

## ESG and agribusiness: A possible combination?



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### ABSTRACT

Agribusiness is an important sector of the global economy, and ESG practices are gaining increasing importance in this sector. This study intends to

analyze scientific production on ESG (environmental, social, and governance) aspects applied to the agribusiness sector based on documents indexed on the Web of Science database and CAPES periodicals from January 2013 to September 2023. The analysis of the selected articles was carried out through a systematic review of the literature, following strict inclusion and exclusion criteria. The search was carried out using keywords and Boolean operators directly in the search databases. After applying the “filters”, five articles remained that met the established criteria. The results indicate that ESG plays a fundamental role in the agribusiness sector, contributing to sustainability, social responsibility, profitability, and competitiveness. However, there are still challenges to be faced in the effective implementation of ESG practices, requiring greater collaboration between interested parties.

**Keywords:** ESG, Agribusiness, Sustainability, Systematic literature review, Agriculture.

## 1 INTRODUCTION

Organizations from various sectors have sought to incorporate ESG (ESG in Portuguese - Environmental, Social and Governance) practices into their operations, with the aim of improving their sustainability and social responsibility. The agribusiness sector, which faces continuous changes and seeks to improve its productivity and competitiveness to meet the demands of an increasingly demanding consumer, is no exception to this trend. Thus, in the context of agribusiness, there is also a growing search for sustainable and responsible practices, in line with the global concern regarding ESG issues.

Although the concern with environmental and social factors is not something recent, the concept of ESG has its origin in a more contemporary past. As pointed out by Gao et al. (2021), the term "Environmental, Social and Governance" first appeared in the UN report entitled "Who Cares, Wins" in 2004. Subsequently, the United Nations Principles for Responsible Investment (UN-PRI) were formally established in 2006, introducing the ESG framework and enumerating several factors to consider.



By deeply understanding the implementation and impacts of ESG practices in the agribusiness sector, it becomes possible to identify opportunities for improvement and promote more sustainable and responsible development in this crucial segment for the Brazilian economy. Vilký and Raudoný (2020) point out that the agriculture of the future demands new models and innovative decisions.

In view of this scenario, this research aims to analyze the scientific production on ESG aspects applied to the agribusiness sector from documents indexed in the *Web of Science* (WoS) and CAPES Periodicals Portal, in the period from Jan./2013 – Sep./2023. Through a systematic review of the literature, we sought to understand how agribusiness has incorporated ESG principles.

This article is organized into five sections. In addition to this introduction, the second section contemplates the theoretical framework used in the study. The third section describes the research method adopted. In the fourth section, the results obtained are discussed and, finally, the fifth section presents the final considerations of the study.

## 2 THEORETICAL FRAMEWORK

### 2.1 AGRIBUSINESS

The term "agribusiness" appeared in the book "*A Concept of Agribusiness*" by Davis and Goldberg (1957), and refers to the integration of all activities related to the production and marketing of agricultural products. It ranges from the production of agricultural inputs, such as seeds and fertilizers, to the final stage of distribution and marketing of agricultural products, such as food, fiber, and renewable energy.

According to Zanella and Leismann (2017), the emergence of agribusiness in Brazil was the result of the intensification of the industrial process, accompanied by the presence of capital goods, agricultural inputs, and the phenomenon of rural exodus. Changes of great relevance began to manifest themselves in Brazil from the 1950s and 1960s, concentrated mainly in the South and Southeast regions, with a subsequent expansion to other regions of the country (Plata & Conceição, 2015). Ferreira et al. (2019), observe that the modernization process had a comprehensive impact on both agricultural and urban use of the Brazilian territory, triggering transformations that echoed in the economy, the production base, the landscape, and even the culture.

The agribusiness sector, in all its aspects, is the most important in the Brazilian economy and contributes essentially to the country's economic growth (Kureski, Moreira & Veiga, 2020). The segment plays a very important role in generating positive balances in the national trade balance, in addition to boosting the economy of several small to medium-sized cities in Brazil (Tarapanoff, 2016).

