONU, 2015). As Cooper and Schindler (2016) advocated, the questionnaire was validated by specialists in the organizational area and sustainable development linked to different higher education institutions and pre-tested with a small number of agribusinesses to verify its clarity, objectivity, format, and content.

The SDG variables that comprise this research involve the specifications in Chart 2, which are listed in the discussion section of the results of this study. That said, with the data analysis, we seek to demonstrate the adherence of the food agroindustries of the State of Rio Grande do Sul to the SDGs by measuring indicators related to these objectives and that are aligned with the FABP.

Chart 2 - Food and Agriculture Business Principles

Principle (FABP)	Description of Activity	Related SDG
1) Promote food security, health, and nutrition	Security of food supply, food security through quality assurance and product health, food waste	2, 3, 12
2) Be environmentally responsible	Water management, climate change, waste and effluent, preservation of biodiversity of fauna and flora and soil, environmental safety	2, 6, 7, 12, 13, 14, 15
3) Ensure economic viability and share value	Improvement in performance, direct purchases, valorization of producers, responsible consumption, management of suppliers and outsourced vendors	8, 9, 12
4) Respect human rights, create decent work, and help rural communities to thrive	Human rights, diversity and inclusion, professional development, occupational health and safety, local development	1, 2, 4, 5, 8, 9, 10, 11
5) Encourage good governance and accountability	Clear functional responsibilities, avoid conflicts of interest, good relationship with stakeholders, combat corruption, risk and fraud prevention, relationship and communication with public entities and agents, regulation and compliance	16
6) Promote access and transfer of knowledge, skills, and technology	Dissemination of knowledge, technology transfer, and expertise	1, 2, 9, 17

Source: Rede Brasil (2016).

As for the procedures for data analysis, these were initially tabulated with the aid of Microsoft Excel software, according to the needs of the study. Subsequently, an analysis was conducted using univariate and bivariate techniques, which involved the independent study of variables and the relationship between the two variables (FIELD, 2009).

Regarding the analyses above, the statistical description of profile characteristics of agroindustries is initially made, followed by the component variables of each FABP (REDE BRASIL, 2016), which are structured based on the interval score attributed by the research participants when answering the proposed questionnaire, serving as a basis for measuring their perception to the alignment of agroindustries with the SDGs. Subsequently, through a correlation analysis, we sought to verify possible associations between the profile characteristics of agribusinesses and the variables of the FABP. This correlation analysis followed the criteria established by Pestana and Gageiro (2020) regarding data distribution tests, rejecting the hypothesis of normality and adopting Spearman's coefficient to verify the association between these variables. Finally, it should be noted that all data analysis was developed from the instrumentalization of the Statistical Package for the Social Sciences (SPSS) software.

V. Results And Discussions

Initially, the profile of the agribusinesses participating in the sample of this study is presented. According to what is presented in Table 1, regarding the time of foundation, the survey revealed that most companies have between 5 and 9 years of operation (29.5%), while 21.3% (lower index) have been operating for 10 to 14 years.

Table 1 - Agribusiness profile

Characteristic	Classification	Frequency	%
Foundation Time	Up to 4 years	64	25.2
	5 to 9 years	75	29.5
	10 to 14 years	54	21.3
	More than 15 years	61	24.0
Location Region	Porto Alegre	15	5.9
	Pelotas	17	6.7
	Santa Maria	11	4.3
	Uruguaiana	8	3.1
	Ijuí	31	12.2
	Passo Fundo	86	33.9
	Caxias do Sul	52	20.5

	Santa Cruz do Sul/Lajeado	34	13.4
Size	Individual entrepreneur (annual revenue of up to BRL 81 thousand)	90	35.4
	Microenterprise (annual revenue of up to BRL 360 thousand)	130	51.2
	Small Size (annual revenue above BRL 360 thousand and up to 4.8 million)	29	11.4
	Medium Size (annual revenue above BRL 4.8 million and up to 300 million)	4	1.6
	Large Size (annual revenue greater than BRL 300 million)	1	0.4

Source: Research data (2024).

Regarding the location of agroindustries - the eight intermediate geographic regions of the State of Rio Grande do Sul classified by the Brazilian Institute of Geography and Statistics (IBGE) were used as a guidance mechanism - it is observed that all regions of the State were included in the sample composition, highlighting the greater participation of the region of Passo Fundo (86 agroindustries), followed by Caxias do Sul (52 agroindustries), and Santa Cruz do Sul/Lajeado (34 agroindustries).

Regarding the size of the agroindustries surveyed, the vast majority are micro-enterprises (51.2%) and individual entrepreneurs (35.4%). The total sample also indicated that 219 companies (86.2%) have predominantly family activity. However, even with this characterization, 110 agribusinesses (43.3%) hire some type of external labor, either fixed or day laborers.

Next, the perception of the agribusinesses in the sample regarding their alignment with the SDGs is presented (ONU, 2015). Table 2 shows the information about FABP 1 - aligned with SDGs 2, 3, and 12 - which addresses the promotion of food security, health, and nutrition. This principle identified a mean adherence of 4.62 (considering the scale from 1 to 5), representing an overall mean agreement of 92% for all indicators among the surveyed sample.

Table 2 - FABP 1: promote food security, health, and nutrition

Related SDGs: 2, 3, 12						
FABP variables 1	**Agreement score**					
	Strongly Disagree⇔Strongly Agree					
	1	**2**	**3**	**4**	**5**	**Mean**
	n	**N**	**n**	**n**	**n**	
	(%)	**(%)**	**(%)**	**(%)**	**(%)**	
Encourages access to food and seeks to increase food productivity	1	3	13	56	181	4.626
	0.4	1.2	5.1	22.0	71.2	
Ensures the quality and health of products	1	0	1	17	235	4.909
	0.4	0	0.4	6.7	92.5	
Trains employees and outsourced vendors on food safety	6	4	49	62	133	4.228
	2.4	1.6	19.3	24.4	52.4	
Labels food according to normative guidelines	5	4	9	24	212	4.708
	2.0	1.6	3.5	9.4	83.5	
Is concerned with animal welfare when these are used in the production process	8	1	9	16	220	4.728
	3.1	0.40	3.5	6.3	86.6	
Actions to avoid food waste: training of employees and suppliers, consumer awareness actions	0	4	22	60	168	4.543
	0	1.6	8.7	23.6	66.1	

Source: Research data (2024).

According to Rede Brasil (2016), the purpose of this FABP 1 for food production relates to access to safe, nutritious, and quality food, allowing an adequate and healthy diet for the population, and observing the issue of losses arising from food waste. In this direction, Table 2 shows that the group of agribusinesses analyzed positively aligns with this purpose and the related SDGs (2, 3, and 12). All the variables studied have a mean adherence of more than 90%, emphasizing the one that identifies the perception regarding the guarantee of the quality and health of the products produced (mean index of 4,909), representing around 98% of respondent' agreement.

As for FABP 2 - being environmentally responsible - there was an overall mean adherence of agribusinesses in the house of 75.86%, lower than that observed in FABP 1. Table 3 highlights the variables that measure water reuse and the use of recycled materials for product packaging, which presented the lowest mean adherence rates: 2.862 and 2.894 (on a scale of 1 to 5), respectively. Another remark in this regard is that although 88.74% of the sample is aware of climate change and says they seek to adapt to this situation, 79% claim to conduct some action to maintain and conserve natural environments to preserve the biodiversity of fauna and flora and another 77% adopt some practice that helps in soil conservation and recovery.

Considering the production process, certain implications for the natural environment are attributed to this industrial group, such as those arising from the emission of greenhouse gases and deforestation that threatens species and ecosystems (MARGONO *et al*., 2014; WILLET *et al*., 2019). Thus, the alignment of the FABP 2 variables with SDGs 2, 6, 7, 12, 13, 14, and 15 could instigate agribusinesses to seek to increasingly offer products that do not harm the environment, either by legal force or the adoption of new habits by consumers.