Agribusiness has stood out as an important generator of jobs in Brazil. According to an article in Forbes magazine (2023), by the first quarter of 2023, more than 28 million Brazilians are employed in the agribusiness sector. In addition, agribusiness plays a key role in the country's Gross Domestic



Product (GDP), as evidenced in Table 1, adapted from data from CEPEA/CNA (2022).

Table 1: Share of agribusiness in the Brazilian GDP.

YEARS	Agribusiness				
	Inputs (A)	Agricultural (B)	Industry ©	Services (D)	Agribusiness (A+B+C+D)
1996	0,5%	4,1%	12,1%	18,1%	34,8%
1997	0,5%	3,9%	10,8%	16,1%	31,3%
1998	0,5%	3,9%	10,1%	15,2%	29,7%
1999	0,6%	4,0%	9,8%	14,9%	29,4%
2000	0,7%	3,9%	10,3%	15,6%	30,5%
2001	0,7%	4,4%	9,7%	15,2%	30,1%
2002	0,9%	5,1%	9,4%	14,7%	30,1%
2003	1,2%	5,8%	9,0%	14,4%	30,4%
2004	1,3%	5,1%	8,4%	12,8%	27,5%
2005	1,0%	4,0%	7,9%	11,6%	24,4%
2006	0,8%	4,3%	7,4%	10,9%	23,4%
2007	0,9%	4,3%	6,9%	10,6%	22,7%
2008	1,1%	4,5%	6,5%	10,4%	22,6%
2009	0,9%	3,8%	6,5%	10,1%	21,3%
2010	0,8%	4,3%	6,2%	10,1%	21,5%
2011	0,9%	4,8%	5,7%	9,3%	20,7%
2012	0,9%	4,2%	5,4%	8,6%	19,1%
2013	0,9%	4,2%	5,2%	8,4%	18,7%
2014	0,8%	4,2%	5,1%	8,5%	18,6%
2015	0,9%	4,3%	5,5%	9,3%	20,0%
2016	0,9%	5,0%	5,9%	10,2%	22,1%
2017	0,8%	4,6%	5,6%	9,6%	20,6%
2018	0,9%	4,3%	5,6%	9,3%	20,0%
2019	1,0%	4,3%	5,6%	9,5%	20,4%
2020	1,1%	6,9%	6,2%	11,6%	25,7%
2021	1,5%	7,7%	6,0%	11,4%	26,6%
2022	1,8%	6,7%	5,8%	10,5%	24,8%

FRONT: Adapted from CEPEA/CNA.

The analysis of the data provided in Table 1, which addresses the evolution of the contribution of agribusiness to Brazil's Gross Domestic Product (GDP) over almost thirty years, indisputably shows the impact that agribusiness has had on the national economy.

One of the main characteristics of the agribusiness sector in Brazil is its diversity of products. The Brazilian territory is home to a wide range of products from agriculture and livestock, which play a very important role in our economy. Among these outstanding products are ethanol and sugar, coffee, various types of meat and leather, originating from animals such as cattle, pigs and poultry, as well as soybeans, fruits and items from forests (Pacheco et al., 2012).

Globally, agribusiness also plays a key role, particularly in providing food for the global population. Food production has become an urgent issue in the face of population growth, rapid urbanization, and rising living standards in several countries (Quintam & Assunção, 2023).



In the contemporary scenario, the intersection between sustainability and agribusiness gains crucial relevance. Modern society has the challenge of creating innovative environmental solutions based on sustainability to deal with global demands related to socio-ecological crises (Fernandes, Souza & Belarmino, 2020). In order to improve its productivity and competitiveness, as well as to satisfy increasingly stringent consumer demands, the agribusiness sector faces constant changes. This leads to the encouragement of innovations that keep pace with these changes (Santos & Araújo, 2017). Sustainable agricultural production is a topic that demands quantification and evaluation through indicators, which have been increasing in recent years due to awareness of the scarcity of environmental resources (Borlachenco & Gonçalves, 2017).