Table 3 - FABP 2: being environmentally responsible

Related SDGs: 2, 6, 7, 12, 13, 14, 15						
FABP variables 2	**Agreement score**					
	Strongly Disagree⇔Strongly Agree					
	1	**2**	**3**	**4**	**5**	**Mean**
	n	**N**	**n**	**n**	**n**	
	(%)	**(%)**	**(%)**	**(%)**	**(%)**	
Controls the amount of water consumed in its activities	3	4	10	37	200	4.681
	1.2	1.6	3.9	14.6	78.7	
Water Reuse	86	24	47	33	64	2.862
	33.9	9.4	18.5	13.0	25.2	
Is aware of climate change and seeks to adapt to this situation	5	5	32	44	168	4.437
	2.0	2.0	12.6	17.3	66.1	
As for the biodiversity of fauna and flora, it conducts actions to maintain and conserve natural environments	26	6	38	57	127	3.996
	10.2	2.4	15.0	22.4	50.0	
Conducts soil conservation and recovery actions	41	6	34	37	136	3.870
	16.1	2.4	13.4	14.6	53.5	
The organic waste from the production process is destined for composting	43	11	34	29	137	3.811
	16.9	4.3	13.4	11.4	53.9	
Product packaging uses recycled materials	64	29	81	30	50	2.894
	25.2	11.4	31.9	11.8	19.7	

Source: Research data (2024).

FABP 3 (related to SDGs 8, 9, and 12) raises concerns about economic viability and value sharing for food-producing companies. Among other objectives, these SDGs aim to promote inclusive and sustainable economic growth, build resilient infrastructures, and promote inclusive and sustainable industrialization (ONU, 2015).

Table 4 - FABP 3: ensure economic viability and share values

Related SDGs: 8, 9, 12						
FABP variables 3	**Agreement score**					
	Strongly Disagree⇔Strongly Agree					
	1	**2**	**3**	**4**	**5**	**Mean**
	n	**N**	**n**	**n**	**n**	
	(%)	**(%)**	**(%)**	**(%)**	**(%)**	
In the case of using raw materials from outsourced vendors, it directly purchases from rural producers, supporting their valorization	21	8	28	28	169	4.244
	8.3	3.1	11.0	11.0	66.5	
Values efficiency in the use of resources (natural, material) and seeks to promote conscious consumption	1	5	13	46	189	4.642
	0.4	2.0	5.1	18.1	74.4	
Conducts actions that improve partnerships with suppliers	4	8	48	72	122	4.181
	1.6	3.1	18.9	28.3	48.0	

Source: Research data (2024).

As detailed in Table 4, the variables surveyed have an overall mean adherence of 87.11% in the sample. In FABP 3, one can highlight the variable that identifies, in the case of using raw material from outsourced vendors, the direct purchase of rural producers, supporting their valorization, reaching a mean index of 4.244, representing an agreement of around 85% among the agroindustries surveyed. This indicator demonstrates, in other words, the concern of these companies with the promotion and development of their surroundings, whether from other producers or even suppliers, corroborating the exposures of Govindan (2018).

Table 5 - FABP 4: Respect human rights, create decent work, and help rural communities to thrive

Related SDGs: 1, 2, 4, 5, 8, 9, 10, 11						
FABP variables 4	**Agreement score**					
	Strongly Disagree⇔Strongly Agree					
	1	**2**	**3**	**4**	**5**	**Mean**
	n	**n**	**n**	**n**	**n**	
	(%)	**(%)**	**(%)**	**(%)**	**(%)**	
Values human rights, including attention to slave and child labor	4	2	5	20	223	4.795
	1.6	0.8	2.0	7.9	87.8	
Dedicates attention to protecting traditional communities (example: indigenous, quilombolas, riverside dwellers, family members)	13	14	41	37	149	4.161
	5.1	5.5	16.1	14.6	58.7	
Offers equal work opportunities regardless of gender, race, color, or special need	14	2	27	33	178	4.413
	5.5	0.8	10.6	13.0	70.1	
Values the hiring of an employee with special needs	77	21	77	23	56	2.843
	30.3	8.3	30.2	9.1	22.0	
Has employee attraction and retention program	131	15	58	18	32	2.232

	51.60	5.9	22.8	7.1	12.6	
Employee salaries are compatible with the market	28	5	32	73	116	3.961
	11.0	2.0	12.6	28.7	45.7	
Adopts employee performance evaluation policy	48	16	46	45	99	3.516
	18.9	6.3	18.1	17.7	39.0	
Offers training courses to employees related to their activities	34	17	64	54	85	3.547
	13.4	6.7	25.2	21.3	33.5	
Offers additional benefits to the worker's quality of life in addition to salary	58	17	64	42	73	3.217
	22.8	6.7	25.2	16.5	28.7	
Has control of work-related injuries	28	6	30	52	138	4.047
	11.0	2.4	11.8	20.5	54.3	
Provides healthy and safe working conditions	6	1	11	41	195	4.646
	2.2	0.4	4.3	16.1	76.8	
Prioritizes local purchases, favoring the development of the municipality or region	0	5	16	28	205	4.705
	0	2.0	6.3	11.0	80.7	
Has actions or participates in a project to strengthen family farming	9	0	11	29	205	4.657
	3.5	8	4.3	11.4	80.7	
Seeks to encourage young people to stay in the countryside	4	2	41	43	164	4.421
	1.6	0.8	16.1	16.9	64.6	
Develops actions that seek to mitigate the impacts of its operations on local development	6	7	25	56	160	4.406
	2.4	2.8	9.8	22.0	63.0	

Source: Research data (2024).

About FABP 4, which addresses respect for human rights, the creation of decent work, and helping rural communities thrive, an overall mean adherence of 79.42% was identified among all variables analyzed. As can be seen in Table 5, the variable that stands out most in terms of agreement is the one that refers to the value of human rights, including attention to slave and child labor, with an overall index of 4.795, which represents a percentage of 95.9% of adherence of agribusinesses to this issue. This human rights issue is highlighted in the 2030 Agenda, especially regarding achieving no poverty and hunger worldwide, access to quality education, gender equality, and decent work opportunities (ONU, 2015).

Still, on FABP 4, the variables that presented the lowest levels of agreement among the agroindustries were those related to adopting an employee attraction and retention program and hiring employees with special needs (2.232 and 2.845, respectively). This may be related to the considerable number of companies analyzed that do not have employees or outsourced contractors, focusing on family work. Despite these indices, there are higher concordances in other variables related to employees, such as the offer of healthy and safe working conditions, with an overall mean of 92.9% for the analyzed sample. Positive levels are also revealed in the perception of incentives for rural prosperity, such as in the variables of encouraging young people to stay in the countryside (mean index of 4.421) and strengthening family farming (mean index of 4.657), which are especially aligned with SDGs 1 (no poverty), 2 (sustainable agriculture), 8 (decent work and economic growth), 10 (reduced inequalities), and 11 (inclusive and sustainable communities) (ONU, 2015).

Table 6 shows the analysis results of FABP 5 - SDG 16 - related to encouraging good governance and responsibility. The variables presented in this principle have themes that direct companies to respect the laws, act responsibly, respect the rights of land and natural resources, avoid corruption, and be transparent about their activities (REDE BRASIL, 2016).

Table 6 - FABP 5: encourage good governance and accountability

Related SDG: 16						
FABP variables 5	**Agreement score**					
	Strongly Disagree⇔Strongly Agree					
	1	**2**	**3**	**4**	**5**	**Mean**
	n	**N**	**n**	**n**	**n**	
	(%)	**(%)**	**(%)**	**(%)**	**(%)**	
The responsibilities of each employee (production and management) are clear	8	3	29	58	156	4.382
	3.1	1.2	11.4	22.8	61.4	
Has short- and long-term strategic planning	5	13	43	66	127	4.169
	2.0	5.1	16.9	26.0	50.0	
Prevents conflicts of interest with employees, governments, suppliers, or customers	5	2	20	40	187	4.583
	2.0	0.8	7.9	15.7	73.6	
Has transparency strategies, taking responsibility for anti-corruption issues and fraud prevention that may influence its activities	7	6	44	64	133	4.220
	2.8	2.4	17.3	25.2	52.4	
Seeks to maintain a relationship and communication with entities (unions, associations, cooperatives) and government agencies	1	9	12	41	191	4.622
	0.4	3.5	4.7	16.1	75.2	
Prioritizes compliance with laws and regulations	2	1	9	30	212	4.768
	0.8	0.4	3.5	11.8	83.5	

Source: Research data (2024).