## 2.2 ESG/ESG

In recent years, ESG (*Environmental, Social and Governance*) has acquired increasing relevance at the global and national levels. This concept encompasses crucial issues such as carbon emissions assessment, labor practices, and anti-corruption. Several criteria and approaches have been developed to guide companies in their roles and responsibilities related to environmental, social, and governance aspects, as highlighted by Irigaray and Stocker (2022). It is worth remembering that in Brazil, in an analogous way, the concepts of ESG already appear in articles 116 and 154 of the Brazilian Corporate Law (Law 6,404, of December 15, 1976).

Although the ESG concept has gained prominence in recent years, the idea of corporate responsibility beyond the economic aspect is not new. In 1972, during the United Nations Conference on the Human Environment in Stockholm, the concept of sustainable development emerged as a prominent issue. This idea was further strengthened at subsequent conferences, including Eco-92 in Rio de Janeiro, the Kyoto Conference in 1997, and the World Summit on Sustainable Development in Johannesburg in 2002 (Orsiolli & Nobre, 2016). The 1987 report "Our Common Future" by the World Commission on Environment and Development defined sustainable development as "that which meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 54). The approach to sustainability continued to evolve, and in 1994, John Elkington proposed the concept of the "tripod of sustainability", which consisted of the 3Ps: *People, Planet* and *Profit*. In 1994, the idea of the Triple Bottom Line emerged in the business world, which presented itself as a new approach to sustainability (Lovicsek, 2021).

There are those who understand that the current acronym ESG represents an evolution of this approach, with the replacement of the "Economic/Profit" factor by the "Governance" factor (Neves, 2021), or even that ESG is a new name for sustainability, a thought riddled with misconceptions; although there is convergence between various aspects, they have different perspectives (Belinky, 2021).



In any case, there is a broadening of the perspective, encompassing not only business results, but also clarity in communication, audit committees, business ethics, and the fight against corruption (Costa & Ferezin, 2021). ESG emerged as a methodology that aims to advance and develop in line with the interests of the community, meeting an urgent need in a globalized world facing environmental challenges (Kölling, Andrade & Peixoto, 2022). It is certain that ESG actions developed over the 2010s onwards and, from 2020 onwards, became a vast global trend.

According to Amel-Zadeh and Serafeim (2018), many investors are incorporating ESG information into their strategies, due to customer demand and as part of their product development efforts. This scenario has promoted the emergence of new products based on ESG Information. A notable example is represented by green bonds, in which returns are directed to projects that aim to improve environmental outcomes. The growth of ESG investments and, consequently, SRI (in Portuguese – Socially Responsible Investing) has been significant in recent years, covering the main global markets (Nagai, 2023).

Such principles have become an essential benchmark for measuring the performance of companies in relation to ethical and sustainable criteria. The application of these principles transcends geographical boundaries and has demonstrated a significant impact on diverse regions and international markets. In fact, research shows that even in Brazil, albeit on a smaller scale, companies have sought to incorporate ESG practices into their activities (Farias & Barreiros, 2021).

However, ESG is not limited to the financial market, but also affects other sectors of the economy that seek to adapt to the new demands of society. ESG practices have caused positive and significant impacts in several sectors, with agribusiness being an excellent example. ESG encourages agribusiness to consider the broader implications of its activities for humanity, taking into account environmental, social, and governance aspects throughout the production process (Terra & Scheffer, 2023).

The *Agrootools*<sup>1</sup> platform, which offers innovative solutions for agribusiness, highlighted in 2021 the possible benefits that producers who adopted ESG practices could obtain. Among these benefits were lower interest rates, including by the Central Bank of Brazil, access to new markets, especially those focused on food production, higher profitability and greater attractiveness for investors. In 2021, the UN Global Compact Brazil Network and Stilingue<sup>2</sup>, a Brazilian *insights platform* specializing in social media monitoring, released an unprecedented study on "The Evolution of ESG in Brazil". The study found that Agribusiness is the sector that demonstrates the greatest familiarity with the acronym ESG, with 87% of participants indicating knowledge on the subject.