For the sample studied, high levels of agreement were observed in these variables, identifying an overall mean of 89.15% for this FABP 5. The indicator that addresses the prioritization of compliance with laws and regulations is the one with the most significant adherence by agribusinesses, reaching an index of 4.768 and representing 85.36% of the sample. This result is very much related to the responsibility of agribusinesses to meet the standards to which they are exposed, corroborating what was exposed by Joshi, Singh, and Sharma (2020) and Hoek *et al*. (2021), who state that this industrial sector is one of the most regulated and legally protected, given the growing environmental, social, ethical, and health concerns, combined with a greater awareness of society about the effects of the production and consumption of food from raw materials in the natural environment.

In terms of governance, it was found that the variable related to the existence of short- and long-term strategic planning had the lowest agreement rate (4.169). Although 83% of the sample demonstrates following an organized plan, there is still room for advancement in this management mechanism within agribusinesses.

FABP 6 - promote access and transfer of knowledge, skills, and technology - relates to SDGs 1, 2, 9, and 17 and aims to promote companies with regard to access to information, that knowledge and skills are used in favor of more sustainable food systems through capacity development (REDE BRASIL, 2016). Table 7 shows the results observed in this principle.

On average, the adherence of the agroindustries surveyed was 77.22% for this FABP 6. The variable with the lowest adherence is related to the contribution to the dissemination of knowledge, technologies, or good practices, reaching a mean index of 3.358, representing 67% of the sample. The variable that seeks to verify the use of new production techniques from practical experimentation reached 4.508 (mean adherence of 90.16% in the sample).

Table 7 - FABP 6: promote access and transfer of knowledge, skills, and technology

Related SDGs: 1, 2, 9, 17						
FABP variables 6	**Agreement score**					
	Strongly Disagree⇔Strongly Agree					
	1	**2**	**3**	**4**	**5**	**Mean**
	n	**n**	**n**	**n**	**n**	
	(%)	**(%)**	**(%)**	**(%)**	**(%)**	
Contributes to the dissemination of knowledge, technologies, and good practices through the holding or participation in events or distribution of teaching materials	60	13	44	50	87	3.358
	23.6	5.1	17.3	19.7	34.3	
Uses new production techniques from practical experimentation	6	6	19	45	178	4.508
	2.4	2.4	7.5	17.7	70.1	
Contributes to the development of studies and technologies through partnerships with universities and innovation and research institutes	17	21	71	53	92	3.717
	6.7	8.3	28.0	20.9	36.2	

Source: Research data (2024).

Chart 3 briefly presents the adherence of the sample agroindustries to the FABP (REDE BRASIL, 2016). There are rates above 75%, which is positive for the analyzed companies.

Chart 3 - Adherence of agroindustries to the Food and Agriculture Business Principles

Principle (FABP)	**Related SDG**	**Mean Adherence**
1) Promote food security, health, and nutrition	2, 3, 12	92.47%
2) Be environmentally responsible	2, 6, 7, 12, 13, 14, 15	75.86%
3) Ensure economic viability and share value	8, 9, 12	87.11%
4) Respect human rights, create decent work, and help rural communities to thrive	1, 2, 4, 5, 8, 9, 10, 11	79.42%
5) Encourage good governance and accountability	16	89.15%
6) Promote access and transfer of knowledge, skills, and technology	1, 2, 9, 17	77.22%
Overall Mean Adherence		**83.54%**

Source: Research data (2024).