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<sup>1</sup> Agrootools - <https://agrootools.com.br/>

<sup>2</sup> Stilingue – <https://stilingue.com.br>



In addition, a survey conducted by Google in partnership with *MindMiners* and *Sistema B*, in September 2022, revealed that at least 87% of Brazilian consumers consider the performance of companies and brands in the scope of ESG to be extremely important, understanding it as a duty that covers all sectors of society, including themselves. Additionally, an article published by EXAME in December 2022 showed that searches for the term ESG have increased tenfold in the last two years, according to data provided by *Google Trends*.

More and more companies, investors, and consumers are aware of the importance of adopting sustainable and responsible practices in their business. ESG is not an imposition, but a benefit for companies that adopt it (Sibarani, 2023). Notwithstanding this, there is a certain amount of skepticism regarding the effective impact and remarkably concrete results of ESG investments, both for *stakeholders* and for society in general. Armstrong (2020) argues that ESG should be viewed with some suspicion, both for those who seek financial return, and for those citizens who seek real change rather than cosmetic ones.

Other concerns are about the reliability of corporate reports, their practical impacts, and the risks of *greenwashing*. Despite the centrality of transparency and the practice of *beporting* in corporate environments (Wickert & Risi, 2019). Therefore, it is emphasized that reporting does not represent, in a concrete way, improving performance in practice, and commitment in theory does not necessarily imply implementation (Price, 2008). The impasses in measuring the practical impacts of different measures, especially in relation to the "S" pillar, further aggravate this scenario (O'Connor & Labowitz, 2017).

Allegorical CSR, ESG or sustainability delineations are commonly known in English as "greenwashing" or "*window-dressing*" and can be translated as "greenwashing" or "*window dressing*" initiatives. These rely on the spread of misinformation to build a public façade of accountability, diverting attention from deceptive or harmful acts (Wickert & Risi, 2019).

### 3 RESEARCH METHOD

The aim of this study is to conduct a systematic review of the literature. As in other study models, this type of research is an approach that is based on the analysis of the literature related to a specific topic to obtain its data (Sampaio & Mancini, 2007). It is a form of research that allows other researchers to reproduce the results, clearly demonstrating which bibliographic sources were used, how the searches were conducted in each of them, how the scientific articles were selected, what criteria were applied to include or exclude the articles and how the analysis of each one of them was carried out (Galvão & Ricarte, 2019).



According to Tranfield, Denyer and Smart (2003), this type of research contributes to raising the methodological quality in the academic environment. For professionals and managers, this research approach helps build a solid knowledge base by unifying *insights* from various studies.

The objective of this study was to analyze the scientific production published in journals indexed in the *Web of Science* databases and in the CAPES Journal Portal. To achieve this goal, keywords and Boolean operators were used. The first version of the keywords was developed in Portuguese, while the second was elaborated in English. This approach was adopted with the purpose of expanding the scope and diversity of studies covered by the analysis. The two versions can be seen in more detail below:

1. ( ESG OR **ESG**) **AND** (Environmental OR Social OR Governance) **AND** (Agribusiness OR Agribusiness **OR** Agribusiness OR "Agricultural Enterprises" OR **Cooperative** OR **Agriculture** OR "Rural Producers" OR **Livestock** OR Farmers);
2. (ESG) **AND** (Environmental **OR** Social **OR** Governance) **AND** (Agribusiness **OR** Agroindustry **OR** "Agricultural companies" **OR** Cooperative **OR** Agriculture **OR** "Rural producers" **OR** Livestock **OR** Farmers).

After conducting the searches in the databases using the sets of keywords and Boolean operators, inclusion and exclusion criteria were used in the form of "filters". Of the studies found, the abstracts were read and a pre-evaluation was carried out according to the exclusion criteria in order to filter the excess articles, in order to ensure compatibility and quality of the selected articles. Table 2 presents the criteria adopted in more detail.

Table 2: Inclusion Criteria (IC) and Exclusion Criteria (CE).

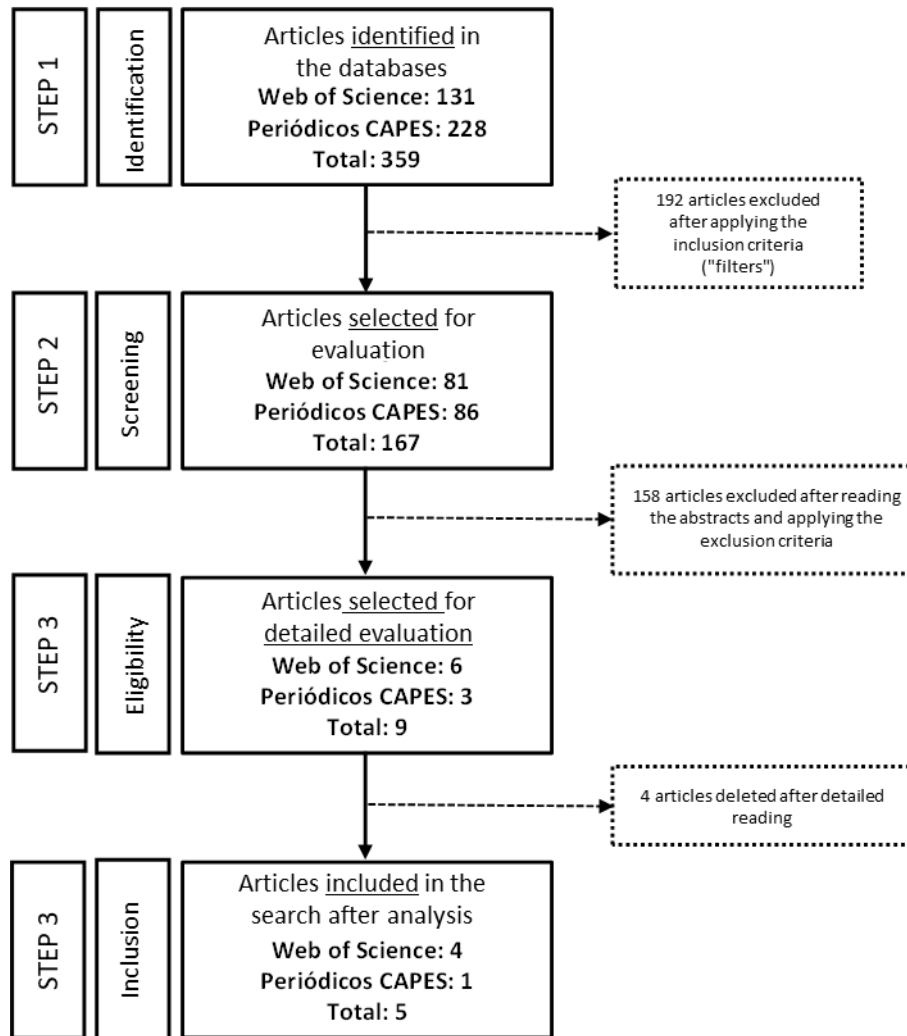
Inclusion ("filters")	Exclusion
CI1 – Only articles that are written in Portuguese or English.	CE1- Repeated articles.
CI2 – Articles published between 2013 and 2023.	CE2 – Articles that address only one of the aspects (environmental, social or governance).
CI3 – Open access articles.	CE3 – Articles that are not directly related to ESG/ESG aspects applied in agribusiness.
X	CE4 – Exclusion of dissertations and theses (institutional repositories) and proceedings of academic events.

Source: Prepared by the authors.

In order to provide greater clarity and facilitate reproducibility, a representative flowchart was developed, as illustrated in Figure 1, following the PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) methodology, widely used in systematic reviews.



Figure 1: Methodological design of the research.



Source: Prepared by the authors.

The number of articles presented in the flowchart resulted from the combination of the results obtained in the search using two variations of keyword sets and Boolean operators, as previously presented. For the eligibility stage, before reading the abstracts and applying the exclusion criteria, it was again verified whether the filtered articles were truly aligned with the inclusion criteria.

It is important to note that, during the detailed reading mentioned in the flowchart, the criterion used for the selection of articles was the identification of studies that offered *substantial and comprehensive insights* into the application, implementation, and evaluation of ESG principles in the context of agribusiness. Therefore, four articles that superficially or tangentially addressed the subject and did not contribute significantly to the objective of this research were excluded.