The good adherence of agribusinesses in the state of Rio Grande do Sul to the FABP, which directs them to align with the SDGs (ONU, 2015), reflects several factors endorsed by the literature. Examples include adherence to the regulations of external agencies as it is a highly legally regulated sector (JOSHI; SINGH; SHARMA, 2020) because it involves food production and the pressure of consumers and environmental defense groups on the agri-food industries (GIDER; HAMM, 2019), with regard to the adoption of sustainable production processes. The results identified in this group of agribusinesses corroborate the discussions of Battersby (2017), Dania, Xing, and Amer (2018), and Depetris-Chauvin et al. (2023), who state that this industrial group has much to contribute towards the sustainable development proposed by the 2030 Agenda, in addition to becoming more competitive (VERDOUW *et al*., 2018) by adopting practices related to sustainable production and food security.

In order to complement the descriptive analysis on the characterization of the SDGs for this sample, certain agroindustry profile variables were correlated with each FABP. Table 8 shows the coefficients and significance levels of the bivariate correlation coefficients observed. To analyze the intensity of the correlation, we considered what Pestana and Gageiro (2020, p. 347) establish, that is, "< 0.2 very weak; ≤ 0.2 to < 4 weak; ≤ 0.4 to < 7 moderate; ≤ 0.7 to < 9 high; ≤ 0.9 to ≤ 1 very high". Given these parameters, there were 08 significant associations (0.005* and 0.001**) between the profile of agribusinesses and the FABP.

Among the significant associations, the time of the foundation of the agribusiness is correlated with four principles, identifying that the longer the foundation of the company, the lower the adherence to FABP 1, 3, 5, and 6. Likewise, the variable of family predominance in the company correlates with the FABP 2. In other words, when the activity is predominantly family, the adherence to the second principle (being environmentally responsible) is lower.

The variable of hiring employees or outsourced workers correlated positively with the FABP 2 and 6. In this direction, agribusiness tends to be more environmentally responsible when external labor is hired and promotes access to and transfer of knowledge, skills, and technology.

Table 8 - Correlation of agroindustry profile variables with the FABP

Profile		AFBP1	AFBP2	AFBP3	AFBP4	AFBP5	AFBP6
Time of foundation	Correlation Coefficient	-.229**	-.118	-.124*	-.024	-.126*	-.193**
	Significance	.000	.061	.048	.709	.044	.002
Predominantly family activity	Correlation Coefficient	.009	-.216**	-.072	.034	.077	-.021
	Significance	.882	.001	.255	.595	.221	.739
Hiring employees or outsourced subcontractors	Correlation Coefficient	.118	.192**	.018	-.113	.015	.220**
	Significance	.061	.002	.776	.071	.812	.000
Size	Correlation Coefficient	-.061	-.063	-.012	.167**	-.001	-.084
	Significance	.329	.314	.850	.007	.982	.183

* Significant POSITIVE correlation, with P = 0.05.
** Significant POSITIVE correlation, with P = 0.01.
Source: Research data (2024).

Finally, another significant association was identified between the variable size of the agribusiness and the FABP 4. This relationship shows that the larger the size of agribusiness, the greater its respect for human rights and willingness to create decent work and help rural communities thrive.

Besides the empirical results presented for the analyzed sample, the approach provided by the FABP (REDE BRASIL, 2016) is mentioned, facilitating that the business activities of the agri-food industry are directed to contribute to the advancement of sustainable development and, in particular, to the SDGs (ONU, 2015). As explained by Liu (2020), there is a need for mechanisms such as this for the monitoring and management of SDG indicators in the context of food production, in addition to being an alternative that offers sustainable actions to meet the demands of food production, considered as a constant challenge for humanity, as shown by Nicholls *et al.* (2020).

VI. Final Considerations

This study aimed to analyze the adherence of food agribusinesses in the State of Rio Grande do Sul to the SDGs. The research involved a sample of these companies, officially registered with the Department of Agriculture, Livestock, and Rural Development. This agency operates in the granting of permission for activities, inspections, and programs to promote activities in this sector at the state level.

It should be noted that food agribusinesses of RS generally adhere to the SDGs. A mean adherence percentage of 83.54% was identified, a significant number that shows how much this segment contributes to sustainable development. Some principles stand out positively, and others point to some elements that can be improved.

The results obtained with the FABP 1 - which addresses the promotion of food security, health, and nutrition - demonstrate the highest mean rates (92.47%) of adherence among the studied sample compared to the other principles analyzed, noting that the evidence obtained reinforces the search of agribusinesses to contribute to SDGs 2 (zero hunger and sustainable agriculture), 3 (health and well-being), and 12 (responsible consumption and production). Regarding the FABP 2 - be environmentally responsible - the lowest mean adherence of agroindustries among the other principles (75.86%) was identified, which leads them to contribute to these levels with the related SDGs: 2 (zero hunger and sustainable agriculture), 6 (drinking water and sanitation), 7 (clean and accessible energy, 12 (responsible consumption and production), 13 (action against global climate change), 14

(life below water), and 15 (life on land). At this point, there is a caveat, as SDGs 2 and 12 are repeated in FABP 1 and 2, influenced by the low adherence of agribusinesses to water reuse and the use of recycled materials in their packaging. Therefore, it indicates points that the agroindustries can work on for improvement.

Regarding the FABP 3 - ensure economic viability and share values - 87.11% of the sample's overall mean adherence was observed for the analyzed variables, which leads to the understanding that agribusinesses are contributing significantly to meeting SDGs 8 (decent work and economic growth), 9 (industry, innovation, and infrastructure), and 12 (responsible consumption and production). About FABP 4 - respect human rights, create decent work, and help rural communities thrive -, it is the principle that has the largest number of related SDGs: 1 (no poverty), 2 (zero hunger and sustainable agriculture), 4 (quality education), 5 (gender equality), 8 (decent work and economic growth), 9 (industry, innovation, and infrastructure), 10 (reduced inequalities), and 11 (sustainable cities and communities), identifying a sample adherence of 79.42% considering the variables researched in this principle.

For FABP 5 - encouragement of good governance and responsibility - an overall mean adherence of agroindustries in the sample of 89.15% was identified among the variables analyzed, leading to compliance at these levels of SDG 16, which addresses the promotion of peace, justice, and effective institutions. Finally, the FABP 6 - promote access to and transfer of knowledge, skills, and technology - presented an overall mean of 77.22% agreement of the sample for the variables surveyed, demonstrating its commitment to the related SDGs: 1 (no poverty), 2 (zero hunger and sustainable agriculture), 9 (industry, innovation, and infrastructure), and 17 (partnerships and means of implementation).

From the correlation of agribusiness profile variables with the mean of each FABP, eight significant associations of the twenty-four possible associations were identified in this analysis. For example, it was confirmed that the longer the foundation of the company, the lower the adherence to FABP 1, 3, 5, and 6, while the greater the size of the agribusiness, the greater the tendency to meet FABP 4. Here, there is a reflection and possibility of future research, as the results indicate that the older the agribusiness, the lower the adherence to the SDGs. Similarly, concerning the size of the agribusiness, the larger it is, the greater the concern for human rights, decent work, and concern for rural communities.

A methodological deepening, especially on the Business Principles for Food and Agriculture developed by Rede Brasil (2016), could clarify where there is greater adherence to the SDGs because, as there is overlapping of SDGs, sometimes it can raise doubts. By analyzing the data in a more detailed way, it is possible to perceive which SDG is involved, as happened with the highest and lowest adherence, where SDGs 2 and 12 are repeated. Still, if the results are observed, they are perceived to relate to elements present in other SDGs. This issue is minimized, as the SDGs must be addressed in an integrated, indivisible, and multidisciplinary manner.

It is considered that satisfactory evidence was obtained in this study, contributing to the recognition of the main practices developed by the agribusinesses of RS that associate them with fulfilling the goals of the 2030 Agenda. It is also essential to highlight the importance of the results of this research, as they demystify some prejudices towards food agribusinesses, composed mainly of family farmers, who produce food seeking to serve a population that is sometimes unaware of its origin and the processes involved.

However, it is suggested that future studies may expand this analysis considering different samples, such as sample expansion in the State of Rio Grande do Sul or including other Brazilian territories, which would allow comparisons of the adherence of agribusinesses to the SDGs for different locations. Moreover, it is always valid to improve the theoretical issues related to the theme addressed here, including the improvement of a research instrument that can measure more accurately the issues associated with the adherence of companies to the principles of sustainable development of the 2030 Agenda.

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