## 4 RESULTS AND DISCUSSION

After the conclusion of the search, inclusion, exclusion, and detailed analysis stages, five (5) articles that met the established criteria remained. Table 3 presents the articles selected for this research, including information on the authors, titles, and the journals or journals of publication.

Table 3: Characterization of the selected articles.

No.	Authors	Title	Year Publication	Magazine/Newspaper
1	Pirtea, Noja, Cristea & Panait.	Interplay between environmental, social and governance coordinates and the financial performance of agricultural companies	2021	Agricultural Economics – Czech
2	Cristea, Noja, Thalassinos, Cîrciumaru & Ponea	Environmental, Social and Governance Credentials of Agricultural Companies — The Interplay with Company Size	2022	Resources
3	Zeng & Jiang	ESG and Corporate Performance: Evidence from Agriculture and Forestry Listed Companies	2023	Sustainability
4	Jesus & Nascimento	ESG strategies to deal with COVID-19 in Brazilian public research company	2021	Brazilian Journal of Operations & Production Management
5	Andrade & Ferraz-Almeida	Profile of family farming producers and use of Environmental, Social and Governance [ESG] criteria in the Southern Lowlands Region, Bahia	2022	Extension & Citizenship Magazine

Source: Prepared by the authors.

Two articles were published in 2021, two in 2022, and one article in 2023 (until September, when the research was conducted). This general picture shows that the theme is quite recent in the field of academic studies.

Article 1 assesses the impacts (direct and global) of ESG (environmental, social and governance) dimensions and human capital characteristics (Board and employees) on the financial performance of state-owned enterprises in the agricultural sector. The financial performance was exploited by EBIT, economic and financial profitability. To this end, a sample of 412 public companies in the agricultural sector in 17 agricultural areas around the world was analyzed, using data from the year 2020. Pirtea et al. (2021), highlight the importance of ESG aspects and human capital in the financial performance of agricultural companies, in addition to pointing to the fact that the investigation increases the awareness of the managers of the companies studied for CSR measures, especially in environmental performance and in the recognition of human capital, aiming to improve the financial performance of companies. The authors present some proposals for companies operating in the agricultural sector to increase their profitability by adopting CSR measures (Table 4).



Table 4: Proposals submitted by Pirtea et al. (2021)

Proposal	Description	Theoretical basis
P1	Full transparency in financial reporting and disclosure of non-financial information	Roudaki (2018)
P2	Government regulation on the items that must make up the report	Ika et al. (2021)
P3	Investment in technological and digital innovation to improve efficiency, as well as adjustment in policies and targets for the environmental pillar	Moreno-Moreno et al. (2018); Panait et al. (2020)
P4	Increasing female participation on corporate boards	Knežević et al. (2017)

Source: Prepared by the authors.

The authors are right to advocate more transparency of financial reporting and other non-financial information (**P1**), taking into account the interests of stakeholders, notably consumers and the government itself. Nevertheless, Pirtea et al. (2021), based on Ika, Akbar, Puspitasari, Sumbodo, and Widagdo (2021), understand that it is up to governments to establish clear regulations regarding the items that must be part of the annual report to be disclosed by companies (**P2**). This proposal, however, seems to leave organizations in a passive position, in a position to comply only with government mandates. Compliance policies can and should have the participation of the government, but not only of it; the active participation of *stakeholders* is a fundamentally necessary condition for the construction of instruments for the disclosure of financial and non-financial information that contribute to increasing the transparency and competitiveness of companies and, consequently, of the nation.

Investments in technological and digital innovation (**P3**) is an unquestionable condition for increasing the efficiency and improving productivity of companies in the agricultural sector. However, it must be borne in mind that access to these digital technologies presents obstacles that, given the size of the company, cannot be overcome. Through credit policies, the government can effectively contribute to expanding access to these technologies for smaller producers. In the latest proposal (**P4**) the authors postulate that increasing the participation of women on boards means improved decision-making, a different attitude towards risk and the use of more diverse skills (Knežević et al., 2017). However, the study does not make it clear how the effective expansion of female participation would contribute to this improvement.

As a limitation of the study, the authors point out the reduced availability of data for longer time series that could reveal more accurate information regarding the profitability of companies. In addition, the use of a single database that does not consider small companies, leaving aside a significant amount of information.

Article 2 explores the relevance of environmental, social, and governance (ESG) aspects in the agribusiness sector and how these factors influence the size of agricultural enterprises. The authors conducted an empirical analysis to investigate two research hypotheses: the direct (H1) and global (H2) influence of environmental ESG actions on the size of agricultural enterprises, along with social and governance ESG factors.



The results obtained by submitting the two hypotheses to appropriate statistical models revealed, on the one hand, the components of ESG measures that have worked as a strength for the size of agricultural companies, such as: total ESG score obtained; the scoring of environmental products; the overall CSR strategy applied; the external audit for CSR sustainability; controversies over bribery, corruption, and fraud; the independence of the compensation committee and the number of employees. In addition to recommending that these factors be incorporated into the strategies developed by agricultural enterprises, the authors propose four other strategies/policies (Table 5) as contributors to sustaining the total assets of enterprises.

Table 5: Strategies/policies presented by Cristea et al. (2022).

Proposal	Strategies/Policies	Theoretical basis
EP1	Expansion of the established targets for CO2 emissions, in line with CSR actions for environmental protection	Juričková et al. (2020)
E2	Adaptation of resource mitigation policies considering imminent changes	Carlson et al. (1993); Juričková et al. (2020)
E3	Expand the extent of CSR reporting with the insertion of new items by policy makers – government	Ika et al. (2021); Pirtea et al. (2021)
E4	Make broader use of governance policies, with the establishment of diversity and opportunity targets, as well as effective anti-bribery and anti-corruption policies	Bijman et al. (2013)
E5	Consider the inclusion of women on the corporate board	Refinitiv Eikon (2021)
E6	Expand investments in technological innovations that affect the financial performance of companies	Cristea et al. (2022)

Source: Prepared by the authors.

The same caveat described in the commentary to the previous article (article 1) is made. The **EP3 proposal** by Cristea et al. (2022), once again, places the government as *a central player* in the process, with the company remaining in a passive position. Purposefully, corporations should, together with all their stakeholders, including the government, develop and keep up to date a report that encompasses the most diverse and genuine general interests. As for the **EP5** proposal, the authors advocate greater participation of women on boards and, once again, do not point out how an increase in the number of female members on corporate boards could effectively contribute to increasing the effectiveness of earnings.

In any case, the research made it possible to conclude that agricultural companies that adopt environmental, social and governance ESG measures can reap significant benefits in terms of growth and size. In addition, the importance of strengthening small and medium-sized agricultural enterprises to support Corporate Social Responsibility (CSR) initiatives and ensure sustainable resource management is highlighted (Cristea et al., 2022).

Based on the assumption that *stakeholders* are increasingly aware of the relationship between ESG and business performance, **article 3** investigates the microeconomic impact of the application of the concept on the business performance of 156 companies in the agroforestry sector in China, based



on their published reports. Overall, the results indicate that companies in the sector with higher ESG are potentially more likely to achieve higher levels of business performance.

Zeng and Jiang's (2023) research provides some recommendations on how to improve ESG microeconomic performance. Table 6 summarizes these recommendations.

Table 6: Recommendations for Chinese companies in the agroforestry sector.

Item	Recommendation	Theoretical basis
R1	Companies in China's agroforestry sector must prioritize the interests of their <i>stakeholders</i> , taking into account social and environmental benefits alongside economic benefits	Zeng and Jiang (2023)
R2	Improving efficiency in the implementation and execution of ESG by companies will promote positive communication between corporations and stakeholders, with a healthy impact on business performance	
R3	Adjustment of fiscal and financial policies by the government in order to support agroforestry companies that are committed to the disclosure of their sustainability reports	
R4	The government should establish clear and effective supervisory mechanisms, considering rights and responsibilities within the scope of ESG, contributing to increased business performance	

Source: Prepared by the authors.

Concluding their conclusions, the authors admit that, despite the efforts made to demonstrate a causal relationship between ESG and business performance, there are certain endogenous factors that have not been considered, such as the fact that the impact of ESG has a delay. The concept of ESG has only recently been introduced in China, ESG data for a few years has been generated and released retrospectively after the creation of ESG rating agencies, which can lead to errors in the study's conclusions. Finally, the authors commit to employing more effective methods to address these issues. Notwithstanding this, the authors offer valuable *insights* for companies in the agroforestry sector seeking to improve their ESG performance and, consequently, their corporate performance (Zeng & Jiang, 2023).

**Article 4** presents some practices and strategies adopted by Embrapa Soils to deal with the effects of Covid-19 during 2020, using the ESG approach. It is worth mentioning that, according to Barbosa and Machado (2013), the Brazilian Agricultural Research Corporation (EMBRAPA) has played a substantial role in increasing productivity and improving the quality of agricultural production through its innovations.

According to Jesus and Nascimento (2021), the ESG approach proved to be effective at Embrapa Soils in facing management challenges in unfavorable scenarios, especially what is expected of a company in a situation of high level of uncertainty such as the Sars-Cov-2 pandemic. The obstacles



and difficulties faced in implementing such strategies were overcome by the benefits they brought to the organization during the Covid-19 pandemic.

The authors found that the ESG strategies adopted by the company to deal with Covid-19 can be linked to all three pillars – environmental, social, economic – and not just one, which reinforces the fact that environmental, social and governance issues can be addressed jointly in the company. Jesus and Nascimento (2021) consider this relevant, since the strategies that integrate the tripod can improve the company's ability to adopt ESG, which in turn contributes to cost reduction and improves the company's ability to implement its strategies, considering the presence of a strong leadership, the ability to adapt processes and the connectivity potential of employees. In the case of Embrapa Soils in particular, these key factors are directly linked to the implementation of ESG strategies, with a direct focus on the company's institutional mission, being strictly related to Embrapa *Soils'* core business.

The authors assert that the work in question may "open the possibility for Embrapa Soils to change its annual planning, considering [...] the ESG pillars to guide their strategies" (p. 11). In addition, they believe that the adoption of ESG can significantly contribute to improving the performance of other government companies.

According to Silva and Breitenbach (2013), there is a contradiction in arguing that family farming and agribusiness are distinct, an understanding corroborated by Silva, Oliveira, Entelmann, and Carraro (2023). That said, **article 5**, drafted by Andrade and Ferraz-Almeida (2022), is based on the assumption that rural producers in the Southern Bahia Lowlands region adopt socio-productive measures aligned with ESG criteria. Based on this, the authors present the profile of rural producers and their information regarding the management of family farming planning and the use of sustainable agricultural production techniques.

However, the study has no connection with the dimensions of ESG. In their conclusions, the authors, referring to the gender aspect of the interviewees, state that "it was composed mostly of men [...]" and that "despite this gender indicator, it is necessary to highlight the effective female participation in the management of agricultural property as well as in the sharing of productive activities". Evidently, the fact that 75.5% of "property decision-making" is concentrated on the wife does not constitute alignment with any indicator of the social dimension of ESG, and is, at the very least, a matter of convenience for the actors interviewed.

There is no apparent relationship between the fact that "most producers receive benefits from public policies, such as Bolsa Família, Agroamigo, Pronaf [...]" with the subsequent statement made by the authors that "with this, it is possible to affirm that access to opportunities that promote economic growth must be inclusive and sustainable". Therefore, this attempt to connect the receipt of various benefits with any criterion of the ESG governance dimension is not sustained. Thus, once again, it is not clear to the reader what the authors, in fact, intended with this assertion.





The research also highlights the need for an ethical and sustainable approach in the agribusiness sector, considering environmental, social and governance aspects at all stages of the production process.

A limitation of this study is the use of articles only in Portuguese and English, which could have excluded relevant research in other languages. Based on this identified limitation, it is suggested that future studies incorporate a wider variety of languages to obtain a more comprehensive view of the topic.

The study aims to contribute to future research on ESG, especially in the agribusiness sector, and can help researchers, professionals and managers to understand the importance of these aspects and identify opportunities for improvement in the sector.



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